General Catalogue

Quality Management ISO 9001:2015
▶Voluntary participation in regular monitoring
DEKRA Certification
DEKRA certified

Environmental Management ISO 14001
▶Voluntary participation in regular monitoring
DEKRA Certification
DEKRA certified

Work Safety OHSAS 18001
▶Voluntary participation in regular monitoring
DEKRA Certification
DEKRA certified

50 YEARS 1967•2017

METAL WORK® PNEUMATIC

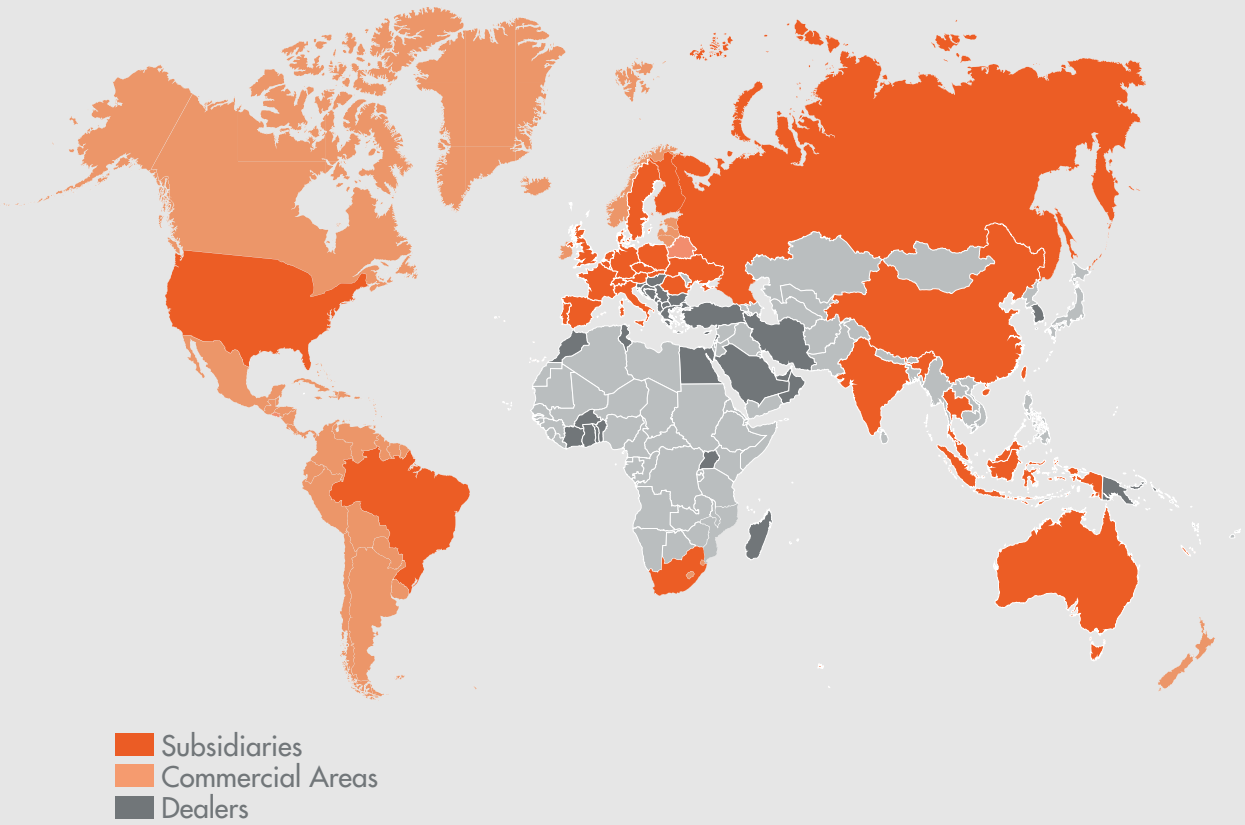
"We work together for a purpose.
There's nothing that can't be done better
today than yesterday."
Erminio Bonatti

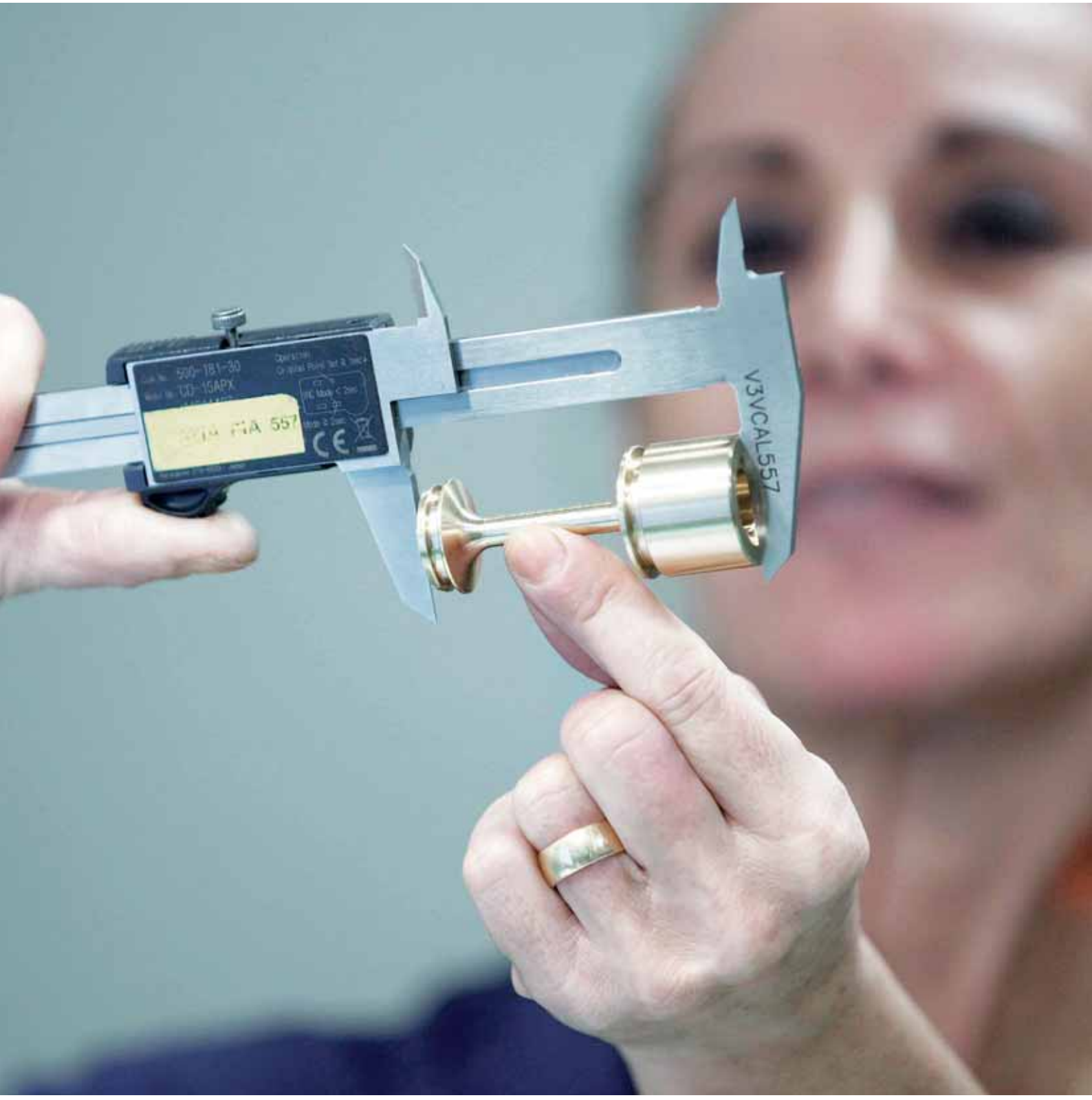
A worldwide company

Metal Work was founded in 1967 and produced push-in fittings for compressed air systems. Since then the company has gradually extended its structure and production range to become a market leader in pneumatic fittings for automation systems.

The main production plant in Concesio, near Brescia, now has a total workforce of over 400. The Italian and worldwide sales network has a further 700 employees.

Product distribution and technical assistance are entrusted to more than 46 Italian and worldwide branches that offer an extensive pre and after sales service. Product quality and an efficient commercial organisation are the basis of the Metal Work model. These qualities enable the company to meet all possible requirements in terms of pneumatic automation.

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Design, produce and distribute quality

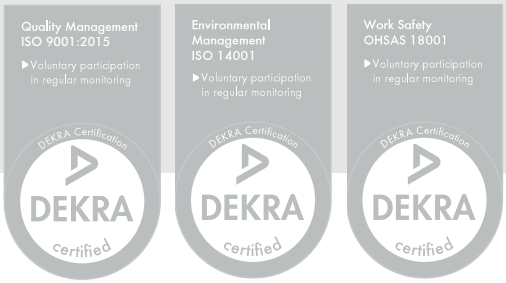
Metal Work is a vertically integrated company. This model controls the entire production cycle, from process to product engineering in a constant search for perfection. Almost the entire range is made internally starting from the choice of raw materials to final assembly. This reduces waste and shortens lead times. A critical analysis of production and testing data is carried out which brings continuous improvements to the product and the production process. "Company Wide Quality Control" is established in the company as a guarantee of continuous improvement.

Total quality

Metal Work has been ISO 9001 certified since 1992, along with ISO 14001 certification in 2000 and OHSAS 1800 certification in 2007. These awards confirm a total quality philosophy and not just for the product. An example is the attention given to energy saving starting from the design phase. The electric power needed to operate our valves has decreased in recent years by 75 percent. The certifications are not just for the parent company but are extended to all Group companies, spreading our philosophy worldwide. All products comply with the main regulations, particularly those of the European community, such as the EMC certificate for electromagnetic compatibility. Metal Work specialists are actively involved in the ISO, UNI, ASSOFLUID committees because they are always a customer guarantee of quality.

Close to the customer

Metal Work's strength lies not only in the product but in service and assistance which provides customer solutions that are suitable for every need, while meeting deadline and quality standards. The Metal Work or P Service retailer is the customer's trusted consultant and helps them solve any problem, be it technical, sourcing material or information. Metal Work also dedicates attention and resources to customer training.



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NRG

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- AUXILIARY VALVES E4
- VARIOUS ACCESSORIES E5
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DOCUMENTATION

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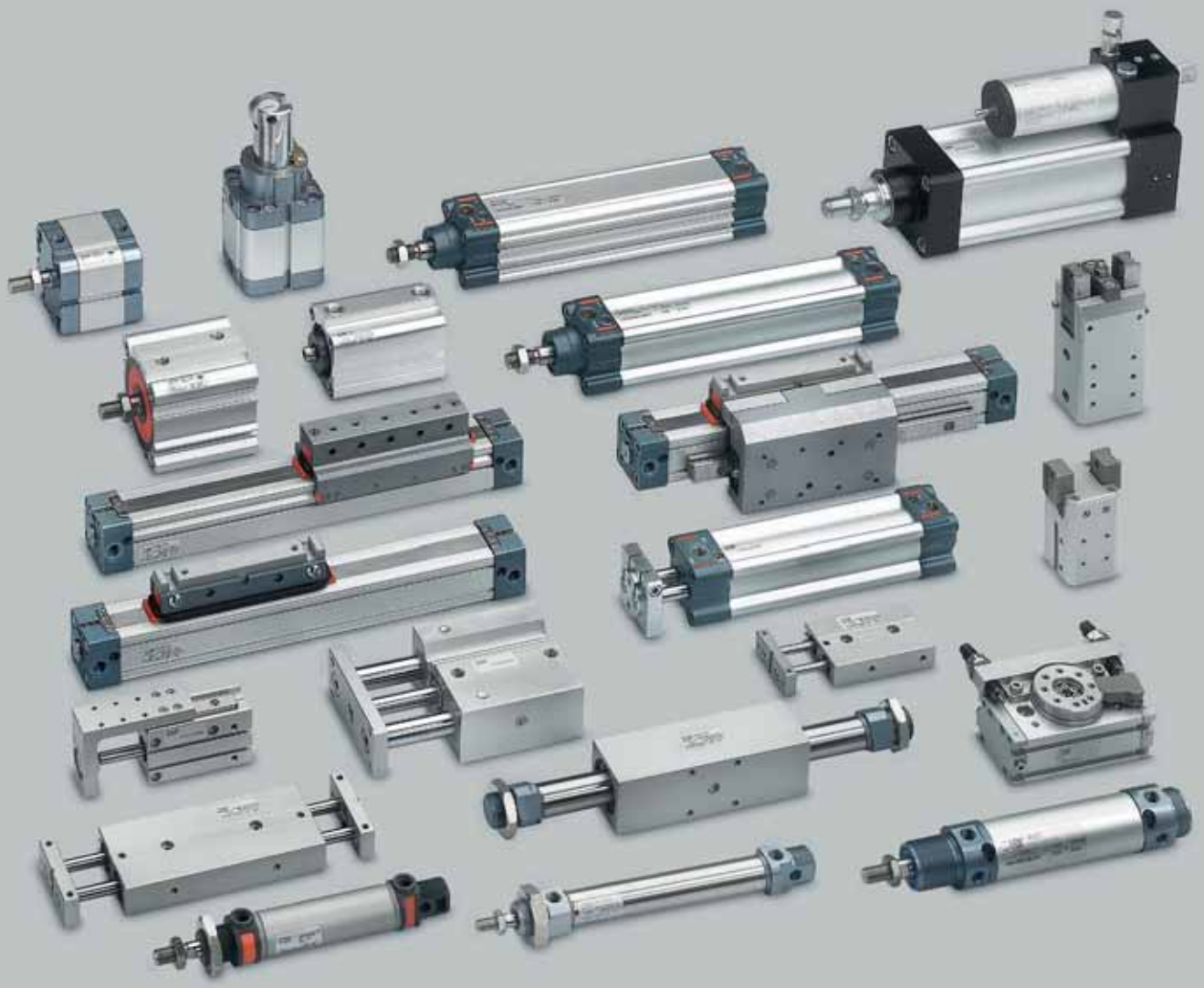
METAL WORK PNEUMATIC



ACTUATORS

- CYLINDERS A1
- GRIPPERS, ROTARY ACTUATORS, SLIDES A2
- V-Lock A3
- HYDRAULIC-PNEUMATIC A4
- ELECTRIC CYLINDER A5
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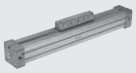

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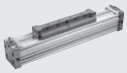

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STAINLESS STEEL CYLINDERS

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- STAINLESS STEEL ISO 15552 CYLINDER — A1.180

GENERAL TECHNICAL DATA

Compressed air
The cylinders have been designed for use with unlubricated air, in which case no maintenance is required. If lubricated air is used, lubrication must be continuous because the additional lubrication removes the lubricant applied at the factory.
With reference to ISO/DIN 8573-1, the compressed air to use is class 4-7-4, i.e.:
- Solid particles/m^3, classe 4:
  max 10.000 $1 < d < 5$ µm
- Humidity classe 7: $C_W \leq 0.5$ g/m^3
- Oil classe 4: Concentration total oil ≤ 5 mg/m^3

Gasket material
For compatibility data, please refer to **chapter Z1**.
Some families of Metal Work cylinders are available with gaskets made of different materials.
Polyurethane: the best in terms of long-life, resistance to wear and reduced friction.
Chemically compatible with:
- Pure aliphatic hydrocarbons (butane, propane, gasoline)
  Any impurities (moisture, alcohol, acid or alkaline compounds) can chemically attack polyurethane
- Mineral oil and grease (some additives can chemically attack the material)
- Silicone oil and grease
- Water up to +50°C
- Resistance to ozone and ageing

Not compatible with:
- Ketones, esters, ethers
- Alcohos, glycols
- Hot water, steam, alkali, amines, acids.
- Good elasticity down to –35°C (for low temperature PU version only).

NBR: These gaskets have a shorter life than polyurethane gaskets.
However, they are recommended for use in environments causing the formation of water condensate, such as tropical climates, where polyurethane gaskets may tend to deteriorate quickly due to hydrolysis.
Chemically compatible with:
- Methane, butane, propane, oily acids
- Aliphatic hydrocarbons
- Lubrication oils
- Gasoline

Not compatible with:
- Ozone and exposure to sunlight
- Good elasticity down to –35°C (for low temperature NBR version only)

FKM/FPM: Can withstand temperatures as high as 150°C.
This makes them ideal for use on rodless cylinders, high-speed applications, involving high temperatures at the sliding lips.
Chemically compatible with:
- Mineral oil and grease, slight swelling with oil grade ASTM no. 1and 3
- Silicon oil and grease
- Animal and vegetable oil and fat
- Aliphatic hydrocarbons (gasoline, butane, propane, natural gas)
- Aromatic hydrocarbons (benzol, toluene)
- Chlorinated hydrocarbons (tetrachloroethylene)
- Fuels
- Ozone, atmospheric agents, ageing

Not compatible with:
- Polar solvents (acetone, methylethylchetone, diethyl ether, dioxane)
- Glycol-based brake fluids
- Ammonia gas, amines, alkali
- Superheated water vapour
- Low molecular organic acids (formic and acetic acid)

No stick-slip cylinders
Standard cylinders are designed to ensure trouble-free operation under any conditions, particularly at high speed. Operation tends to be irregular and jerky at very low speeds in the presence of side loads. In this case, No stick-slip cylinders are recommended as they allow smooth operation. These versions feature specific tribological properties and preferably polyurethane gaskets.

Radial oscillation of the piston rod
These cylinders have been designed to apply forces in the direction of the axis and not to withstand side loads. If you intend to use the cylinder piston rod with side loads, the play between the piston rod and guide bushing must be taken into account. Indicatively, each 100-mm stroke corresponds to 1-mm radial oscillation measured at the end of the piston rod.
This indication refers to ISO 15552, ISO 6432 and RNDC cylinders.

Cylinder operating life
The life of cylinders depends on numerous factors including axial and radial loads, speed, frequency of use, temperature, shocks, air loss (limits).
Below are a few factors that must be taken purely as a reference.
They are not binding or guaranteed due to the variability of different factors.
Without radial load:
ISO 15552 cylinders and round cylinders with polyurethane gaskets: 15.000 km.
ISO 15552 cylinders and round cylinders with NBR gaskets: 8.000 km.
ISO 6432 cylinders, SSC cylinders and compact cylinders with polyurethane gaskets: 30 million cycles.
ISO 6432 cylinders and SSC cylinders with NRB gaskets: 15 million cycles.
Rodless cylinders: 5.000 km.

Stroke tolerances
The actual cylinder stroke has a tolerance with respect to the nominal stroke, in compliance with any applicable laws, within the following ranges:

• ISO 15552 cylinders	32 - 50	-0	+2	mm
	63 - 200	-0	+2.5	mm
	250 - 320	- 0	+ 4	mm
• ISO 6432	8 - 25	-1	+1	mm
• Round cylinders	32 - 50	-0.5	+1.5	mm
• SSC cylinders	12 - 50	-1	+1	mm
	63 - 100	-1	+1.5	mm
• Compact cylinders	12 - 100	-0.5	+1.5	mm
• Compact cylinders ISO 21287	20 - 100	-0.5	+1.5	mm
• Rodless cylinders	16 - 63	-1	+2	mm

Air loss
All the cylinders have air losses, mainly around the gaskets.
ISO 10099 establishes the maximum loss allowed in a new cylinder (see table below):

Cylinder diameter	8-10-12	16-20-25	32-40-50	63-80-100	125-160-200	250-320
Loss (Nl/hour)	0.6	0.8	1.2	2	3	5

Metal Work's own standards are more rigorous than ISO standards, but air loss still occurs.

Strokes exceeding the maximum value specified in the catalogue
Metal Work can supply cylinders with strokes greater than those specified in the catalogue, considering the production technological limits. The Metal Work Sales Department can provide you will full details. However, it is up to the end user to use these special cylinders properly, by guiding the piston rod, avoiding peak loads, etc.

Magnetic sensors
The magnetic field generated by permanent magnets housed in the piston assembly changes in shape and intensity depending on the presence of magnetic metal masses in the vicinity of the cylinder. These masses may prevent the sensors from switching correctly, in which case non-magnetic materials should be used. In particular, the tie rods of short-stroke and compact cylinders should preferably be made of stainless steel.
N.B.: for actuators having a stroke lower than 5 mm, reading difficulties may occur due to sensor hysteresis.

METAL WORK PNEUMATIC

CALCULATING PEAK LOAD ON THE PISTON ROD

During operation, the piston rod of the cylinder behaves like a rod subjected to peak load (bending + compression).
In the case of long strokes, it is necessary to make sure the diameter of the piston rod is correct for the load applied and the type of cylinder and piston rod mounting.
The following formulae can be used to do this.

A. Calculating the maximum force with a given stroke and piston rod diameter:

$$F \leq \frac{199600\ \varnothing^4}{C^2 \cdot K^2}$$

B. Calculating the minimum acceptable piston rod diameter with a given stroke and force:

$$S \geq \sqrt[4]{\frac{F \cdot C^2 \cdot K^2}{199600}}$$

Where:

F	Force applied	[N]
Ø	Diameter of the piston rod	[mm]
C	Stroke	[mm]
K	Free length coefficient depending on the mounting – see diagrams	

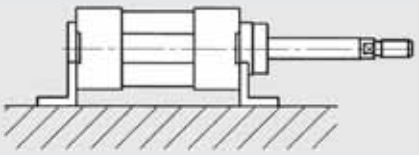
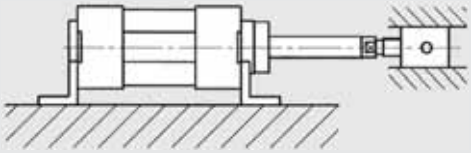
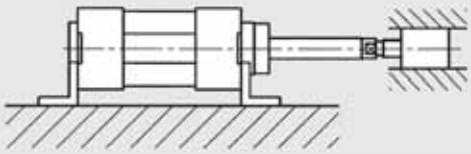
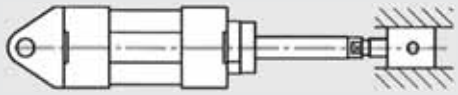
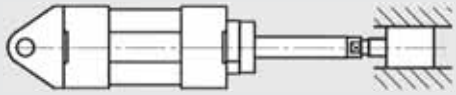
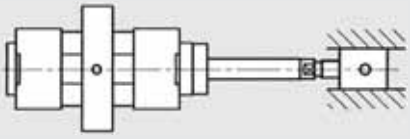
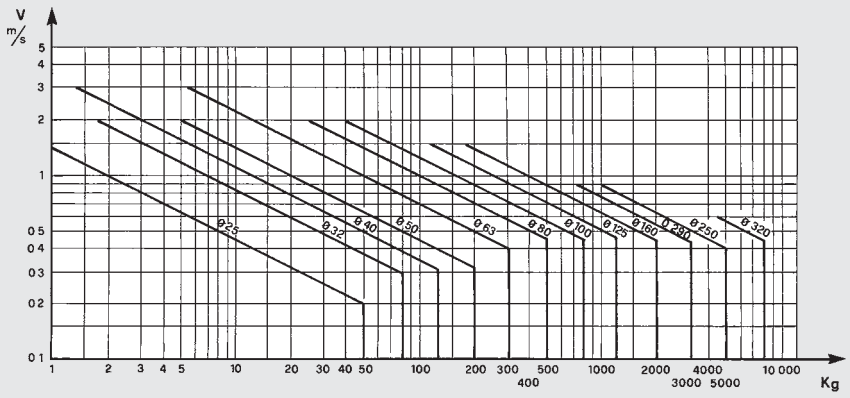
CONSTRAINT	K
	2
	0.7
	0.5
	2
	1
	1.5

CHART OF SPEED / MAXIMUM ABSORBABLE LOAD

For the cylinder to reach the end-of-stroke position without suffering damaging impact due to intensity and repetition, it is necessary to annul the kinetic energy of the moving mass and the relative work generated. The maximum absorbable load depends on the transference speed and the absorption capacity of the standard pneumatic cushion in the various cylinders. The chart gives the speed and absorbable mass in various diameters at a pressure of 6 bar, under the best regulation conditions and in a horizontal direction.



CONSUMPTION OF AIR IN THE CYLINDERS

Cylinder bore D mm	Piston rod diameter d mm	Motion	Useful area cm²	Air consumption during thrust and traction in Nl/cm of stroke, depending on the working pressure P in bar at 20°C									
				1 bar	2 bar	3 bar	4 bar	5 bar	6 bar	7 bar	8 bar	9 bar	10 bar
8	4	thrust	0.50	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050	0.0055
		traction	0.38	0.0008	0.0011	0.0015	0.0019	0.0023	0.0026	0.0030	0.0034	0.0038	0.0041
10	4	thrust	0.79	0.0016	0.0024	0.0031	0.0039	0.0047	0.0055	0.0063	0.0071	0.0079	0.0086
		traction	0.66	0.0013	0.0020	0.0026	0.0033	0.0040	0.0046	0.0053	0.0059	0.0066	0.0073
12	6	thrust	1.13	0.0023	0.0034	0.0045	0.0057	0.0068	0.0079	0.0090	0.0102	0.0113	0.0124
		traction	0.85	0.0017	0.0025	0.0034	0.0042	0.0051	0.0059	0.0068	0.0076	0.0085	0.0093
16	6	thrust	2.01	0.0040	0.0060	0.0080	0.0101	0.0121	0.0141	0.0161	0.0181	0.0201	0.0221
		traction	1.73	0.0035	0.0052	0.0069	0.0086	0.0104	0.0121	0.0138	0.0156	0.0173	0.0190
16	8	thrust	2.01	0.0040	0.0060	0.0080	0.0101	0.0121	0.0141	0.0161	0.0181	0.0201	0.0221
		traction	1.51	0.0030	0.0045	0.0060	0.0075	0.0090	0.0106	0.0121	0.0136	0.0151	0.0166
20	8	thrust	3.14	0.0063	0.0094	0.0126	0.0157	0.0188	0.0220	0.0251	0.0283	0.0314	0.0346
		traction	2.64	0.0053	0.0079	0.0106	0.0132	0.0158	0.0185	0.0211	0.0237	0.0264	0.0290
20	10	thrust	3.14	0.0063	0.0094	0.0126	0.0157	0.0188	0.0220	0.0251	0.0283	0.0314	0.0346
		traction	2.36	0.0047	0.0071	0.0094	0.0118	0.0141	0.0165	0.0188	0.0212	0.0236	0.0259
25	10	thrust	4.91	0.0098	0.0147	0.0196	0.0245	0.0295	0.0344	0.0393	0.0442	0.0491	0.0540
		traction	4.12	0.0082	0.0124	0.0165	0.0206	0.0247	0.0289	0.0330	0.0371	0.0412	0.0454
32	12	thrust	8.04	0.0161	0.0241	0.0322	0.0402	0.0483	0.0563	0.0643	0.0724	0.0804	0.0885
		traction	6.91	0.0138	0.0207	0.0276	0.0346	0.0415	0.0484	0.0553	0.0622	0.0691	0.0760
40	12	thrust	12.57	0.0251	0.0377	0.0503	0.0628	0.0754	0.0880	0.1005	0.1131	0.1257	0.1382
		traction	11.44	0.0229	0.0343	0.0457	0.0572	0.0686	0.0800	0.0915	0.1029	0.1144	0.1258
40	16	thrust	12.57	0.0251	0.0377	0.0503	0.0628	0.0754	0.0880	0.1005	0.1131	0.1257	0.1382
		traction	10.56	0.0211	0.0317	0.0422	0.0528	0.0633	0.0739	0.0844	0.0950	0.1056	0.1161
50	16	thrust	19.63	0.0393	0.0589	0.0785	0.0982	0.1178	0.1374	0.1571	0.1767	0.1963	0.2160
		traction	17.62	0.0352	0.0529	0.0705	0.0881	0.1057	0.1234	0.1410	0.1586	0.1762	0.1939
50	20	thrust	19.63	0.0393	0.0589	0.0785	0.0982	0.1178	0.1374	0.1571	0.1767	0.1963	0.2160
		traction	16.49	0.0330	0.0495	0.0660	0.0825	0.0990	0.1155	0.1319	0.1484	0.1649	0.1814
63	16	thrust	31.17	0.0623	0.0935	0.1247	0.1559	0.1870	0.2182	0.2494	0.2805	0.3117	0.3429
		traction	29.16	0.0583	0.0875	0.1166	0.1458	0.1750	0.2041	0.2333	0.2624	0.2916	0.3208
63	20	thrust	31.17	0.0623	0.0935	0.1247	0.1559	0.1870	0.2182	0.2494	0.2805	0.3117	0.3429
		traction	28.03	0.0561	0.0841	0.1121	0.1402	0.1682	0.1962	0.2242	0.2523	0.2803	0.3083
80	20	thrust	50.26	0.1005	0.1508	0.2011	0.2513	0.3016	0.3518	0.4021	0.4524	0.5026	0.5529
		traction	47.12	0.0942	0.1414	0.1885	0.2356	0.2827	0.3299	0.3770	0.4241	0.4712	0.5183
80	25	thrust	50.26	0.1005	0.1508	0.2011	0.2513	0.3016	0.3518	0.4021	0.4524	0.5026	0.5529
		traction	45.36	0.0907	0.1361	0.1814	0.2268	0.2721	0.3175	0.3628	0.4082	0.4536	0.4989
100	25	thrust	78.54	0.1571	0.2356	0.3142	0.3927	0.4712	0.5498	0.6283	0.7068	0.7854	0.8639
		traction	73.63	0.1473	0.2209	0.2945	0.3681	0.4418	0.5154	0.5890	0.6627	0.7363	0.8099
125	32	thrust	122.71	0.2454	0.3681	0.4909	0.6136	0.7363	0.8590	0.9817	1.1044	1.2271	1.3499
		traction	114.67	0.2293	0.3440	0.4587	0.5734	0.6880	0.8027	0.9174	1.0321	1.1467	1.2614
160	40	thrust	201.06	0.4021	0.6032	0.8042	1.0053	1.2063	1.4074	1.6084	1.8095	2.0106	2.2116
		traction	188.49	0.3770	0.5655	0.7540	0.9425	1.1309	1.3194	1.5079	1.6964	1.8849	2.0734
200	40	thrust	314.15	0.6283	0.9425	1.2566	1.5708	1.8849	2.1991	2.5132	2.8274	3.1415	3.4557
		traction	301.58	0.6032	0.9048	1.2063	1.5079	1.8095	2.1111	2.4127	2.7143	3.0158	3.3174
250	50	thrust	490.87	0.9817	1.4726	1.9635	2.4544	2.9452	3.4361	3.9270	4.4178	4.9087	5.3996
		traction	471.24	0.9425	1.4137	1.8850	2.3562	2.8274	3.2987	3.7699	4.2412	4.7124	5.1836
320	63	thrust	804.25	1.6085	2.4128	3.2170	4.0213	4.8255	5.6298	6.4340	7.2383	8.0425	8.8468
		traction	773.08	1.5462	2.3192	3.0923	3.8654	4.6385	5.4116	6.1846	6.9577	7.7308	8.5039

METAL WORK PNEUMATIC

FORCE OF SPRINGS IN SINGLE-ACTING CYLINDERS (THEORETICAL)

ISO 15552 single-acting cylinders

Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
32	63	250	35
40	88	250	51
50	102	250	64
63	102	250	64

Round single-acting cylinders

Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
32	86	250	34
40	95	250	50
50	108	250	62

ISO 6432 single-acting cylinders

Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
8	3	50	1
10	5	50	1
12	7	50	3
16	21	50	5
20	25	50	12
25	25	50	18

SSC single-acting cylinders

Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
12	6	25	1.5
16	7	25	3
20	12	25	4
25	14	25	5
32	33	50	6
40	45	50	15
50	70	50	20
63	81	50	25

$$P = P_1 + \frac{(P_2 - P_1)}{C_{max}} \cdot C_x$$

P_1 = Force with spring extended

P_2 = Force with spring compressed

C_x = Required stroke

C_{max} = Max stroke

Single-acting cartridge cylinders

Bore mm	Force with spring compressed N	Max. stroke mm	Force with spring extended N
6	3.7	5	–
10	7.8	5	–
16	7.2	5	–
6	3.9	10	–
10	9.6	10	–
16	13.3	10	–
6	3.9	15	–
10	9.1	15	–
16	13.3	15	–

FORCES GENERATED DURING THRUST AND TRACTION (THEORETICAL)

Cylinder bore D mm	Piston rod diameter d mm	Motion	Useful area cm²	Thrust and traction force in daN depending on the operating pressure in bar									
				1 bar	2 bar	3 bar	4 bar	5 bar	6 bar	7 bar	8 bar	9 bar	10 bar
8	4	thrust	0.50	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
		traction	0.38	0.4	0.8	1.1	1.5	1.9	2.3	2.6	3.0	3.4	3.8
10	4	thrust	0.79	0.8	1.6	2.4	3.1	3.9	4.7	5.5	6.3	7.1	7.9
		traction	0.66	0.7	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	6.6
12	6	thrust	1.13	1.1	2.3	3.4	4.5	5.7	6.8	7.9	9.0	10.2	11.3
		traction	0.85	0.8	1.7	2.5	3.4	4.2	5.1	5.9	6.8	7.6	8.5
16	6	thrust	2.01	2.0	4.0	6.0	8.0	10.1	12.1	14.1	16.1	18.1	20.1
		traction	1.73	1.7	3.5	5.2	6.9	8.6	10.4	12.1	13.8	15.6	17.3
16	8	thrust	2.01	2.0	4.0	6.0	8.0	10.1	12.1	14.1	16.1	18.1	20.1
		traction	1.51	1.5	3.0	4.5	6.0	7.5	9.0	10.6	12.1	13.6	15.1
20	8	thrust	3.14	3.1	6.3	9.4	12.6	15.7	18.8	22.0	25.1	28.3	31.4
		traction	2.64	2.6	5.3	7.9	10.6	13.2	15.8	18.5	21.1	23.8	26.4
20	10	thrust	3.14	3.1	6.3	9.4	12.6	15.7	18.8	22.0	25.1	28.3	31.4
		traction	2.36	2.4	4.7	7.1	9.4	11.8	14.1	16.5	18.8	21.2	23.6
25	10	thrust	4.91	4.9	9.8	14.7	19.6	24.5	29.5	34.4	39.3	44.2	49.1
		traction	4.12	4.1	8.2	12.4	16.5	20.6	24.7	28.9	33.0	37.1	41.2
32	12	thrust	8.04	8.0	16.1	24.1	32.2	40.2	48.3	56.3	64.3	72.4	80.4
		traction	6.91	6.9	13.8	20.7	27.6	34.6	41.5	48.4	55.3	62.2	69.1
40	12	thrust	12.57	12.6	25.1	37.7	50.3	62.8	75.4	88.0	100.5	113.1	125.7
		traction	11.44	11.4	22.9	34.3	45.7	57.2	68.6	80.0	91.5	102.9	114.4
40	16	thrust	12.57	12.6	25.1	37.7	50.3	62.8	75.4	88.0	100.5	113.1	125.7
		traction	10.56	10.6	21.1	31.7	42.2	52.8	63.3	73.9	84.4	95.0	105.6
50	16	thrust	19.63	19.6	39.3	58.9	78.5	98.2	117.8	137.4	157.1	176.7	196.3
		traction	17.62	17.6	35.2	52.9	70.5	88.1	105.7	123.4	141.0	158.6	176.2
50	20	thrust	19.63	19.6	39.3	58.9	78.5	98.2	117.8	137.4	157.1	176.7	196.3
		traction	16.49	16.5	33.0	49.5	66.0	82.5	99.0	115.5	131.9	148.4	164.9
63	16	thrust	31.17	31.2	62.3	93.5	124.7	155.9	187.0	218.2	249.4	280.6	311.7
		traction	29.16	29.2	58.3	87.5	116.6	145.8	175.0	204.1	233.3	262.5	291.6
63	20	thrust	31.17	31.2	62.3	93.5	124.7	155.9	187.0	218.2	249.4	280.6	311.7
		traction	28.03	28.0	56.1	84.1	112.1	140.2	168.2	196.2	224.2	252.3	280.3
80	20	thrust	50.27	50.3	100.5	150.8	201.1	251.3	301.6	351.9	402.1	452.4	502.7
		traction	47.12	47.1	94.2	141.4	188.5	235.6	282.7	329.9	377.0	424.1	471.2
80	25	thrust	50.27	50.3	100.5	150.8	201.1	251.3	301.6	351.9	402.1	452.4	502.7
		traction	45.36	45.4	90.7	136.1	181.4	226.8	272.1	317.5	362.9	408.2	453.6
100	25	thrust	78.54	78.5	157.1	235.6	314.2	392.7	471.2	549.8	628.3	706.9	785.4
		traction	73.63	73.6	147.3	220.9	294.5	368.2	441.8	515.4	589.0	662.7	736.3
125	32	thrust	122.72	122.7	245.4	368.2	490.9	613.6	736.3	859.0	981.7	1104.5	1227.2
		traction	114.68	114.7	229.4	344.0	458.7	573.4	688.1	802.7	917.4	1032.1	1146.8
160	40	thrust	201.06	201.1	402.1	603.2	804.2	1005.3	1206.4	1407.4	1608.5	1809.6	2010.6
		traction	188.50	188.5	377.0	565.5	754.0	942.5	1131.0	1319.5	1508.0	1696.5	1885.0
200	40	thrust	314.16	314.2	628.3	942.5	1256.6	1570.8	1885.0	2199.1	2513.3	2827.4	3141.6
		traction	301.59	301.6	603.2	904.8	1206.4	1508.0	1809.6	2111.1	2412.7	2714.3	3015.9
250	50	thrust	490.87	490.9	981.7	1472.6	1963.5	2454.4	2945.2	3436.1	3927.0	4417.8	4908.7
		traction	471.24	471.2	942.5	1413.7	1885.0	2356.2	2827.4	3298.7	3769.9	4241.2	4712.4
320	63	thrust	804.25	804.3	1608.5	2412.8	3217.0	4021.3	4825.5	5629.8	6434.0	7238.3	8042.5
		traction	773.08	773.1	1546.2	2319.2	3092.3	3865.4	4638.5	5411.6	6184.6	6957.7	7730.8

METAL WORK PNEUMATIC

WEIGHT OF CYLINDERS

Mini-cylinders series ISO 6432				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
8	40	0.234	55	0.334
10	41	0.257	59	0.371
12	77	0.419	111	0.635
16	93	0.491	133	0.708
20	181	0.732	233	1.121
25	241	1.100	334	1.722

Mini-cylinders ISO 6432 series TP				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
16	66	0.377	101	0.604
20	94	0.628	131	1.03
25	144	0.908	207	1.536

Cylinder series ISO 15552, ISO 15552 TWO-FLAT				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	433	2.20	494	3.09
40	660	3.15	783	4.73
50	1087	4.57	1348	7.04
63	1443	5.03	1718	7.44
80	2815	7.49	3260	10.16
100	3897	8.79	4425	12.33
125	6988	13.42	8040	18.00
160	12979	22.92	13800	30.00
200	17000	28.00	18000	39.00
250	29285	39.00	32640	51.00
320	49100	62.00	58000	71.00

Cylinder series ISO 15552 type A, ISO 15552 type A TWO-FLAT				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	460	3.09	576	3.98
40	716	4.08	916	5.66
50	1155	5.86	1513	8.33
63	1524	5.92	1945	8.33
80	2886	9.07	3520	11.74
100	3965	9.48	4779	13.02
125	7093	14.11	8642	18.69

Cylinder ISO 15552 series 3				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	434	2.30	495	3.19
40	660	3.22	783	4.80
50	1079	4.50	1340	6.97
63	1427	4.78	1702	7.24
80	2774	6.73	3219	10.58
100	3836	7.73	4364	11.58
125	6529	11.63	7581	17.94

Cylinder ISO 15552 Ultra-low frictions		
Ø	Single-rod	
	Weight [g] Stroke = 0	Weight [g] each mm
32	504	2.30
40	774	3.22
50	1245	4.50
63	1697	4.78

Twin-rod cylinder series TWNC				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	725	2.57	790	3.79
40	945	2.81	1065	4.03
50	1499	3.96	1737	5.72
63	2360	5.72	2628	8.85
80	4300	9.59	4730	15.52
100	6270	10.89	6775	16.80

ISO 21287 cylinder series LINER				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
20	98	2.49	110	3.10
25	119	2.63	133	3.24
32	182	3.62	197	4.50
40	228	4.09	243	4.98
50	330	5.67	355	7.25
63	461	6.52	487	8.10
80	991	10.11	1066	12.58
100	1869	13.78	2029	17.63

Compact cylinder series CMPC								
Ø	Single-rod		Through-rod		Non-ratating		Through-rod non-rotating	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
12	96	1.59	104	1.82	105	1.90	114	2.12
16	105	1.51	124	1.90	109	1.81	129	2.20
20	171	2.35	204	2.95	181	2.78	214	3.39
25	201	2.73	233	3.32	220	3.15	252	3.76
32	246	3.17	282	4.05	306	3.96	343	4.84
40	370	4.41	408	5.29	457	5.20	495	6.08
50	552	6.42	605	7.98	709	7.64	768	9.21
63	779	7.34	656	8.90	977	8.56	1054	10.13
80	1468	12.57	1624	15.02	1851	14.33	2027	16.78
100	2988	16.11	3100	19.93	3710	17.87	3850	21.70

Compact cylinder series CMPC TWO-FLAT				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	261	3.17	297	4.05
40	394	4.41	432	5.29
50	595	6.42	648	7.98
63	845	7.34	129	8.90
80	1524	12.57	1680	15.02

Compact Stopper cylinder		
Ø x Stroke	Trunnion version	Roller version
	Weight [g]	Weight [g]
20x15	210	220
32x20	420	460
50x30	1190	1300
80x30	-	4500
80x40	-	4750

Round cylinder series RNDC				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	404	1.44	455	2.04
40	660	1.58	808	3.14
50	1235	3.59	1507	6.03

Compact guided cylinder				
Ø	Non-cushioned (approximate)		Cushioned (approximate)	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
16	295	4.77	414	4.77
20	486	6.38	543	6.38
25	550	10.01	735	10.01
32	942	16.51	1354	16.51
40	1028	18.04	1479	18.04
50	1355	23.76	1949	23.76
63	1900	32.56	2714	32.56
80	3910	55.77	-	-
100	5710	73.48	-	-

Short-stroke cylinder series SSCY								
Ø	Single-rod		Through-rod		Non-ratating		Oscillating	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
12	45	1.24	52	1.47	64	1.35	-	-
16	63	1.65	72	2.05	88	1.6	-	-
20	91	2.14	104	2.75	126	2.37	-	-
25	144	3.04	167	3.65	189	3.25	-	-
32	185	4.14	200	4.72	260	4.56	272	4.14
40	275	5.05	295	5.94	373	5.49	386	5.05
50	412	7.09	437	8.9	592	7.89	620	7.09
63	587	9.32	621	10.91	854	10.57	889	9.32
80	393	14.41	1485	16.9	1740	25.87	-	-
100	673	21.94	2841	25.9	2692	30.77	-	-

Rodless cylinder								
Ø	Standard		Series Double		with ball recirculating Guide		with Guida "V"	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
16	244	0.86	561	1.72	460	1.79	-	-
25	746	1.79	1607	3.58	1421	2.99	953	1.98
32	1707	3.84	3737	7.68	3025	5.04	2150	3.21
40	2911	5.55	–	–	4434	6.75	3210	4.67
63 (Std)	7280	9.22	–	–	10860	10.65	9230	9.27
63 (Heavy)	–	–	–	–	13275	14.02	-	-

Rodless cylinder series PU						
Ø	Standard		with ball recirculating Guide		with Guida "V"	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
25	1009	2.54	-	-	-	-
32	1535	3.72	-	-	-	-
40	2702	4.78	-	-	-	-
50	4875	7.50	7550	8.90	7450	7.50

Rodless cylinder series MAGNETIC SLIDE		
Ø	Weight [g] Stroke = 0	Weight [g] each mm
16	490	0.262
20	795	0.325
25	1250	0.487

Guide unit				
Ø	Type GDS		Type GDH and GDM	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
12	150	0.78	374	0.78
16	150	0.78	374	0.78
20	420	1.22	759	1.22
25	420	1.22	759	1.22
32	772	1.76	1200	1.76
40	1000	1.76	2000	3.13
50	1900	3.13	3300	4.90
63	2300	3.13	4750	4.90
80	3800	4.90	8500	7.26
100	7000	4.90	12000	7.26

Stainless steel ISO 6432 Mini-cylinders				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
16	140	0.50	150	0.90
20	310	0.70	335	1.20
25	410	1.10	445	1.90

Stainless steel round cylinders RNDC				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	825	1.50	880	2.70
40	1460	2.40	1590	4.50
50	2250	4.10	2670	7.00
63	3280	4.60	3530	7.50

Stainless steel ISO 15552 cylinders				
Ø	Single-rod		Through-rod	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
32	1366	2.4	1467	3.3
40	1885	3.2	203	4.8
50	2837	5.5	3103	8.0
63	4347	5.9	4647	8.4
80	7485	10.8	799	16.3
100	11332	13.9	12033	17.8
125	18259	20.9	19432	27.2

ISO 6432 MINI-CYLINDER SERIES STD

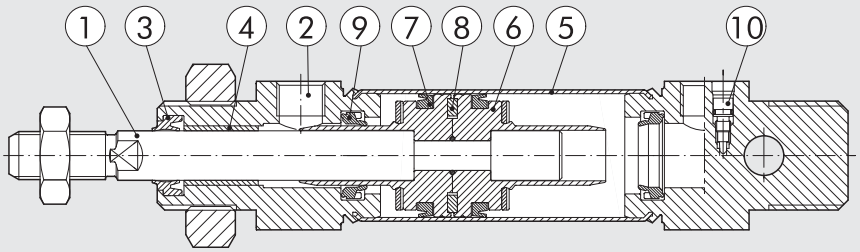
Mini-cylinders to ISO 6432 with a chamfered stainless steel barrel.
The cylinder head dimensions have been reduced for some sizes so that they can be used where there are space restrictions.
Can be used with different types of sensors.
Available in various versions with a wide range of accessories:

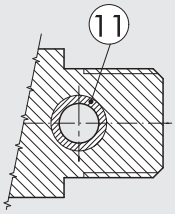
- with or without magnet
- single acting extended, retracted or through piston rod
- double acting, single or through piston rod
- with pneumatic cushioning (Ø 16-20-25)
- gaskets made of NBR, POLYURETHANE, and FKM/FPM (for high temperatures), and low-temperature gaskets
- special executions on request
- fixing accessories, guide units and mechanical rod locking

TECHNICAL DATA		Polyurethane	NBR	FKM/FPM	Low temperature
Max operating pressure	bar	10			
	MPa	1			
Temperature range	°C	–10 to +80	–10 to +80	–10 to +150 (non-magnetic cylinders)	–35 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous			
Bores	mm	8; 10; 12; 16; 20; 25			
Design		Chamfered barrel			
Standard strokes ✚	mm	Single-acting: for bores Ø 8 to 25 strokes from 1 to 50			
		Double-acting: for bores Ø 8 to 10 strokes from 1 to 100			
		for bores Ø 12 to 16 strokes from 1 to 200			
		for bores Ø 20 to 25 strokes from 1 to 500			
		Double-acting, cushioned: for bores Ø 16 strokes from 1 to 300			
		for bores Ø 20 to 25 strokes from 1 to 500			
Versions		Double-acting, Double-acting cushioned, Single-acting extended or retracted rod, Through-rod, Through-rod cushioned, Version with piston rod block, No stick-slip			
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request.			
Inrush pressure		Ø 8	Ø 10	Ø 12	Ø 16	Ø 20	Ø 25
single piston rod	bar	0.8	0.8	0.8	0.6	0.6	0.6
through-rod	bar	1	1	1	0.8	0.8	0.8
Forces generated at 6 bar thrust/retraction		See cylinder "**General technical data**" at the beginning of the chapter			
Weights		See cylinder "**General technical data**" at the beginning of the chapter			
Notes		**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.**			
		✚ Maximum recommended strokes. Higher values can create operating problems			

COMPONENTS

① PISTON ROD: C45 steel or stainless steel, thick chromed
② HEAD: anodised aluminium alloy
③ PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
④ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑤ BARREL: AISI 304 steel
⑥ HALF-PISTON: acetal resin
⑦ PISTON GASKET: polyurethane, NBR or FKM/FPM
⑧ MAGNET: plastoneodymium
⑨ CUSHIONING GASKET: NBR or FKM/FPM
⑩ NEEDLE: OT 58 with needle out movement safety system even when fully open
⑪ BUSHING (optional): self-lubricating bronze

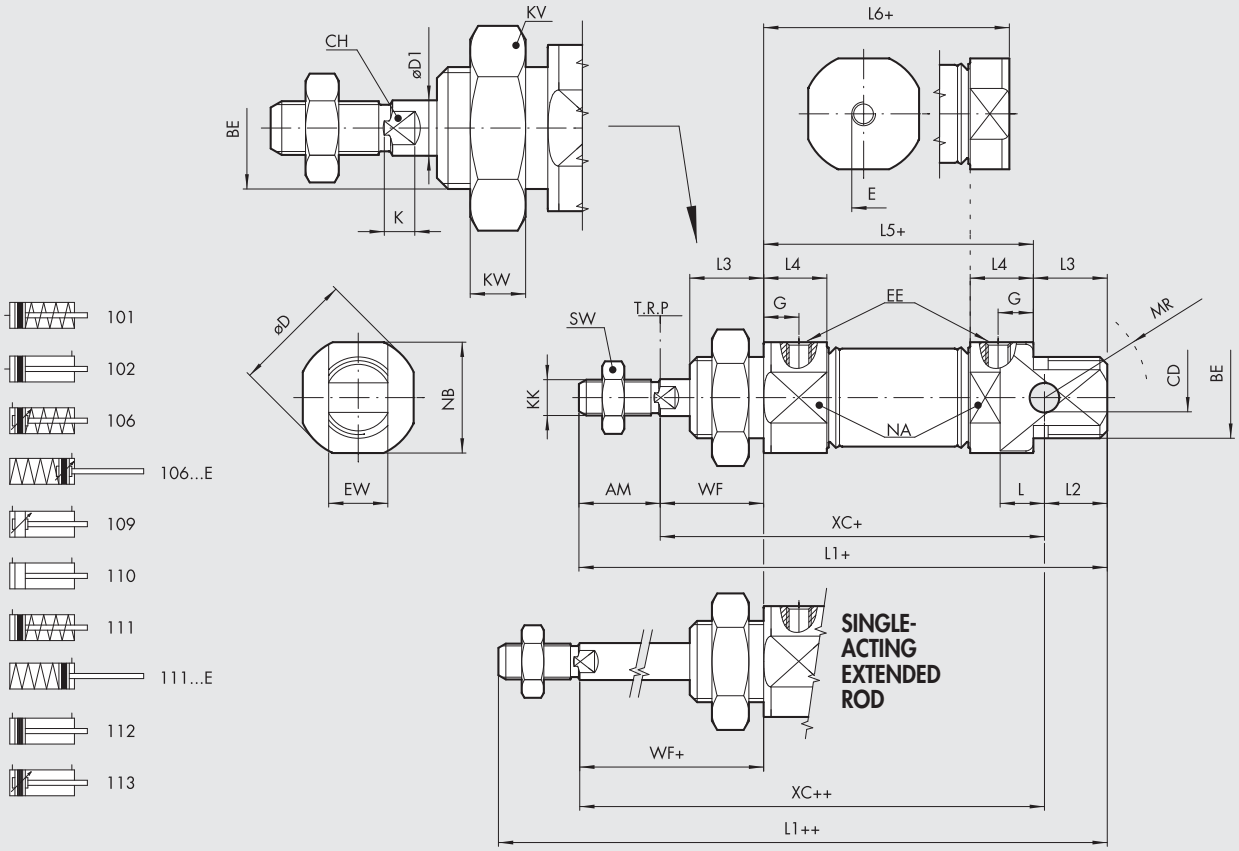




METAL WORK PNEUMATIC

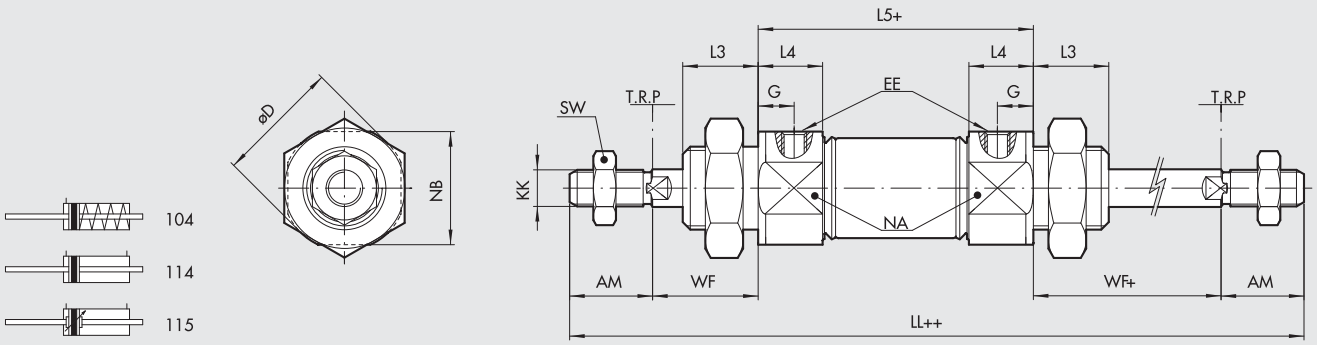
DIMENSIONS

STANDARD VERSION



+ = ADD STROKE
++ = ADD TWICE THE STROKE

THROUGH-ROD VERSION



Ø	AM +0.0;-2.0	BE	øCD H9	øD	øD1	E	G	EE	EW d13	L	LL	L1	L2	L3	L4	L5	L6	KK	XC ±1	WF ±1,2	KW	KV	MR	NA	NB	SW	CH	K
8	12	M12x1.25	4	16.7	4	M5	6	M5	8	6.5	102	86	10	12	10	46	46	M4	64	16	7	19	12	15	15	7	3	3
10	12	M12x1.25	4	16.7	4	M5	6	M5	8	6.5	102	86	10	12	10	46	46	M4	64	16	7	19	12	15	15	7	3	3
12	16	M16x1.5	6	19	6	M5	6	M5	12	9	125	104	13	17	10	49	47	M6	75	22	8	24	16	17	17	10	5	3.5
16	16	M16x1.5	6	19.7	6	1/8	6	M5	12	9	132	111	13	17	10	56	53	M6	82	22	8	24	16	18	18	10	5	3.5
20	20	M22x1.5	8	27.9	8	1/8	8	G 1/8	16	12	156	129	14	17	15.5	68	61	M8	95	24	7	32	18	24	24	13	7	4.6
25	22	M22x1.5	8	33	10	1/8	9	G 1/8	16	12	173	143	17	20	17.1	73	66.5	M10x1.25	104	28	7	32	21	30	30	17	8	5

VERSION 106...E (SINGLE-ACTING EXTENDED ROD, CUSHIONED)
VERSION 111...E (SINGLE-ACTING EXTENDED ROD)

Ø	Stroke	L1	L5	XC
16	0 - 25	115.4	60.4	86.4
16	26 - 50	135.4	80.4	106.4

Ø	Stroke	L1	L5	XC
20	0 - 25	133.4	72.4	99.4
20	26 - 50	154.4	93.4	120.4

Ø	Stroke	L1	L5	XC
25	0 - 25	146.1	76.1	107.1
25	26 - 50	169	99	130

KEY TO CODES

CYL	1 1 2 TYPE	0	16 BORE	0020 STROKE	C MATERIAL	P GASKETS	▶ E
	101 SE axial coupling **102** DEM axial coupling **104** SE through-rod ■◀ **106** SE cushioned ■ **109** DEA **110** DE ◀ **111** SE **112** DEM ■ **113** DEMA ✱▼ **114** DEM through-rod ✱▼■ **115** DEMA through-rod ◆ **116** DEM for mechanical lock ■ **117** DEMA for mechanical lock	**0** Standard **U** Bronze rear head bushing **V** Without head nut **S** Non-magnetic ▲ **G** No stick-slip	▼ 08 ▼ 10 ▼ 12 16 20 25	For the maximum suppliable strokes, look at the technical data	**A** C45 chrome rod, aluminium piston **C** C45 chrome rod, technopolymer piston **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**P** Polyurethane **N** NBR ● **V** FKM/FPM ● **B** Low temperature	**E** Single-acting extended rod

DE: Double-acting (non-cushioned, not magnetic)
DEM: Magnetic double-acting (non-cushioned)
DEMA: Magnetic double-acting (cushioned)
DEA: Cushioned double-acting (non-magnetic)
SE: Single-acting (magnetic)

● Only available for non-magnetic versions (S) and with aluminium piston (A or Z)
▲ **For speeds lower than 0.2m/s, to prevent surging. Use no-lubricated air only**
▼ Stainless steel piston rod
■ Available from Ø 16
◆ Available from Ø 12
✱ For ø16 to 25 aluminium piston, stainless stell piston rod
◀ 106... single-acting retracted rod, cushioned
106...E single-acting extended rod, cushioned available in Ø 16 - Ø 20 - Ø 25
111... single-acting retracting piston rod
111...E single-acting extended piston rod, available in Ø 16 - Ø 20 - Ø 25
▶ Letter to be added only to the single acting extended rod version

NOTES

ISO 6432 MINI-CYLINDER SERIES TP

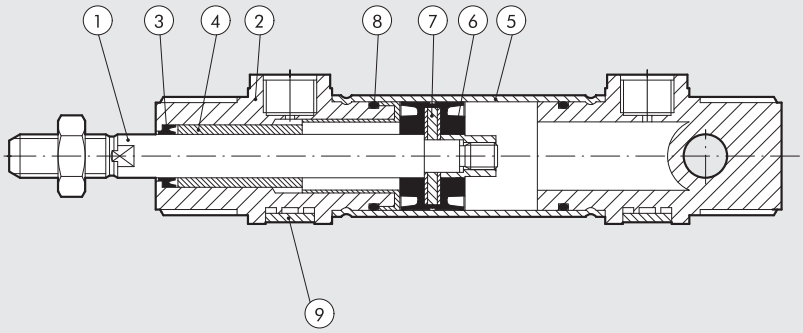
Minicylinders manufactured according to the ISO 6432 regulation having high resistance technopolymer heads and anodized aluminium liner.
Available in various versions with a wide range of accessories:

- with or without magnet
- single and double acting-single or through rod
- gaskets made of POLYURETHANE
- fixing accessories and guide units.

TECHNICAL DATA		POLYURETHANE		
Max operating pressure	bar	10		
	MPa	1		
Temperature range	°C	–10 to +60		
Fluid		Unlubricated air. Lubrication, if used, must be continuous		
Bores	mm	16; 20; 25		
Design		Aluminium liner chamfered on the heads		
Standard strokes ✚	mm	Ø 16: from 1 to 200		
	mm	Ø 20 to 25: from 1 to 500		
Versions		Double-acting, Double Through-rod (for both there are magnetic and non magnetic versions)		
Forces generated at 6 bar thrust/retraction		See cylinder "**General technical data**" at the beginning of the chapter		
Weights		See cylinder "**General technical data**" at the beginning of the chapter		
Inrush pressure		Ø 16	Ø 20	Ø 25
single piston rod	bar	0.6	0.6	0.6
through-rod	bar	0.8	0.8	0.8
Notes		The standard version is lacking of the head nut.		
		Use of fittings with a taper thread is NOT recommended.		
		✚ Maximum recommended strokes. Higher values can create operating problems		

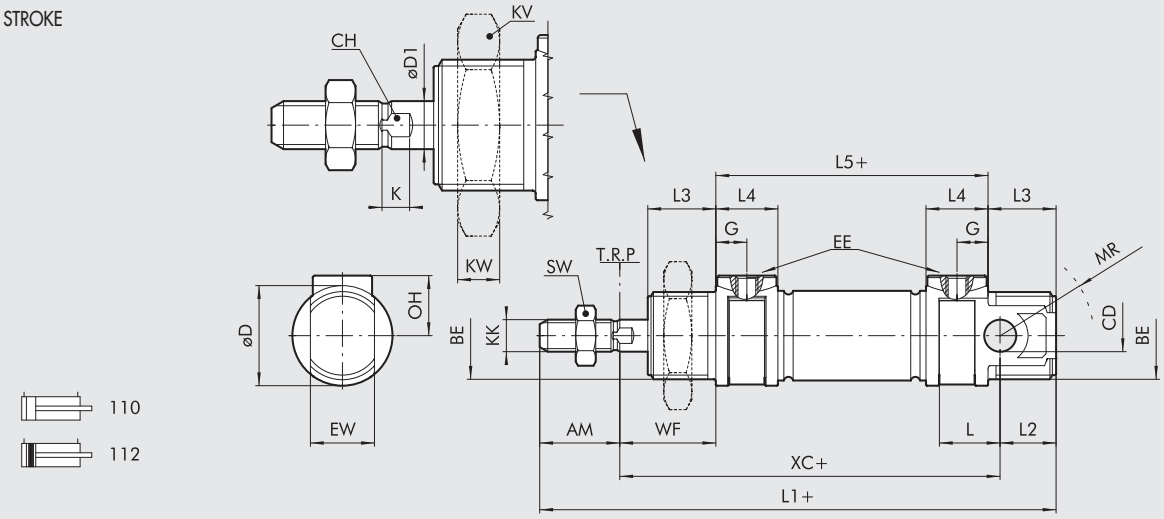
COMPONENTS

① PISTON ROD: C45 steel or stainless steel, thick chromed
② HEADS: high resistance technopolymer
③ PISTON ROD GASKET: polyurethane
④ GUIDE OPERATOR: technopolymer
⑤ BARREL: drawn anoside aluminium alloy
⑥ PISTON GASKET: polyurethane
⑦ MAGNET: plastoneodymium
⑧ STATIC O-RINGS: NBR
⑨ COVER PLATE: technopolymer



DIMENSIONS OF STANDARD VERSIONS

+ = ADD STROKE

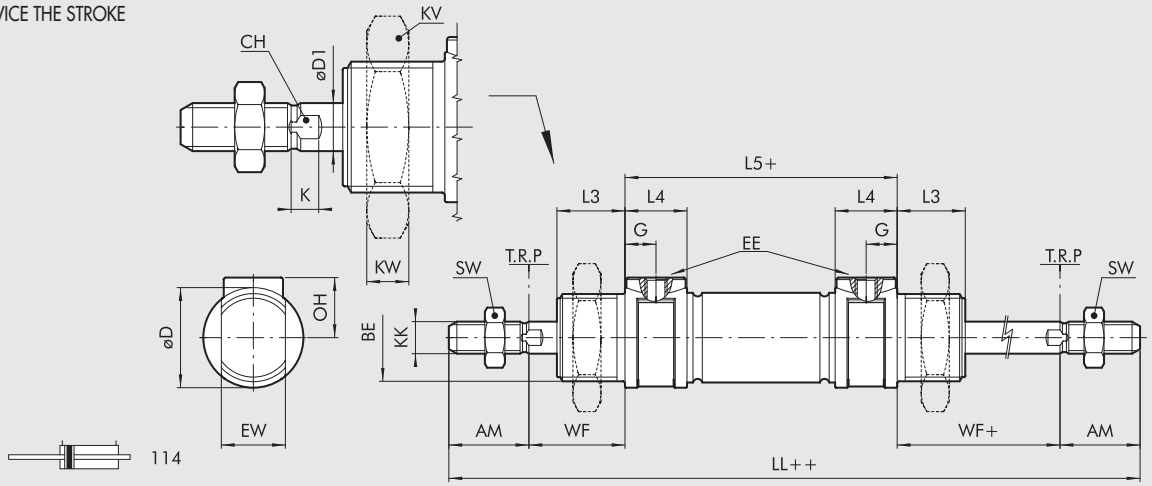


Ø	AM	BE	CD (H9)	øD	øD1	G	EE	EW (d13)	OH	L	L1	L2	L3	L4	L5	KK	XC(±1)	WF	KW	KV	MR	SW	CH	K
16	16	M16x1.5	6	21	6	4.7	M5	12	12	11	111	13	17	9.5	56	M6	82	22	8	24	16	10	5	3.5
20	20	M22x1.5	8	25	8	7.7	1/8"	16	16	15	129	14	17	15.5	68	M8	95	24	7	32	18	13	7	4.6
25	22	M22x1.5	8	30	10	7.7	1/8"	16	17	15	143	17	20	15.5	73	M10x1.25	104	28	7	32	21	17	8	5.5

MAX LOCKING TORQUE [Nm]		
Ø	BE (front/rear)	EE
16	12/8	1.2
20	22/15	3
25	22/15	3

DIMENSIONS OF STANDARD VERSIONS WITH THROUGH-ROD

+ = ADD STROKE
++ = ADD TWICE THE STROKE



Ø	AM	BE	øD	øD1	G	EE	OH	LL	L3	L4	L5	KK	WF	KW	KV	SW	CH	K
16	16	M16x1.5	21	6	4.7	M5	12	132	17	9.5	56	M6	22	8	24	10	5	3.5
20	20	M22x1.5	25	8	7.7	1/8"	16	156	17	15.5	68	M8	24	7	32	13	7	4.6
25	22	M22x1.5	30	10	7.7	1/8"	17	173	20	15.5	73	M10x1.25	28	7	32	17	8	5.5

MAX LOCKING TORQUE [Nm]		
Ø	BE	EE
16	12	1.2
20	22	3
25	22	3

KEY TO CODES

CYL	1 1 0	3	16	0	020	C	P
	TYPE		**BORE**		**STROKE**	**MATERIAL**	**GASKETS**
	110 DE non-magnetic minicylinder **112** DEM minicylinder **114** DEM through-rod minicylinder	● **3** TP heads (standard) **4** TP heads (standard) + head nut	■ 16 20 25	**0** Standard **S** Non-magnetic	For the maximum suppliable strokes, look at the technical data	**C** C45 chrome rod **X** Stainless rod	**P** Polyurethane

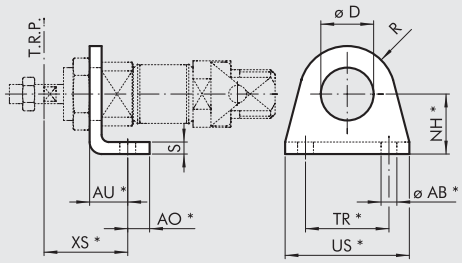
DE: Double-acting (non-cushioned, not magnetic).
DEM: Double action magnetic (unless otherwise specified) not cushioned.

As standard the cylinders are already No stick-slip version.
● This version don't provide the nut on the head.
■ Ø 16 will be only in version with stainless rod (X).

ACCESSORIES FOR ISO 6432 MINI-CYLINDERS

FIXINGS

FOOT MODEL A

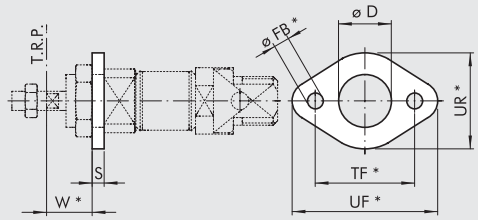


Code	Ø	ø D	XS ±1.4	AU	AO	NH ±0.3	TR Js14	US	ø AB H13	R	S	Weight [g]
W0950080001	8	12	24	11	5	16	25	35	4.5	10	3	22
W0950080001	10	12	24	11	5	16	25	35	4.5	10	3	22
W0950120001	12	16	32	14	6	20	32	42	5.5	13	4	42
W0950120001	16	16	32	14	6	20	32	42	5.5	13	4	42
W0950200001	20	22	36	17	8	25	40	54	6.5	20	5	90
W0950200001	25	22	40	17	8	25	40	54	6.5	20	5	90

*ISO 6432 values

Note: Individually packed

FLANGE MODEL C

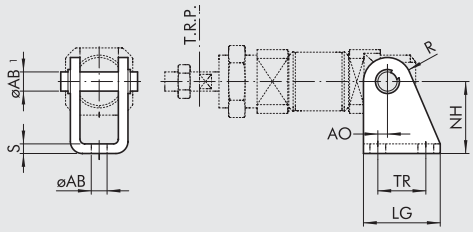


Code	Ø	ø D	W ±1.4	ø FB H13	TF Js14	UF	UR	S	Weight [g]
W0950080002	8	12	13	4.5	30	40	22	3	10
W0950080002	10	12	13	4.5	30	40	22	3	10
W0950120002	12	16	18	5.5	40	52	30	4	26
W0950120002	16	16	18	5.5	40	52	30	4	26
W0950200002	20	22	19	6.5	50	66	40	5	52
W0950200002	25	22	23	6.5	50	66	40	5	52

*ISO 6432 values

Note: Individually packed

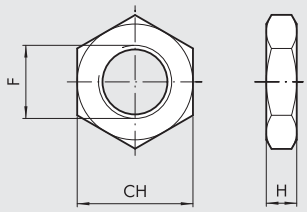
COUNTER-HINGE MODEL BC



Code	Ø	AO	LG	TR Js13	NH ±0.2	MO	ø AB1	ø AB H13	R	S	Weight [g]
W0950080005	8	2.5	22	12.5	24	18	4	4.5	6	2.5	24
W0950080005	10	2.5	22	12.5	24	18	4	4.5	6	2.5	24
W0950120005	12	2	25	15	27	25	6	5.5	7	3	40
W0950120005	16	2	25	15	27	25	6	5.5	7	3	40
W0950200005	20	4	32	20	30	30	8	6.5	10	4	78
W0950200005	25	4	32	20	30	30	8	6.5	10	4	78

Note: Supplied complete with 1 pin and 2 snap rings

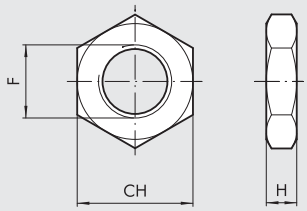
NUT FOR HEADS MODEL D



Code	Ø	F	CH	H	Weight [g]
0950080010	8	M12x1.25	19	7	12
0950080010	10	M12x1.25	19	7	12
0950120010	12	M16x1.5	24	8	20
0950120010	16	M16x1.5	24	8	20
0950200010	20	M22x1.5	32	7	44
0950200010	25	M22x1.5	32	7	44

Note: Individually packed

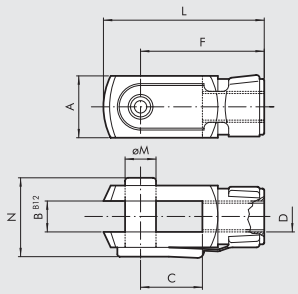
NUT FOR PISTON RODS MODEL DA



Code	Ø	F	CH	H	Weight [g]
0950080011	8	M4	7	3	0.6
0950080011	10	M4	7	3	0.6
0950120011	12	M6	10	4	1
0950120011	16	M6	10	4	1
0950200011	20	M8	13	5	3
0950322010	25	M10x1.25	17	6	7

Note: Individually packed

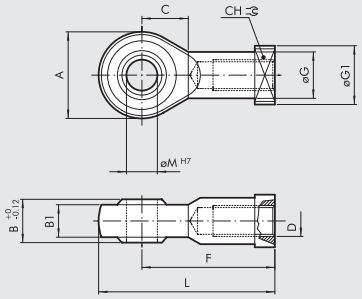
FORK MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0950080020	8	4	8	4	8	21	16	M4	11	8
W0950080020	10	4	8	4	8	21	16	M4	11	8
W0950120020	12	6	12	6	12	31	24	M6	16	20
W0950120020	16	6	12	6	12	31	24	M6	16	20
W0950200020	20	8	16	8	16	42	32	M8	22	48
W0950322020	25	10	20	10	20	52	40	M10x1.25	26	92

Note: Individually packed

ROD EYE MODEL GA-M



Code	Ø	øM	C	B	B1	A	L	F	D	øG	øG1	CH	Weight [g]
W0950080025	8	5	10	8	6	18	36	27	M4	9	11	9	22
W0950080025	10	5	10	8	6	18	36	27	M4	9	11	9	22
W0950120025	12	6	11	9	6.75	20	40	30	M6	10	13	11	28
W0950120025	16	6	11	9	6.75	20	40	30	M6	10	13	11	28
W0950200025	20	8	13	12	9	24	48	36	M8	12.5	16	14	50
W0950322025	25	10	15	14	10.5	28	57	43	M10x1.25	15	19	17	78

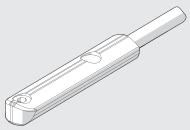
Note: Individually packed

ACCESSORIES FOR ISO 6432 MINI-CYLINDERS: MAGNETIC SENSORS

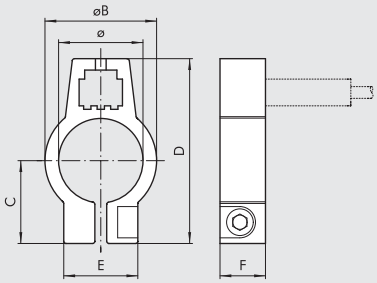
Ⓔ RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, OVAL TYPE
Traditional



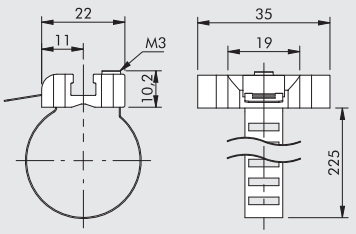
Ⓕ SENSOR CIRCLIP MOD. DSW



Code	Bore	Model	Ø	øB	C	D	E	F
W0950000608	8	Circlip DSW - 08	9.3	12.3	11	24	12.3	9
W0950000610	10	Circlip DSW - 10	11.3	14.3	12	26	12.3	9
W0950000612	12	Circlip DSW - 12	13.3	16.3	13	28	12.3	9
W0950000616	16	Circlip DSW - 16	17.3	20.3	15.5	32	12.3	9
W0950000620	20	Circlip DSW - 20	21.3	24.3	17.5	36	14	9
W0950000625	25	Circlip DSW - 25	26.3	29.3	20	41.5	14	9

Note: Individually packed

Ⓖ UNIVERSAL SENSOR CIRCLIP



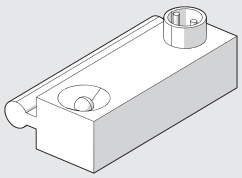
Code	Bore	Model
W0950001103	8 to 25	Sensor circlip

Note: Individually packed
MATERIAL
Circlip: stainless steel
Sensor holder: zamak

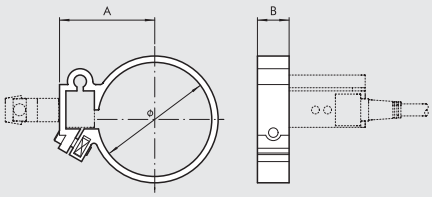
METAL WORK PNEUMATIC

Ⓐ SENSOR SERIES DSM

For codes and technical data, see **chapter A6**.



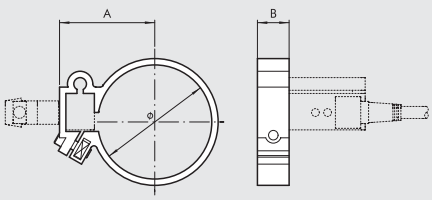
Ⓑ SENSOR CIRCLIP MOD. DXF FOR STAINLESS STEEL BARREL



Code	Bore	Model	Ø	A	B
W0950000508	8	Circlip DXF - 09	9.3	15	10
W0950000510	10	Circlip DXF - 11	11.3	16.5	10
W0950000512	12	Circlip DXF - 13	13.3	17.5	10
W0950000516	16	Circlip DXF - 17	17.3	18.5	10
W0950000520	20	Circlip DXF - 21	21.3	21	10
W0950000525	25	Circlip DXF - 26	26.3	23.5	10

Note: Individually packed

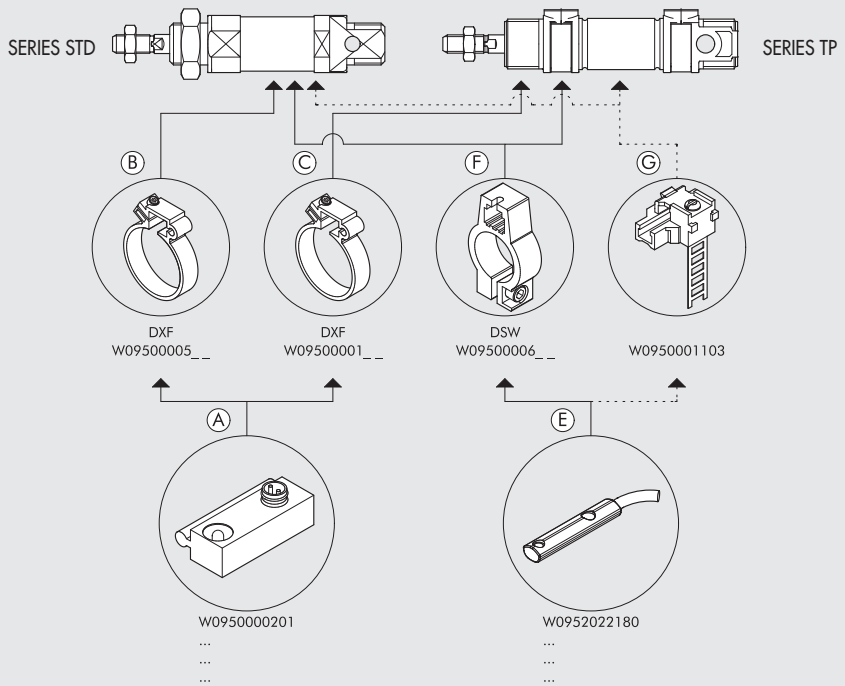
Ⓒ SENSOR CIRCLIP MOD. DXF FOR ALUMINIUM BARREL



Code	Bore	Model	Ø	A	B
W0950000108	8	Circlip DXF 12- 8	12	17	10
W0950000110	10	Circlip DXF 14-10	14	18	10
W0950000112	12	Circlip DXF 16-12	16	19	10
W0950000116	16	Circlip DXF 20-16	20	21	10
W0950000120	20	Circlip DXF 24-20	24	23	10
W0950000125	25	Circlip DXF 29-25	29	28	10

Note: Individually packed. For the Ø16 in addition to the circlip 2 reduction rings, for the Ø20 and Ø25 1 reduction ring.

USE SENSORS



ACCESSORIES FOR ISO 6432 MINI-CYLINDERS: MECHANICAL PISTON ROD LOCK

TECHNICAL DATA

Operating pressure	bar	3 to 6
	MPa	0.3 to 0.6
Temperature range	°C	-10 to +80
Installation		In any position
Mechanics		Double pad with mechanical locking
		Mechanical stick-slip
Operation		NC bidirectional
Fluid		Lubricated or unlubricated compressed air
Locking force		Ø 12-16: 180 N / Ø 20: 250 N
		Ø 25: 400 N
Pilot port		M5
MATERIALS		
body		Aluminium
pad		Brass
spring		NBR
piston		Synthetic, with added teflon®
gasket		NBR

OPERATING PRINCIPLE

The mechanical piston rod lock is a normally-closed mechanism.
In the absence of pneumatic piloting, the two pads (A) lock the cylinder rod in both directions (Fig. 1). With pneumatic piloting, the piston rod guide forces the pads to come right up to each other and overcome the counter spring (B) force and the piston rod can slide (Fig. 2).
It is important to remember that the mechanical piston rod lock is a static type, which means that it is necessary to stop the cylinder piston rod pneumatically before locking the part mechanically.

Fig. 1

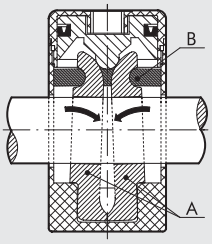
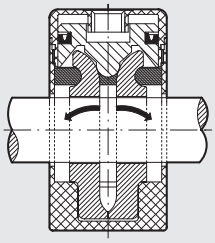
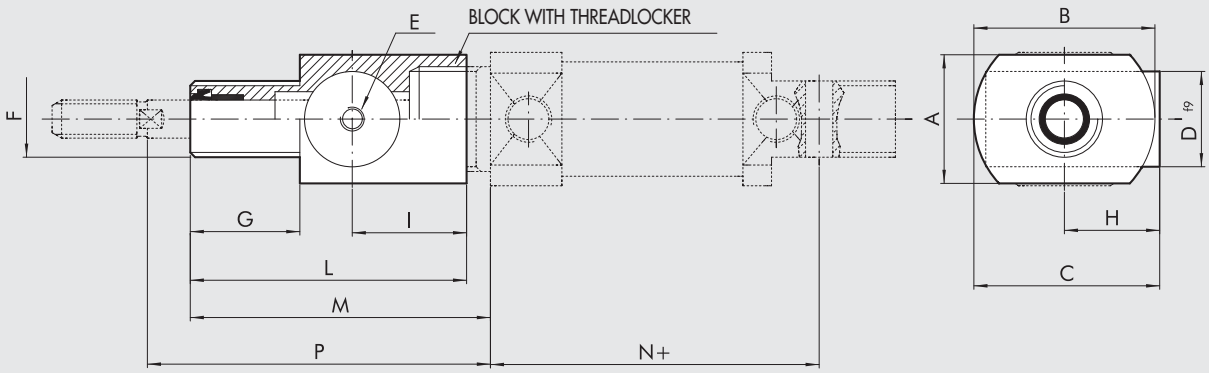


Fig. 2



DIMENSIONS

+ = ADD STROKE



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	P(±1.2)	Weight [g]
W5010001099	12	⍁ 25	⍁ 25	31.5	20	M5	M16x1.5	12	19	23	47	52	53	57	100
W5010001099	16	⍁ 25	⍁ 25	31.5	20	M5	M16x1.5	12	19	23	47	52	60	57	100
W5010001100	20	27	38	40	20	M5	M22x1.5	23	21	24	58	65	71	72	100
W5010001101	25	27	38	40	20	M5	M22x1.5	23	21	24	58	68	76	76	100

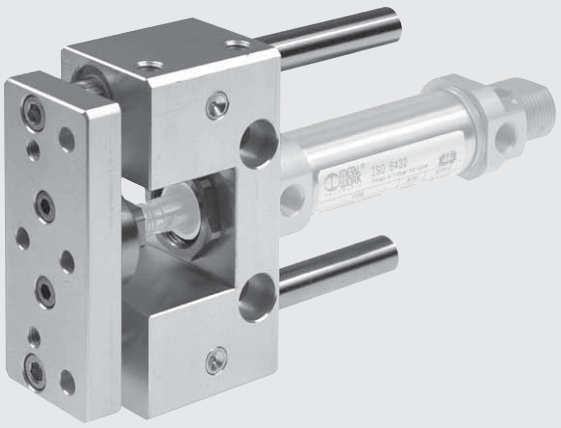
ACCESSORIES FOR ISO 6432 MINI-CYLINDERS: GUIDE UNIT

Guide units series DS-DH-DM ensure optimal alignment and anti-rotation effect of the pneumatic cylinder connected to it. The guide units can be used separately or combined in order to get complete handling units: in which case the guide units can be coupled using the type A and C anchorage (foot and flange).
The guide unit can be coupled to ISO 6432 cylinders (Ø 12 - Ø 25).
The following versions are available:
U PROFILE (GDS)*: for limited loads and speeds
H PROFILE (GDH)*: for high loads
H PROFILE (GDM)**: for high speeds

* With bronze guide bushing
** With ball guide bushing

STANDARD STROKES: 50 - 100 - 150 - 200 - 250 - 320 - 400 - 500

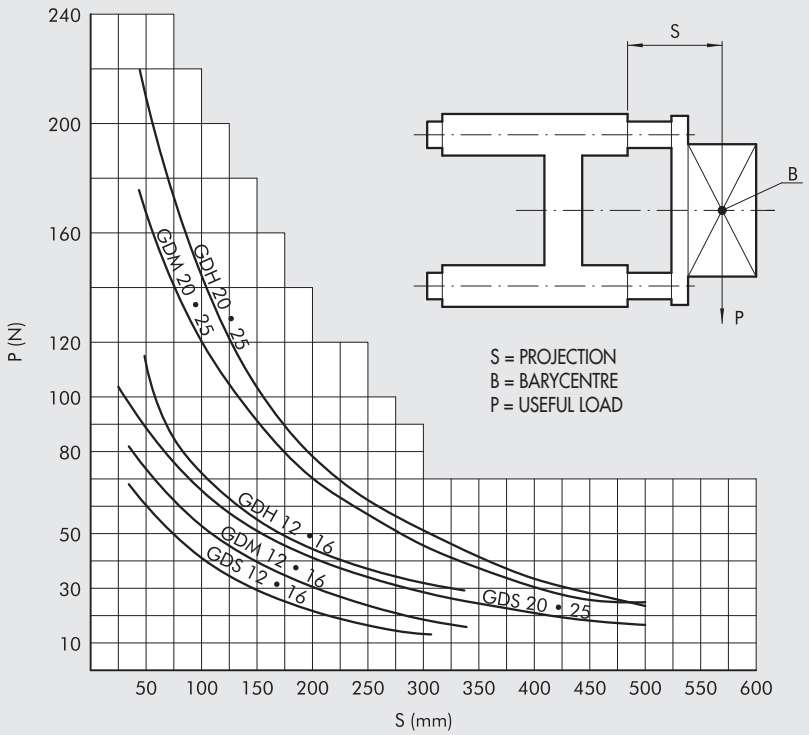
For weights, see cylinder "**General technical data**" at the beginning of the chapter.



GUIDE ELEMENTS

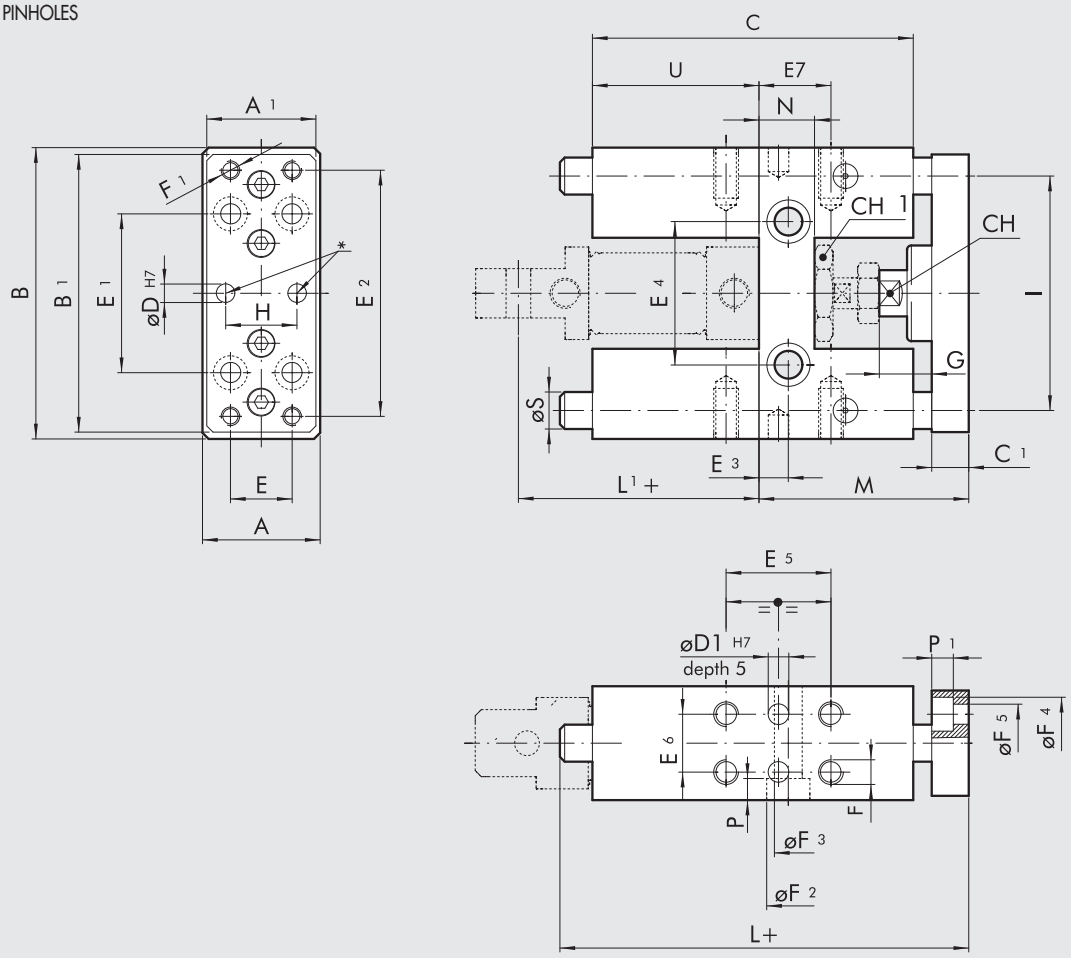
SERIES GDS-GDH	Body:	aluminium alloy
	Guide bushing:	self-lubricating syntered bronze and wiper rings
	Piston rod:	chromed rolled steel
SERIES GDM	Body:	aluminium alloy
	Guide bushing:	linear guide ball bearings and wiper rings
	Piston rod:	tempered and chromed steel

GUIDE UNIT LOAD DIAGRAM



DIMENSIONS OF TYPE GDH-GDM

+ = ADD THE STROKE
✱ = CENTERING PINHOLES



Ø	A	A_1	B	B_1	C	C_1	Ch	Ch_1	D	D_1	E	E_1	E_2	E_3	E_4	E_5	E_6	E_7	F	F_1	F_2	F_3	F_4	F_5	G	H	I	L	L_1	M	N	P	S	U
12	30	27	65	63	75	10	8	19	4	-	15	32	54	6.5	24	32.5	22	11	M4	M4	8.5	5.1	7.5	4.5	15	15	46	130	53	54	15	5.5	10	37
16	30	27	65	63	75	10	8	19	4	-	15	32	54	6.5	24	32.5	22	11	M4	M4	8.5	5.1	7.5	4.5	15	15	46	130	60	54	15	5.5	10	37
20	34	32	79	76	108	12	13	27	6	5	20	40	68	8.5	38	32.5	23	15	M6	M5	10.5	6.5	9	5.5	22	20	58	160	71	65	15	7	12	58
25	34	32	79	76	108	12	13	27	6	5	20	40	68	8.5	38	32.5	23	15	M6	M5	10.5	6.5	9	5.5	22	20	58	160	76	65	15	7	12	58

GDH (BRONZE GUIDE BUSHING)

Code	Bore	Type
W0700122...	**12**	UNIT MW DH 012
W0700162...	**16**	UNIT MW DH 016
W0700202...	**20**	UNIT MW DH 020
W0700252...	**25**	UNIT MW DH 025

...Enter the stroke in 3 digits (e.g. 50 = 050).
Also available in V-Lock version (see **chapter A3**).

GDM (BALL GUIDE BUSHING)

Code	Bore	Type
W0700123...	**12**	UNIT MW DM 012
W0700163...	**16**	UNIT MW DM 016
W0700203...	**20**	UNIT MW DM 020
W0700253...	**25**	UNIT MW DM 025

...Enter the stroke in 3 digits (e.g. 50 = 050).
Also available in V-Lock version (see **chapter A3**).

STROKE

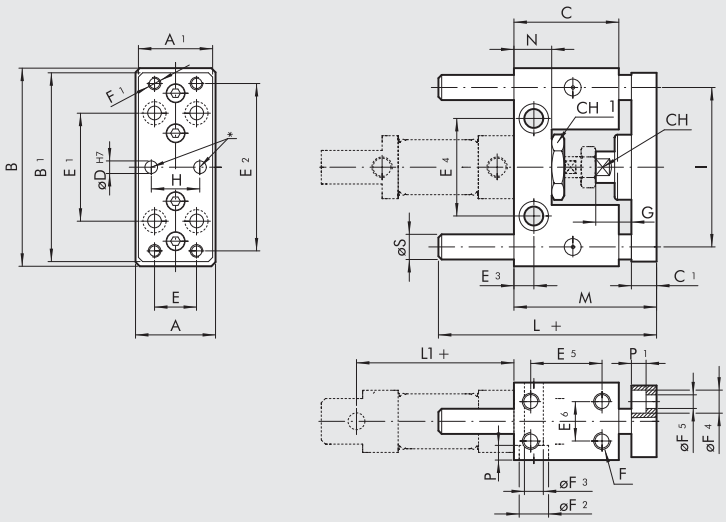
Cylinder stroke [mm]		Guide stroke [mm]
from	**to**	
0	75	50
75	125	100
125	175	150
175	225	200
225	275	250
275	345	320
345	425	400
425	525	500

Note:
Thanks to the dimensional features, it is possible to extend the use of GDH/GDM guides to cylinders with strokes up to 25 mm above the nominal guide stroke. The table here shows the stroke/cylinder range that can be used depending on the nominal stroke of the guide.

METAL WORK PNEUMATIC

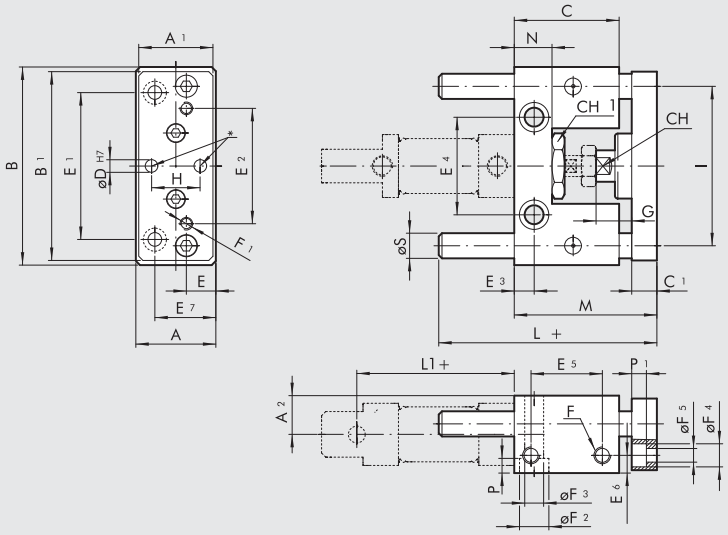
DIMENSIONS OF TYPE GDS

+ = ADD THE STROKE
✱ = CENTERING PINHOLES



Ø	A	A_1	B	B_1	C	C_1	Ch	Ch_1	D	E	E_1	E_2	E_3	E_4	E_5	E_6	F	F_1	F_2	F_3	F_4	F_5	G	H	I	L	L_1	M	N	P	P_1	S
12	30	27	65	63	38	10	8	19	4	15	32	54	6.5	24	25	22	M4	M4	8.5	5.1	7.5	4.5	15	15	46	70	53	54	13	5.5	4.5	10
16	30	27	65	63	38	10	8	19	4	15	32	54	6.5	24	25	22	M4	M4	8.5	5.1	7.5	4.5	15	15	46	70	60	54	13	5.5	4.5	10

+ = ADD THE STROKE
✱ = CENTERING PINHOLES



Ø	A	A_1	A_2	B	B_1	C	C_1	Ch	Ch_1	D	E	E_1	E_2	E_3	E_4	E_5	E_6	E_7	F	F_1	F_2	F_3	F_4	F_5	G	H	I	L	L_1	M	N	P	P_1	S
20	40	38	20	100	90	48	12	13	27	6	14	70	55	8.5	46.5	32	10	30	M8	M6	14	9	11	6.5	22	20	76	77	71	65	17	9	6.5	12
25	40	38	20	100	90	48	12	13	27	6	14	70	55	8.5	46.5	32	10	30	M8	M6	14	9	11	6.5	22	20	76	77	76	71	17	9	6.5	12

GDS (BRONZE GUIDE BUSHING)

Code	Bore	Type
W0700121...	**12**	UNIT MW DS 012
W0700161...	**16**	UNIT MW DS 016
W0700201...	**20**	UNIT MW DS 020
W0700251...	**25**	UNIT MW DS 025

...Enter the stroke in 3 digits (e.g. 50 = 050).

STROKE

Cylinder stroke [mm]		Guide stroke [mm]
from	**to**	
0	50	50
51	100	100
101	150	150
151	200	200
201	250	250

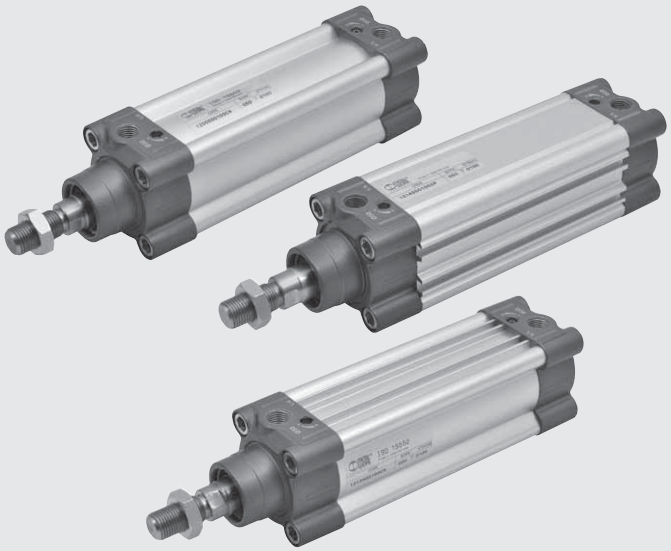
Note:
Thanks to the dimensional features, it is possible to use the range of strokes - cylinders, as shown in the table here, without the guide piston rods projecting beyond the cylinder fixing value (L1 +).

ISO 15552 CYLINDER (EX ISO 6431)

Cylinders made to ISO 15552 available in various versions and with a wide range of accessories:

- Configuration with or without magnet
- Single-or double acting – single-or through-rod
- Wide choice of NBR, POLYURETHANE and FKM/FPM gaskets (for high temperatures, for low temperature)
- Special versions on request
- Fixing accessories, guide units and mechanical piston rod lock.

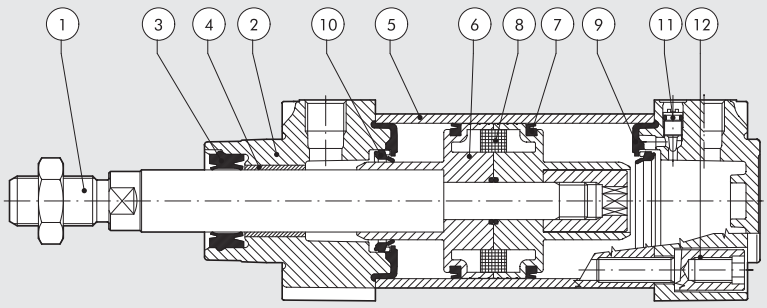
They are available in three series, which differ according to the shape of the barrel and, consequently, the type of sensors and accessories that can be mounted.
These cylinders are called series STD, type A, series 3.



TECHNICAL DATA		Polyurethane	NBR	FKM/FPM	Low Temperature
Max operating pressure	bar	10			
	MPa	1			
	psi	145			
Temperature range	°C	–10 to +80	–10 to +80	–10 to +150 (non-magnetic cyl.)	–35 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous			
Bore	mm	32; 40; 50; 63; 80; 100; 125			
Design		Heads with Tap Tite screws			
Standard stroke ✚	mm	Single-acting: for bores 32 to 63 strokes from 1 to 250			
		Double-acting: for bores 32 to 80 strokes from 1 to 2800			
		for bores 100 to 125 strokes from 1 to 2600			
Versions		Double-acting cushioned, Single-acting extended or retracted rod cushioned, Through-rod cushioned, Long cushioning, High-temperature, Piston rod lock, Oil seal, Through-rod oil seal, Low friction, No stick-slip.			
Sensor magnet		All versions come complete with magnet. Supplied without magnet on request.			
Inrush pressure		Ø 32; 40: 0.4 bar			
		Ø 50; 63 strokes < 1500 mm: 0.3 bar; strokes > 1500 mm: 0.4 bar			
		Ø 80; 100; 125 strokes < 1500 mm: 0.2 bar; strokes > 1500 mm: 0.4 bar			
Notes		**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.**			
		✚ Maximum recommended strokes. Higher values can create operating problems			
Forces generated at 6 bar thrust/retraction		See cylinder "**General technical data**" at the beginning of the chapter			
Weights		See cylinder "**General technical data**" at the beginning of the chapter			

COMPONENTS

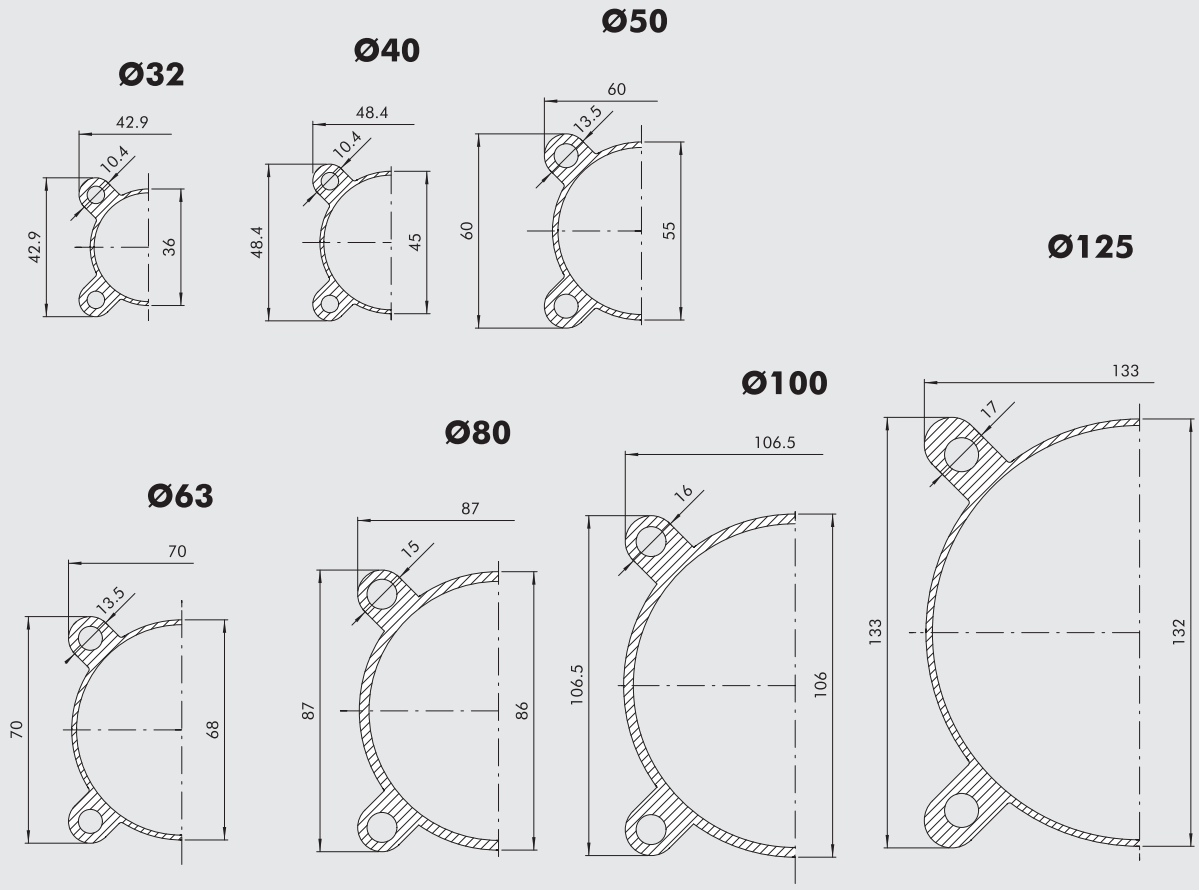
① PISTON ROD: C45 steel or stainless steel, thick chromed
② HEAD: die cast aluminium
③ PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
④ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑤ BARREL: drawn anodised calibrated aluminium
⑥ HALF-PISTON: self-lubricating technopolymer with built-in cushioning olives (aluminium with PTFE pad for diameters 80-100-125)
⑦ PISTON GASKET: polyurethane, NBR or FKM/FPM
⑧ MAGNET: plastoferrite
⑨ BUFFER + Static O-rings: NBR or FKM/FPM
⑩ CUSHIONING GASKET: polyurethane, NBR or FKM/FPM
⑪ CUSHIONING NEEDLE: OT 58 with needle out movement safety system even when fully open
⑫ SCREWS: Tap Tite for assembly



ISO 15552 CYLINDER – SERIES STD (EX ISO 6431)

ISO 15552 cylinders, featuring a smooth barrel with no longitudinal slots.
This means it is easier to clean the cylinder and there are fewer points where dirt can collect.
Specific brackets are required for mounting magnetic sensors.

BARREL CROSS SECTION



KEY TO CODES CYLINDER ISO 15552 STD

CYL	1 2 1	0	3 2	0 0 5 0	C	P	▼ E
	TYPE		**BORE**	**STROKE**	**MATERIAL**	**GASKETS**	
	120 Double-acting, cushioned, non-magnetic **121** Double-acting, cushioned **122** Through-rod **124** Double-acting, non-cuschioned **125** Opposed ✚ **126** Single-acting **127** Tandem **134** Rod lock version ✱ **136** Version with piston rod lock ✱ ◆ **137** Piston rod lock + guide unit	**0** Diameter **S** Non-magnetic ▲ **G** No stick-slip	32 40 50 63 80 ■ 100 ■ 125	For the maximum suppliable strokes, look at the technical data	**A** C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over **C** C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**N** NBR gaskets **P** Polyurethane gaskets **V** FKM/FPM gaskets ● **B** Low temperature	**E** Single-acting extended rod

■ In the code of cylinder with letter in fourth position Ø 100 becomes A1; Ø 125 becomes A2
● Only available for versions with aluminium piston (A or Z)
✚ Available until Ø 63 and only the versions with piston in aluminum (A or Z)
126... Single-acting retracted rod
126...E Single-acting extended rod

▼ Letter to be added only to the single acting extended rod version
▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**
◆ Available up to Ø 100
✱ Not available for gaskets V or B

KEY TO CODES CYLINDER ISO 15552 STD LOW-FRICTION

CYL	1 2 3	A	3 2	0 0 5 0	C	P
		TYPE	**BORE**	**STROKE**	**MATERIAL**	**GASKETS**
		A Low friction, type A **B** Low friction, type B **C** Low friction, type C **D** Low friction, type D **E** Low friction, type E **F** Low friction, type F	32 40 50 63 80 A1 = Ø 100 A2 = Ø 125	Ø 32 to 80 stroke 1 to 2800 mm Ø 100 to 125 stroke 1 to 2600 mm	**A** C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over **C** C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**N** NBR gaskets **P** Polyurethane gaskets **V** FKM/FPM gaskets

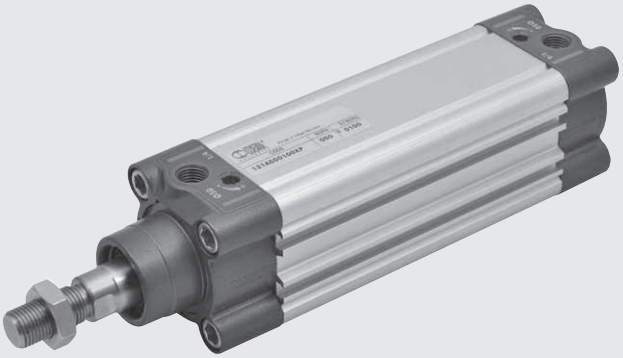
KEY TO CODES CYLINDER ISO 15552 STD LONG-CUSHIONING

CYL	1 3 1	A	3 2	0 0 5 0	A	P
		TYPE	**BORE**	**STROKE**	**MATERIAL**	**GASKETS**
		A 200 mm front/rear cushioning cone – 200 mm ext. **B** 150 mm front/rear cushioning cone – 150 mm ext. **C** 100 mm front/rear cushioning cone – 100 mm ext. **D** 150 mm front/rear cushioning cone – 200 mm ext. **E** 100 mm front/rear cushioning cone – 200 mm ext. **F** 50 mm front/rear cushioning cone – 100 mm ext. **G** 100 mm front/rear cushioning cone – 150 mm ext. **H** 200 mm front cushioning cone – 200 mm ext. **I** 150 mm front cushioning cone – 150 mm ext. **L** 100 mm front cushioning cone – 100 mm ext. **M** 150 mm front cushioning cone – 200 mm ext. **N** 100 mm front cushioning cone – 150 mm ext. **O** 50 mm front cushioning cone – 100 mm ext. **Q** 200 mm rear cushioning cone – 200 mm ext. **R** 150 mm rear cushioning cone – 150 mm ext. **S** 100 mm rear cushioning cone – 100 mm ext. **T** 150 mm rear cushioning cone – 200 mm ext. **U** 100 mm rear cushioning cone – 200 mm ext. **V** 50 mm rear cushioning cone – 100 mm ext.	32 40 50 63	1 to 2600 mm	**A** C45 chromed rod, aluminium piston rod for all sizes **Z** Stainless steel piston rod and nut aluminium piston	**N** NBR gaskets **P** Polyurethane gaskets ✱ **V** FKM/FPM gaskets

✱ Version valid only for types: Q, R, S, T, U and V.

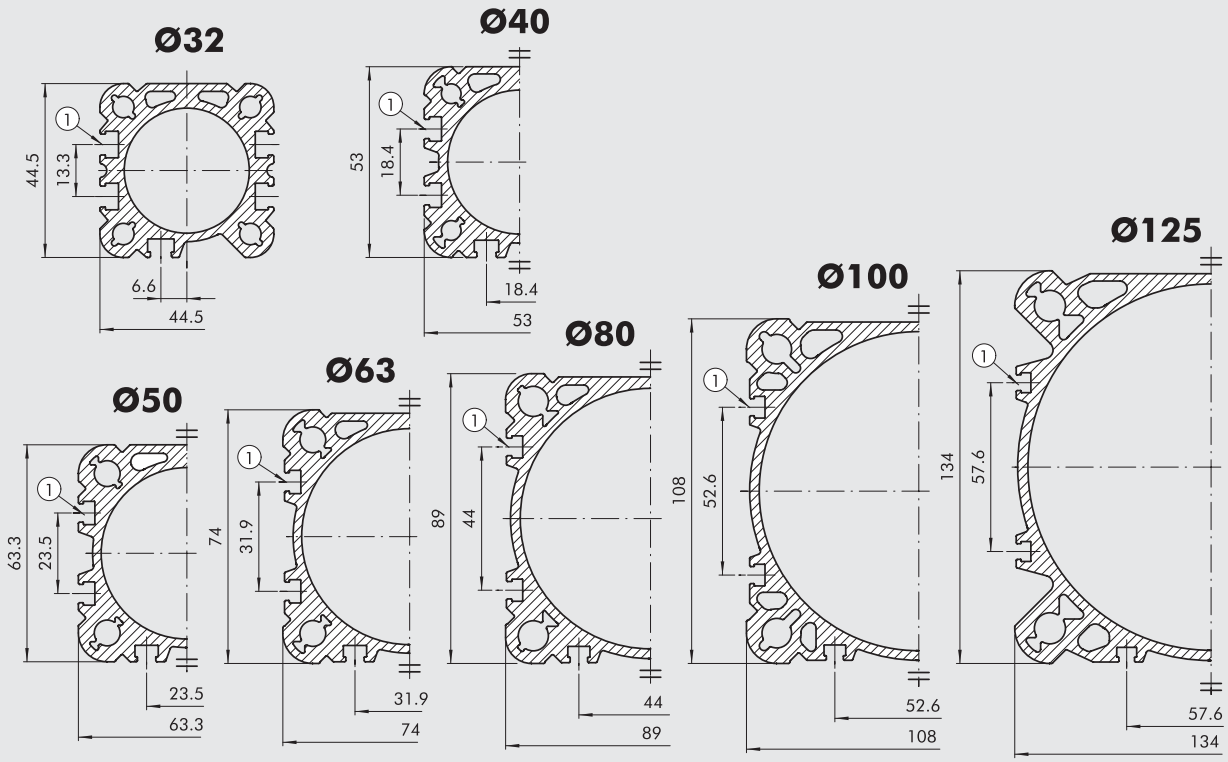
ISO 15552 CYLINDER – TYPE A (EX ISO 6431)

ISO 15552 cylinders, featuring a barrel with longitudinal slots on three sides for inserting and securing retractable sensors.
The same slots can also be used for valves and other mechanical parts.



BARREL CROSS SECTION

① SLOTS FOR RETRACTABLE SENSOR



KEY TO CODES CYLINDER ISO 15552 TYPE "A"

CYL	1 2 1	A	3 2	0 0 5 0	C	P	▼ E
	TYPE		BORE	STROKE	MATERIAL	GASKETS	
	121 Double-acting, cushioned **122** Through-rod **124** Double-acting, non-cuschioned **125** Opposed ✚ **126** Single-acting **127** Tandem **134** Rod lock version ✱ **136** Version with piston rod lock ✱ ◆ **137** Piston rod lock + guide unit	**A** Standard ▲ **B** No stick-slip **C** Non-magnetic	32 40 50 63 80 A1 = Ø 100 A2 = Ø 125	For the maximum suppliable strokes, look at the technical data	**A** C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over **C** C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**N** NBR gaskets **P** Polyurethane gaskets **V** FKM/FPM gaskets ● **B** Low temperature	**E** Single-acting extended rod

● Only available for versions with aluminium piston (A or Z)
✚ Available until Ø 63 and only the versions with piston in aluminum (A or Z)
126... Single-acting retracted rod
126...E Single-acting extended rod

▼ Letter to be added only to the single acting extended rod version
▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**
◆ Available up to Ø 100
✱ Not available for gaskets V or B

KEY TO CODES CYLINDER ISO 15552 LOW-FRICTION TYPE "A"

CYL	1 2 9	A	3 2	0 0 5 0	C	P
		TYPE	BORE	STROKE	MATERIAL	GASKETS
		A Low friction, type A **B** Low friction, type B **C** Low friction, type C **D** Low friction, type D **E** Low friction, type E **F** Low friction, type F	32 40 50 63 80 A1 = Ø 100 A2 = Ø 125	Ø 32 to 80 stroke 1 to 2800 mm Ø 100 to 125 stroke 1 to 2600 mm	**A** C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over **C** C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**N** NBR gaskets **P** Polyurethane gaskets **V** FKM/FPM gaskets

KEY TO CODES CYLINDER ISO 15552 LONG-CUSHIONING TYPE "A"

CYL	1 3 0	A	3 2	0 0 5 0	A	P
		TYPE	BORE	STROKE	MATERIAL	GASKETS
		A 200 mm front/rear cushioning cone – 200 mm ext. **B** 150 mm front/rear cushioning cone – 150 mm ext. **C** 100 mm front/rear cushioning cone – 100 mm ext. **D** 150 mm front/rear cushioning cone – 200 mm ext. **E** 100 mm front/rear cushioning cone – 200 mm ext. **F** 50 mm front/rear cushioning cone – 100 mm ext. **G** 100 mm front/rear cushioning cone – 150 mm ext. **H** 200 mm front cushioning cone – 200 mm ext. **I** 150 mm front cushioning cone – 150 mm ext. **L** 100 mm front cushioning cone – 100 mm ext. **M** 150 mm front cushioning cone – 200 mm ext. **N** 100 mm front cushioning cone – 150 mm ext. **O** 50 mm front cushioning cone – 100 mm ext. **Q** 200 mm rear cushioning cone – 200 mm ext. **R** 150 mm rear cushioning cone – 150 mm ext. **S** 100 mm rear cushioning cone – 100 mm ext. **T** 150 mm rear cushioning cone – 200 mm ext. **U** 100 mm rear cushioning cone – 200 mm ext. **V** 50 mm rear cushioning cone – 100 mm ext.	32 40 50 63	1 to 2600 mm	**A** C45 chromed rod, aluminium piston rod for all sizes **Z** Stainless steel piston rod and nut aluminium piston	**N** NBR gaskets **P** Polyurethane gaskets ✱ **V** FKM/FPM gaskets

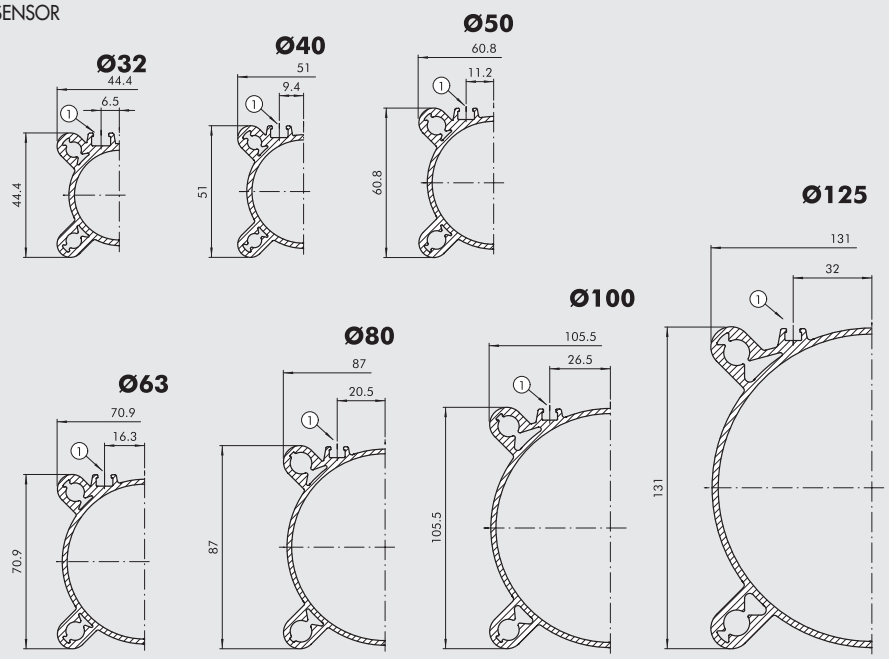
✱ Version valid only for types: Q, R, S, T, U and V.

ISO 15552 CYLINDER – SERIES 3 (EX ISO 6431)

ISO 15552 cylinders, featuring specially-shaped barrels designed to reduce weight to a minimum.
Two T-slots on the same side as the threaded fittings can take retractable sensors.
The other three sides of the barrel are smooth, with no slots, and hence easy to clean.

BARREL CROSS SECTION

① SLOTS FOR RETRACTABLE SENSOR



KEY TO CODES

CYL	121 TYPE	3	32 BORE	0050 STROKE	C MATERIAL	P GASKETS	▼E
	121 Double-acting, cushioned **122** Through-rod **124** Double-acting, non-cuschioned **125** Opposed ✚ **126** Single-acting **127** Tandem **134** Rod lock version ■ **136** Version with piston rod lock ■ ✱ **137** Piston rod lock + guide unit	**3** Series 3 ◆ **4** Series 3 No stick slip **5** Series 3 Non-magnetic	32 40 50 63 80 A1 = Ø 100 A2 = Ø 125	For the maximum suppliable strokes, look at the technical data	**A** C45 chromed rod, aluminium piston rod: standard for all cylinders with ≥ 1000 mm-stroke cylinders and for cylinder with Ø 80 mm and over **C** C45 chromed rod, technopolymer piston: standard for cylinders of Ø 32 to 63 mm with <1000 mm strokes **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**N** NBR gaskets **P** Polyurethane gaskets **V** FKM/FPM gaskets ● **B** Low temperature	**E** Single-acting extended rod

● Only available for versions with aluminium piston (A or Z)
✚ Available until Ø 63 and only the versions with piston in aluminum (A or Z)
126... Single-acting retracted rod
126...E Single-acting extended rod

▼ Letter to be added only to the single acting extended rod version
◆ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**
✱ Available until Ø 100
■ Not available for gasket V or B

ISO 15552 LOW-FRICTION CYLINDER (EX ISO 6431) CODE 123 FOR SERIES STD CODE 129 FOR TYPE A

The low-friction cylinder is typically used as a dandy or tensioning cylinder since it is a single-acting cylinder without a return spring.
The configurations are shown below:

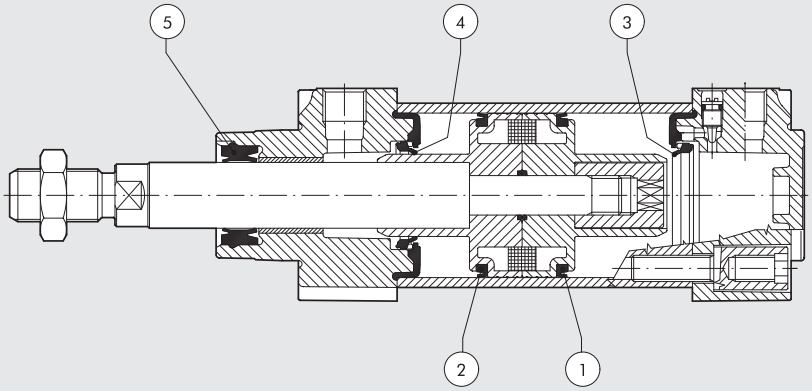
1) The best type is A as it involves less friction.
2) Type B should be used when the cylinder is working under normal conditions outside the pneumatic cushioning area.
   Cushioning is only for emergency use. It acts as a shock absorber in the case of malfunction.
3) Type C differs from type A due to the presence of a piston rod gasket that prevents dirt getting in when operating in dirty environments.
4) Type D differs from type B due to the presence of a piston rod gasket that prevents dirt getting in when operating in dirty environments.
5) Type E should be used when the pressurized chamber is the front one.
6) For type F, see point 2.

NB. THE CYLINDER IS ALWAYS SINGLE-ACTING WITHOUT A RETURN SPRING.

	TYPE	GASKETS
Rear chamber pressure	A	1
Rear chamber pressure and cushioning in case of impact	B	1+3
Rear chamber pressure and piston rod gasket	C	1+5
Rear chamber pressure, cushioning in case of impact and piston rod gasket	D	1+3+5
Front chamber pressure	E	2+5
Front chamber pressure and cushioning in case of impact	F	2+5+4

COMPONENTS

① Rear chamber piston gasket made of polyurethane, NBR or FKM/FPM
② Front chamber piston gasket made of polyurethane, NBR or FKM/FPM
③ Rear chamber cushioning gasket made of polyurethane, NBR or FKM/FPM
④ Front chamber cushioning gasket made of polyurethane, NBR or FKM/FPM
⑤ Piston rod gasket made of polyurethane, NBR or FKM/FPM



ISO 15552 ULTRA-LOW FRICTIONS CYLINDER (EX ISO 6431)

A typical ultra-low friction cylinder is generally used as an oscillating or tensioning cylinder. It is single acting, in the sense that compressed air is normally fed into one of the two chambers only. An external force acts on the other side. Metal Work's ultra-low friction cylinder is designed as a double-acting one, which means the compressed air can be fed into the rear or either the front chamber. They are built to comply with ISO 15552 and are available with or without a magnet.
Supplied with a series 3 barrel.
A through-rod version is not available.
These cylinders are always non-cushioned.
The gaskets are made of NBR.
A full range of accessories is available.

TECHNICAL DATA		NBR
Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	–10 to +80
Fluid		Unlubricated air
Bore	mm	32; 40; 50; 63; 80; 100; 125
Standard stroke	mm	1 to 1200
Design		Heads with Tap Tite screws
Versions		Double-acting magnetic, Double-acting non-magnetic (always "No stick-slip" cylinder)
Sensor magnet		All the versions with or without magnet
Inrush pressure	bar	Ø 32 = 0.08
		Ø 40 = 0.06
		Ø 50 = 0.05
		Ø 63 = 0.04
		Ø 80 = 0.03
		Ø 100 = 0.03
		Ø 125 = 0.03
Forces generated at 6 bar thrust/retraction		See cylinder "**General technical data**" at the beginning of the chapter
Weights		See cylinder "**General technical data**" at the beginning of the chapter
Notes		There may be leakage between the two chambers in the presence of low pressures (up to 1 bar)

COMPONENTS

① PISTON ROD: C45 steel or stainless steel, thick chromed
② HEAD: die cast aluminium
③ PISTON ROD GASKET: NBR
④ GUIDE BUSHING: steel strip with bronze insert
⑤ BARREL: drawn anodised calibrated aluminium
⑥ PISTON GASKET: NBR
⑦ HALF-PISTON: aluminium alloy
⑧ MAGNET: plastoferrite
⑨ GUIDE RING: special technopolymer
⑩ BUFFER + Static O-rings: NBR
⑪ CUSHIONING NEEDLE: OT 58 with needle out movement safety system even when fully open
⑫ SCREWS: Tap Tite for assembly

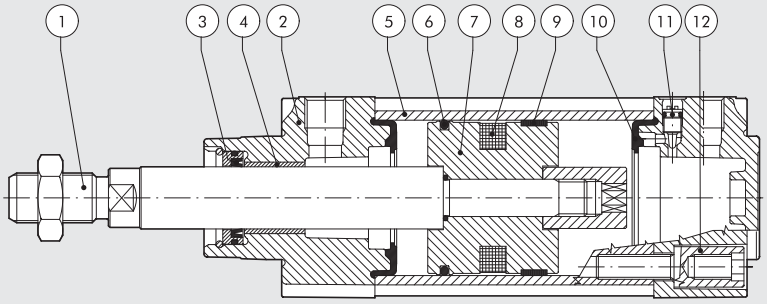
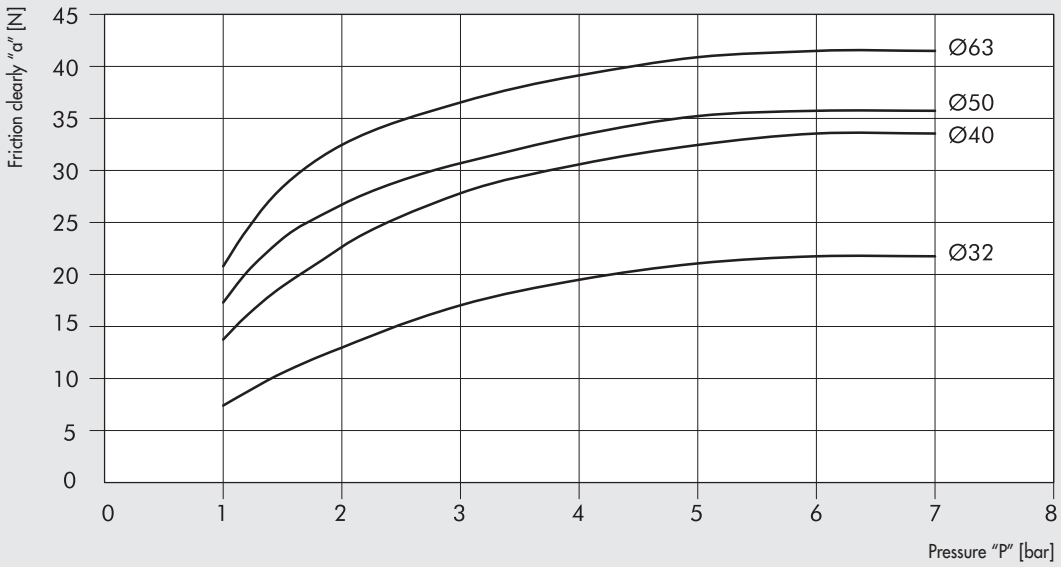
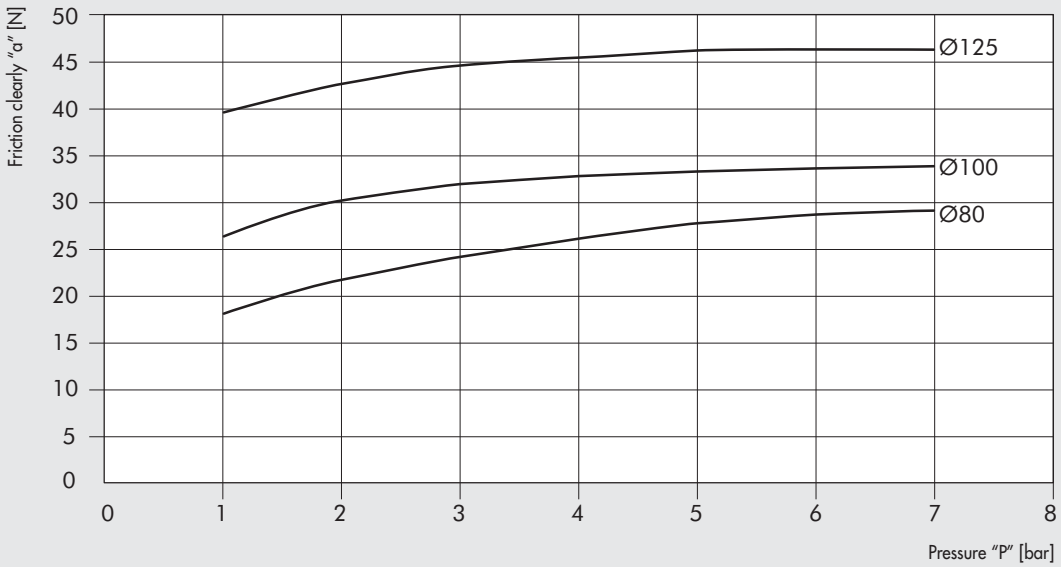


DIAGRAM OF THE CLEAN FRICTIONS





The clean friction values "a" in N have been obtained by inserting in the back chamber the pressure "P" in bars, and simultaneously by detecting the necessary force "F" in N to make the rod re-enter, applying the following formula:

$a = F - [(P \times S) \times 9.81]$

where "S" is the thrust section in cm^2

KEY TO CODES

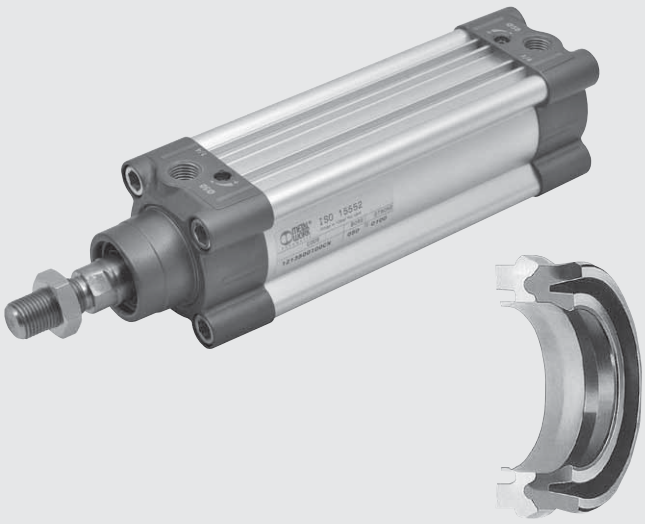
CYL	1 2 3	3	3 2	0 1 0 0	A	N
	TYPE		BORE	STROKE	MATERIAL	GASKETS
	123 Ultra-low friction	**3** Double-acting magnetic **5** Double-acting not magnetic	32 40 50 63 80 A1 = 100 A2 = 125	From 1 to 1200 mm	**A** C45 chromed rod, aluminium piston rod **Z** Stainless steel piston rod and nut aluminium piston	**N** NBR gaskets

ALL the cylinders are No stick-slip.
ALL the cylinders are non-cushioned.
Ultra-low friction cylinders are not available in the through-rod version.

ISO 15552 CYLINDER WITH "COMBI" PISTON ROD GASKET (EX ISO 6431)

In some applications the piston rod is exposed to pollutants and dirt, which tend to adhere to the surface.
Ordinary gaskets are made of relatively soft elastomers as their main job is to provide a pneumatic seal. In critical applications they are unable to scrape dirt off the surface of the piston rod.
COMBI piston rod gaskets are designed to solve these problems.
They are made up of two separate parts:

- **a sealing element,** inside the cylinder, made of a special NBR elastomer with a Shore A hardness of 80 to provide a pneumatic seal.
- **a scraper ring,** outside the cylinder, made of highly wear-resistant plastic.

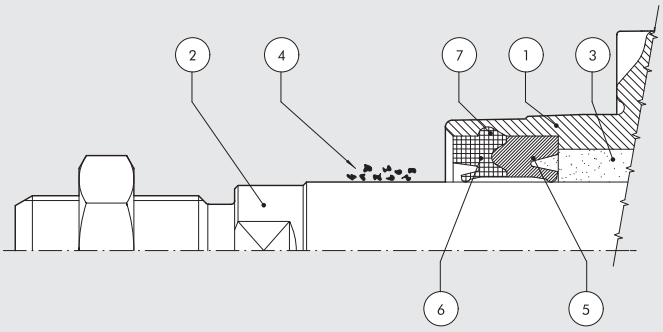


FEATURES AND ADVANTAGES

COMBI gaskets have three functions - sealing, scraping and securing.
The outer projection of the scraper ring secures the cylinder head in its seat, so steel retaining rings are not required. This eliminates the risk of corrosion due to the presence of metal.
Friction is reduced. The materials used in the scraper ring and sealing element make the gasket extremely long lasting.
Cylinders with COMBI gaskets can be used with unlubricated dry air.
The cylinder head seat is the same as for other Metal Work cylinder gaskets, so the cylinder head is standard.

OPERATING PRINCIPLE

The gasket is housed in the cylinder head ①. Inside the cylinder there is compressed air ③. Dirt ④ deposits on the piston rod ②.
The sealing element ⑤ provides the pneumatic seal. The scraper ring ⑥ cleans the piston rod. The projection ⑦ on the scraper ring secures the gasket in the cylinder head seat.



TECHNICAL DATA

Bores: 32; 40; 50; 63; 80; 100; 125.

The same as for ISO 15552 cylinders with NBR gaskets.
Maximum recommended speed: 1 m/s.

KEY TO CODES

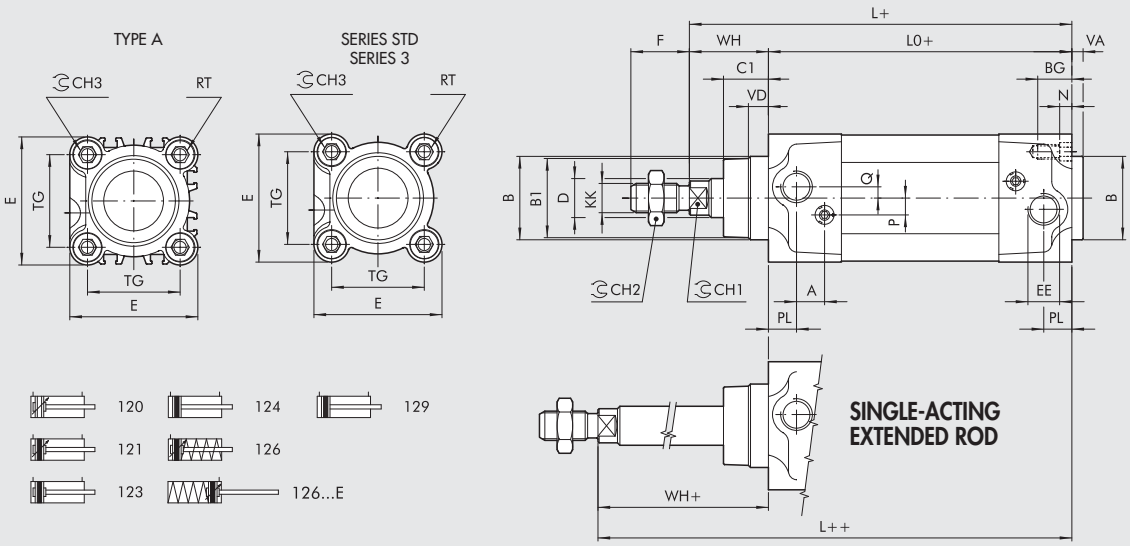
The codes for ISO 15552 cylinders apply, the last letter C identifying the type of gasket.
"Long cushioning" version not provided.

Example:
1210320100CC: ISO 15552 cylinder, dual-acting, cushioned, magnetic, diameter 32, stroke 100 mm, piston rod made of C45 chrome, COMBI piston rod gasket, other gaskets NBR.

ISO 15552 CYLINDER DIMENSIONS

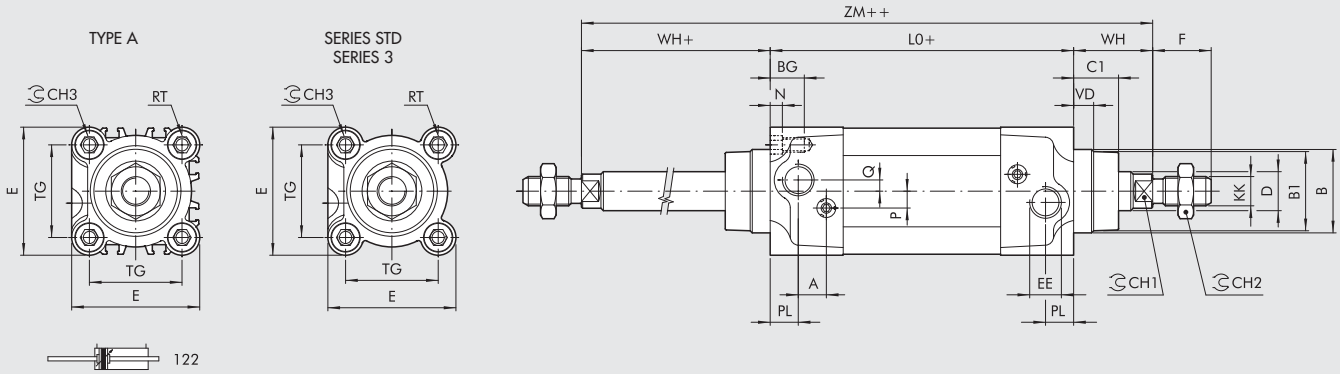
DIMENSIONS

STANDARD VERSION



+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

THROUGH-ROD VERSION



Ø	PL	VD	A	B	B_1	WH	C_1	CH_1	CH_2	CH_3	KK	D	TG	VA	F	EE	RT	E	L	L_0	ZM	BG	N	P	Q
32	10	6.5	10	30	28	26	16	10	17	6	M10x1.25	12	32.5	4	22	G1/8	M6	46	120	94	146	14.5	4.5	6	4
40	12	8	10	35	33	30	20	13	19	6	M12x1.25	16	38	4	24	G1/4	M6	54	135	105	165	14.5	4.5	6	4
50	14	13	10	40	38	37	25	17	24	8	M16x1.5	20	46.5	4	32	G1/4	M8	64.5	143	106	180	17.5	5.5	6	6
63	16	14	10	45	40	37	25	17	24	8	M16x1.5	20	56.5	4	32	G3/8	M8	75.5	158	121	195	17.5	5.5	6	6
80	18	12	12	45	43	46	33	22	30	10	M20x1.5	25	72	4	40	G3/8	M10	94	174	128	220	21.5	5.5	10	7
100	20	14	12	55	49	51	38	22	30	10	M20x1.5	25	89	4	40	G1/2	M10	111	189	138	240	21.5	5.5	10	7
125	25	20	10	60	54	65	45	27	41	12	M27x2	32	110	6	54	G1/2	M12	135	225	160	290	25.5	6.5	12	8

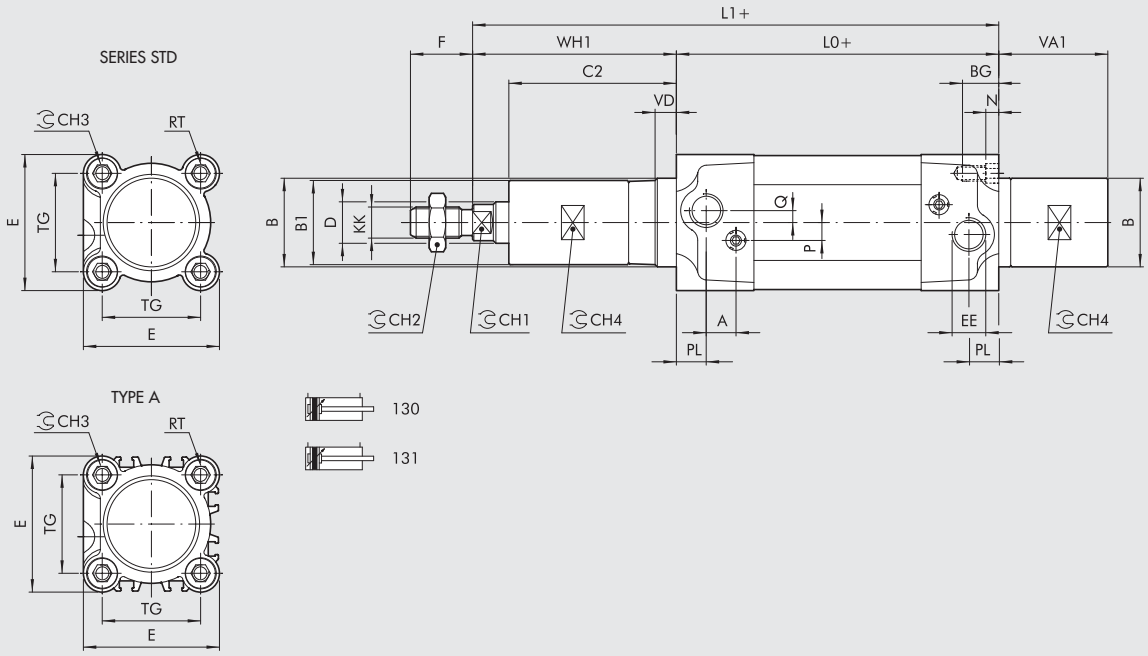
VERSION 126 ... (SINGLE-ACTING RETRACTED ROD)
VERSION 126...E (SINGLE-ACTING EXTENDED ROD)

			L0								L							
			Ø 32		Ø 40		Ø 50		Ø 63		Ø 32		Ø 40		Ø 50		Ø 63	
Stroke	126...	126...E	126...	126...E	126...	126...E	126...	126...E	126...	126...E	126...	126...E	126...	126...E	126...	126...E	126...	126...E
0 - 25	ISO	ISO	94	94	105	105	106	106	121	121	120	120	135	135	143	143	158	158
26 - 50	ISO	NON ISO	94	115	105	129.5	106	130.5	121	145.5	120	141	135	159.5	143	167.5	158	182.5
51 - 75	NON ISO	NON ISO	115	136	129.5	154	130.5	155	145.5	170	141	162	159.5	184	167.5	192	182.5	207
76 - 100	NON ISO	NON ISO	136	157	154	178.5	155	179.5	170	194.5	162	183	184	208.5	192	216.5	207	231.5
101 - 125	NON ISO	NON ISO	157	178	178.5	203	179.5	204	194.5	219	183	204	208.5	233	216.5	241	231.5	256
126 - 150	NON ISO	NON ISO	178	199	203	227.5	204	228.5	219	243.5	204	225	233	257.5	241	265.5	256	280.5
151 - 175	NON ISO	NON ISO	199	220	227.5	252	228.5	253	243.5	268	225	246	257.5	282	265.5	290	280.5	305
176 - 200	NON ISO	NON ISO	220	241	252	276.5	253	277.5	268	292.5	246	267	282	306.5	290	314.5	305	329.5
201 - 225	NON ISO	NON ISO	241	262	276.5	301	277.5	302	292.5	317	267	288	306.5	331	314.5	339	329.5	354
226 - 250	NON ISO	NON ISO	262	283	301	325.5	302	326.5	317	341.5	288	309	331	355.5	339	363.5	354	378.5

METAL WORK PNEUMATIC

DIMENSIONS CUSHIONING VERSION

+ = ADD THE STROKE



Ø	PL	VD	A	B	B_1	CH_1	CH_2	CH_3	CH_4	KK	D	TG	F	EE	RT	E	L_0	BG	N	P	Q
32	10	6.5	10	30	29	10	17	6	27	M10x1.25	12	32.5	22	G1/8	M6	46	94	14.5	4.5	6	4
40	12	8	10	35	34	13	19	6	30	M12x1.25	16	38	24	G1/4	M6	54	105	14.5	4.5	6	4
50	14	13	10	40	38	17	24	8	35	M16x1.5	20	46.5	32	G1/4	M8	64.5	106	17.5	5.5	6	6
63	16	14	10	45	38	17	24	8	35	M16x1.5	20	56.5	32	G3/8	M8	75.5	121	17.5	5.5	6	6

100 mm CUSHIONING

Ø	WH_1	C_2	VA_1	L_1
32	106	96	79	200
40	107	97	76.5	212
50	113.5	101.5	76.5	219.5
63	113.5	101.5	76.5	234.5

150 mm CUSHIONING

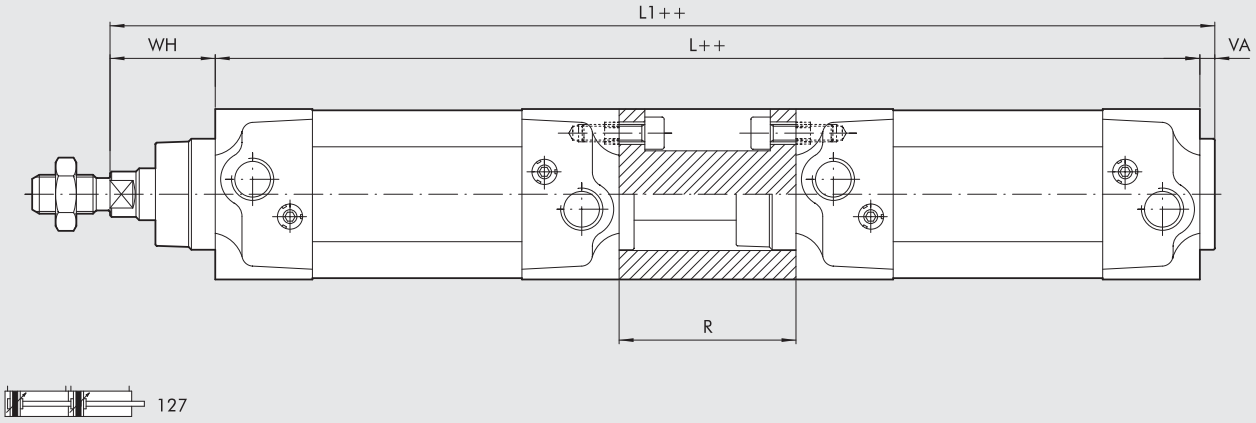
Ø	WH_1	C_2	VA_1	L_1
32	156	146	129	250
40	157	147	121.5	262
50	162.5	150.5	119.5	268.5
63	162.5	150.5	123.5	283.5

200 mm CUSHIONING

Ø	WH_1	C_2	VA_1	L_1
32	206	196	179	300
40	207	197	176.5	312
50	213.5	201.5	176.5	319.5
63	213.5	201.5	176.5	334.5

DIMENSIONS OF TANDEM VERSION

++ = ADD TWICE THE STROKE

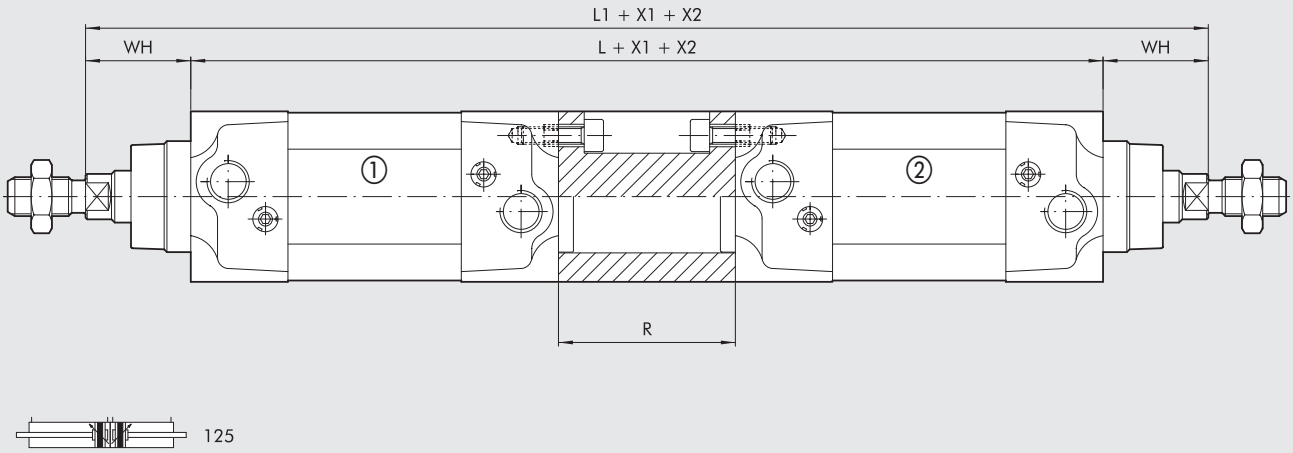


Ø	WH	VA	R	L	L_1
32	26	4	55	243	273
40	30	4	55	265	299
50	37	4	68	280	321
63	37	4	68	310	351
80	46	4	92	348	398
100	51	4	92	368	423
125	65	6	120	440	511

Refer to standard cylinders for other values.

DIMENSIONS OF OPPOSED VERSION

X1 = STROKE CYLINDER 1
X2 = STROKE CYLINDER 2



Ø	WH	R	L	L_1
32	26	55	243	295
40	30	55	265	325
50	37	68	280	354
63	37	68	310	384
80	46	92	348	440
100	51	92	368	470
125	65	120	440	570

Refer to standard cylinders for other values.

ISO 15552 TWO-FLAT CYLINDER (EX ISO 6431)

This version of cylinder is used to keep the parts fixed to the piston rod at an angle and to apply torques within the specified limits.
The piston rod of the Two-Flat has two opposing longitudinal surfaces; it is made of stainless steel.
The front cylinder head includes a sintered bronze bush that matches the profile of the piston rod and prevents it from rotating on its own axis.
A special polyurethane gasket ensures pneumatic seal and prevents the accumulation of dirt. This technical solution is more reliable and gives a better pneumatic seal than with square or hexagonal piston rods.
Supplied in series STD, with a smooth barrel, and type A or series 3, with a barrel with slots for retractable sensors.
They are available in several versions and with a wide range of accessories:

- with or without magnet
- double acting, single piston rod
- double acting, through rod; one piston rod is Two-Flat, the other cylindrical
- fixing accessories.

TECHNICAL DATA		POLYURETHANE			
Max operating pressure	bar	10			
	MPa	1			
	psi	145			
Temperature range	°C	–10 to +80			
Fluid		Unlubricated air. Lubrication, if used, must be continuous			
Bore	mm	32; 40; 50; 63			
Design		Heads with Tap Tite screws			
Maximun stroke	mm	Ø 32 = 300	Ø 40 = 400	Ø 50 = 500	Ø 63 = 500
Versions		Double-acting cushioned, Through-rod cushioned, No stick-slip			
Sensor magnet		All versions come complete with magnet. Supplied without magnet on request			
Inrush pressure	bar	Ø 32 = 0.4	Ø 40 = 0.4	Ø 50 = 0.3	Ø 63 = 0.3
Max torque on piston rod	Nm	Ø 32 = 0.2	Ø 40 = 0.4	Ø 50 = 1	Ø 63 = 1
Maximum rotation on the rod	degrees	Ø 32 = 1° 30′	Ø 40 = 1° 30′	Ø 50 = 1°	Ø 63 = 1°
Forces generated at 6 bar thrust/retraction		See cylinder "**General technical data**" at the beginning of the chapter			
Weights		See cylinder "**General technical data**" at the beginning of the chapter			
Notes		**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air**			

KEY TO CODES FOR ISO 15552 TWO-FLAT STD CYLINDERS

CYL	1 2 1 TYPE	0 	3 2 BORE	0 0 5 0 STROKE	F MATERIAL	P GASKETS
	120 Double-acting, cuschioned, non-magnetic **121** Double-acting, cuschioned **122** Through-rod	**0** Diameter **S** Non-magnetic ▲ **G** No stick-slip	32 40 50 63	✚ Ø 32 stroke 1 to 300 mm ✚ Ø 40 stroke 1 to 400 mm ✚ Ø 50 to 63 stroke 1 to 500 mm	**F** "Two-Flat" piston rod AISI 303 stainless steel nut	**P** Polyurethane gaskets

✚ Maximum recommended strokes. Higher values can create operating problems
▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**

KEY TO CODES FOR ISO 15552 TWO-FLAT TYPE A CYLINDERS

CYL	1 2 1 TYPE	A 	3 2 BORE	0 0 5 0 STROKE	F MATERIAL	P GASKETS
	121 Double-acting, cuschioned **122** Through-rod	**A** Standard ▲ **B** No stick-slip **C** Non-magnetic	32 40 50 63	✚ Ø 32 stroke 1 to 300 mm ✚ Ø 40 stroke 1 to 400 mm ✚ Ø 50 to 63 stroke 1 to 500 mm	**F** "Two-Flat" piston rod AISI 303 stainless steel nut	**P** Polyurethane gaskets

✚ Maximum recommended strokes. Higher values can create operating problems
▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**

KEY TO CODES FOR ISO 15552 TWO-FLAT SERIES 3 CYLINDERS

CYL	1 2 1 TYPE	3	3 2 BORE	0 0 5 0 STROKE	F MATERIAL	P GASKETS
	121 Double-acting cuschioned **122** Through-rod	**3** Series 3 ▲ **4** Series 3 No stick-slip **5** Series 3 Non-magnetic	32 40 50 63	✚ Ø 32 stroke 1 to 300 mm ✚ Ø 40 stroke 1 to 400 mm ✚ Ø 50 to 63 stroke 1 to 500 mm	**F** "Two-Flat" piston rod AISI 303 stainless steel nut	**P** Polyurethane gaskets

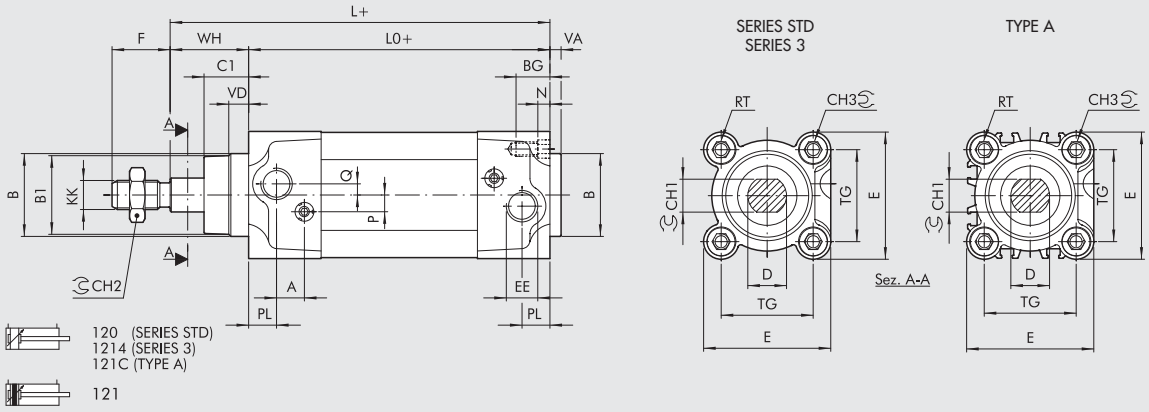
✚ Maximum recommended strokes. Higher values can create operating problems

▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**

DIMENSIONS

STANDARD VERSION

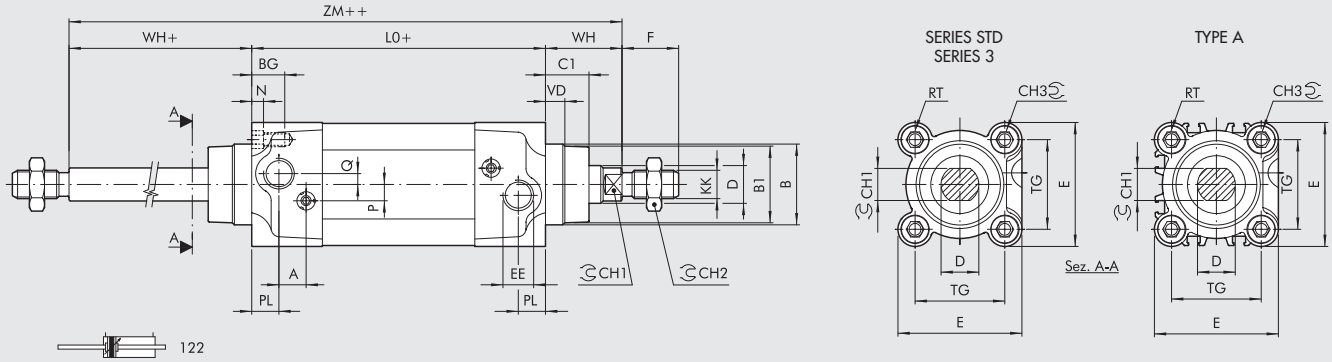
+ = ADD THE STROKE



THROUGH-ROD VERSION

+ = ADD THE STROKE

++ = ADD TWICE THE STROKE



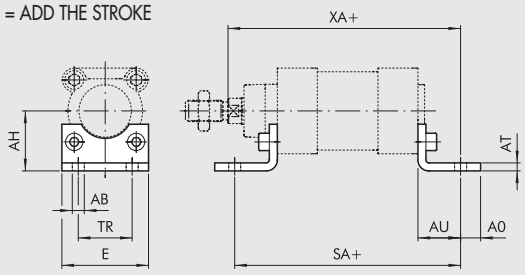
Ø	PL	VD	A	B	B_1	WH	C_1	CH_1	CH_2	CH_3	KK	D	TG	VA	F	EE	RT	E	L	L_0	ZM	BG	N	P	Q
32	10	6.5	10	30	28	26	16	10	17	6	M10x1.25	12	32.5	4	22	G1/8	M6	46	120	94	146	14.5	4.5	6	4
40	12	8	10	35	33	30	20	13	19	6	M12x1.25	16	38	4	24	G1/4	M6	54	135	105	165	14.5	4.5	6	4
50	14	13	10	40	38	37	25	17	24	8	M16x1.5	20	46.5	4	32	G1/4	M8	64.5	143	106	180	17.5	5.5	6	6
63	16	14	10	45	40	37	25	17	24	8	M16x1.5	20	56.5	4	32	G3/8	M8	75.5	158	121	195	17.5	5.5	6	6

ACCESSORIES FOR ISO 15552 STD, TYPE A, SERIES 3, TWO-FLAT:

FIXINGS

FOOT - MODEL A

+ = ADD THE STROKE

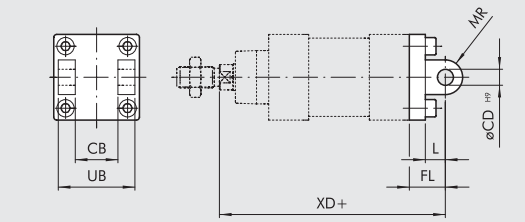


Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	XA	SA	Weight [g]
W0950322001	32	7	32	11	4	24	32	45	144	142	76
W0950402001	40	9	36	15	4	28	36	52	163	161	100
W0950502001	50	9	45	15	4	32	45	65	175	170	162
W0950632001	63	9	50	15	6	32	50	75	190	185	266
W0950802001	80	12	63	20	6	41	63	95	215	210	456
W0951002001	100	14	71	25	6	41	75	115	230	220	572
W0951252001	125	16	90	15	7	45	90	140	270	250	1130

Note: Individually packed with 2 screws

FEMALE HINGE - MODEL B

+ = ADD THE STROKE

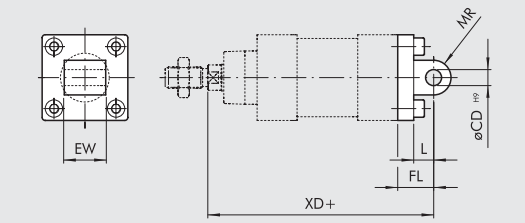


Code	Ø	UB	CB	FL	øCD	XD	MR	L	Weight [g]
W0950322003	32	45	26	22	10	142	10	12	116
W0950402003	40	52	28	25	12	160	12	15	160
W0950502003	50	60	32	27	12	170	12	15	252
W0950632003	63	70	40	32	16	190	16	20	394
W0950802003	80	90	50	36	16	210	16	20	670
W0951002003	100	110	60	41	20	230	20	25	1085
W0951252003	125	130	70	50	25	275	25	30	2000

Note: Supplied with 4 screws, 4 washers, 2 snap-rings, 1 pin

MALE HINGE - MODEL BA

+ = ADD THE STROKE

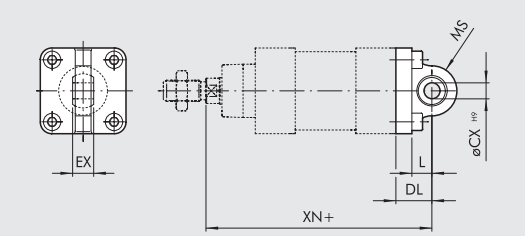


Code	Ø	EW	FL	MR	øCD	L	XD	Weight [g]
W0950322004	32	26	22	11	10	12	142	94
W0950402004	40	28	25	13	12	15	160	124
W0950502004	50	32	27	13	12	15	170	220
W0950632004	63	40	32	17	16	20	190	316
W0950802004	80	50	36	17	16	20	210	578
W0951002004	100	60	41	21	20	25	230	850
W0951252004	125	70	50	26	25	30	275	1590

Note: Supplied with 4 screws

ARTICULATED MALE HINGE - MODEL BAS

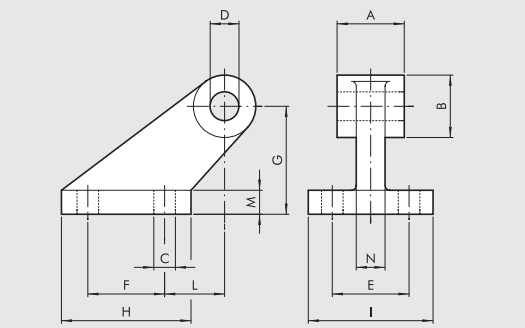
+ = ADD THE STROKE



Code	Ø	DL	MS	L	XN	øCX	EX	Weight [g]
W0950322006	32	22	16	12	142	10	14	106
W0950402006	40	25	18	15	160	12	16	142
W0950502006	50	27	21	15	170	12	16	236
W0950632006	63	32	23	20	190	16	21	336
W0950802006	80	36	28	20	210	16	21	572
W0951002006	100	41	30	25	230	20	25	840
W0951252006	125	50	40	30	275	25	31	1520

Note: Supplied with 4 screws

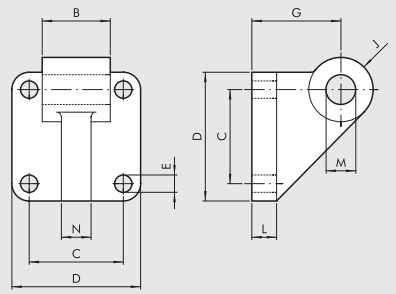
CETOP HINGE FOR MODEL B - MODEL GL



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96
W0950402008	40	28	26	9	12	32	32	45	54	52	25	10	12	216
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440
W0950802008	80	50	33	11	16	40	50	63	75	63	32	12	15	464
W0951002008	100	60	44	14	20	50	70	90	103	80	40	16	22	985
W0951252008	125	70	44	14	25	50	70	90	103	80	40	16	22	1000

Note: Supplied with 4 screws, 4 washers

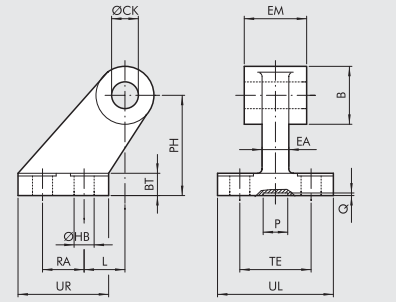
ISO HINGE FOR MODEL B - MODEL GS



Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]
W0950322108	32	25.5	32.5	45	7	32	11	10	10	10	106
W0950402108	40	27.5	38	52	7	36	13	10	12	12	138
W0950502108	50	31.5	46.5	65	9	45	13	12	12	12	252
W0950632108	63	39.5	56.5	75	9	50	17	12	16	15	350
W0950802108	80	49.5	72	95	11	63	17	16	16	15	655
W0951002108	100	59.5	89	115	11	73	21	16	20	22	980

Note: Supplied with 4 screws, 4 washers

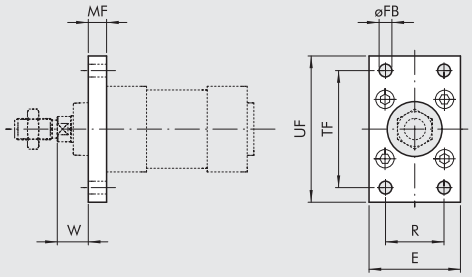
ISO 15552 HINGE FOR MODEL B - MODEL AB7



Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]
W0950322017	32	26	20	6.6	10	38	18	32	31	51	3	8	10	21	3	60
W0950402017	40	28	22	6.6	12	41	22	36	35	54	2	10	15*	21	3	85
W0950502017	50	32	26	9	12	50	30	45	45	65	3	12	16	21	3	162
W0950632017	63	40	30	9	16	52	35	50	50	67	2	14*	16	21	3	191
W0950802017	80	50	30	11	16	66	40	63	60	86	7	14	20	21	3	332
W0951002017	100	60	38	11	20	76	50	71	70	96	5	17*	20	11	3	522
W0951252017	125	70	45	14	25	94	60	90	90	124	10	20	30	21	3	960

* Dimensions not to ISO 15552

FRONT FLANGE - MODEL C

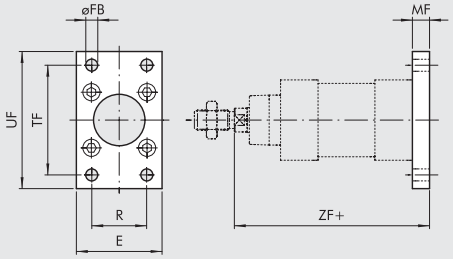


Code	Ø	TF	UF	E	MF	R	øFB	W	Weight [g]
W0950322002	32	64	80	50	10	32	7	16	246
W0950402002	40	72	90	55	10	36	9	20	290
W0950502002	50	90	110	65	12	45	9	25	522
W0950632002	63	100	120	75	12	50	9	25	670
W0950802002	80	126	153	95	16	63	12	30	1420
W0951002002	100	150	178	115	16	75	14	35	2040
W0951252002	125	180	220	140	20	90	16	45	4300

Note: Supplied with 4 screws

REAR FLANGE - MODEL C

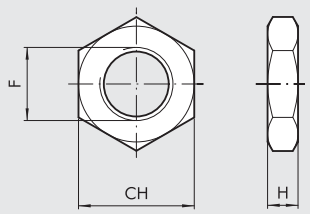
+ = ADD THE STROKE



Code	Ø	TF	UF	E	MF	R	øFB	ZF	Weight [g]
W0950322002	32	64	80	50	10	32	7	130	246
W0950402002	40	72	90	55	10	36	9	145	290
W0950502002	50	90	110	65	12	45	9	155	522
W0950632002	63	100	120	75	12	50	9	170	670
W0950802002	80	126	153	95	16	63	12	190	1420
W0951002002	100	150	178	115	16	75	14	205	2040
W0951252002	125	180	220	140	20	90	16	245	4300

Note: Supplied with 4 screws.

ROD NUT - MODEL S

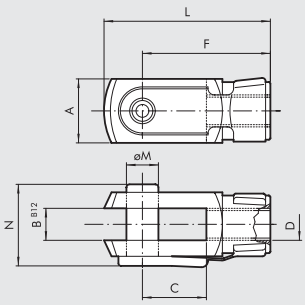


Code	Ø	F	H	CH	Weight [g]
0950322010	32	M10x1.25	6	17	6
0950402010	40	M12x1.25	7	19	12
0950502010	50/63	M16x1.5	8	24	20
0950802010	80/100	M20x1.5	9	30	32
0951252010	125	M27x2	12	41	74

Note: Individually packed

METAL WORK PNEUMATIC

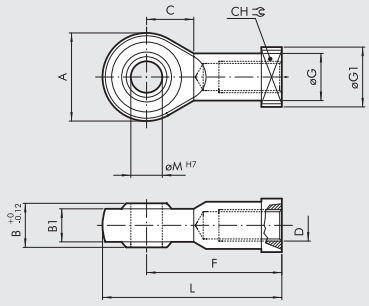
FORK MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0950322020	32	10	20	10	20	52	40	M10x1.25	26	92
W0950402020	40	12	24	12	24	62	48	M12x1.25	32	148
W0950502020	50	16	32	16	32	83	64	M16x1.5	40	340
W0950502020	63	16	32	16	32	83	64	M16x1.5	40	340
W0950802020	80	20	40	20	40	105	80	M20x1.5	48	690
W0950802020	100	20	40	20	40	105	80	M20x1.5	48	690
W0951252020	125	30	54	30	55	148	110	M27x2	65	1835

Note: Individually packed

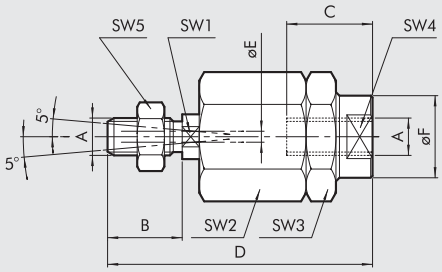
ROD EYE - MODEL GA-M



Code	Ø	øM	C	B1	B	A	L	F	D	øG	CH	øG1	Weight [g]
W0950322025	32	10	15	10.5	14	28	57	43	M10x1.25	15	17	19	78
W0950402025	40	12	17	12	16	32	66	50	M12x1.25	17.5	19	19	116
W0950502025	50	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950502025	63	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950802025	80	20	26	18	25	50	102	77	M20x1.5	27.5	30	27	404
W0950802025	100	20	26	18	25	50	102	77	M20x1.5	27.5	30	27	404
W0951252025	125	30	36	25	37	70	145	110	M27x2	40	41	50	1190

Note: Individually packed

SELF ALIGNING ROD COUPLER - MODEL GA-K



Code	Ø	A	B	C	D	øF	øE	SW_1	SW_2	SW_3	SW_4	SW_5	Weight [g]
W0950322030	32	M10x1.25	20	20	71	22	4	12	30	30	19	17	216
W0950402030	40	M12x1.25	24	20	75	22	4	12	30	30	19	19	220
W0950502030	50	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950502030	63	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950802030	80	M20x1.5	40	40	119	32	4	20	41	41	30	30	680
W0950802030	100	M20x1.5	40	40	119	32	4	20	41	41	30	30	680

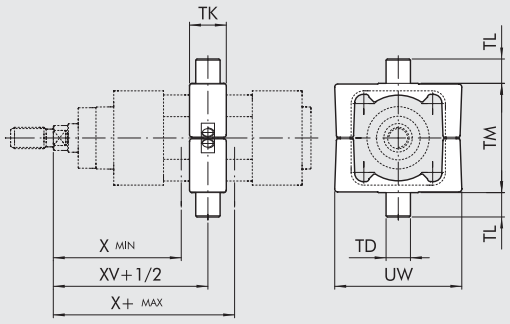
Note: Individually packed

NOTES

ACCESSORIES FOR ISO 15552 CYLINDERS: INTERMEDIATE HINGE

INTERMEDIATE HINGE - MODEL EN, FOR STD AND STD TWO-FLAT SERIES

\+ = ADD THE STROKE
+ 1/2 = ADD HALF THE STROKE

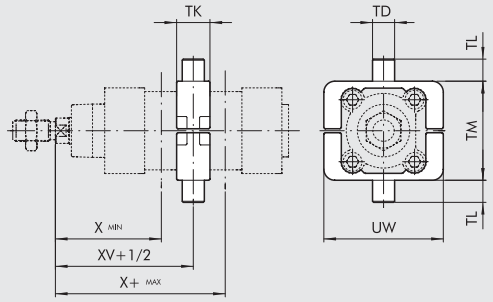


Code	Ø	X (min)	XV	X (max)	TM	TL	TD e 9	TK	UW	Weight [g]
0950322007	32	63	73	83	50	12	12	22	65	282
0950402007	40	72	82.5	93	63	16	16	28	75	582
0950502007	50	83	90	97	75	16	16	32	95	880
0950632007	63	86.5	97.5	108.5	90	20	20	35	105	1230
0950802007	80	104	110	116	110	20	20	40	130	2030
0951002007	100	113.5	120	126.5	132	25	25	45	145	2600
0951252007	125	135	145	155	160	25	25	50	175	3900

Note: Supplied complete with 4 grub screws, 2 pins

INTERMEDIATE HINGE - MODEL EN, FOR TYPE A AND TYPE A TWO-FLAT SERIES

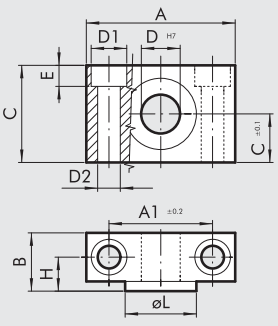
\+ = ADD THE STROKE
+ 1/2 = ADD HALF THE STROKE



Code	Ø	X (min)	XV	X (max)	TM	TL	TD e 9	TK	UW	Weight [g]
0950322107	32	63	73	83	50	12	12	22	65	170
0950402107	40	72	82.5	93	63	16	16	28	75	360
0950502107	50	83	90	97	75	16	16	28	95	580
0950632107	63	86.5	97.5	108.5	90	20	20	36	105	950
0950802107	80	104	110	116	110	20	20	36	130	1480
0951002107	100	113.5	120	126.5	132	25	25	45	145	2140
0951252107	125	135	145	155	160	25	25	50	175	2950

Note: Supplied with 8 grub screws, 2 pins

COUNTER-HINGE FOR MODEL EN - MODEL EL



Code	Ø	A	A_1	B	C	C_1	D_1	D_2	D	E	H	øL	Weight [g]
W0950322009	32	46	32	18	30	15	11	7	12	6.5	10.5	22	162
W0950402009	40	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950402009	50	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950632009	63	65	42	23	40	20	18	11	20	10.5	13	35	414
W0950632009	80	65	42	23	40	20	18	11	20	10.5	13	35	414
W0951002009	100	75	50	28.5	50	25	20	13	25	12.5	16	40	715
W0951002009	125	75	50	28.5	50	25	20	13	25	12.5	16	40	715

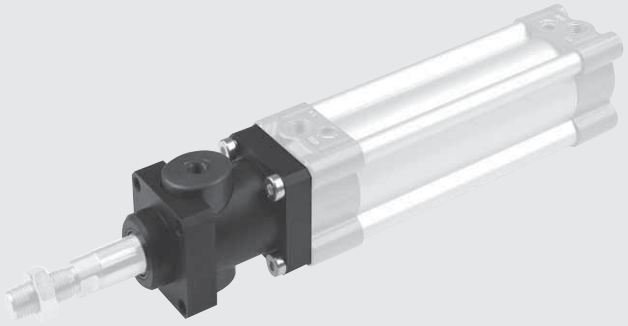
Note: 2-pieces pack with 4 screws

ACCESSORIES FOR ISO 15552 CYLINDERS: MECHANICAL ROD BLOCK

TECHNICAL DATA

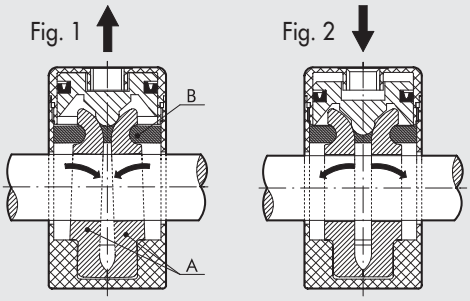
Pilot pressure	bar	4 to 8						
	MPa	0.4 to 0.8						
Temperature range	°C	-10 to +80						
	°F	14 to 176						
Operation		NC - bidirectional						
Mechanics		Double pad with mechanical lock						
		Mechanical stick-slip						
Locking force	Ø	32	40	50	63	80	100	125
	N	650	1100	1600	2500	4000	6300	8700

MATERIAL	
body	Aluminium
pad	Brass
spring	NBR
piston	Synthetic material with added Teflon®
gasket	NBR
Pilot port	M5 or 1/8"



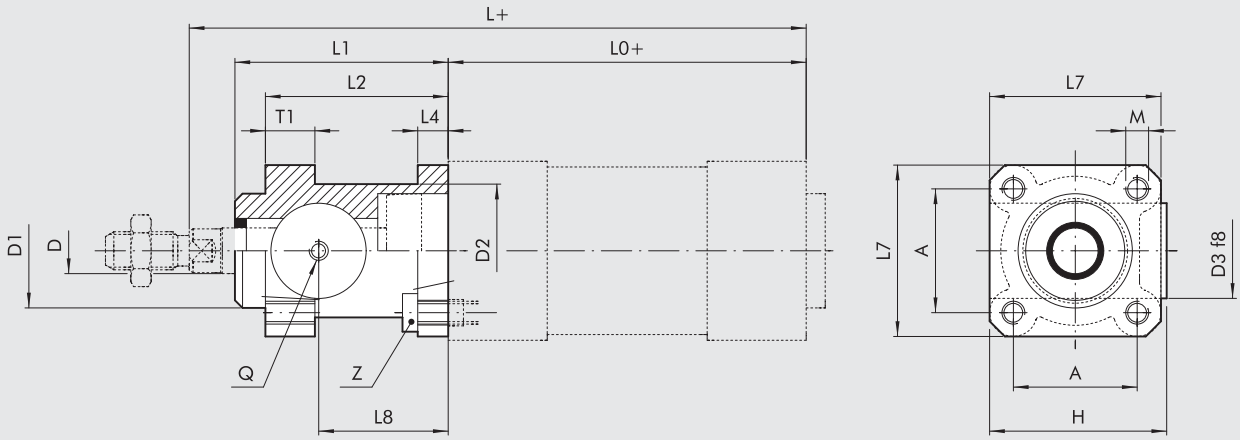
OPERATING PRINCIPLE

The mechanical piston rod lock is a normally-closed mechanism.
In the absence of pneumatic piloting, the two pads (A) lock the cylinder rod in both directions (Fig. 1). With pneumatic piloting, the piston rod guide forces the pads to come right up to each other and overcome the counter spring (B) force and the piston rod can slide (Fig. 2).
It is important to remember that the mechanical piston rod lock is a static type, which means that it is necessary to stop the cylinder piston rod pneumatically before locking the part mechanically.



DIMENSIONS

+ = ADD THE STROKE



Code	Ø	L_1	L_2	L_4	L_7	L_8	D	D_1	D_2	D_3	H	A	T_1	M	Z	Q	L_0	L	Weight [g]
W5010001102	**32**	58	48	8	45	34	12	30	35	25	46.5	32.5	13	M6	M6x20	M5	94	162	150
W5010001103	**40**	65	55	8	50	38	16	35	40	28	53	38	13	M6	M6x20	G1/8	105	180	200
W5010001104	**50**	82	70	15	60	48	20	40	50	35	64	46.5	16	M8	M8x30	G1/8	106	200	500
W5010001109	**63**	82	70	15	70	49.5	20	45	60	38	75	56.5	16	M8	M8x30	G1/8	121	215	700
W5010001106	**80**	110	90	18	90	61	25	45	80	48	95	72	20	M10	M10x35	G1/8	128	251	1700
W5010001107	**100**	115	100	18	105	68	25	55	100	58	110.5	89	20	M10	M10x35	G1/8	138	266	2700
W5010001108	**125**	167	122	22	140	86.5	32	60	130	65	150	110	30	M12	M12x40	G1/8	160	347	5600

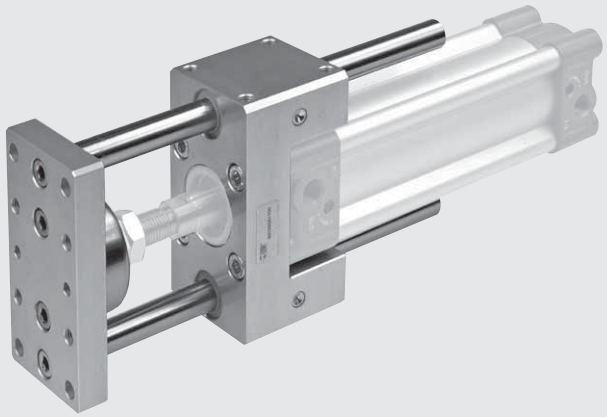
ACCESSORIES FOR ISO 15552 CYLINDERS: GUIDE UNITS

Guide units series DS-DH-DM ensure optimal alignment and anti-rotation effect of the pneumatic cylinder connected to it. The guide units can be used separately or combined in order to get complete handling units, in which case the guide units can be coupled using the type A and C anchorage (pin and flange).
The guide units can be coupled to ISO 15552 cylinders (Ø 32 to 100).
The following versions are available:
U PROFILE (GDS)*: for limited loads and speeds
H PROFILE (GDH)*: for high loads
H PROFILE (GDM)**: for high speeds

* With bronze guide bushing
** With ball guide bushing

STANDARD STROKES: 50 - 100 - 150 - 200 - 250 - 320 - 400 - 500

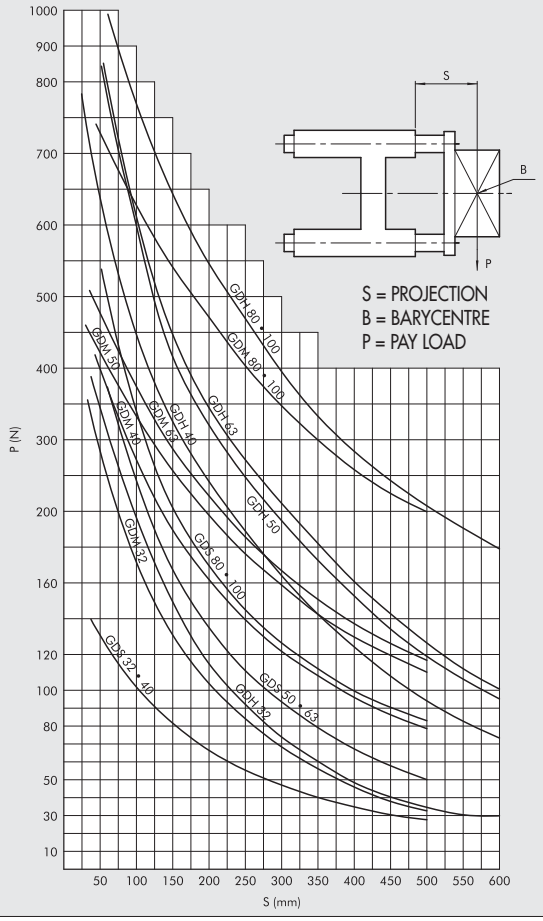
For weights, see cylinder "**General technical data**" at the beginning of the chapter.



COMPONENTS

SERIES GDS-GDH	Body:	aluminium alloy
	Guide bushing:	self-lubricating sintered bronze and wiper rings
	Piston rod:	chromed rolled steel
SERIES GDM	Body:	aluminium alloy
	Guide bushing:	ball linear bearings and scraper ring
	Piston rod:	tempered stainless steel

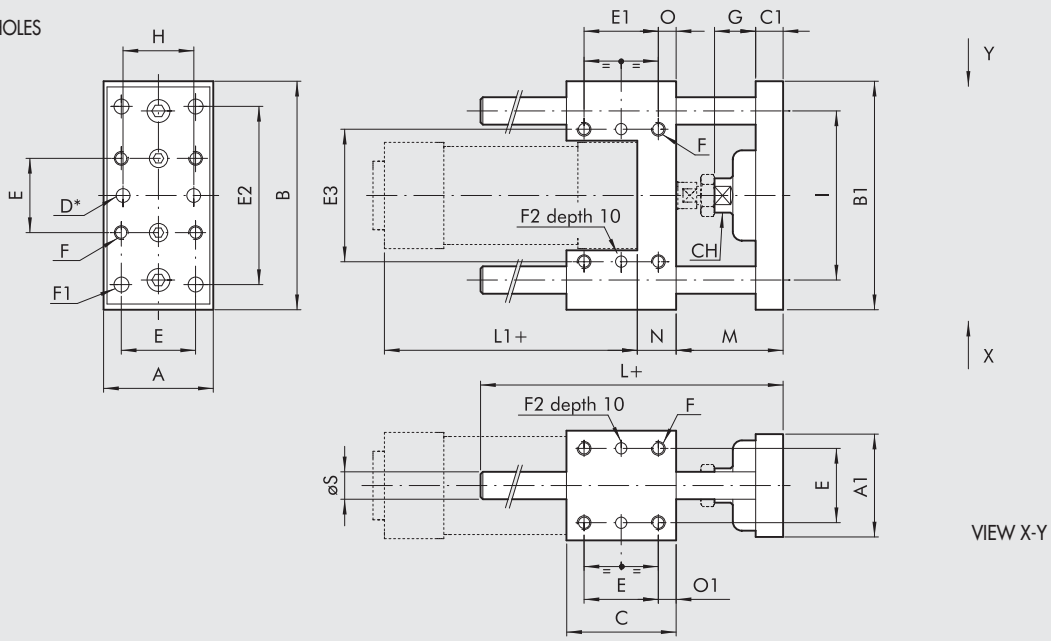
GRAPH OF GUIDE UNIT LOADS



METAL WORK PNEUMATIC

DIMENSIONS TYPE GDS

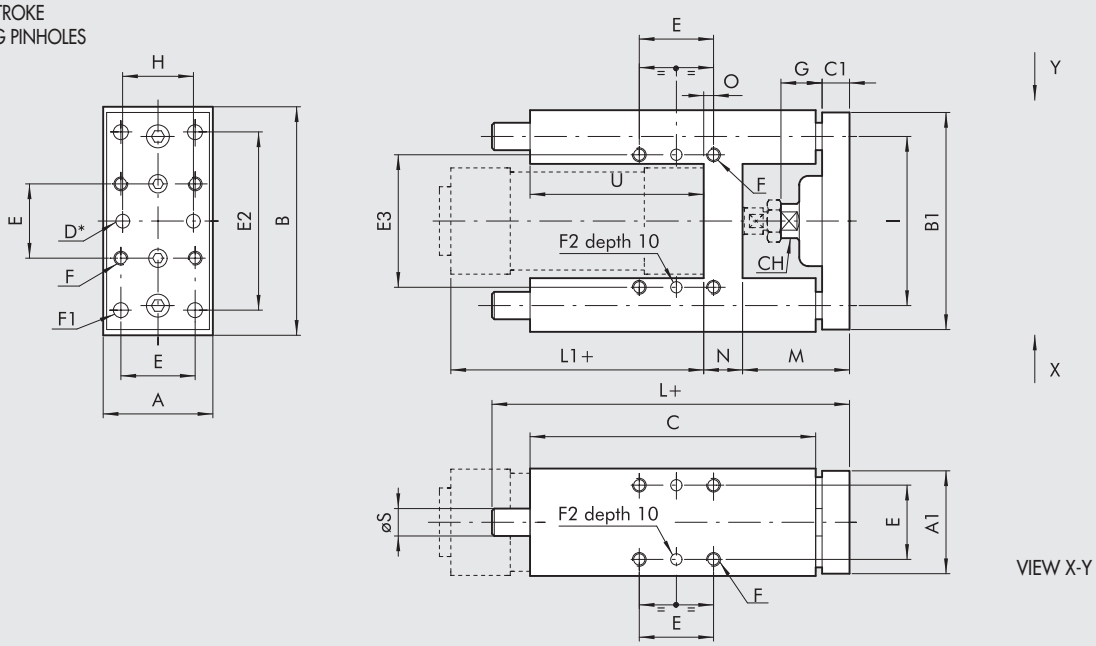
+ = ADD THE STROKE
✱ = CENTERING PINHOLES



Ø	A	A_1	B	B_1	C	C_1	D^{H7}	E	E_1	E_2	E_3	F	F_1	F_2^{H7}	G	H	I	L	L_1	M	N	O	O_1	Ø S	CH
32	48	45	100	95	48	12	6	32.5	32.5	78	58	M6	6.5	6	18	31	74	108	94	46	17	7.8	7.8	12	15
40	56	53	106	101	58	15	6	38	38	84	64	M6	6.5	6	21	36	80	120	105	52	21	10	10	12	15
50	66	63	125	120	59	15	6	46.5	46.5	100	80	M8	8.5	6	24	45	96	130	106	65	25	6.3	6.3	16	22
63	76	73	132	127	76	15	6	56.5	56.5	105	95	M8	8.5	6	24	45	104	145	121	65	25	9.8	9.8	16	22
80	98	95	165	160	90	16	6	72	50	130	130	M10	11	6	31	56	130	170	128	71	34	20	9	20	27
100	118	115	185	180	110	16	6	89	70	150	150	M10	11	6	31	56	152	190	138	71	39	20	10.5	20	27

DIMENSIONS TYPE GDH-GDM

+ = ADD THE STROKE
✱ = CENTERING PINHOLES



Ø	A	A_1	B	B_1	C	C_1	CH	D^{H7}	E	E_2	E_3	F	F_1	F_2^{H7}	G	H	I	L	L_1	M	N	O	Ø S	U
32	49	45	97	90	125	12	13	6	32.5	78	61	M6	6.5	6	18	31	74	177	94	48	17	4.3	12	76
40	58	54	115	110	139	15	15	6	38	84	69	M6	6.5	6	21	36	87	192	105	53	21	11	16	81
50	69	63	137	130	148	15	22	6	46.5	100	85	M8	8.5	6	24	45	104	205	106	63	26	18.5	20	78
63	85	79	152	145	182	15	22	6	56.5	105	100	M8	8.5	6	24	45	119	237	121	62	26	15.3	20	111
80	105	99	189	180	215	20	27	6	72	130	130	M10	11	6	31	56	148	280	128	76	34	21	25	128
100	129	120	213	200	220	20	27	6	89	150	150	M10	11	6	31	56	172	280	138	76	39	24.5	25	128

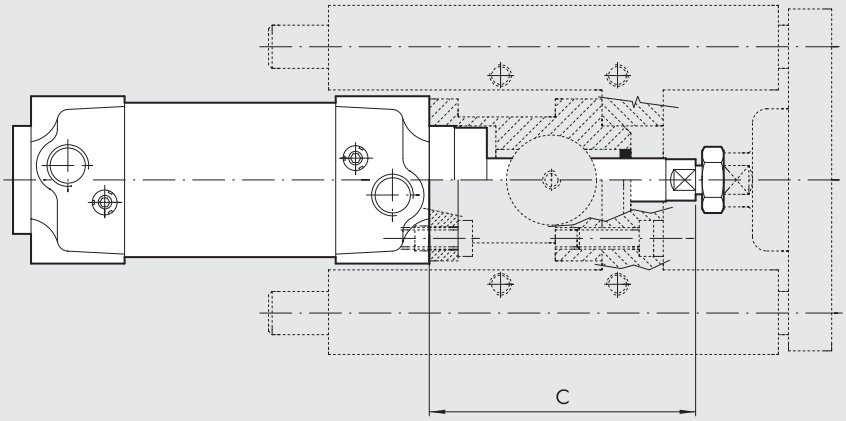
ORDER CODE GUIDE UNIT

Version	Code	Bore	Type
Sliding on bronze bushings (GDS)	**W0700321...**	32	UNIT MW DS 032...
	W0700401...	40	UNIT MW DS 040...
	W0700501...	50	UNIT MW DS 050...
	W0700631...	63	UNIT MW DS 063...
	W0700801...	80	UNIT MW DS 080...
	W0701001...	100	UNIT MW DS 100...
Sliding on bronze bushings (GDH)	**W0700322...***	32	UNIT MW DH 032...
	W0700402...*	40	UNIT MW DH 040...
	W0700502...	50	UNIT MW DH 050...
	W0700632...	63	UNIT MW DH 063...
	W0700802...	80	UNIT MW DH 080...
	W0701002...	100	UNIT MW DH 100...
	* Also available in V-Lock version (see **chapter A3**).		
Sliding on ball bearing (GDM)	**W0700323...***	32	UNIT MW DM 032...
	W0700403...*	40	UNIT MW DM 040...
	W0700503...	50	UNIT MW DM 050...
	W0700633...	63	UNIT MW DM 063...
	W0700803...	80	UNIT MW DM 080...
	W0701003...	100	UNIT MW DM 100...
	* Also available in V-Lock version (see **chapter A3**).		

Note: To complete the type and code, add the 3-digit stroke (e.g. 50=050)

DIMENSIONS PISTON ROD LOCK + GUIDE UNIT COD. 137

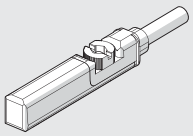
Ø	C
32	74
40	85
50	107
63	107
80	136
100	143



ACCESSORIES FOR ISO 15552 CYLINDERS: MAGNETIC SENSORS AND POSITION SENSOR

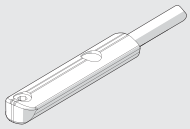
RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



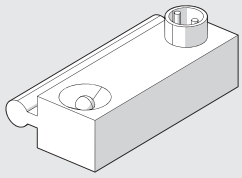
Can only be used on ISO 15552 type A and series 3 cylinders.
For codes and technical data, see **chapter A6**.

SENSOR, OVAL TYPE
Traditional



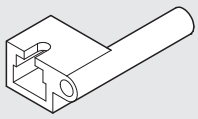
Can be used on all ISO 15552 cylinders.
Use the adaptor to secure to STD cylinders.
For codes and technical data, see **chapter A6**.

SENSOR SERIES DSM



Can be used on ISO 15552 cylinders in the STD series and series 3.
For codes and technical data, see **chapter A6**.

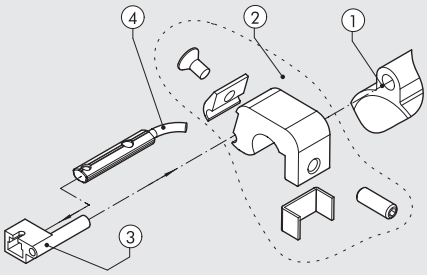
ADAPTER FOR OVAL TYPE RETRACTABLE SENSORS



Code	Description
W0950001001	Adaptor DSS005 for DST/ST brackets

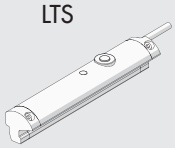
ASSEMBLY DIAGRAM

① ISO 15552 cylinder with serie STD or serie 3 barrel
② Sensor bracket mod. DST (Ø 32 to 125)
③ Adaptor
④ Retractable sensor "oval type"

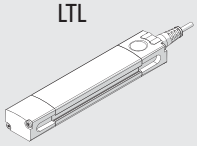


POSITION SENSOR

LTS



LTL

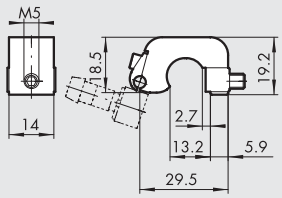


Model	For ISO 15552 cylinders
LTS	type A - series 3
LTL	type A

For technical data and usage strokes see **chapter A6**.

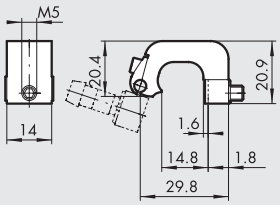
SENSOR SUPPORT BRACKETS FOR SENSORS DSM

Ø 32 to 40



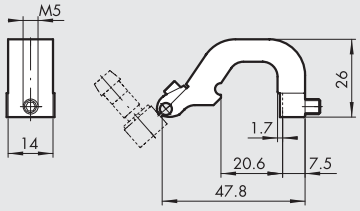
Code	Description
W0950000711	Bracket D.32-40 DST 80

Ø 50 to 63



Code	Description
W0950000712	Bracket D.50-63 DST 81

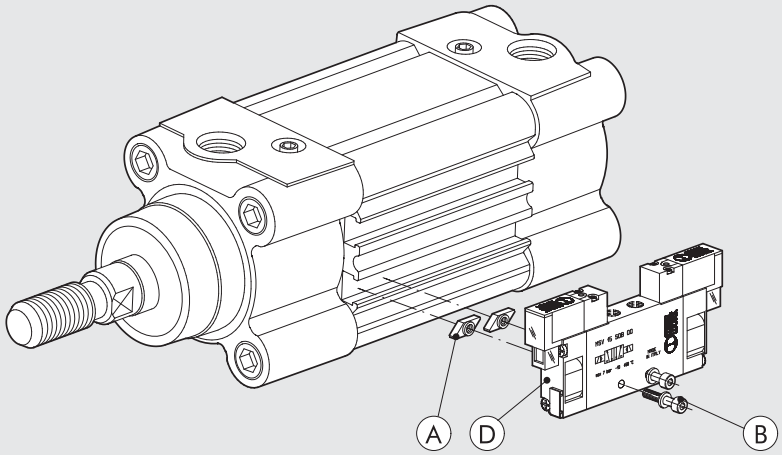
Ø 80 to 125



Code	Description
W0950000713	Bracket D.80-100-125 DST 82

VALVE ASSEMBLY ON CYLINDER FOR TYPE A AND SERIES 3 CYLINDERS

With this type of cylinder, the valves (D) can be mounted directly using the retracting sensor slot, without requiring the use of intermediate brackets.
This can be done using the special plates (A), which come with both the M3 and M4 threads, and screws (B) of the size, type and quantity shown in the table below.
For ISO 1 and ISO 2 valves, the kit on which the valve is to be mounted (codes shown in the tables) will be fitted to the cylinder using the special plates (A) and the screws (B) listed in the table.



Type of valve to mount (D)	M3 fixing plate (A) code 0950003002	M4 fixing plate (A) code 0950003001	Screw (B) for connection to cylinder (one per plate)	Washer (B) (one per screw)	Valve assembly kit
MINIMACH	n° 2	–	M3x16 UNI 5931 (DIN 912)	A3.2 UNI 1751 (DIN 127A)	–
MACH 11	n° 2	–	M3x16 UNI 5931 (DIN 912)	A3.2 UNI 1751 (DIN 127A)	–
SERIE 70 1/8	–	n° 2	M4x25 UNI 5931 (DIN 912)	–	–
SERIE 70 1/4	–	n° 2	M4x30 UNI 5931 (DIN 912)	A4.3 UNI 1751 (DIN 127A)	–
SERIE 70 1/2	–	n° 2	M4x45 UNI 5931 (DIN 912)	A4.3 UNI 1751 (DIN 127A)	–
ISO 1	–	n° 2	M4x8 UNI 7688 (DIN 965A)	–	0950002001
ISO 2	–	n° 2	M4x8 UNI 7688 (DIN 965A)	–	0950002002

FIXING BRACKET SERIES KCV FOR TYPE STD AND SERIES 3 CYLINDERS

Fig. Ⓐ

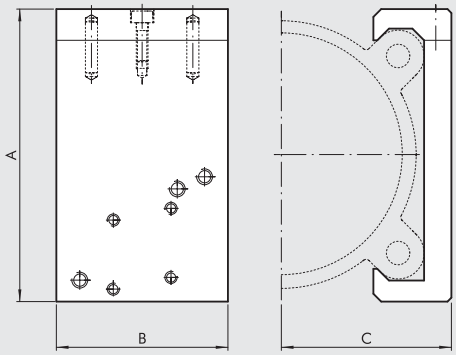
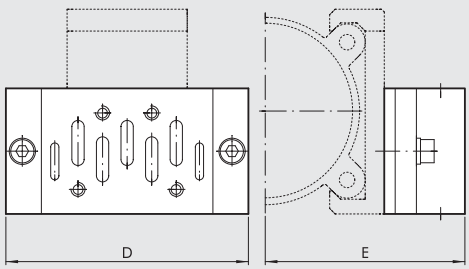


Fig. Ⓑ



VALVE FIXING BRACKET - CYLINDER (Fig. A)

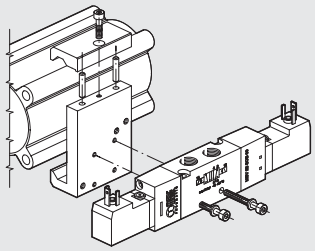
					ISO 1		ISO 2			
Code	Ø	A	B	C	D	E	D	E	Applicable valves	Weight [g]
0950322090	**32**	54	40	29.5	110	64.5	124	70.5	MACH 16 Series 70 1/8-1/4 ISO 1 - ISO 2	80
0950402090	**40**	59.5	40	32.2	110	67.2	124	73.2	MACH 16 Series 70 1/8-1/4 ISO 1 - ISO 2	86
0950502090	**50**	71.5	40	37	110	72	124	78	MACH 16 Series 70 1/8-1/4 ISO 1 - ISO 2	93
0950632090	**63**	81.5	40	42	110	77	124	83	MACH 16 Series 70 1/8-1/4 ISO 1 - ISO 2	101
0950802090	**80**	99	60	53.5	110	88.5	124	94.5	Series 70 1/8-1/4-1/2 ISO 1 - ISO 2	222
0951002090	**100**	119.5	60	63.5	110	98.5	124	104.5	Series 70 1/8-1/4-1/2 ISO 1 - ISO 2	258
0951252090	**125**	148	60	76.5	110	111.5	124	117.9	Series 70 1/8-1/4-1/2 ISO 1 - ISO 2	298

KIT FOR FIXING VALVES TO BRACKETS, FOR SERIES KCV BRACKETS

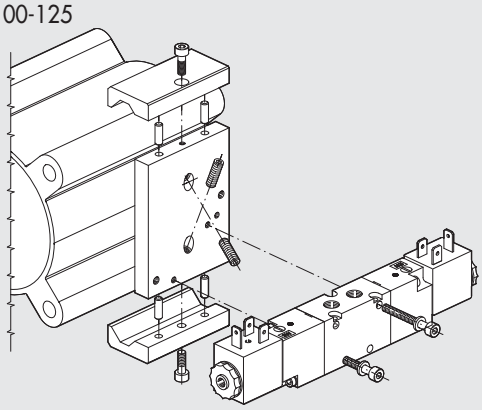
Code	Valve kit	Composition	Weight [g]
0950002003	MACH 16	2 hex. screws M3x25 with washer	4
0950002004	Series 70 1/8-1/4	2 hex. screws M4x30 with washer	8
0950002006	Series 70 1/2	2 hex. screws M5x50 with washer	20
0950002001	ISO 1	Adaptor + ISO 1 BASE SIDE + screws + washers (Fig.B)	230
0950002002	ISO 2	Adaptor + ISO 2 BASE SIDE + screws + washers (Fig.B)	350

VALVE ASSEMBLY ON CYLINDER

FOR Ø 32-40-50-63



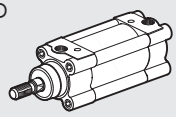
FOR Ø 80-100-125



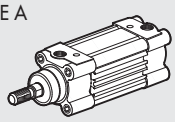
CYLINDERS ISO 15552 STD, TYPE "A" AND SERIES 3 TWO-FLAT: SPARE PARTS

NEW RELEASE

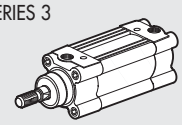
STD

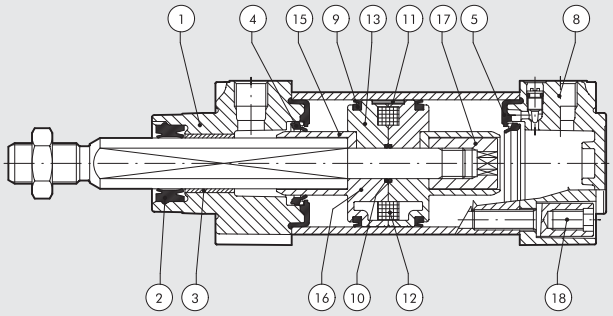


TYPE A



SERIES 3

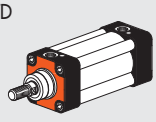




Code	Bore	Type	Parts
009 . . . 0101F	Ø 32 to 63	Set of polyurethane gaskets	4-5-9-10
009 . . . 0110FN	Ø 32 to 63	Complete polyurethane front head kit	1-2-3-4-5-18
009 . . . 0111N	Ø 32 to 63	Complete polyurethane rear head kit	4-5-8-18
009 . . . 0604	Ø 32 to 63	Complete polyurethane piston kit	9-10-16-17
009 . . . 0704FN	Ø 32 to 63	Complete polyurethane head front+rear+piston kit	1-2-3-4-5-8-9-10-16-17-18
009 . . . 0800	Ø 32 to 63	Magnet	12

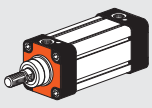
OLD RELEASE

STD



The OLD RELEASE version with black front heads is no longer available. For spare parts, please contact our sales offices.

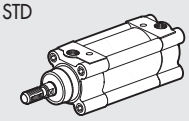
TYPE A



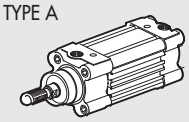
CYLINDERS ISO 15552 STD, TYPE "A" AND SERIES 3: SPARE PARTS

NEW RELEASE

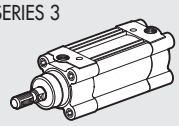
STD

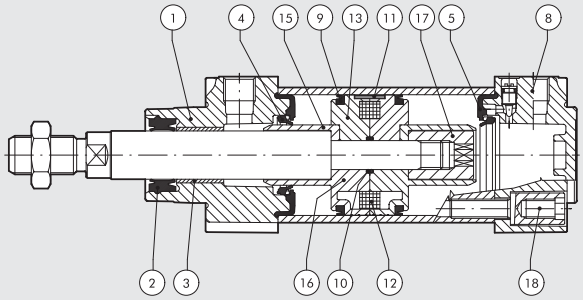


TYPE A



SERIES 3

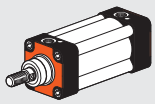




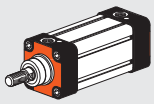
Code	Bore	Type	Parts
009 . . . 0101	Ø 32 to 125	Complete set of polyurethane gaskets	2-4-5-9-10
009 . . . 0103	Ø 32 to 125	Complete set of (high temperature) FKM/FPM gaskets	2-4-5-9-10
009 . . . 0502	Ø 32 to 125	Complete set of NBR gaskets	2-4-5-9-10
009 . . . 1651	Ø 32 to 125	Polyurethane piston rod gasket kit + seeger	2
009 . . . 1652	Ø 32 to 125	NBR piston rod gasket kit + seeger	2
009 . . . 1653	Ø 32 to 125	FKM/FPM piston rod gasket kit + seeger	2
009 . . . 0110N	Ø 32 to 125	Complete polyurethane front head kit	1-2-3-4-5-18
009 . . . 0304N	Ø 32 to 125	Complete NBR front head kit	1-2-3-4-5-18
009 . . . 0111N	Ø 32 to 125	Complete polyurethane rear head kit	4-5-8-18
009 . . . 0305N	Ø 32 to 125	Complete NBR rear head kit	4-5-8-18
009 . . . 0604	Ø 32 to 63	Complete polyurethane piston kit	9-10-16-17
009 . . . 0604	Ø 80 to 125	Complete polyurethane piston kit	9-10-11-13-15-17
009 . . . 0602	Ø 32 to 63	Complete NBR piston kit	9-10-16-17
009 . . . 0602	Ø 80 to 125	Complete NBR piston kit	9-10-11-13-15-17
009 . . . 0704N	Ø 32 to 63	Complete polyurethane head front + rear + piston kit	1-2-3-4-5-8-9-10-16-17-18
009 . . . 0704N	Ø 80 to 125	Complete polyurethane head front + rear + piston kit	1-2-3-4-5-8-9-10-11-13-15-17-18
009 . . . 0702N	Ø 32 to 63	Complete NBR head front + rear + pistion kit	1-2-3-4-5-8-9-10-16-17-18
009 . . . 0702N	Ø 80 to 125	Complete NBR head front + rear + piston kit	1-2-3-4-5-8-9-10-11-13-15-17-18
009 . . . 0800	Ø 32 to 125	Magnet	12

OLD RELEASE

STD



TYPE A



The OLD RELEASE version with black front heads is no longer available. For spare parts, please contact our sales offices.

ISO 15552 CYLINDER – SERIES HCR (High Corrosion Resistance)

In some applications, the cylinders are exposed to aggressive environments (e.g. the dairy, fruit & vegetable and food industry) or to substances and washings with aggressive detergents (e.g. caustic soda, hydrochloric acid and lactic acid).
Under these conditions, the HCR series cylinders ensure better corrosion resistance.
Cylinders made to ISO 15552, designed and built with materials and/or surface treatments that are highly resistant to corrosion.
They come in various versions and with a specific range of accessories:

- with or without magnet
- with single or through piston rod

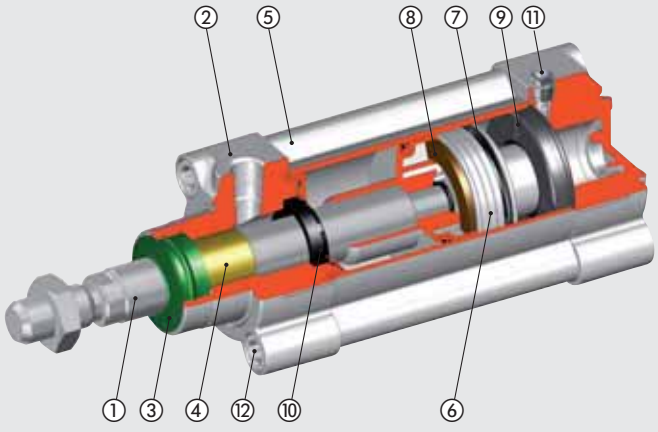
Also available with liner in the STD series or series 3.

TECHNICAL DATA

Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	–10 to +60
Resistance in corrosive environments at 20°C		Basic solution (5% sodium hydroxide - pH max 12)
		Acid solution (5% hydrochloric acid - pH min. 2.5)
		Salt mist testing to DIN 50021-SS, 500 hours
Fluid		Unlubricated air. Lubrication, if used, must be continuous
Bores	mm	32; 40; 50; 63; 80; 100; 125
Standard strokes	mm	For bores 32 to 80 strokes from 1 to 2800
		for bores 100 to 125 strokes from 1 to 2600
Versions		Double-acting, Double-acting cushioned, Through-rod cushioned
		(magnetic and non-magnetic versions are available for each type)
Gaskets		Piston rod gaskets made of polyurethane, other gaskets in NBR
Forces generated at 6 bar thrust/retraction		See cylinder "**General technical data**" at the beginning of the chapter
Weights		See cylinder "**General technical data**" at the beginning of the chapter

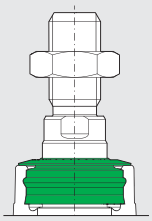
COMPONENTS

① PISTON ROD: AISI 316, thickness-chromed
② HEAD: anodized pressure die-cast aluminium, epoxy-vinyl ester and epoxy-resin powder coating
③ PISTON ROD GASKET: special polyurethane
④ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑤ BARREL: drawn anodised calibrated aluminium
⑥ SEMI-PISTON: made of self-lubricating technopolymer with built-in cushioning olives (aluminium with technopolymer pad for Ø 80, 10 and 125)
⑦ PISTON GASKET: NBR
⑧ MAGNET: plastoferrite
⑨ BUFFER + Static O-rings: NBR
⑩ CUSHIONING GASKET: NBR
⑪ NEEDLE: AISI 316
⑫ SCREWS: AISI 316



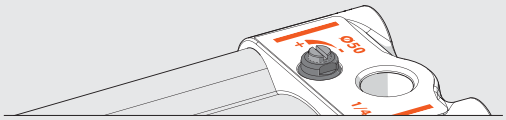
PISTON ROD GASKET FOR HYGIENICALLY-SENSITIVE APPLICATIONS

No fluid stagnation, not even with cylinder in upward direction.
This type of gasket is not available for Ø 125.



CUSHIONING PINS WITHOUT RECESSES

Anti-ejection pin and bushing made of AISI 316 stainless steel, protruding from the head and with a pass-through screwdriver slot to prevent fluid stagnation.



TRIPLE HEAD PROTECTION

EPOXY-RESIN POWDER COATING

EPOXY-VINYL ESTER COATING

ANODISATION

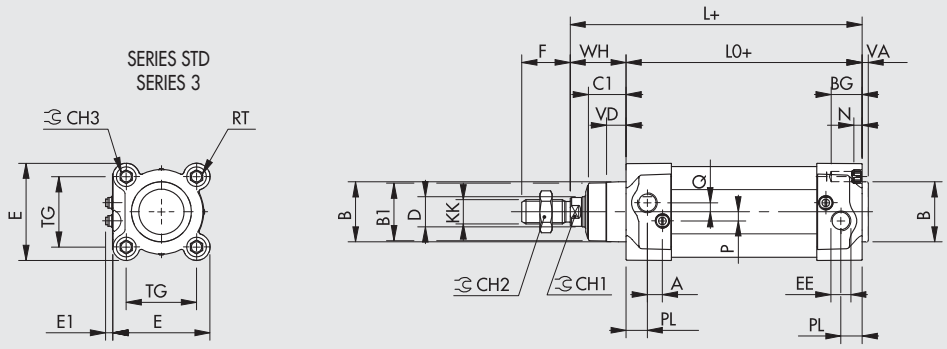
HEAD MADE OF PRESSURE DIE-CAST ALUMINIUM ALLOY

FOOD GRADE GREASE

NSF H1 certified.
Adhesive, waterproof.

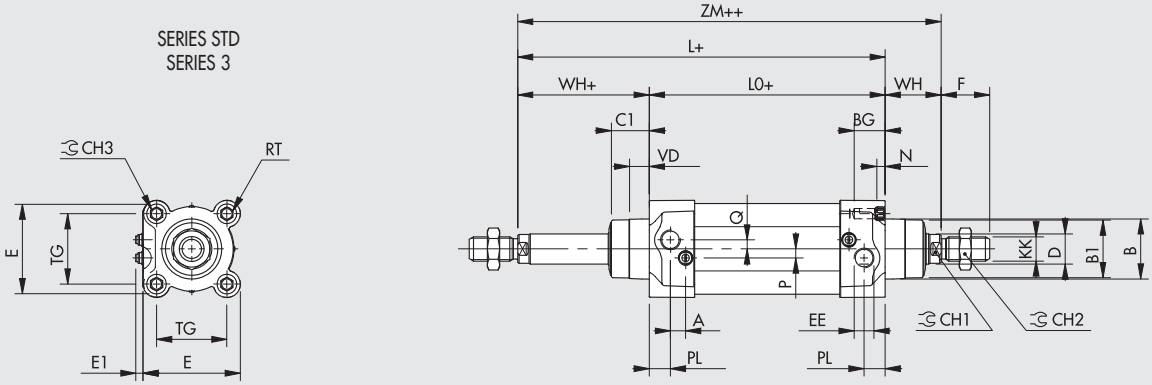
DIMENSIONS

STANDARD VERSION



+ = ADD STROKE
++ = ADD TWICE THE STROKE

THROUGH-ROD VERSION



Ø	PL	VD	A	B	B1	WH	C1	CH1	CH2	CH3	KK	D	TG	VA	F	EE	RT	E	E1 min	E1 max	L	L0	ZM	BG	N	P	Q
32	10	6.5	10	30	28	26	16	10	17	6	M10x1.25	12	32.5	4	22	G1/8	M6	46	5.5	8.4	94	146	14.5	4.5	6	4	
40	12	8	10	35	33	30	20	13	19	6	M12x1.25	16	38	4	24	G1/4	M6	54	4.5	8.4	135	105	165	14.5	4.5	6	4
50	14	13	10	40	38	37	25	17	24	8	M16x1.5	20	46.5	4	32	G1/4	M8	64.5	4.5	8.9	143	106	180	17.5	5.5	6	6
63	16	14	10	45	40	37	25	17	24	8	M16x1.5	20	56.5	4	32	G3/8	M8	75.5	4.1	9.5	158	121	195	17.5	5.5	6	6
80	18	12	12	45	43	46	33	22	30	10	M20x1.5	25	72	4	40	G3/8	M10	94	6.2	12.2	174	128	220	21.5	5.5	10	7
100	20	14	12	55	49	51	38	22	30	10	M20x1.5	25	89	4	40	G1/2	M10	111	6.7	12.2	189	138	240	21.5	5.5	10	7
125	25	20	10	60	54	65	45	27	41	12	M27x2	32	110	6	54	G1/2	M12	135	5.7	12.7	225	160	290	25.5	6.5	12	8

METAL WORK PNEUMATIC

KEY TO CODES

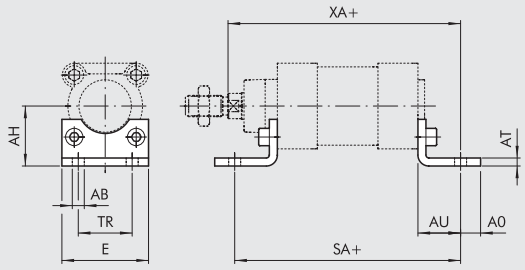
CYL	1 2 1 TYPE	0 BORE	32 STROKE	0050 MATERIAL	B GASKETS	L
	121 Double-acting, cuschioned ▲ **122** Through-rod **124** Double-acting, non-cuschioned	**0** Diameter **S** Standard Non-magnetic **3** Series 3 **5** Series 3 Non-magnetic	32 40 50 63 80 ■ 100 ■ 125	For the maximum suppliable strokes, look at the technical data	**B** AISI 316 rod, technopolymer piston rod: standard for cylinders of Ø32 to Ø63 **W** AISI 316 rod, aluminium piston rod: standard for all cylinders from Ø80 to 125, Ø32 to 63 with strokes > 999 and Ø32 to125 for through piston rod versions	**L** Piston rod gaskets made of special polyurethane; other gaskets made of NBR

▲ Only available for versions with aluminium piston (W)
■ In the code of cylinder with digit S, 3 or 5 in fourth position bore 100 becomes A1; bore 125 becomes A2

ACCESSORIES: FIXINGS

STAINLESS STEEL SHORT FOOT MOUNTING (AISI 304)

+ = ADD THE STROKE

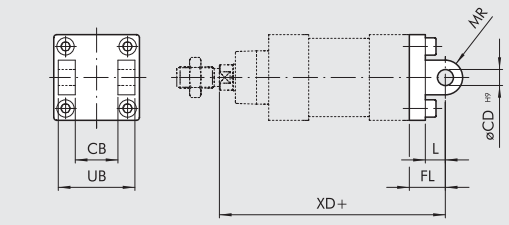


Code	Ø	øAB	AH	AO	AT	AU	TR	E	XA	SA	Weight [g]
W095X322001	32	7	32	11	4	24	32	45	144	142	85
W095X402001	40	9	36	8	4	28	36	52	163	161	95
W095X502001	50	9	45	15	5	32	45	65	175	170	200
W095X632001	63	9	50	13	5	32	50	75	190	185	225
W095X802001	80	12	63	14	6	41	63	95	215	210	435
W095XA12001	100	14	71	16	6	41	75	115	230	220	555
W095XA22001	125	18	90	25	8	45	90	140	270	250	1145

Note: Individually packed with 2 screws

STAINLESS STEEL FEMALE HINGE - MODEL B (AISI 304)

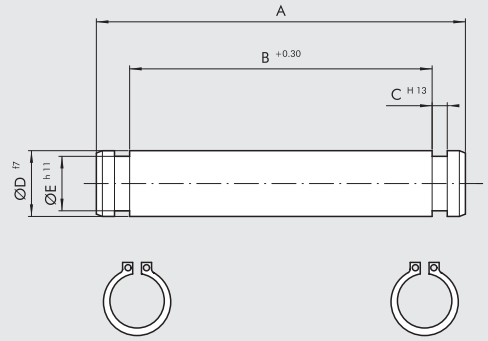
+ = ADD THE STROKE



Code	Ø	UB	CB	FL	øCD	XD	MR	L	Weight [g]
W095X322003	32	45	26	22	10	142	10	9	175
W095X402003	40	52	28	25	12	160	12	9	250
W095X502003	50	60	32	27	12	170	12	11	425
W095X632003	63	70	40	32	16	190	16	11	635
W095X802003	80	90	50	36	16	210	16	14	1270
W095XA12003	100	110	60	41	20	230	20	14	2000
W095XA22003	125	130	70	50	25	275	25	20	3715

Note: Supplied with 4 screws, 4 washers. **WITHOUT PIN**.

STAINLESS STEEL FEMALE HINGE PIN (AISI 304)

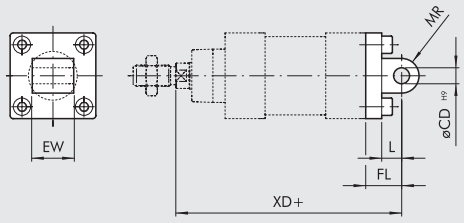


Code	Ø	A	B	C	D	E	Weight [g]
W095X322050	32	53	46	1.1	10	9.6	35
W095X402050	40	60	53	1.1	12	11.5	55
W095X502050	50	68	61	1.1	12	11.5	65
W095X632050	63	78	71	1.1	16	15.2	125
W095X802050	80	98	91	1.1	16	15.2	160
W095XA12050	100	118	111	1.3	20	19	295
W095XA22050	125	139	132	1.3	25	23.9	540

Note: Supplied with 2 snap-rings

STAINLESS STEEL MALE HINGE - MODEL BA (AISI 304)

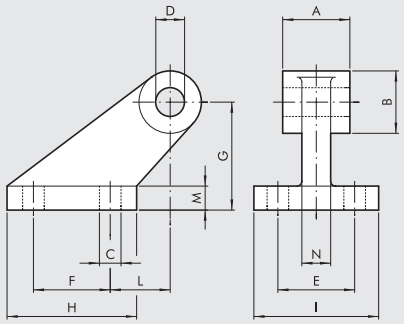
+ = ADD THE STROKE



Code	Ø	EW	FL	MR	øCD	L	XD	Weight [g]
W095X322004	32	26	22	10	10	9	142	195
W095X402004	40	28	25	12	12	9	160	265
W095X502004	50	32	27	12	12	11	170	445
W095X632004	63	40	32	16	16	11	190	715
W095X802004	80	50	36	16	16	14	210	1375
W095XA12004	100	60	41	20	20	14	230	2165
W095XA22004	125	70	50	25	25	20	275	3800

Note: Supplied with 4 screws, 4 washers

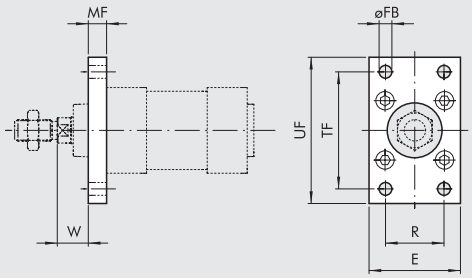
STAINLESS STEEL ISO COUNTER-HINGE FOR MODEL B - MODEL GL (AISI 304)



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W095X322008	32	26	20	6.6	10	38	18	32	31	51	3	8	10	165
W095X402008	40	28	22	6.6	12	41	22	36	35	54	2	10	15	235
W095X502008	50	32	26	9	12	50	30	45	45	65	3	12	16	460
W095X632008	63	40	30	9	16	52	35	50	50	67	2	14	16	590
W095X802008	80	50	30	11	16	66	40	63	60	86	7	14	20	1000
W095XA12008	100	60	38	11	20	76	50	71	70	96	5	17	20	1515
W095XA22008	125	70	45	14	25	94	60	90	90	124	10	20	30	3170

Note: Individually packed

STAINLESS STEEL FRONT FLANGE - MODEL C (AISI 304)

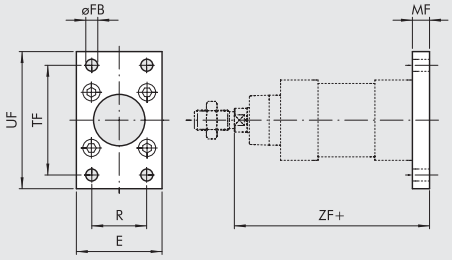


Code	Ø	UF	TF	E	R	MF	øFB	W	Weight [g]
W095X322002	32	80	64	45	32	10	7	16	220
W095X402002	40	90	72	52	36	10	9	20	280
W095X502002	50	110	90	65	45	12	9	25	540
W095X632002	63	120	100	75	50	12	9	25	680
W095X802002	80	150	126	95	63	16	12	30	1550
W095XA12002	100	170	150	115	75	16	14	35	2100
W095XA22002	125	205	180	140	90	20	16	45	3950

Note: Supplied with 4 screws

STAINLESS STEEL REAR FLANGE - MODEL C (AISI 304)

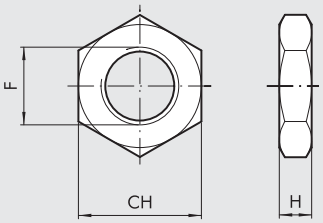
+ = ADD THE STROKE



Code	Ø	UF	TF	E	R	MF	øFB	ZF	Weight [g]
W095X322002	32	80	64	45	32	10	7	105	220
W095X402002	40	90	72	52	36	10	9	115	280
W095X502002	50	110	90	65	45	12	9	118	540
W095X632002	63	120	100	75	50	12	9	133	680
W095X802002	80	150	126	95	63	16	12	144	1550
W095XA12002	100	170	150	115	75	16	14	154	2100
W095XA22002	125	205	180	140	90	20	16	245	3950

Note: Supplied with 4 screws

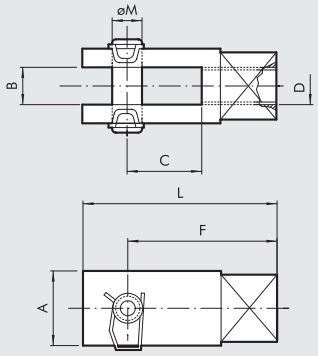
STAINLESS STEEL NUT FOR PISTON RODS (AISI 316)



Code	Ø	F	H	CH	Weight [g]
W095X322011	32	M10x1.25	6	17	8
W095X402011	40	M12x1.25	7	19	11
W095X502011	50	M16x1.5	8	24	18
W095X502011	63	M16x1.5	8	24	18
W095X802011	80	M20x1.5	9	30	31
W095X802011	100	M20x1.5	9	30	31
W095XA22011	125	M27x2	12	41	81

Note: Individually packed

STAINLESS STEEL FORK-MODEL GK-M (AISI 304)



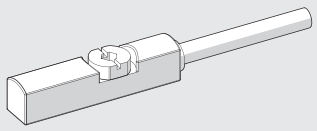
Code	Ø	A	B	C	D	F	L	øM	Weight [g]
W095X322020	32	20	10	20	M10x1.25	40	52	10	90
W095X402020	40	24	12	24	M12x1.25	48	62	12	145
W095X502020	50	32	16	32	M16x1.5	64	83	16	325
W095X502020	63	32	16	32	M16x1.5	64	83	16	325
W095X802020	80	40	20	40	M20x1.5	80	105	20	680
W095X802020	100	40	20	40	M20x1.5	80	105	20	680

Note: Individually packed

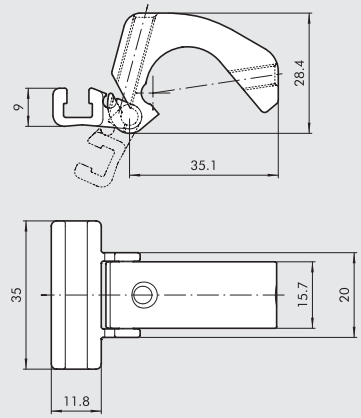
ACCESSORIES: MAGNETIC SENSORS

RETRACTABLE SENSOR, SQUARE TYPE (FOR CORROSIVE ENVIRONMENTS)

For codes and technical data, see **chapter A6**.



SENSOR BRACKET



Code	Bore	Description
W0950001100	32 to 125	Sensor bracket

Note: Individually packed

MATERIAL

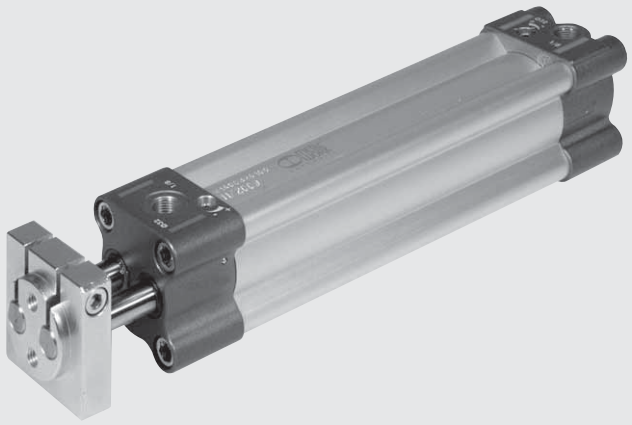
Bracket: aluminium
Sensor holder: aluminium
Fixing screw: stainless steel

NOTES

TWIN-ROD CYLINDER SERIES TWNC

Anti-rotation cylinders with axial dimensions to ISO 15552.
Serie STD barrel.

- standard configuration with magnet
- double-acting – passing twinner rods and single passing rod
- polyurethane gasket

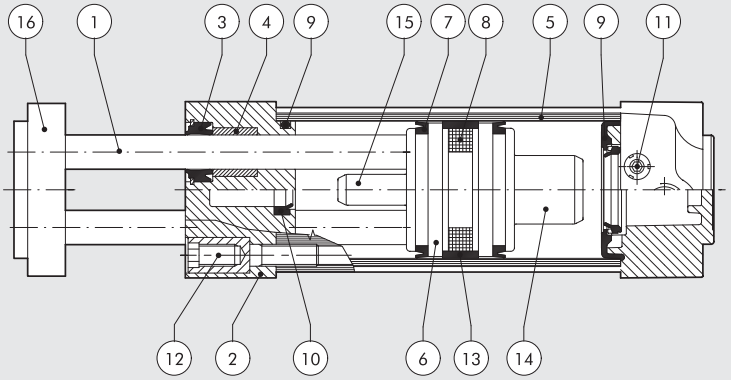


TECHNICAL DATA

Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	–10 to +80
Fluid		Filtered, unlubricated air. Lubrication, if used, must be continuous
Bores	mm	32; 40; 50; 63; 80; 100
Strokes ✚	mm	from 25 to 500
Design		Extruded profile
Esecution		Magnetic standard cushioned
Forces generated at 6 bar thrust/retraction	N	Ø 32: 434/350
		Ø 40: 678/597
		Ø 50: 1060/940
		Ø 63: 1683/1471
		Ø 80: 2714/2295
		Ø 100: 4241/3812
Weight		See cylinder "**General technical data**" at the beginning of the chapter
Notes		✚ Maximum recommended strokes. Higher values can create operating problems

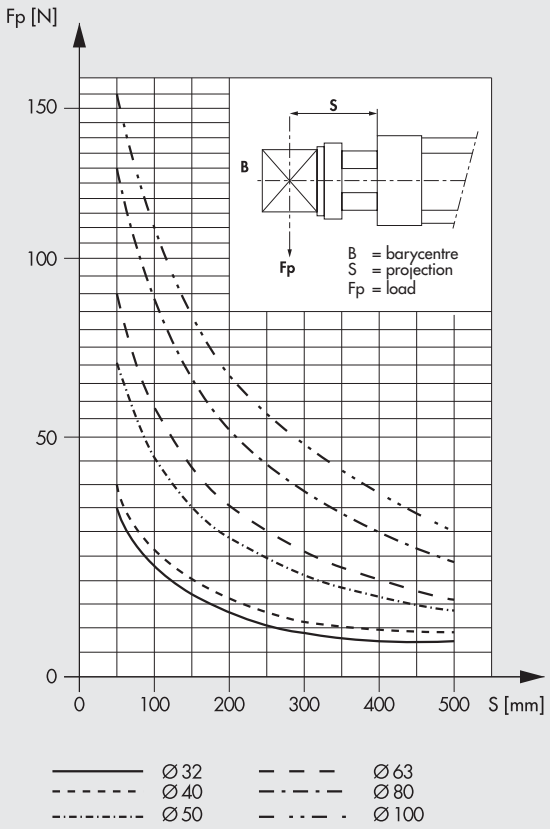
COMPONENTS

① PISTON ROD: thick chromed steel
② HEAD: aluminium alloy
③ PISTON ROD GASKET: polyurethane
④ GUIDE BUSHING: sintered bronze
⑤ BARREL: drawn anodised aluminium alloy
⑥ PISTON: aluminium alloy
⑦ PISTON GASKET: polyurethane
⑧ MAGNET: plastoferrite
⑨ BUFFER+STATIC O-rings: NBR
⑩ CUSHIONING GASKET: front NBR, rear polyurethane
⑪ NEEDLE: OT 58 brass
⑫ SCREWS: Tap Tite for fixing and assembly
⑬ GUIDE RING: special technopolymer
⑭ REAR CUSHIONING CONE: OT58 brass
⑮ FRONT CUSHIONING CONE: aluminium
⑯ FLANGE: zinc-plated steel

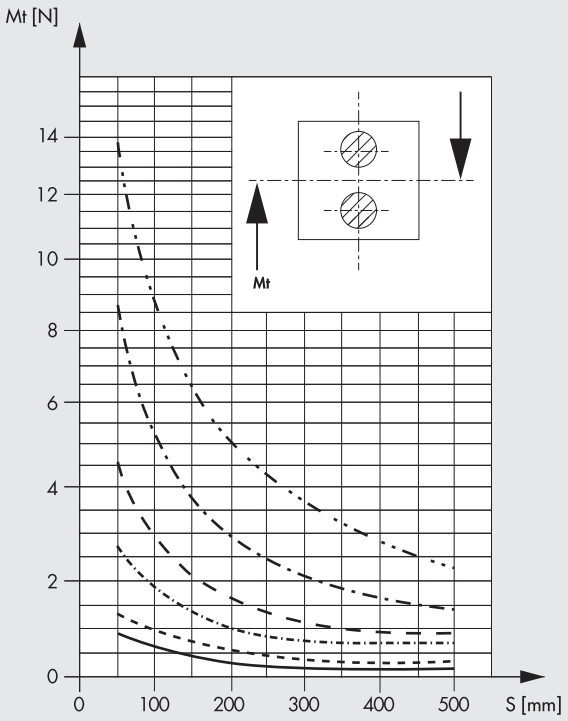


PERMISSIBLE LOADS

FLEXION LOADS

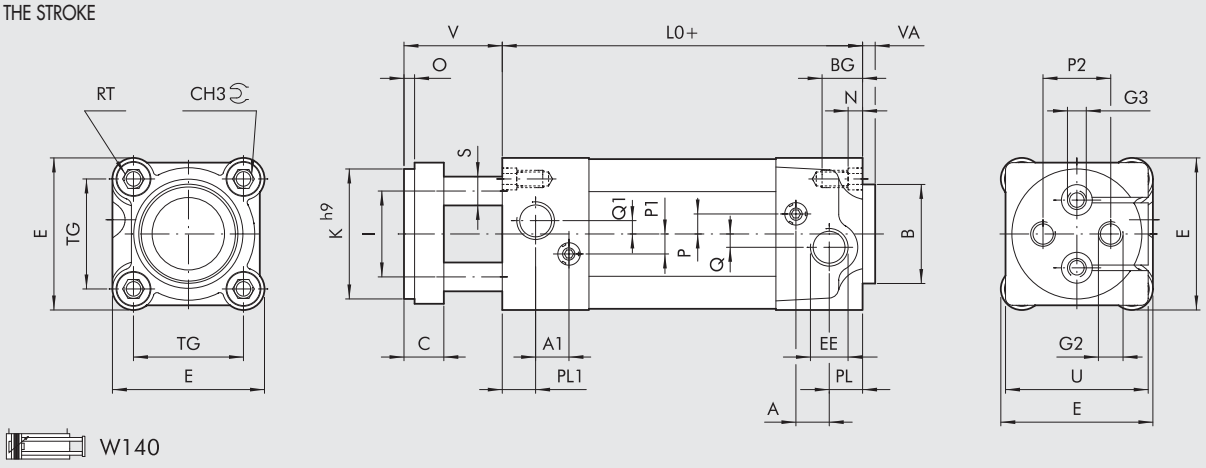


TWISTING MOMENTS



TWIN RODS CYLINDER

+ = ADD THE STROKE

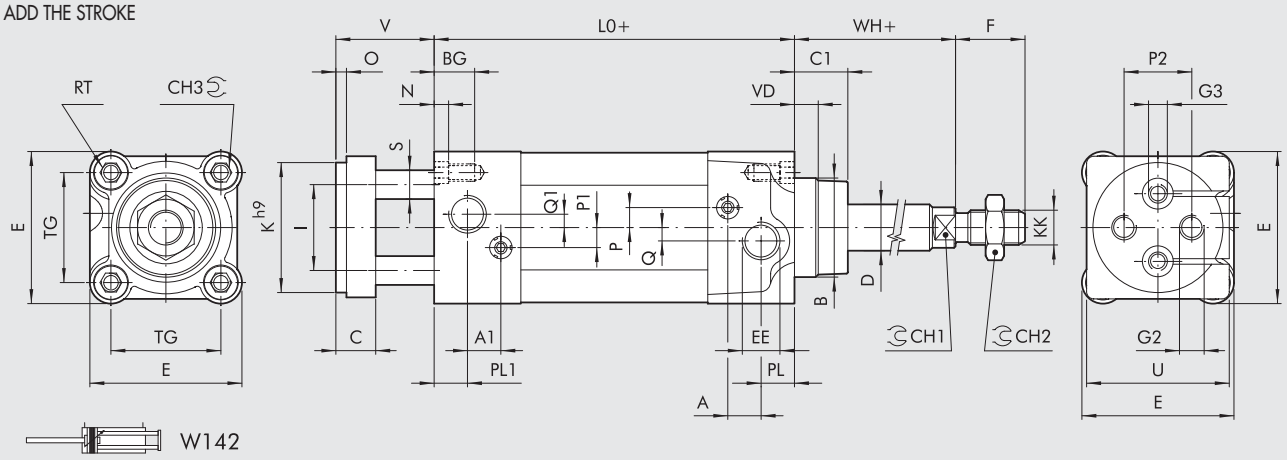


Ø	PL	PL1	A	A1	B	CH3	TG	VA	EE	RT	E	L0	BG	N	P	P1	P2	Q	Q1	C	I	K h9	S	O	V	U	G2	G3
32	10	13	10	10.5	30	6	32.5	4	G1/8	M6	46	100	14.5	4.5	6	8	19	4	-	15	18	32	10	4	40	45	M6	-
40	12	12	10	10	35	6	38	4	G1/4	M6	54	100	14.5	4.5	6	6	22	4	4	15	22	40	10	4	40	49	M8	-
50	14	14	10	10	40	8	46.5	4	G1/4	M8	64.5	106	17.5	5.5	6	6	30	6	6	18	30	50	12	5	43	54	M8	M8
63	16	16	10	10	45	8	56.5	4	G3/8	M8	75.5	116	17.5	5.5	6	6	38	6	6	22	38	63	16	5	47	69	M10	M10
80	18	18	12	12	45	10	72	4	G3/8	M10	94	131	21.5	5.5	10	10	50	7	7	25	48	80	22	5	50	89	M12	M12
100	20	20	12	12	55	10	89	4	G1/2	M10	111	138	21.5	5.5	10	10	70	7	7	25	60	100	22	5	50	109	M12	M12

METAL WORK PNEUMATIC

SINGLE THROUGH-ROD CYLINDER

+ = ADD THE STROKE



Ø	PL	PL1	A	A1	B	CH1	CH2	CH3	TG	EE	RT	E	L0	BG	N	P	P1	P2	Q	Q1	C	C1	D	F	I	K h9	KK	S	O	V	VD	U	G2	G3	WH
32	10	13	10	10.5	30	10	17	6	32.5	G1/8	M6	46	100	14.5	4.5	6	8	19	4	-	15	16	12	22	18	32	M10x1.25	10	4	40	6.5	45	M6	-	26
40	12	12	10	10	35	13	19	6	38	G1/4	M6	54	100	14.5	4.5	6	6	22	4	4	15	20	16	24	22	40	M12x1.25	10	4	40	8	49	M8	-	30
50	14	14	10	10	40	17	24	8	46.5	G1/4	M8	64.5	106	17.5	5.5	6	6	30	6	6	18	25	20	32	30	50	M16x1.5	12	5	43	13	54	M8	M8	37
63	16	16	10	10	45	17	24	8	56.5	G3/8	M8	75.5	116	17.5	5.5	6	6	38	6	6	22	25	20	32	38	63	M16x1.5	16	5	47	14	69	M10	M10	37
80	18	18	12	12	45	22	30	10	72	G3/8	M10	94	131	21.5	5.5	10	10	50	7	7	25	33	25	40	48	80	M20x1.5	22	5	50	12	89	M12	M12	46
100	20	20	12	12	55	22	30	10	89	G1/2	M10	111	138	21.5	5.5	10	10	70	7	7	25	38	25	40	60	100	M20x1.5	22	5	50	14	109	M12	M12	51

KEY TO CODES

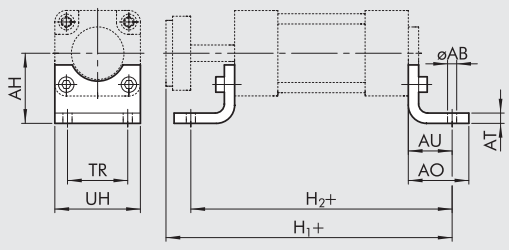
CYL	W 1 4 0	0 3 2	0 0 2 5
	TYPE	**BORES**	**STROKE**
	W140 Double-acting cylinder, magnetic, cushioned	032	✚ 0025 to 0500 mm
	W142 Double-acting cylinder, magnetic, cushioned single through-rod	040	
		050	
		063	
		080	
		100	

✚ Maximum recommended strokes.
Higher values can create operating problems.

ACCESSORIES: FIXINGS

FOOT - MODEL A/S

+ = ADD THE STROKE

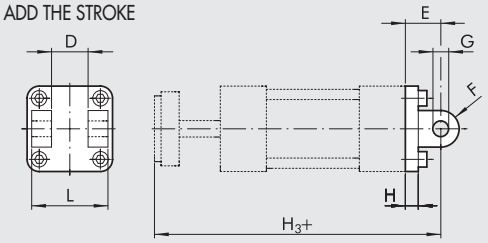


Code	Ø	AB	AH	AO	AT	AU	TR	UH	H_1	H_2	Weight [g]
W0950323001	**32**	7	32	35	4	24	32	45	164	148	76
W0950403001	**40**	9	36	43	4	28	36	52	168	156	98
W0950503001	**50**	9	45	47	4	32	45	65	181	170	156
W0950633001	**63**	9	50	47	6	32	50	75	195	180	246
W0950803001	**80**	12	63	61	6	41	63	95	222	213	406
W0951003001	**100**	14	71	66	6	41	75	115	229	220	540

Note: Individually packed with 2 screws
For fixing the leg to the supporting surface, it is advisable to use a DIN 7984 sunk-headed screw

FEMALE HINGE - MODEL B

+ = ADD THE STROKE

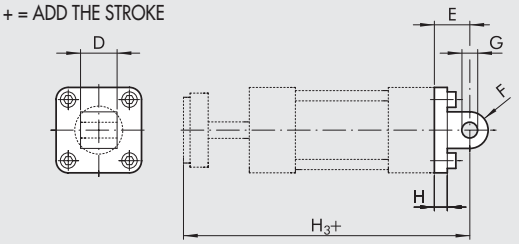


Code	Ø	D	E	F	G	H	H_3	L	Weight [g]
W0950322003	**32**	26	22	11	10	10	162	45	116
W0950402003	**40**	28	25	13	12	10	165	52	160
W0950502003	**50**	32	27	13	12	12	176	60	252
W0950632003	**63**	40	32	17	16	12	195	70	394
W0950802003	**80**	50	36	17	16	16	217	90	670
W0951002003	**100**	60	41	21	23	16	229	110	1085

Note: Supplied with 4 screws, 4 washers, 2 snap-rings and 1 pin

MALE HINGE - MODEL BA

+ = ADD THE STROKE

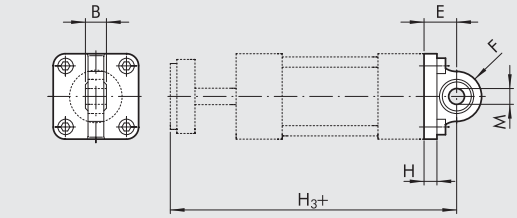


Code	Ø	D	E	F	G	H	H_3	Weight [g]
W0950322004	32	26	22	11	10	10	162	94
W0950402004	40	28	25	13	12	10	165	124
W0950502004	50	32	27	13	12	12	176	220
W0950632004	63	40	32	17	16	12	195	316
W0950802004	80	50	36	17	16	16	217	578
W0951002004	100	60	41	21	20	16	229	850

Note: Supplied with 4 screws, 4 washers

ARTICULATED MALE HINGE - MODEL BAS

+ = ADD THE STROKE

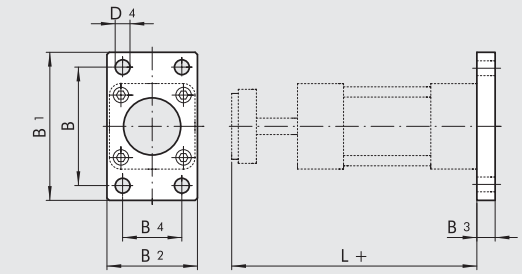


Code	Ø	B	E	F	H	H_3	M	Weight [g]
W0950322006	32	14	22	16	10	162	10	106
W0950402006	40	16	25	18	10	165	12	142
W0950502006	50	16	27	21	12	176	12	236
W0950632006	63	21	32	23	12	195	16	336
W0950802006	80	21	36	28	16	217	16	572
W0951002006	100	25	41	30	16	229	20	840

Note: Supplied with 4 screws, 4 washers.

REAR FLANGE - MODEL C

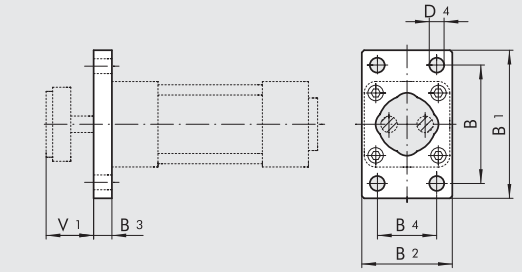
+ = ADD THE STROKE



Code	Ø	B	B_1	B_2	B_3	B_4	D_4	L	Weight [g]
W0950322002	32	64	80	50	10	32	7	140	246
W0950402002	40	72	90	55	10	36	9	140	290
W0950502002	50	90	110	65	12	45	9	149	522
W0950632002	63	100	120	75	12	50	9	163	670
W0950802002	80	126	153	95	16	63	12	181	1420
W0951002002	100	150	178	115	16	75	14	188	2040

Note: Supplied with 4 screws.

FRONT FLANGE - MODEL C/S



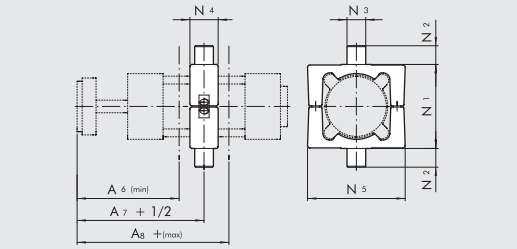
Code	Ø	B	B_1	B_2	B_3	B_4	D_4	V_1	Weight [g]
W0950323002	32	64	80	50	10	32	7	30	228
W0950403002	40	72	90	55	10	36	9	30	288
W0950503002	50	90	110	65	12	45	9	31	486
W0950633002	63	100	120	75	12	50	9	35	569
W0950803002	80	126	153	95	16	63	12	34	1145
W0951003002	100	150	178	115	16	75	14	34	1760

Note: Supplied with 4 screws

INTERMEDIATE HINGE - MODEL EN

+ = ADD THE STROKE

+1/2 = ADD HALF THE STROKE

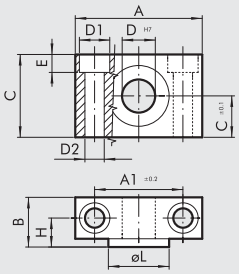


Code	Ø	N_1	N_2	N_3	N_4	N_5	A_6	A_7	A_8	Weight [g]
0950322007	32	50	12	12	22	65	79	91	103	282
0950402007	40	63	16	16	28	75	82	90	98	582
0950502007	50	75	16	16	32	95	91.5	97.5	103.5	880
0950632007	63	90	20	20	35	105	95.5	104.5	113.5	1230
0950802007	80	110	20	20	40	130	108	115.5	123	2030
0951002007	100	132	25	25	45	145	110.5	119	127.5	2600

Note: Supplied with 4 screws, 2 pin

METAL WORK PNEUMATIC

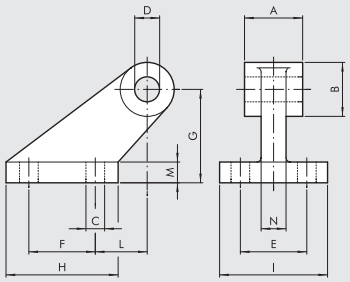
COUNTER-HINGE FOR MODEL EN - MODEL EL



Code	Ø	A	A_1	B	C	C_1	D_1	D_2	D	E	H	ØL	Weight [g]
W0950322009	32	46	32	18	30	15	11	7	12	6.5	10.5	22	162
W0950402009	40	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950402009	50	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950632009	63	65	42	23	40	20	18	11	20	10.5	13	35	414
W0950632009	80	65	42	23	40	20	18	11	20	10.5	13	35	414
W0951002009	100	75	50	28.5	50	25	20	13	25	12.5	16	40	715

Note: 2-pieces pack with 4 screws

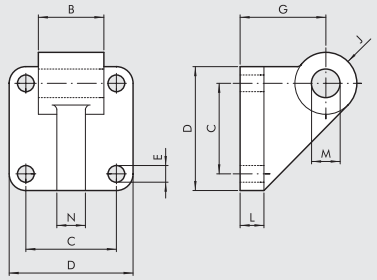
COUNTER-HINGE CETOP FOR MODEL B - MODEL GL



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96
W0950402008	40	28	26	9	12	32	32	45	54	52	25	10	12	216
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440
W0950802008	80	50	33	11	16	40	50	63	75	63	32	12	15	464
W0951002008	100	60	44	14	20	50	70	90	103	80	40	16	22	985

Note: Supplied with 4 screws, 4 washers

COUNTER-HINGE ISO FOR MODEL B - MODEL GS

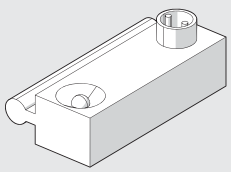


Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]
W0950322108	32	25.5	32.5	45	7	32	11	10	10	10	106
W0950402108	40	27.5	38	52	7	36	13	10	12	12	138
W0950502108	50	31.5	46.5	65	9	45	13	12	12	12	252
W0950632108	63	39.5	56.5	75	9	50	17	12	16	15	350
W0950802108	80	49.5	72	95	11	63	17	16	16	15	655
W0951002108	100	59.5	89	115	11	73	21	20	20	22	980

Note: Supplied with 4 screws, 4 washers

ACCESSORIES: MAGNETIC SENSORS

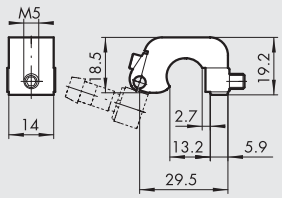
SENSOR SERIES DSM



For codes and technical data, see **chapter A6**.

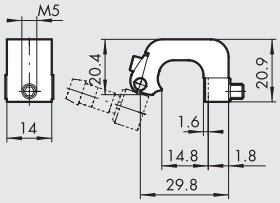
SENSOR SUPPORT BRACKETS FOR SENSORS DSM

Ø 32 to 40



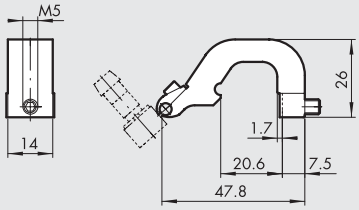
Code	Description
W0950000711	Bracket D.32-40 DST 80

Ø 50 to 63



Code	Description
W0950000712	Bracket D.50-63 DST 81

Ø 80 to 100

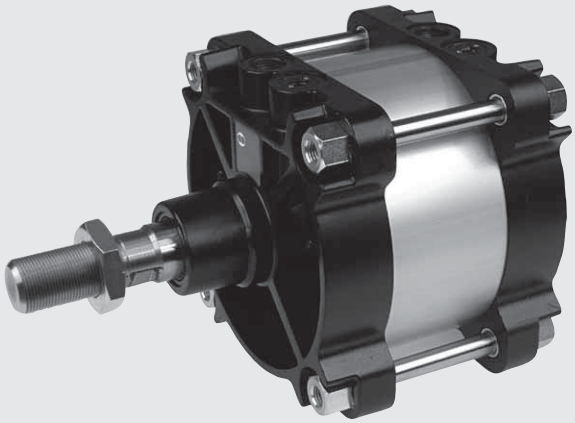


Code	Description
W0950000713	Bracket D.80-100-125 DST 82

ISO 15552 CYLINDER Ø 160-200 (ex ISO 6431) WITH ROUND BARREL

Cylinders made to ISO 15552 available in various versions and with a wide range of accessories:

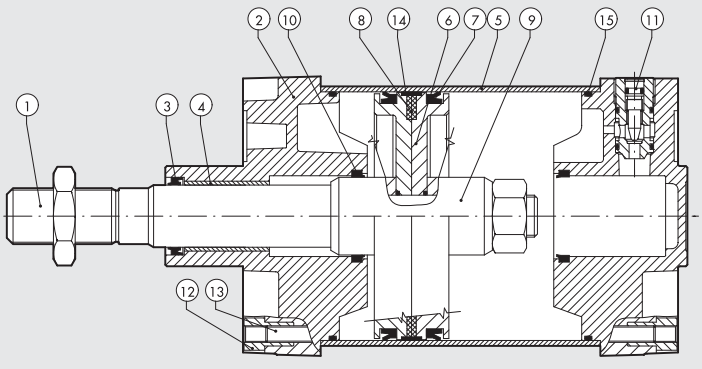
- configuration with or without magnet
- double-acting – single-or through-rod
- NBR gaskets or FKM/FPM (high temperature)
- available with mounted intermediate hinge
- special configurations on request



TECHNICAL DATA		NBR	FKM/FPM
Max operating pressure	bar	10	
	MPa	1	
Temperature range	°C	-10 to +80	-10 to +150
Design		Round barrel with tie rods	
Standard strokes	mm	25-50-75-80-100-125-150-200-250-300-350-400-500-600-700-800-900-1000	
Weight		See cylinder "**General technical data**" at the beginning of the chapter	
Forces generated at 6 bar (tensile stress)		See cylinder "**General technical data**" at the beginning of the chapter	

COMPONENTS

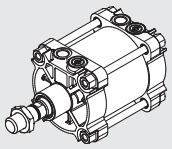
① PISTON ROD: C45 steel or stainless steel, thick chromed
② HEAD: die cast aluminium
③ PISTON ROD GASKET: NBR or FKM/FPM
④ GUIDE BUSHING: sintered bronze
⑤ BARREL: drawn anodised aluminium alloy
⑥ PISTON: aluminium
⑦ PISTON GASKET: NBR or FKM/FPM
⑧ MAGNET: plastoferrite
⑨ CUSHIONING CAP: aluminium
⑩ CUSHIONING GASKET: polyurethane or FKM/FPM
⑪ CUSHIONING NEEDLE: OT 58 with needle out movement safety system even when fully open
⑫ SCREWS: galvanised steel
⑬ TIE RODS: stainless steel
⑭ GUIDE BELT: technopolimer
⑮ STATIC O-RINGS: NBR or FKM/FPM

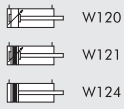


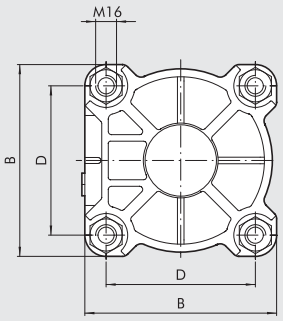
METAL WORK PNEUMATIC

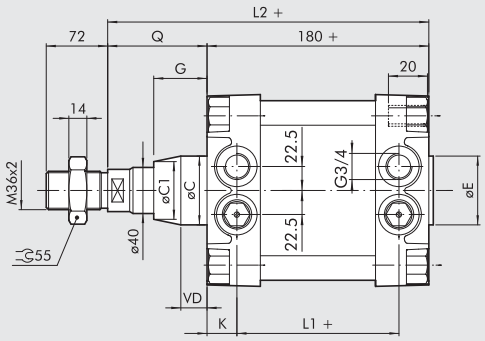
DIMENSIONS OF STANDARD VERSION

+ = ADD THE STROKE





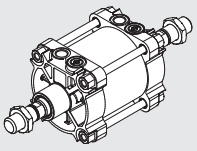


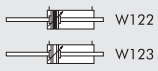


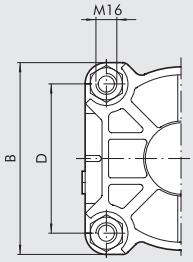
Ø	B	øC	øC1	øE	D	G	L_1	L_2	Q	VD	K
160	180	65	-	65	140	50	124	260	80	-	28
200	220	75	~ 65	75	175	60	122	275	95	~ 15	29

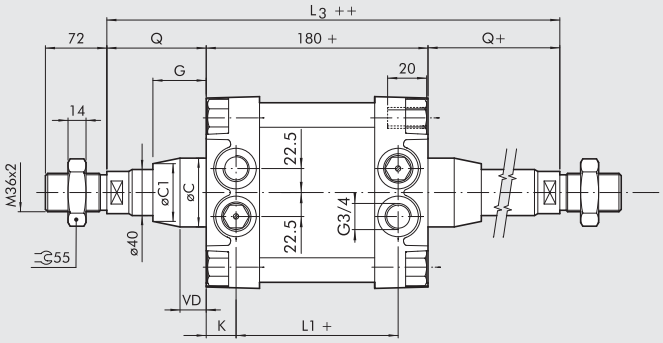
DIMENSIONS OF THROUGH-ROD VERSION

+ = ADD THE STROKE
++ = ADD TWICE THE STROKE





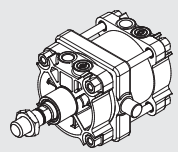


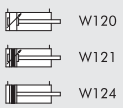


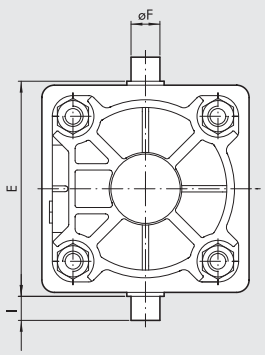
Ø	B	øC	øC1	D	G	L_1	L_3	Q	VD	K
160	180	65	-	140	50	124	340	80	-	28
200	220	75	~ 65	175	60	122	370	95	~ 15	29

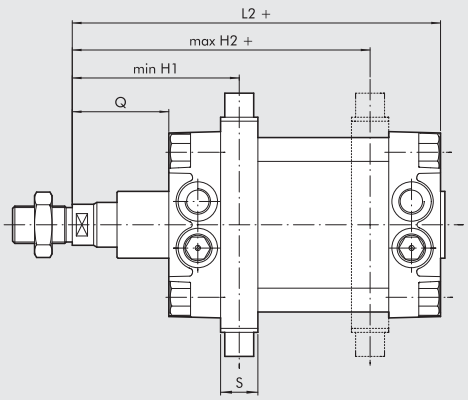
DIMENSIONS OF VERSION WITH INTERMEDIATE HINGE

+ = ADD THE STROKE









Ø	E	øF	H1	H2	I	L2	Q	S
160	200	32	150	190	32	260	80	40
200	250	32	165	205	32	275	95	40

For the missing values, refer to standard cylinders. **In your order, please specify the desired value for H1**

KEY TO CODES FOR ROUND BARREL

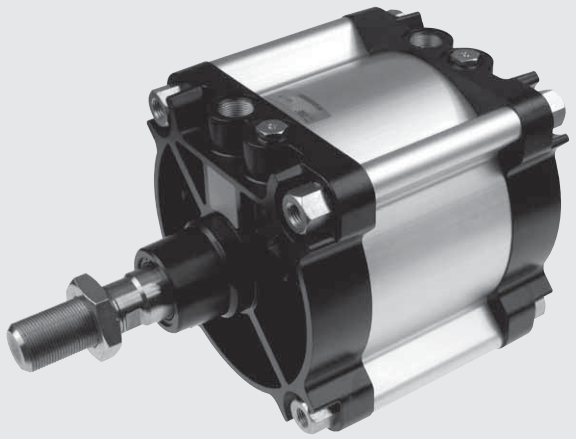
CYL	W 1 2 1 TYPE	1 6 0 DIAMETER-EXECUTION	0 0 5 0 STROKE	0 2 0 0 EXECUTION
	W120 Double-acting, cushioned, non magnetic **W121** Double-acting, cushioned, **W122** Double-acting, cushioned, through-rod **W123** Double-acting, cushioned, through-rod, non magnetic **W124** Double-acting, non-cushioned	**160** 160 **200** 200 **XA3** 160 stainless steel piston rod **XA4** 200 stainless steel piston rod **VA3** 160 FKM/FPM gasket, stainless steel piston rod **VA4** 200 FKM/FPM gasket, stainless steel piston rod **KA3** 160 FKM/FPM gasket, C45 piston rod **KA4** 200 FKM/FPM gasket, C45 piston rod **AA3** 160 + intermediate hinge **AA4** 200 + intermediate hinge ● **GA3** 160 No stick-slip ● **GA4** 200 No stick-slip	✚ 0025 to 2800 mm	**Specify H1 value ONLY for version with intermediate hinge**

✚ Maximum recommended strokes. Higher values can create operating problems
● **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**

VERSION WITH SHAPED BARREL

An alternative to the round barrel version is a version with a shaped barrel.
The technical data, components and dimensions are the same as for the round barrel version.

Note: Type with intermediate hinge not available.



KEY TO CODES FOR SHAPED BARREL

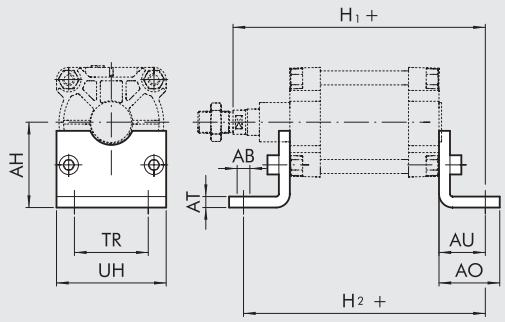
CYL	1 2 1 TYPE	1 6 0 DIAMETER-EXECUTION	0 0 5 0 STROKE	A MATERIAL	N GASKETS
	120 Double-acting, cuschioned, non-magnetic **121** Double-acting, cuschioned, **122** Double-acting, cuschioned, through-rod **124** Double-acting, non-cuschioned	**160** 160 **200** 200 **SA3** 160 non magnetic **SA4** 200 non magnetic ● **GA3** 160 No stick-slip ● **GA4** 200 No stick-slip	✚ 0025 to 2800 mm	**A** C45 chromed, piston rod **Z** Stainless steel chromed, piston rod	**N** NBR gaskets **V** FKM/FPM gaskets

✚ Maximum recommended strokes. Higher values can create operating problems
● **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**

ACCESSORIES FOR ISO 15552 CYLINDERS Ø 160-200: FIXINGS

FOOT - MODEL A

+ = ADD THE STROKE

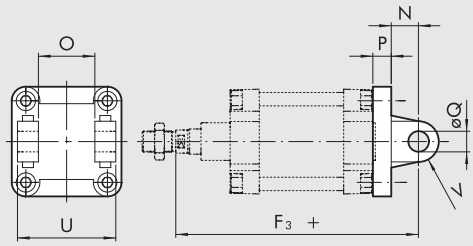


Code	Ø	AB	AH	AO	AT	AU	H_1	H_2	TR	UH	Weight [g]
W0951602001	160	18	115	80	10	60	319	300	115	180	2400
W0952002001	200	22	135	100	12	70	345	320	135	220	4000

Note: Individually packed with 2 screws

FEMALE HINGE - MODEL B

+ = ADD THE STROKE

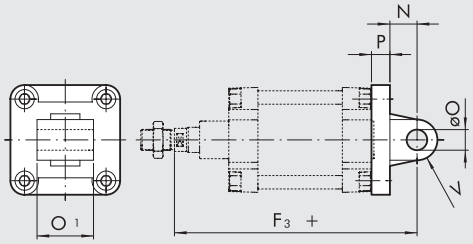


Code	Ø	U	O	øQ	P	N	F_3	V	Weight [g]
W0951602003	160	170	90	30	20	35	314	25	3300
W0952002003	200	170	90	30	25	35	335	25	4300

Note: Supplied complete with 4 screws, 2 snap rings and 1 pin

MALE HINGE - MODEL BA

+ = ADD THE STROKE

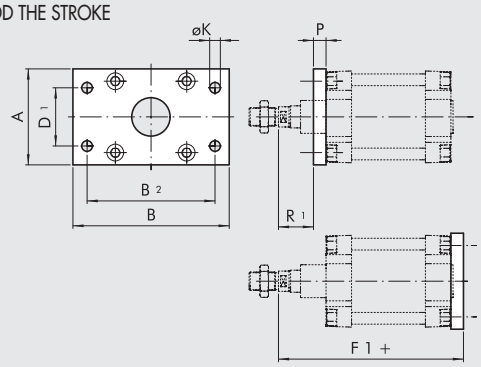


Code	Ø	O_1	øO	P	N	F_3	V	Weight [g]
W0951602004	160	90	30	20	35	314	25	2150
W0952002004	200	90	30	25	35	335	25	3550

Note: Supplied complete with 4 screws

FLANGE - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE

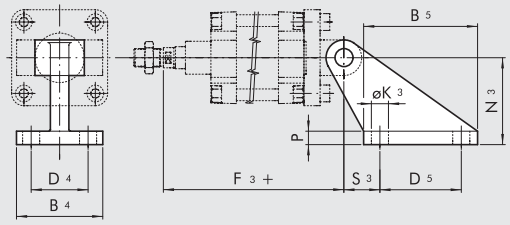


Code	Ø	A	B	B_2	D_1	øK	R_1	P	F_1	Weight [g]
W0951602002	160	180	270	230	115	18	59	20	279	6900
W0952002002	200	225	312	270	135	22	70	25	300	12800

Note: Individually packed with 4 screws

CETOP COUNTER-HINGE - MODEL GL

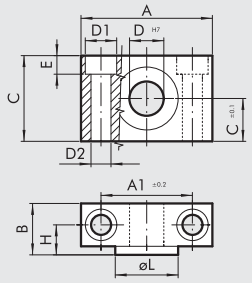
+= ADD THE STROKE



Code	Ø	B_4	B_5	D_4	D_5	N_2	N_3	S_3	$øK_3$	P	F_3	Weight [g]
W0951602008	**160**	110	154	63	110	55	140	50	18	20	314	2300
W0951602008	**200**	110	154	63	110	60	140	50	18	20	335	2300

Note: Supplied complete with 4 screws, 4 washers

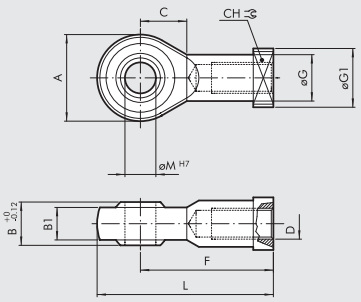
COUNTER-HINGE MODEL EL



Code	Ø	A	A_1	B	C	C_1	D_1	D_2	D	E	H	øL	Weight [g]
W0951602009	**160**	92	60	40	60	30	25	17	32	16.5	22.5	48	2740
W0951602009	**200**	92	60	40	60	30	25	17	32	16.5	22.5	48	2740

Note: 2-pieces pack with 4 screws

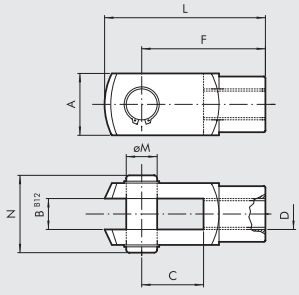
ROD EYE - MODEL GA-M



Code	Ø	øM	C	B_1	B	A	L	F	D	øG	CH	$øG_1$	Weight [g]
W0952002025	**160**	35	41	28	43	80	165	125	M36x2	46	50	58	1645
W0952002025	**200**	35	41	28	43	80	165	125	M36x2	46	50	58	1645

Note: Individually packed

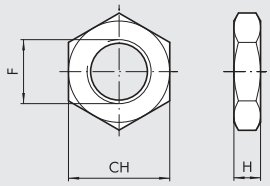
FORK - MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0951602020	**160**	35	72	35	70	188	144	M36x2	84	3850
W0951602020	**200**	35	72	35	70	188	144	M36x2	84	3850

Note: Individually packed

ROD NUT - MODEL S



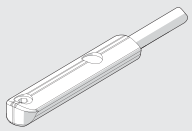
Code	Ø	F	H	CH	Weight [g]
W0951602010	**160**	M36x2	14	55	170
W0951602010	**200**	M36x2	14	55	170

Note: Individually packed

ACCESSORIES FOR ISO 15552 CYLINDERS Ø 160-200: MAGNETIC SENSORS

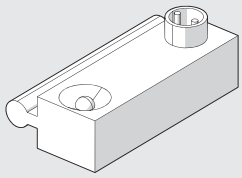
RETRACTABLE SENSOR

SENSOR, OVAL TYPE
Traditional



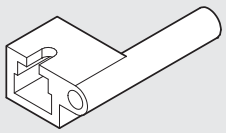
For codes and technical data, see **chapter A6**.

SENSOR SERIES DSM



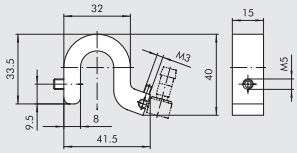
For codes and technical data, see **chapter A6**.

ADAPTOR FOR RETRACTABLE SENSOR



Code	Description
W0950001001	Adaptor DSS005 for DST/ST brackets

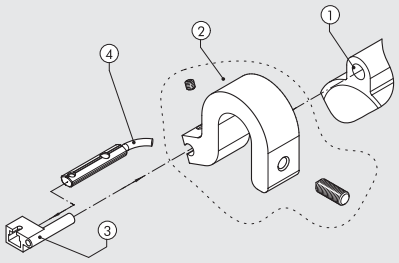
SENSOR SUPPORT BRACKET FOR STANDARD VERSION (WITH ROUND BARREL)



Code	Description
0951602093	Bracket 160-200

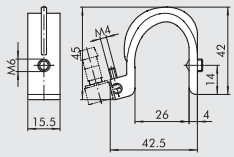
ASSEMBLY DIAGRAM

① ISO 15552 cylinder with traditional barrel
② Sensor bracket mod. ST (Ø 160 and 200)
③ Adaptor
④ Retractable sensor "oval type"



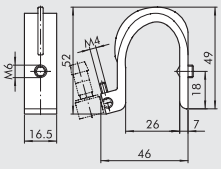
SENSOR SUPPORT BRACKET FOR OLD VERSION BARREL (SHAPED)

Ø 160



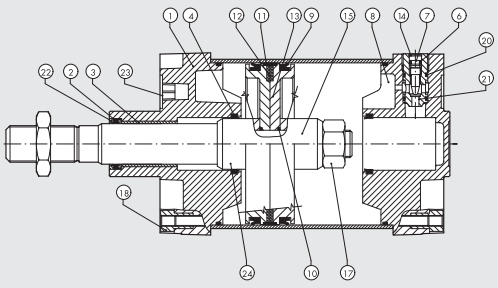
Code	Description
W0950000715	Bracket ST 160

Ø 200



Code	Description
W0950000716	Bracket ST 200

CYLINDERS ISO 15552 Ø 160-200: SPARE PARTS

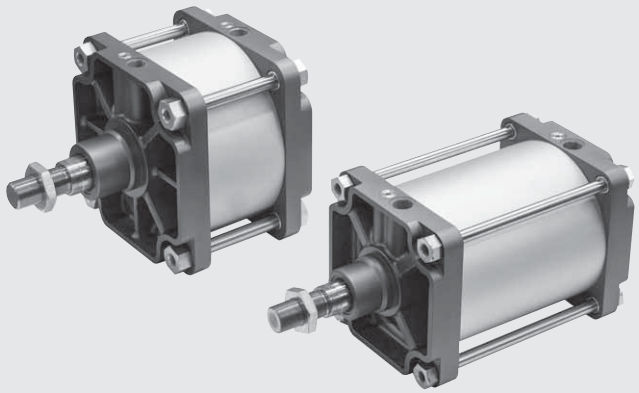


Code	Bores	Type	Parts
W095__2101	160 - 200	Complete set of gaskets	2-4-5-6-9-10-20-22
W0951602165	160 - 200	NBR piston rod gasket kit + seeger	2
W0951602166	160 - 200	FKM/FPM piston rod gasket kit + seeger	2
W095__2102	160 - 200	Complete set of (high temperature) FKM/FPM gaskets	2-4-5-6-9-10-20-22
W095__0104	160 - 200	Complete front head kit	1-2-3-4-5-6-7-14-18-20-21-22-23
W095__0105	160 - 200	Complete rear head kit	4-5-6-7-8-14-18-20-21-23
W095__2115	160 - 200	Complete magnetic piston kit	9-10-11-12-13-15-17-24
W095__2118	160 - 200	Complete non-magnetic piston kit	9-10-11-13-15-17-24
W095__2120	160 - 200	Complete head A + P + non-magnetic piston	1-2-3-4-5-6-7-8-9-10-11-13-14-15 17-18-20-21-22-23-24
W095__2119	160 - 200	Complete head A + P + magnetic piston	1-2-3-4-5-6-7-8-9-10-11-12-13-14 15-17-18-20-21-22-23-24
W095__2300	160 - 200	Magnet	12

ISO 15552 CYLINDER Ø 250-320

Cylinders made to ISO 15552 available in various versions and with a wide range of accessories:

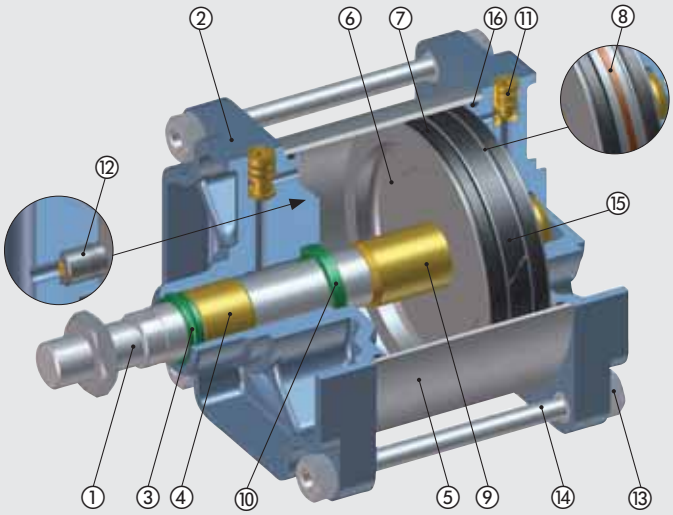
- double-acting – single-or through-rod
- with or without cushioning
- configuration with or without magnet
- with NBR gaskets, and polyurethane gasket for the piston rod only
- with FKM/FPM gaskets (high temperature versions)
- available with mounted intermediate hinge
- special configurations on request



TECHNICAL DATA		NBR	FKM/FPM
Max operating pressure	bar	10	
	MPa	1	
	psi	145	
Temperature range	°C	-10 to +80	-10 to +150
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	250 and 320	
Design		Round barrel with tie rods	
Standard strokes	mm	from 1 to 2000	
Versions		Double-acting, Cushioned or non-cushioned, Single piston rod or cushioned through piston rod, High-temperature, No stick-slip	
Magnet for sensors		Versions with or without magnet	
Inrush pressure		**Ø 250**: 0.2 bar / **Ø 320**: 0.15 bar	
Forces generated at 6 bar thrust/retraction		See cylinder "**General technical data**" at the beginning of the chapter	
Weights		See cylinder "**General technical data**" at the beginning of the chapter	
Notes		**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air**	

COMPONENTS

① PISTON ROD: High thickness C45 chrome steel or stainless steel (AISI 304)
② HEAD: fused aluminum painted
③ PISTON ROD GASKET: polyurethane or FKM/FPM
④ GUIDE BUSHING: sintered bronze
⑤ BARREL: anodised aluminium
⑥ PISTON: aluminium
⑦ PISTON GASKET: NBR or FKM/FPM
⑧ MAGNET: plastoferrite
⑨ CUSHIONING CAP: aluminium
⑩ CUSHIONING GASKET: NBR or FKM/FPM
⑪ CUSHIONING NEEDLE: OT 58
⑫ ONE-WAY VALVE for Ø 320 only: to speed up restart from end of stroke, bypassing the cushioning gasket
⑬ SCREWS: galvanised steel
⑭ TIE RODS: C45 steel, chromed
⑮ GUIDE BELT: PTFE
⑯ STATIC O-RINGS: NBR or FKM/FPM

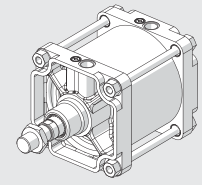


METAL WORK PNEUMATIC

DIMENSIONS

STANDARD VERSION

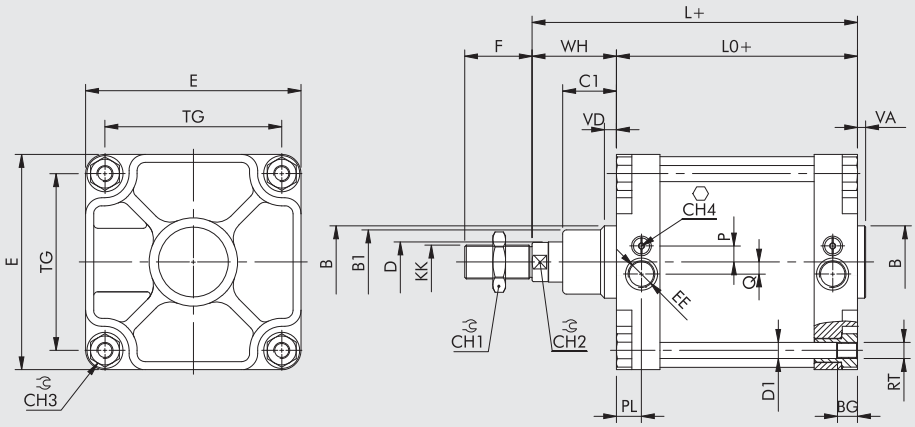
+ = ADD THE STROKE



W120

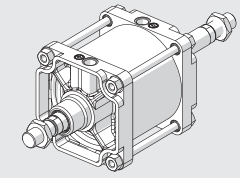
W121

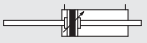
W124

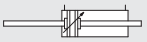


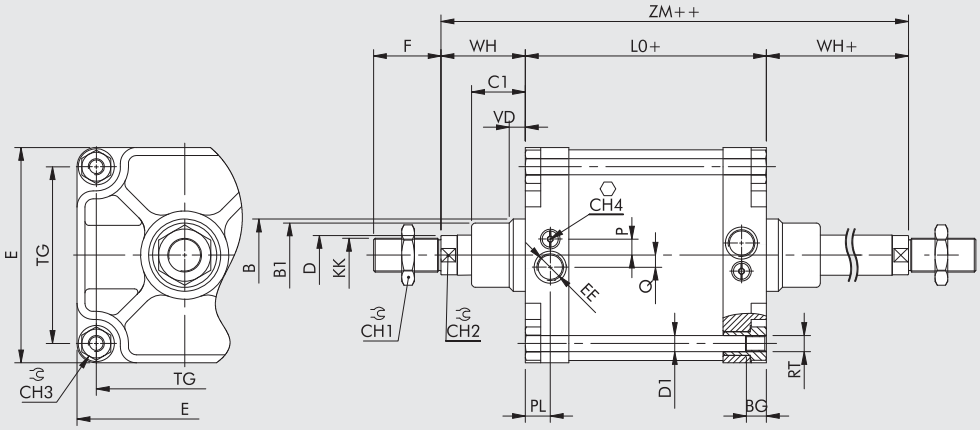
THROUGH-ROD VERSION

+ = ADD THE STROKE
++ = ADD TWICE THE STROKE




W122

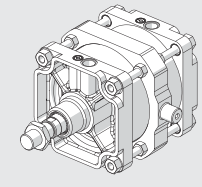

W123



Ø	PL	VD	B	B_1	WH	C_1	CH_1	CH_2	CH_3	CH_4	KK	D	D_1	TG	VA	F	EE	RT	E	L	L_0	ZM	BG	P	Q
250	31	20	90	80	105	67	65	46	36	6	M42x2	50	20	220	10	84	G1	M20	268	305	200	410	25	15	20
320	31	20	110	100	120	82	75	55	46	6	M48x2	63	25	270	10	96	G1	M24	340	340	220	460	28	36	-

DIMENSIONS OF VERSION WITH INTERMEDIATE HINGE

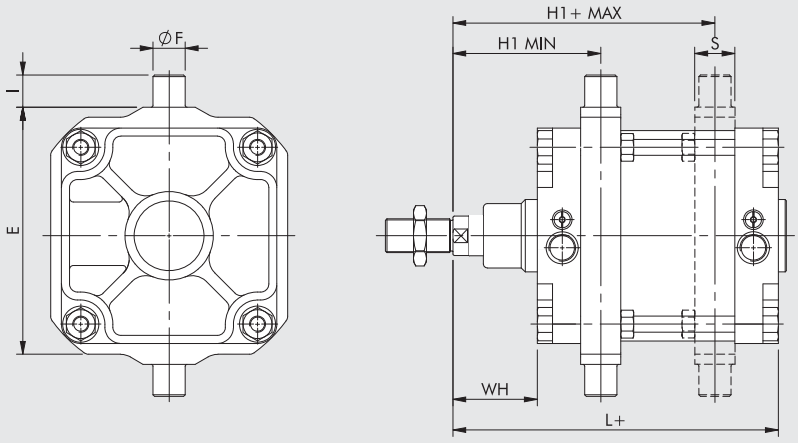
+ = ADD THE STROKE



W120

W121

W124



Ø	E	øF	$H1_{min}$	$H1_{max}$	I	L	WH	S
250	320	40	184	226	40	305	105	50
320	400	50	212	248	50	340	120	70

For the missing values, refer to standard cylinders. **In your order, please specify the desired value for H1**

KEY TO CODES

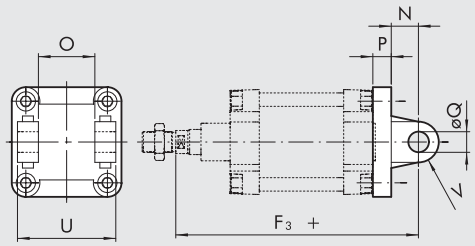
CIL	W 1 2 1 TYPE	2 5 0 DIAMETER-EXECUTION	0 3 0 0 STROKE	0 2 0 0 EXECUTION
	W120 Double-acting, cushioned, non magnetic **W121** Double-acting, cushioned **W122** Double-acting, cushioned, through-rod **W123** Double-acting, cushioned, through-rod, non magnetic **W124** Double-acting, non-cushioned	**250** 250 **320** 320 **XA5** 250 stainless steel piston rod and nut **XA6** 320 stainless steel piston rod and nut **KA5** 250 FKM/FPM gasket, C45 piston rod and nut **VA5** 250 FKM/FPM gasket, C45 piston rod and nut **AA5** 250 + intermediate hinge **AA6** 320 + intermediate hinge ● **GA5** 250 no stick-slip ● **GA6** 320 no stick-slip	0001 to 2000 mm	**Specify H1 value ONLY for version with intermediate hinge**

● **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only.**

ACCESSORIES: FIXINGS

FEMALE HINGE - MODEL B

+ = ADD THE STROKE

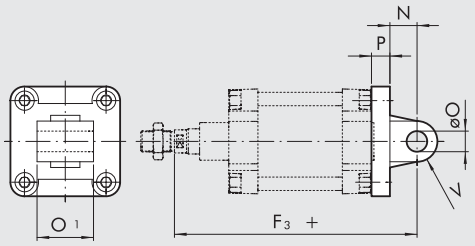


Code	Ø	U	O	øQ	P	N	F_3	V	Weight [g]
W0952502003	**250**	200	110	40	25	45	375	40	7600
W0953202003	**320**	220	120	45	30	50	420	45	13200

Note: Supplied complete with 4 screws, 2 snap rings and 1 pin

MALE HINGE - MODEL BA

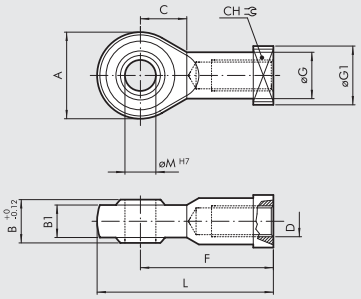
+ = ADD THE STROKE



Code	Ø	O_1	øO	P	N	F_3	V	Weight [g]
W0952502004	**250**	110	40	25	45	375	40	5910
W0953202004	**320**	120	45	30	50	420	45	10900

Note: Supplied complete with 4 screws

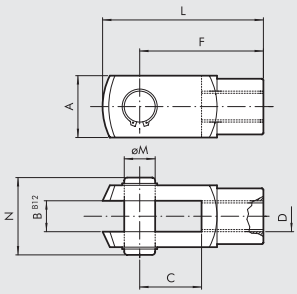
ROD EYE - MODEL GA-M



Code	Ø	øM	C	B_1	B	A	L	F	D	øG	CH	$øG_1$	Weight [g]
W0952502025	**250**	40	45	33	49	102	193	142	M42x2	56	55	69	2800
W0953202025	**320**	50	60	45	60	117	218.5	160	M48x2	66	65	75	5000

Note: Individually packed

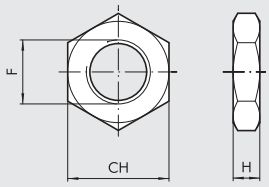
FORK - MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0952502020	**250**	42	84	42	85	232	168	M42x2	102	6400
W0953202020	**320**	50	96	50	95	265	192	M48x2	113	9600

Note: invidually packed with 2 seeger and 1 pin

ROD NUT - MODEL S



ZINC-PLATED STEEL

Code	Ø	F	H	CH	Weight [g]
W0952502010	**250**	M42x2	16	65	285
W0953202010	**320**	M48x2	18	75	420

Note: Individually packed

STAINLESS STEEL (AISI 304)

Code	Ø	F	H	CH	Weight [g]
W095XA52010	**250**	M42x2	16	65	285
W095XA62010	**320**	M48x2	18	75	420

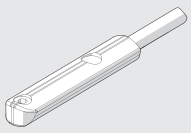
Note: Individually packed

ACCESSORIES: MAGNETIC SENSORS

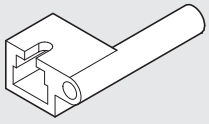
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, OVAL TYPE
Traditional



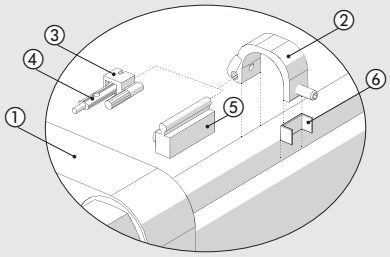
ADAPTOR FOR RETRACTABLE SENSOR



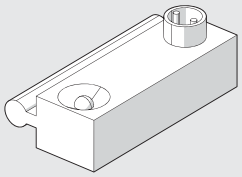
Code	Description
W0950001001	Adaptor DSS005 for DST/ST brackets

ASSEMBLY DIAGRAM

① ISO 15552 cylinder, round pipe with tie rods
② Sensor bracket mod. ST (Ø 250 and 320)
③ Adaptor for retractable sensor
④ Retractable sensor
⑤ Sensor DSM
⑥ Adaptor (only for Ø 250)



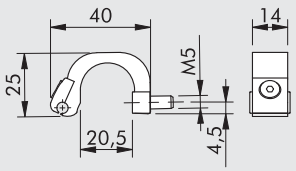
SENSOR SERIES DSM



For codes and technical data, see **chapter A6**.

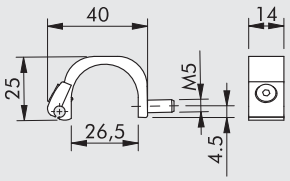
SENSOR SUPPORT BRACKET

Ø 250



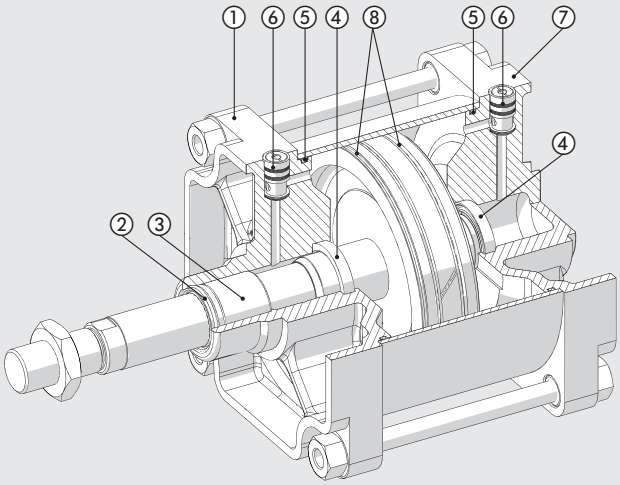
Code	Description
W0950000722	Bracket ST250

Ø 320



W0950000723	Bracket ST320

SPARE PARTS



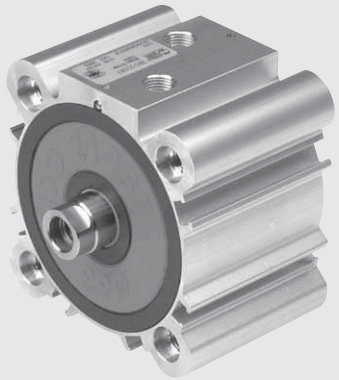
Code	Bores	Type	Parts
W095 . . . 02101	250 - 320	Complete set of gaskets	2-4-5-8
W0952502102	250	Complete set of (high temperature) FKM/FPM gaskets	2-4-5-8
W095 . . .00104	250 - 320	Complete front head kit	1-2-3-4-5-6
W095 . . .00105	250 - 320	Complete rear head kit	4-5-6-7

ISO 21287 CYLINDER SERIES LINER

Compact cylinder to ISO 21287, LINER series, available in different versions to meet all possible requirements:

- With or without magnet
- Double acting, single or through piston rod
- Double acting, perforated through piston rod
- Single acting, extended, retracted or through piston rod
- Single acting, perforated through rod
- Double acting anti-rotating version and double acting through piston rod
- Polyurethane or FKM/FPM gaskets (for high temperatures) also available
- Dimensions and centre distances to ISO 21287.

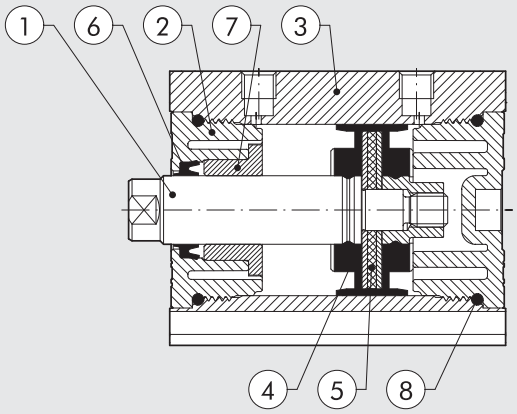
The heads have been eliminated for ease of installation, improved sturdiness and precision. The metal lining is designed to withstand heavy-duty work, tensile stress and impact. Technopolymer parts can withstand dynamic and pneumatic thrust. The lining virtually acts as a "bearing" to which most of user accessories are attached.
The wide range of anchors provide numerous fixing points.
Retractable magnetic limit switches can be mounted to identify the position in the cylinder grooves.



TECHNICAL DATA		POLYURETHANE	FKM/FPM
Max operating pressure	bar	10	
	MPa	1	
	psi	145	
Temperature range	°C	-10 to +60 (Ø 20 to 63) -10 to +80 (Ø 80 to 100)	-10 to +150 (non-magnetic cylinders)
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	20; 25; 32; 40; 50; 63; 80; 100 with ISO 21287 fixing centre distances	
Design		With profile	
Versions		Double-acting, Double-acting through-rod, Single-acting extended or retracted rod, Single-acting through-rod, Double-acting through-rod perforated, Double-acting non-rotating, Double-acting through-rod non-rotating, No stick-slip All versions are available with male or female piston rod.	
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request.	
Inrush pressure		Ø 20 | Ø 25 | Ø 32 | Ø 40 | Ø 50 | Ø 63 | Ø 80 | Ø 100	
for single piston rod	bar	0.6 | 0.6 | 0.6 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4	
for through-rod	bar	0.8 | 0.8 | 0.6 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4	
Forces generated at 6 bar thrust/retraction		See cylinder "**General technical data**" at the beginning of the chapter	
Weights		See cylinder "**General technical data**" at the beginning of the chapter	
Notes		For correct operation, it is advisable to use 50 µm filtered air **For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air**	

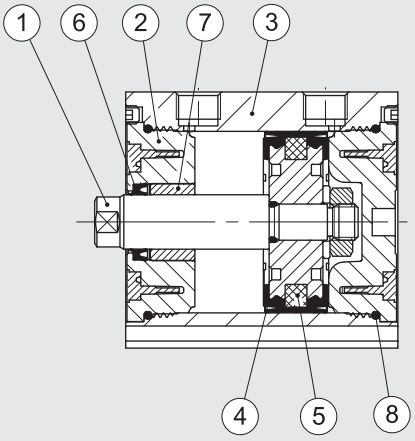
COMPONENTS Ø 20-25

① PISTON ROD: stainless steel, thick chromed
② END CAP: high-performance technopolymer
③ BARREL: drawn anodised and calibrated aluminium alloy
④ PISTON GASKET: polyurethane or FKM/FPM (for high temperature)
⑤ MAGNET: plastoneodimio
⑥ PISTON ROD GASKET: polyurethane or FKM/FPM (for high temperature)
⑦ GUIDE BUSHING: sintered bronze
⑧ STATIC O-RINGS: NBR or FKM/FPM (for high temperature)



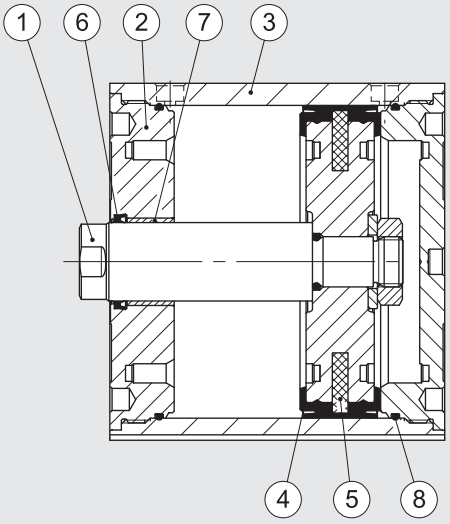
COMPONENTS Ø 32-63

① PISTON ROD: C45 stell or stainless steel, thick chromed
② END CAP: high-performance technopolymer
③ BARREL: drawn anodised and calibrated aluminium alloy
④ PISTON GASKET: polyurethane or FKM/FPM (for high temperature)
⑤ MAGNET: Ø 32 plastoneodimio - Ø 40 to 63 plastoferrite
⑥ PISTON ROD GASKET: polyurethane or FKM/FPM (for high temperature)
⑦ GUIDE BUSHING: sintered bronze
⑧ STATIC O-RINGS: NBR or FKM/FPM (for high temperature)

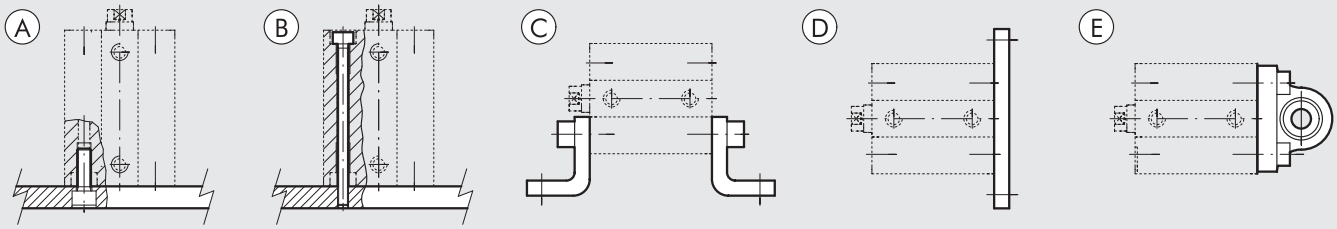


COMPONENTS Ø 80-100

① PISTON ROD: C45 stell or stainless steel, thick chromed
② END CAP: anodized aluminium alloy
③ BARREL: drawn anodised and calibrated aluminium alloy
④ PISTON GASKET: polyurethane or FKM/FPM (for high temperature)
⑤ MAGNET: plastoferrite
⑥ PISTON ROD GASKET: polyurethane or FKM/FPM (for high temperature)
⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑧ STATIC O-RINGS: NBR or FKM/FPM (for high temperature)



FIXING OPTIONS



Ⓐ Fixing to structural work with a through screw, using the thread in the heads
Ⓑ Direct fixing from above using long through screws or tie rods. Non-magnetic stainless steel must be used (e.g. AISI 304)
Ⓒ Fixing with feet; the ordering code covers the supply of one foot and two screws for fixing to the cylinder
Ⓓ Fixing with a flange mounted on the front or rear head; the ordering code covers the supply of a flange and four screws for fixing to the cylinder
Ⓔ Fixing with articulated hinge to compensate for slight system misalignment and turn freely
The ordering code covers the supply of a hinge and four screws for fixing to the cylinder.

METAL WORK PNEUMATIC

FORCE OF SPRINGS IN SINGLE-ACTING CYLINDERS (THEORETICAL)

Bore	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
Min. load (N)	8.40	13.90	19.00	24.80	36.30	50.20	77.60	131.80
Max. load (N)	20.90	33.20	35.90	53.70	62.20	82.30	118.90	183.30

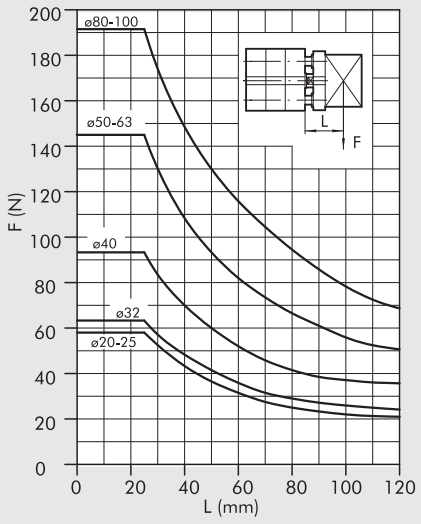
STROKES FOR COMPACT CYLINDERS ISO 21287

Standard stroke for single-acting cylinders	Standard stroke for other types	Max. recommended strokes for other types	Max. recommended strokes for non-rotating cylinders	Max recommended strokes for through-rod perforated
Ø 20 to 100 → from 1 to 25 mm	Ø 20 to 25 → from 1 to 60 mm	Ø 20 to 25 → 300 mm	Ø 20 to 63 → 120 mm	Ø 20 to 40 → from 1 to 80 mm
	Ø 32 to 100 → from 1 to 80 mm	Ø 32 to 63 → 400 mm	Ø 80 to 100 → 150 mm	Ø 50 to 63 → from 1 to 100 mm
		Ø 80 to 100 → 500 mm		Ø 80 to 100 → from 1 to 160 mm

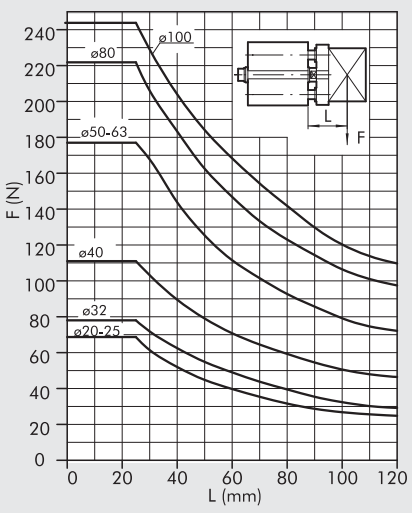
Maximum recommended strokes. Higher values can create operating problems

MAXIMUM LOADS FOR NON-ROTATING VERSION

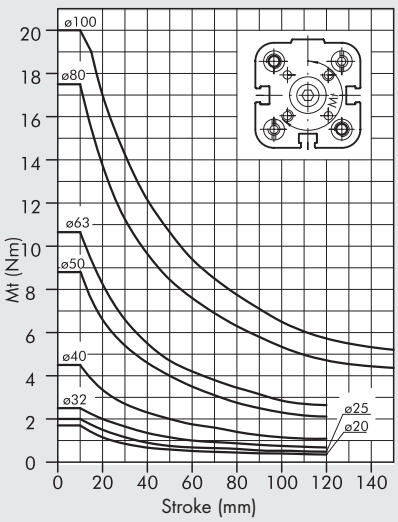
TRANSVERSAL FORCE FOR NON-ROTATING



TRANSVERSAL FORCE FOR NON-ROTATING THROUGH-ROD

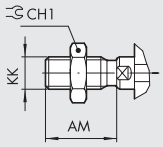


TORQUE DEPENDING ON STROKE

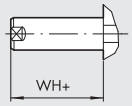


DIMENSIONS OF DOUBLE-ACTING Ø 20 to 50 AND SINGLE-ACTING Ø 20 to 50

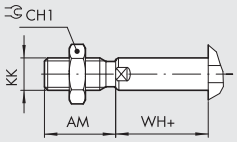
SE-DE MALE PISTON ROD



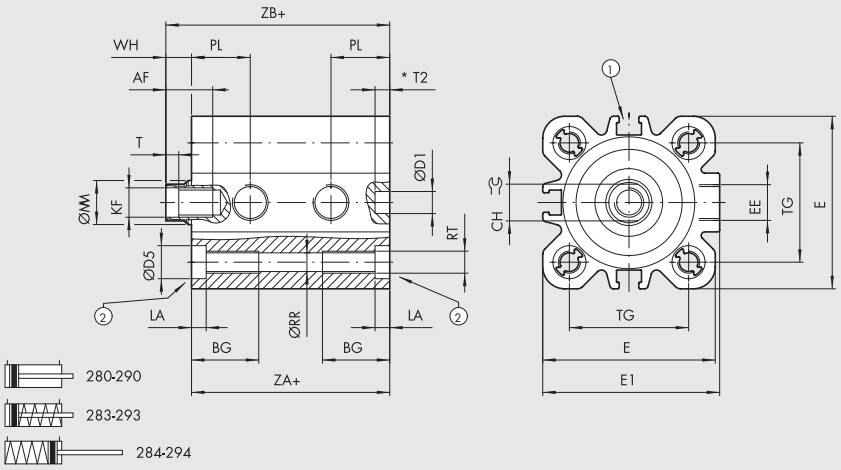
SE EXTENDED PISTON ROD



SE MALE EXTENDED PISTON ROD



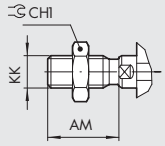
\+ = ADD THE STROKE
* = SECTION WITH TOLERANCE
1 = SENSOR SLOT
2 = SEAT FOR DIN 7984 SCREWS



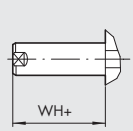
Ø	AF	AM	BG	CH	CH1	ØD1 H9	ØD5	E	E1	EE	KF	KK	LA	ØMM	PL	ØRR	RT	T	T2	TG ±0.2	WH	ZA +0.3 -0	ZB
20	14	16	17.5	8	13	6	7.5	35.5	36.5	M5	M6	M8	4.2	10	12	4.2	M5	2.5	3	22	6	37	43
25	14	16	17.5	8	13	6	7.5	39.5	40	M5	M6	M8	4.2	10	13	4.2	M5	2.5	3.5	26	6	39	45
32	16.5	19	21.5	10	17	6	9	47	48.2	G1/8	M8	M10x1.25	4	12	16	5.1	M6	3.5	4	32.5	7	44	51
40	16.5	19	21.5	10	17	6	9	55.5	56.5	G1/8	M8	M10x1.25	4	12	16	5.1	M6	3.5	4	38	7	45	52
50	17	22	21	13	19	6	10.5	66.5	67.8	G1/8	M10	M12x1.25	4.5	16	15.5	6.8	M8	4	3	46.5	8	45	53

DIMENSIONS OF DOUBLE-ACTING Ø 63 to 100 AND SINGLE-ACTING Ø 63 to 100

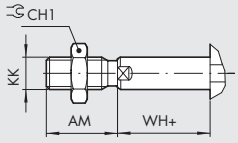
SE-DE MALE PISTON ROD



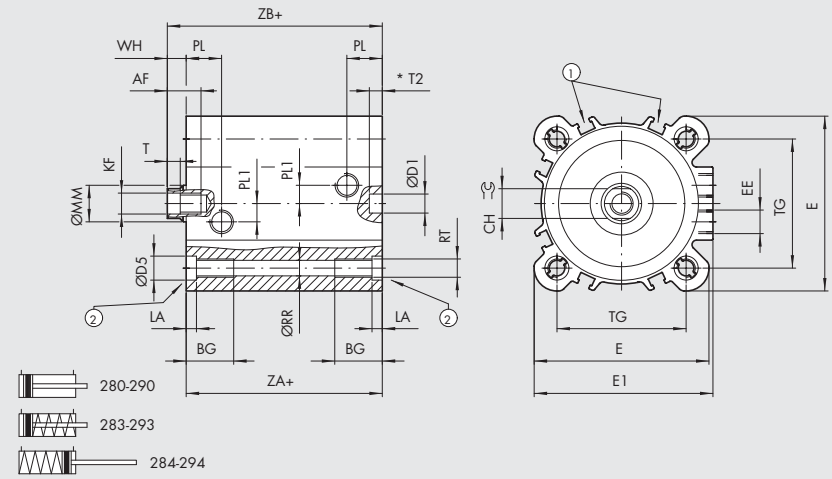
SE EXTENDED PISTON ROD



SE MALE EXTENDED PISTON ROD



\+ = ADD THE STROKE
* = SECTION WITH TOLERANCE
1 = SENSOR SLOT
2 = SEAT FOR DIN 7984 SCREWS

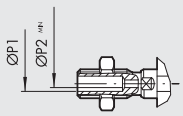


Ø	AF	AM	BG	CH	CH1	ØD1 H9	ØD5	E	E1	EE	KF	KK	LA	ØMM	PL1	PL	ØRR	RT	T	T2	TG ±0.2	WH	ZA +0.4 -0	ZB
63	17	22	21	13	19	8	10.5	76.5	78.3	G1/8	M10	M12x1.25	4.5	16	8	15.5	6.8	M8	4	3.5	56.5	8	49	57
80	22	28	22.5	17	24	8	14	95.5	95.5	G1/8	M12	M16x1.5	5	20	14	16.5	8.5	M10	5	4	72	10	54	64
100	24	28	25.5	22	30	8	14	114	114	G1/8	M12	M16x1.5	5	25	19	19.2	8.5	M10	5	4	89	10	67	77

METAL WORK PNEUMATIC

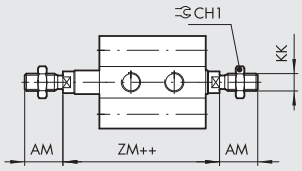
DIMENSIONS OF THROUGH-ROD Ø 20 to 50

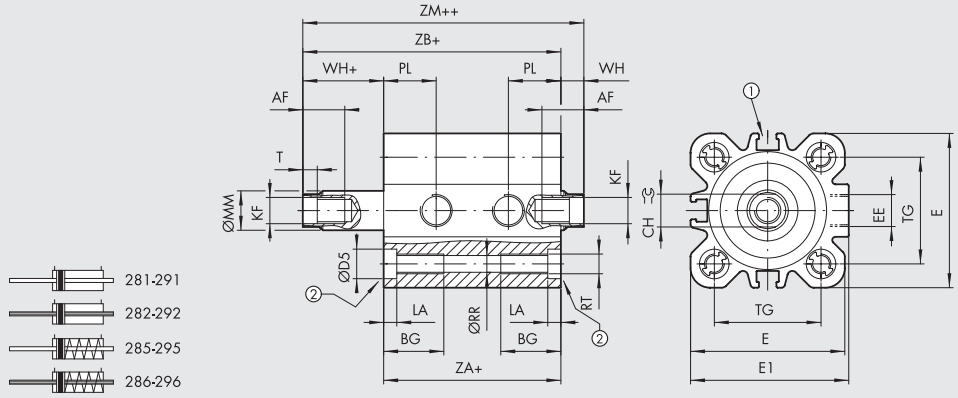
SE-DE MALE PERFORATED THROUGH-ROD



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE
1 = SENSOR SLOT
2 = SEAT FOR DIN 7984 SCREWS

SE-DE MALE PISTON ROD

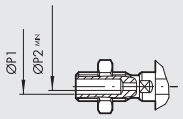




Ø	AF	AM	BG	CH	CH1	ØD5	E	E1	EE	KF	KK	LA	ØMM	ØP1	ØP2	PL	ØRR	RT	T	TG$^{\pm 0.2}$	WH	ZA$^{+0.3}_{0}$	ZB	ZM
20	14	16	17.5	8	13	7.5	35.5	36.5	M5	M6	M8	4.2	10	3	1.5	12	4.2	M5	2.5	22	6	37	43	49
25	14	16	17.5	8	13	7.5	39.5	40	M5	M6	M8	4.2	10	3	1.5	13	4.2	M5	2.5	26	6	39	45	51
32	16.5	19	21.5	10	17	9	47	48.2	G1/8	M8	M10x1.25	4	12	4	2.5	16	5.1	M6	3.5	32.5	7	44	51	58
40	16.5	19	21.5	10	17	9	55.5	56.5	G1/8	M8	M10x1.25	4	12	4	2.5	16	5.1	M6	3.5	38	7	45	52	59
50	17	22	21	13	19	10.5	66.5	67.8	G1/8	M10	M12x1.25	4.5	16	6	4	15.5	6.8	M8	4	46.5	8	45	53	61

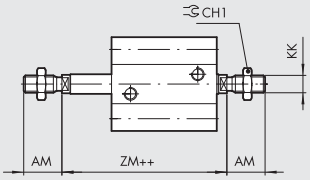
DIMENSIONS OF THROUGH-ROD Ø 63 to 100

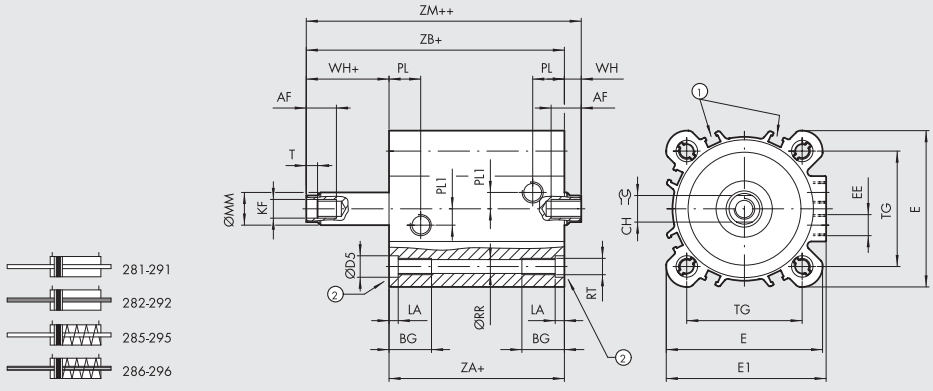
SE-DE MALE PERFORATED THROUGH-ROD



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE
1 = SENSOR SLOT
2 = SEAT FOR DIN 7984 SCREWS

SE-DE MALE PISTON ROD

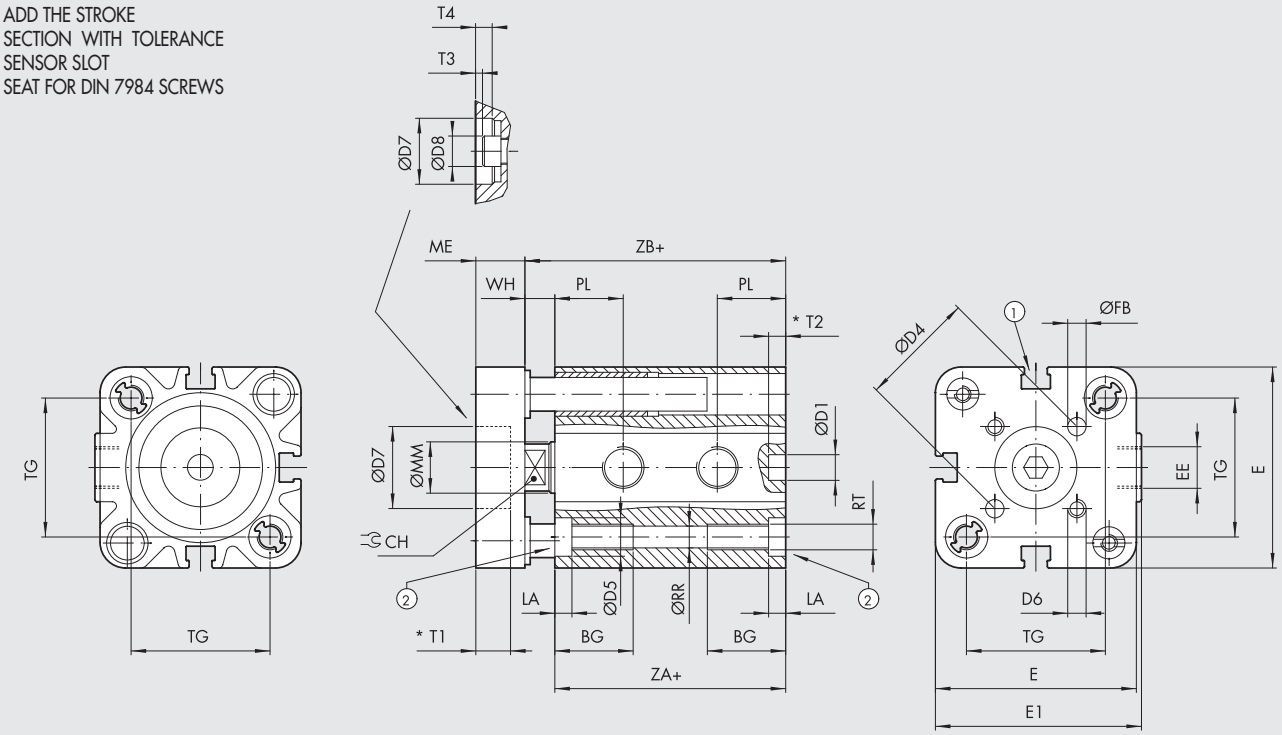




Ø	AF	AM	BG	CH	CH1	ØD5	E	E1	EE	KF	KK	LA	ØMM	ØP1	ØP2	PL1	PL	ØRR	RT	T	TG $^{\pm 0.2}$	WH	ZA$^{+0.4}_{0}$	ZB	ZM
63	17	22	21	13	19	10.5	76.5	78.3	G1/8	M10	M12x1.25	4.5	16	6	4	8	15.5	6.8	M8	4	56.5	8	49	57	65
80	22	28	22.5	17	24	14	95.5	95.5	G1/8	M12	M16x1.5	5	20	G1/8	5	14	16.5	8.5	M10	5	72	10	54	64	74
100	24	28	25.5	22	30	14	114	114	G1/8	M12	M16x1.5	5	25	G1/8	6	19	19.2	8.5	M10	5	89	10	67	77	87

DIMENSIONS OF NON-ROTATING Ø 20 to 50

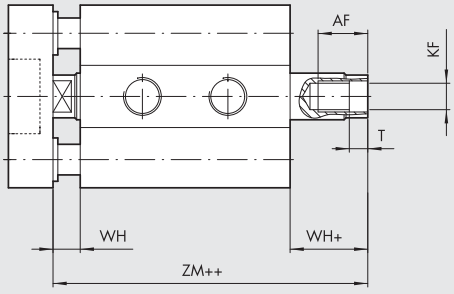
\+ = ADD THE STROKE
* = SECTION WITH TOLERANCE
1 = SENSOR SLOT
2 = SEAT FOR DIN 7984 SCREWS



297

NON-ROTATING FEMALE THROUGH-ROD

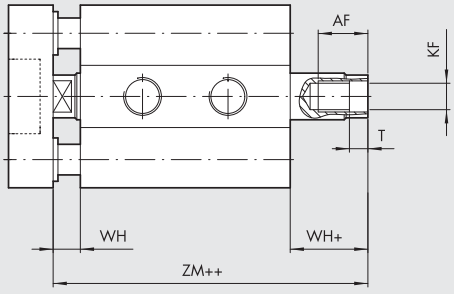
\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE



29A

NON-ROTATING MALE THROUGH-ROD

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE



29A

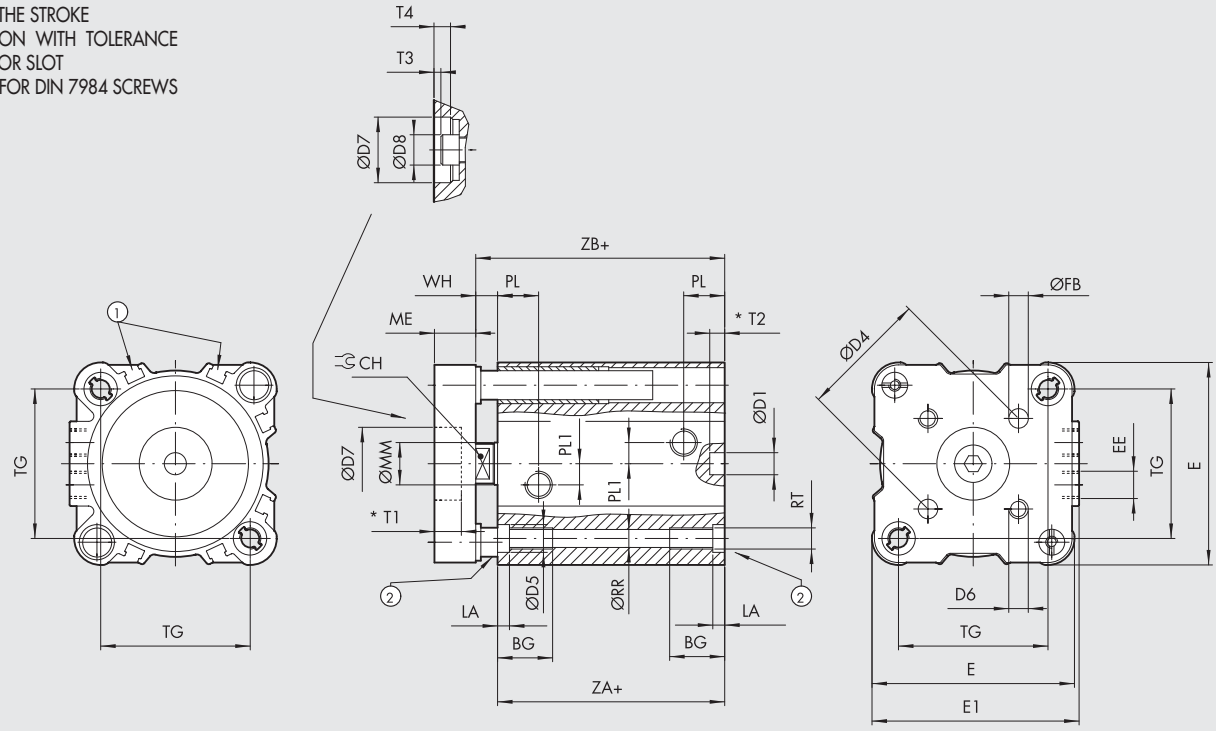
Ø	AF	AM	BG	CH	CH1	ØD1 H9	ØD4	ØD5	D6	ØD7 H9	ØD8	E	E1	EE	ØFB	KF	KK	LA	ME	ØMM	PL	ØRR	RT	T	T1	T2	T3	T4
20	14	16	17.5	8	13	6	17	7.5	M4	-	-	35.5	36.5	M5	4	M6	M8	4.2	8	10	12	4.2	M5	2.5	-	3	-	-
25	14	16	17.5	8	13	6	22	7.5	M5	14	10	39.5	40	M5	5	M6	M8	4.2	8	10	13	4.2	M5	2.5	3.5	3.5	1	3.5
32	16.5	19	21.5	10	17	6	28	9	M5	17	13	47	48.2	G1/8	5	M8	M10x1.25	4	10	12	16	5.1	M6	3.5	3.5	4	1	3.5
40	16.5	19	21.5	10	17	6	33	9	M5	17	13	55.5	56.5	G1/8	5	M8	M10x1.25	4	10	12	16	5.1	M6	3.5	3.5	4	1	3.5
50	17	22	21	13	19	6	42	10.5	M6	22	16	66.5	67.8	G1/8	6	M10	M12x1.25	4.5	12	16	15.5	6.8	M8	4	5	3	1.5	5

Ø	TG ±0.2	WH	ZA +0.3 0	ZB	ZM
20	22	6	37	43	49
25	26	6	39	45	51
32	32.5	7	44	51	58
40	38	7	45	52	59
50	46.5	8	45	53	61

METAL WORK PNEUMATIC

DIMENSIONS OF NON-ROTATING Ø 63 to 100

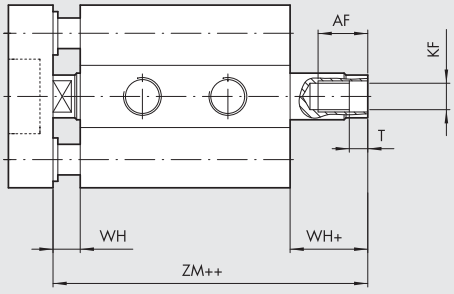
\+ = ADD THE STROKE
* = SECTION WITH TOLERANCE
1 = SENSOR SLOT
2 = SEAT FOR DIN 7984 SCREWS

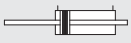


297

NON-ROTATING FEMALE THROUGH-ROD

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

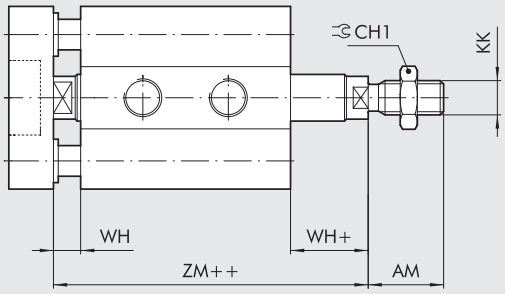


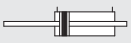


29A

NON-ROTATING MALE THROUGH-ROD

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE





28A

Ø	AF	AM	BG	CH	CH1	ØD1 H9	ØD4	ØD5	D6	ØD7 H9	ØD8	E	E1	EE	ØFB	KF	KK	LA	ME	ØMM	PL1	PL	ØRR	RT	T	T1	T2	T3
63	17	22	21	13	19	8	50	10.5	M6	22	16	76.5	78.3	G1/8	6	M10	M12x1.25	4.5	12	16	8	15.5	6.8	M8	4	5	3.5	1.5
80	22	28	22.5	17	24	8	65	14	M8	24	18	95.5	95.5	G1/8	8	M12	M16x1.5	5	14	20	14	16.5	8.5	M10	5	7.5	4	3.5
100	24	28	25.5	22	30	8	80	14	M10	24	18	114	114	G1/8	10	M12	M16x1.5	5	14	25	19	19.2	8.5	M10	5	7.5	4	3.5

Ø	T4	TG ±0.2	WH	ZA +0.4 0	ZB	ZM
63	5	56.5	8	49	57	65
80	7.5	72	10	54	64	74
100	7.5	89	10	67	77	87

KEY TO CODE

CYL	2 8 TYPE	0	0	20 BORE	0	0 5 0 STROKE **	X MATERIAL	P GASKETS
	28 Compact cylinder ISO 21287 male piston rod **29** Compact cylinder ISO 21287 female piston rod	**0** Double-acting **1** Double-acting through-rod **2** Double-acting through-rod perforated ● **3** Single-acting retracting piston rod ● **4** Single-acting extended piston rod ● **5** Single-acting through-rod ● **6** Single-acting through piston rod perforated ▼ **7** Double-acting non-rotating **A** Double-acting through-rod non-rotating	**0** Magnetic □ **S** Non-magnetic ▲ **G** No stick-slip	20 25 32 40 50 63 80 ◆ 100	**0** Standard		✱ **C** C45 piston rod chromium-plated ▷ **X** Stainless steel piston rod and nut ◁ **A** C45 chromed rod, aluminium piston ○ **Z** Stainless steel piston rod and nut aluminium piston	**P** Polyurethane gaskets ▶ **V** FKM/FPM gaskets

** For the maximum suppliabe stroke, see page **A1**.75

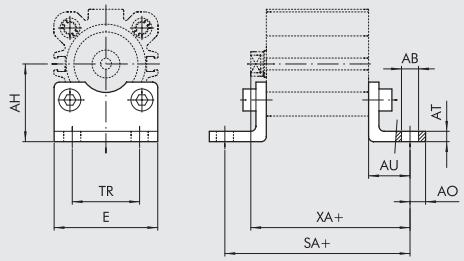
● Can also be used as double-acting with spring return
▼ For versions 29 only (female piston rod)
▲ For Ø 12 to 25 the standard version (0 or S) it's already No stick-slip
For Ø 20 to 100 version with gaskets in FKM / FPM (0 or S) is already "No stick-slip"
For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only
◆ In the code of cylinder with letter in fourth position Ø 100 becomes A1
▶ Only for standard double acting and standard through rod double acting version (for Ø20 and Ø25 only "non-magnetic" version provided)
□ Compulsory for Ø 20 and Ø 25 version Z
✱ Only for Ø 32 to 63 P version (Polyurethane gaskets)
▷ Only for Ø 20 to 63 P version (Polyurethane gaskets)
◁ Only for Ø 32 to 100 V version (FKM/FPM gaskets) and for Ø 80 and 100 P version (Polyurethane gaskets)
○ Only for Ø 20 to 100 V version (FKM/FPM gaskets) and for Ø 80 and 100 P version (Polyurethane gaskets)

NOTES

ACCESSORIES FOR ISO 21287 CYLINDERS: FIXING

FOOT - MODEL A

+ = ADD THE STROKE



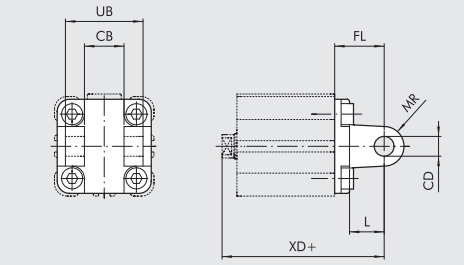
Code	Ø	ØAB	AH	AO	AT	AU	E	SA	TR	XA	Weight [g]
W0950206001	20	6.6	27	6	4	16	36	69	22	59	46
W0950256001	25	6.6	30*	6	4	16	40	71	26	61	52
W0950322001	32	7	32*	11*	4	24*	45	92*	32	75*	76
W0950402001	40	9	36*	15*	4	28*	52	101*	36	80*	100
W0950502001	50	9	45	15*	5	32*	65	109*	45	85*	162
W0950632001	63	9	50	15*	5	32*	75	113*	50	89*	266
W0950802001	80	12	63	20*	6	41*	95	136*	63	105*	456
W0951002001	100	14	71*	25*	6	41*	115	149*	75	118*	572

Note: Individually packed with 2 screws

* **IMPORTANT:** Values not to ISO 21287. Cylinder pins to ISO 15552 are used.

FEMALE HINGE-MODEL B

+ = ADD THE STROKE

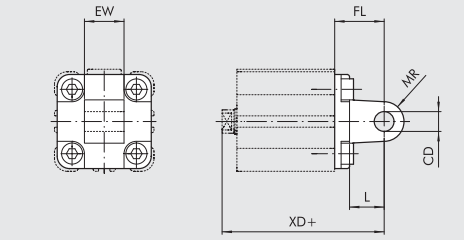


Code	Ø	CB H14	ØCD H9	FL	L	MR	UB H14	XD	Weight [g]
W0950322003	32	26	10	22	12	10	45	73	112
W0950402003	40	28	12	25	15	12	52	77	159
W0950502003	50	32	12	27	15	12	60	80	250
W0950632003	63	40	16	32	20	16	70	89	390
W0950802003	80	50	16	36	20	16	90	100	668
W0951002003	100	60	20	41	25	20	110	118	1047

Note: Supplied with 4 screws, 4 washers, 2 snap-rings and 1 pin

MALE HINGE-MODEL BA

+ = ADD THE STROKE

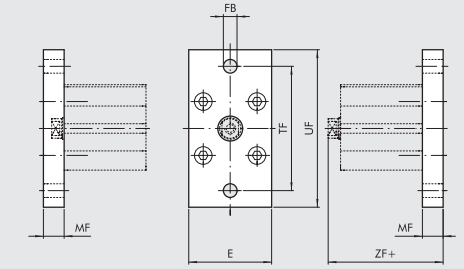


Code	Ø	ØCD H9	EW	FL	L	MR	XD	Weight [g]
W0950206004	20	8	16	20	12	8	63	44
W0950256004	25	8	16	20	12	8	65	48
W0950322004	32	10	26	22	12	11	73	94
W0950402004	40	12	28	25	15	13	77	124
W0950502004	50	12	32	27	15	13	80	220
W0950632004	63	16	40	32	20	17	89	316
W0950802004	80	16	50	36	20	17	100	578
W0951002004	100	20	60	41	25	21	118	850

Note: Supplied with 4 screws, 4 washers

FLANGE Ø 20 to 25 - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE



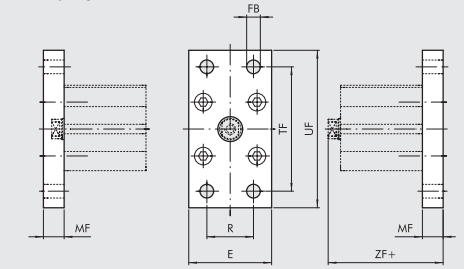
Code	Ø	E	ØFB	MF	TF	UF	ZF	Weight [g]
W0950206002	20	36	6.6	10*	55	70	53*	184
W0950256002	25	40	6.6	10*	60	76	55*	226

Note: Supplied with 4 screws

* **IMPORTANT:** Non ISO 21287 norm fixing distance

FLANGE Ø 32 to 100 - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE

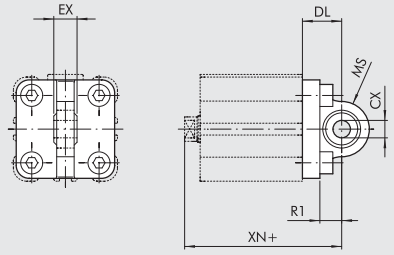


Code	Ø	E	ØFB	MF	R	TF	UF	ZF	Weight [g]
W0950322002	32	50	7	10	32	64	80	61	246
W0950402002	40	55	9	10	36	72	90	62	290
W0950502002	50	65	9	12	45	90	110	65	522
W0950632002	63	75	9	12	50	100	120	69	670
W0950802002	80	95	12	16	63	126	153	80	1420
W0951002002	100	115	14	16	75	150	178	93	2040

Note: Supplied with 4 screws

ARTICULATED MALE HINGE - MODEL BAS

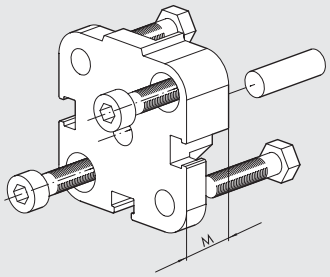
+ = ADD THE STROKE



Code	Ø	ØCX	DL	EX	MS	R1	XN	Weight [g]
W0950322006	32	10	22	14	16	12	73	106
W0950402006	40	12	25	16	18	15	77	142
W0950502006	50	12	27	16	21	19	80	236
W0950632006	63	16	32	21	23	20	89	336
W0950802006	80	16	36	21	28	24	100	572
W0951002006	100	20	41	25	30	25	118	840

Note: Supplied with 4 screws, 4 washers

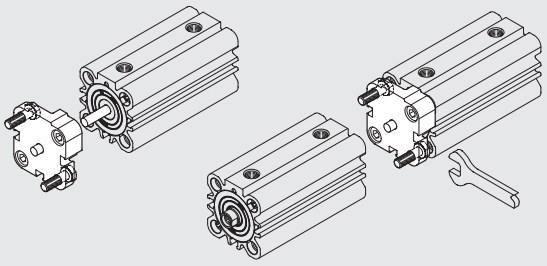
FLANGE FOR OPPOSITE CYLINDERS



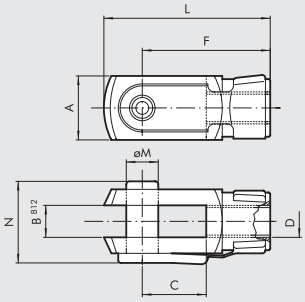
Code	Ø	M	Weight [g]
0950203060	20	12.5	45
0950253060	25	13	57
0950323060	32	14.5	88
0950403061	40	14.5	106
0950503061	50	14.5	158
0950633061	63	14.5	258
0950803061	80	16.5	452
0951003061	100	19.5	801

Note: Supplied complete with 1 pin, 4 screws

ASSEMBLING OPPOSING CYLINDERS



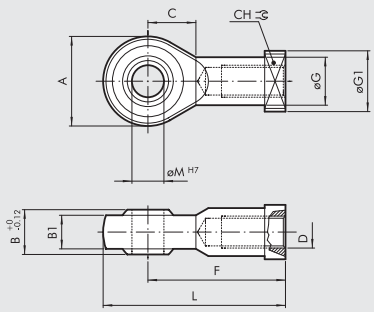
FORK - MODEL GK-M



Code	Ø	A	B	C	D	F	L	øM	N	Weight [g]
W0950200020	20	16	8	16	M8	32	42	8	22	48
W0950200020	25	16	8	16	M8	32	42	8	22	48
W0950322020	32	20	10	20	M10x1.25	40	52	10	26	92
W0950322020	40	20	10	20	M10x1.25	40	52	10	26	92
W0950402020	50	24	12	24	M12x1.25	48	62	12	32	148
W0950402020	63	24	12	24	M12x1.25	48	62	12	32	148
W0950502020	80	32	16	32	M16x1.5	64	83	16	40	340
W0950502020	100	32	16	32	M16x1.5	64	83	16	40	340

Note: Individually packed

ROD EYE - MODEL GA-M

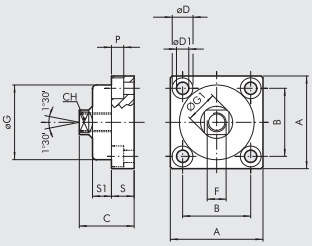


Code	Ø	A	B	B1	C	CH	D	F	øG	øG1	L	øM	Weight [g]
W0950200025	20	24	12	9	13	14	M8	36	12.5	16	48	8	50
W0950200025	25	24	12	9	13	14	M8	36	12.5	16	48	8	50
W0950322025	32	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950322025	40	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950402025	50	32	16	12	17	19	M12x1.25	50	17.5	22	66	12	116
W0950402025	63	32	16	12	17	19	M12x1.25	50	17.5	22	66	12	116
W0950502025	80	42	21	15	23	22	M16x1.5	64	22	27	85	16	226
W0950502025	100	42	21	15	23	22	M16x1.5	64	22	27	85	16	226

Note: Individually packed

METAL WORK PNEUMATIC

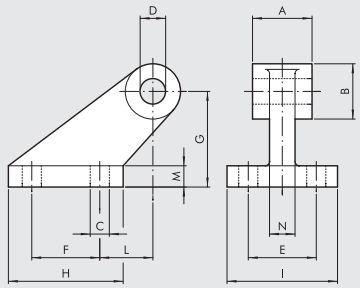
COMPENSATION JOINT - MODEL GA



Code	Ø	A	B	C	CH	øD	øD1	F	øG	ØG1	P	S	S1	Weight [g]
W0950326021	32	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950326021	40	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950406021	50	59	42	36	15	14	8.5	M12x1.25	44	19	8.5	15	13.5	286
W0950406021	63	59	42	36	15	14	8.5	M12x1.25	44	19	8.5	15	13.5	286
W0950506021	80	79	58	44	22	17	10.5	M16x1.5	59	26	10.5	20	15	628
W0950506021	100	79	58	44	22	17	10.5	M16x1.5	59	26	10.5	20	15	628

Note: Individually packed

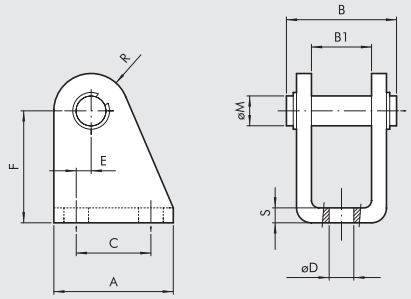
COUNTER-HINGE CETOP Ø 32 to 100



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96
W0950402008	40	28	26	9	12	32	32	45	54	52	25	10	12	216
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440
W0950802008	80	50	33	11	16	40	50	63	75	63	32	12	15	464
W0951002008	100	60	44	14	20	50	70	90	103	80	40	16	22	985

Note: Supplied complete with 4 screws, 4 washers

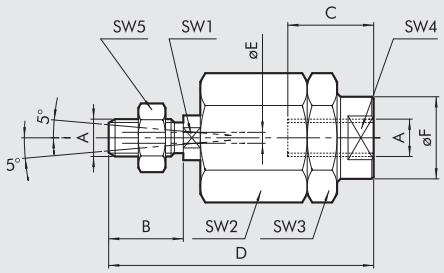
COUNTER-HINGE Ø 16 to 25 - MODEL BC



Code	Ø	A	B	B1	C	øD	E	F	øM	R	S	Weight [g]
W0950200005	20	32	30	16	20	6.5	4	30	8	10	4	78
W0950200005	25	32	30	16	20	6.5	4	30	8	10	4	78

Note: Supplied complete with 1 pin and and 2 snap rings

SELF ALIGNING ROD COUPLER - MODEL GA-K



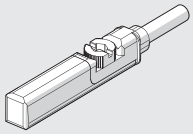
Code	Ø	A	B	C	D	øE	øF	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950200030	20	M8	20	20	57	4	12.5	7	17	17	11	13	56
W0950200030	25	M8	20	20	57	4	12.5	7	17	17	11	13	56
W0950322030	32	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950322030	40	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950402030	50	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950402030	63	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950502030	80	M16x1.5	32	32	103	4	32	20	41	41	30	24	620
W0950502030	100	M16x1.5	32	32	103	4	32	20	41	41	30	24	620

Note: Individually packed

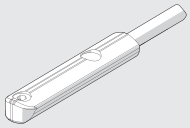
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

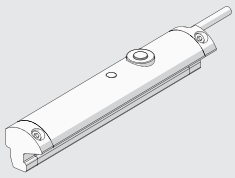
SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



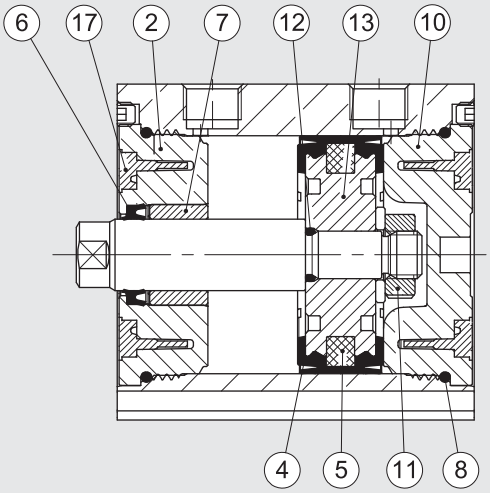
LTS POSITION SENSORS



For technical data and usage strokes see **chapter A6**.

SPARE PARTS FOR ISO 21287 CYLINDER

COMPACT CYLINDERS ISO 21287 (POLYURETHANE)



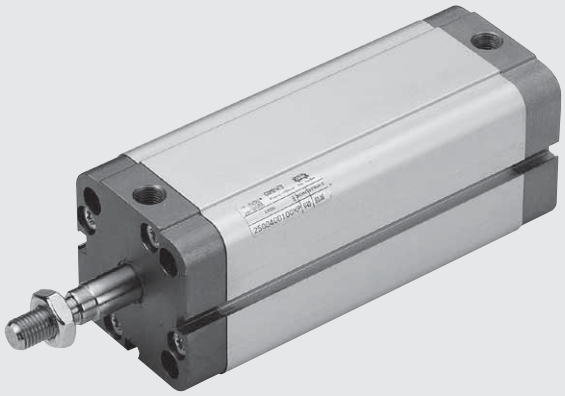
Code	Bores	Type	Parts
009 . . . L001	Ø 20, 25	Complete set of gaskets polyurethane	④ ⑥ ⑧
009 . . . L001	Ø 32 to 63	Complete set of gaskets polyurethane	④ ⑥ ⑧ ⑫ ⑰
009 . . . L001	Ø 80, 100	Complete set of gaskets polyurethane	④ ⑥ ⑧ ⑫
009 . . . L008	Ø 20, 25	Complete set of (high temperature) FKM/FPM gaskets	④ ⑥ ⑧
009 . . . L008	Ø 32 to 63	Complete set of (high temperature) FKM/FPM gaskets	④ ⑥ ⑧ ⑫ ⑰
009 . . . L008	Ø 80, 100	Complete set of (high temperature) FKM/FPM gaskets	④ ⑥ ⑧ ⑫
009 . . . 7013	Ø 20 to 100	Polyurethane piston rod gasket kit	⑥
009 . . . 7014	Ø 20 to 100	FKM/FPM piston rod gasket kit	⑥
009 . . . L101	Ø 20, 25, 80, 100	Front head kit	② ⑥ ⑦ ⑧
009 . . . L101	Ø 32 to 63	Front head kit	② ⑥ ⑦ ⑧ ⑰
009 . . . L201	Ø 20, 25, 80, 100	Rear head kit	⑧ ⑩
009 . . . L201	Ø 32 to 63	Rear head kit	⑧ ⑩ ⑰
009 . . . 7401	Ø 20, 25	Piston kit polyurethane	④ ⑤ ⑪
009 . . . L401	Ø 32 to 63	Piston kit polyurethane	④ ⑤ ⑪ ⑫ ⑬ ⑰
009 . . . 7401	Ø 80 to 100	Piston kit polyurethane	④ ⑤ ⑪ ⑫ ⑬
009 . . . 7501	Ø 20, 25, 80, 100	Magnet	⑤
009 . . . L501	Ø 32 to 63	Magnet	⑤ ⑰
009 . . . L901	Ø 20, 25	Front + rear cylinder head + piston kit polyurethane	② ④ ⑤ ⑥ ⑦ ⑧ ⑩ ⑪
009 . . . L901	Ø 32 to 63	Front + rear cylinder head + piston kit polyurethane	② ④ ⑤ ⑥ ⑦ ⑧ ⑩ ⑪ ⑫ ⑬ ⑰
009 . . . L901	Ø 80, 100	Front + rear cylinder head + piston kit polyurethane	② ④ ⑤ ⑥ ⑦ ⑧ ⑩ ⑪ ⑫ ⑬

COMPACT CYLINDER SERIES CMPC

Compact cylinder series CMPC available in numerous versions to meet a full range of requirements:

- With or without magnet
- Single-acting extended rod, retracted or through-rod
- Dual-acting non-rotating and dual-acting through-rod versions
- Tandem with two, three or four stages
- Multi-position with two and three stages
- Fixing centre distances to ISO 15552 from Ø 32 to Ø 100 and from Ø 20 to Ø 100 complying with French standard NFE 49-004-1 and 2 (UNITOP). Ø 12 and Ø 16 have centre distances compatible with trade cylinders.

The special profile and outer heads locked onto the barrel by screws ensure optimal guiding of the cylinder and multiple fixing options with a wide range of mountings. To determine the position in the relevant cylinder slots, it is possible to mount retracting magnetic limit switches.
Available also in a version having FKM/FPM gaskets (for high temperature) from Ø 20 to Ø 100.



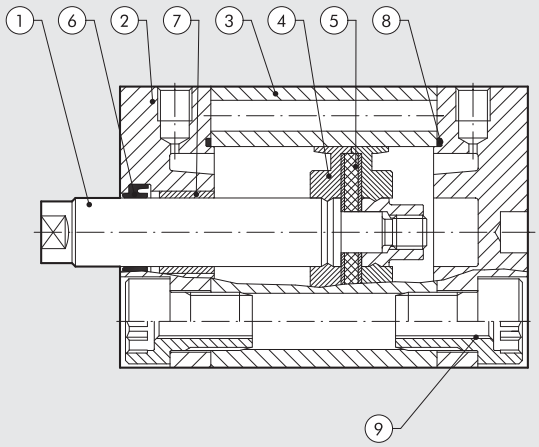
TECHNICAL DATA		POLYURETHANE	FKM/FPM
Max operating pressure	bar	10	
	MPa	1	
	psi	145	
Temperature range	°C	–10 to +80	–10 to +150 (non-magnetic cylinders)
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	Ø 12; 16; interchangeable with similar products	
	mm	Ø 32; 40; 50; 63; 80; 100 with ISO 15552 fixing centre distances	
	mm	Ø 20; 25; 32; 40; 50; 63; 80; 100 with NFE 49-004-1 and 2 fixing centre distances	
Design		With profile, heads with screws	
Versions		Double-acting, Single-acting extended or retracted rod, Through-rod, Through-rod perforated, Single-acting through-rod, Through-rod non-rotating, No stick-slip	
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request	

Inrush pressure		Ø 12	Ø 16	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
single piston rod	bar	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4
through-rod	bar	1	0.8	0.8	0.8	0.6	0.4	0.4	0.4	0.4	0.4

Forces generated at 6 bar thrust/retraction	See cylinder "**General technical data**" at the beginning of the chapter
Weights	See cylinder "**General technical data**" at the beginning of the chapter
Notes	For correct operation, it is advisable to use 50 µm filtered air
	For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air

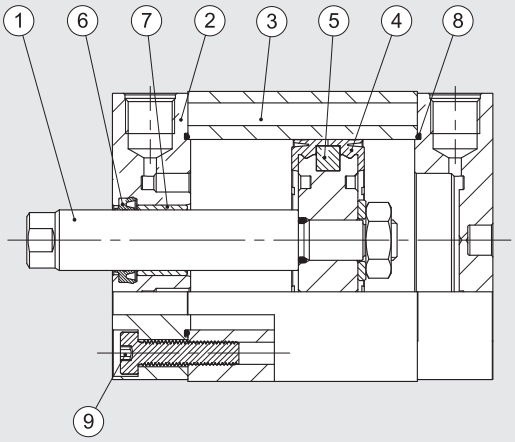
COMPONENTS Ø 12 to 25

① PISTON ROD: stainless steel, thick chromed
② HEAD: extruded anodised aluminium alloy
③ BARREL: drawn anodised and calibrated aluminium alloy
④ PISTON GASKET: polyurethane or FKM/FPM
⑤ MAGNET: neodymium-plastic
⑥ PISTON ROD GASKET: polyurethane or FKM/FPM
⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑧ STATIC O-RINGS: NBR or FKM/FPM
⑨ SECURING SCREWS: zinc-plated steel



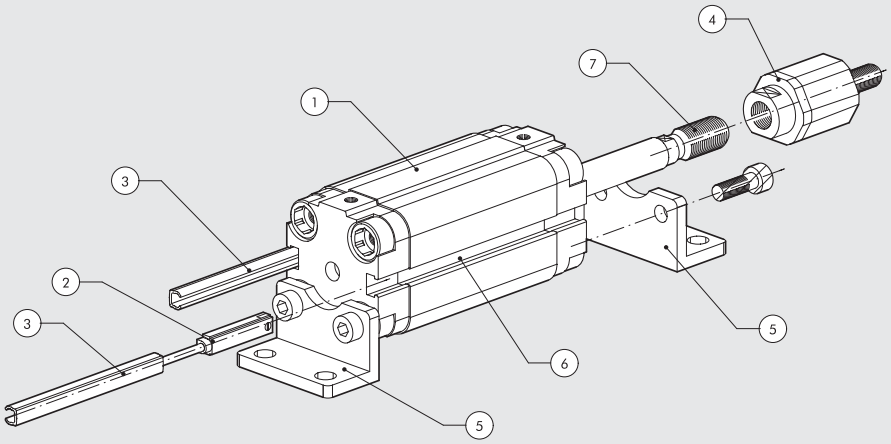
COMPONENTS Ø 32 to 100

① PISTON ROD: C45 steel or stainless steel, thick chromed
② HEAD: extruded anodised aluminium alloy
③ BARREL: drawn anodised and calibrated aluminium alloy
④ PISTON GASKET: polyurethane or FKM/FPM
⑤ MAGNET: Ø 12 to 32 neodymium-plastic
Ø 40 to 100 plastoferrite
⑥ PISTON ROD GASKET: polyurethane or FKM/FPM
⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑧ STATIC O-rings: NBR or FKM/FPM
⑨ SECURING SCREWS: zinc-plated steel

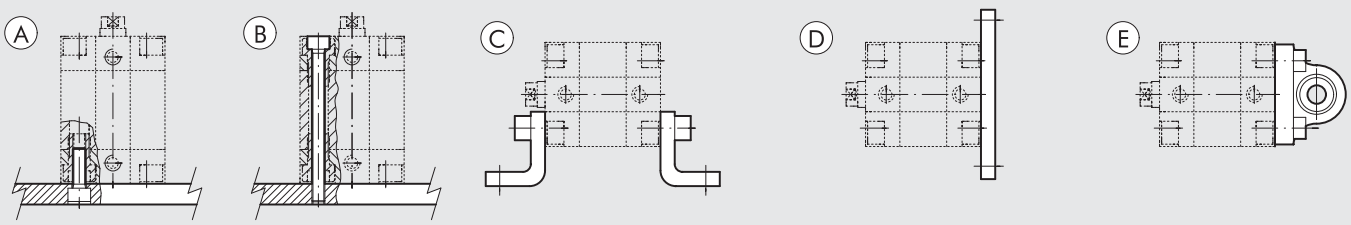


TECHNICAL DATA

① Compact cylinder available
with two separate fixing centre distances
• Ø 32 to 100 to ISO 15552
• Ø 20 to 100 to NFE 49-004-1 and 2
② Pre-wired retracting sensor
with or without connector
③ Plastic strip to keep out dirt and/or protect
the sensor wire cod. W0950000160
④ Ball-and-socket joint code W095_ _ _2030
⑤ Example of cylinder mounting
with feet code W095_ _ _6001.
All mountings come complete
with cylinder assembly screws
⑥ Sensor slot
⑦ Piston rod with male or female thread
as required



COMPACT CYLINDER FIXING OPTIONS



Ⓐ Fixing to structural work with a through screw, using the thread in the heads
Ⓑ Direct fixing from above using long through screws or tie rods. Non-magnetic stainless steel must be used (e.g. AISI 304)
Ⓒ Fixing with feet; the ordering code covers the supply of one foot and two screws for fixing to the cylinder
Ⓓ Fixing with a flange mounted on the front or rear head; the ordering code covers the supply of a flange and four screws for fixing to the cylinder
Ⓔ Fixing with articulated hinge to compensate for slight system misalignment and turn freely
The ordering code covers the supply of a hinge and four screws for fixing to the cylinder

METAL WORK PNEUMATIC

FORCE OF SPRINGS IN SINGLE-ACTING CYLINDERS (THEORETICAL)

Bore	Ø 12	Ø 16	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
Min. load (N)	4.40	4.90	8.40	13.90	19.00	24.80	36.30	50.20	77.60	131.80
Max. load (N)	9.80	14.20	20.90	33.20	35.90	53.70	62.20	82.30	118.90	183.30

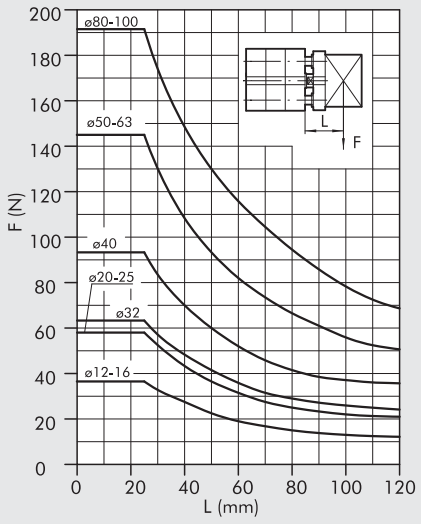
STROKES FOR COMPACT CYLINDERS

Standard stroke for single-acting cylinders	Standard stroke for other types	Max. recommended strokes for other types	Max. recommended strokes for non-rotating cylinders	Max recommended strokes for through-rod perforated
Ø 12 → from 5 to 10 mm	Ø 12 to 16 → from 5 to 40 mm	Ø 12 to 25 → 200 mm	Ø 12 to 63 → 120 mm	Ø 20 to 40 → from 5 to 80 mm
Ø 16 to 100 → from 5 to 25 mm	Ø 20 to 25 → from 5 to 50 mm	Ø 32 to 40 → 300 mm	Ø 80 to 100 → 150 mm	Ø 50 to 63 → from 5 to 100 mm
	Ø 32 to 100 → from 5 to 80 mm	Ø 50 to 63 → 400 mm		Ø 80 to 100 → from 5 to 160 mm
		Ø 80 to 100 → 500 mm		

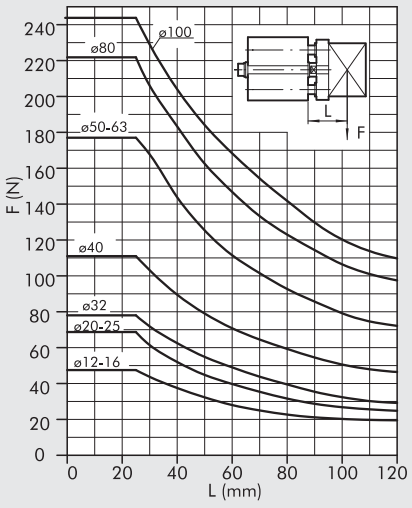
Maximum recommended strokes. Higher values can create operating problems

MAXIMUM LOADS FOR NON-ROTATING VERSION

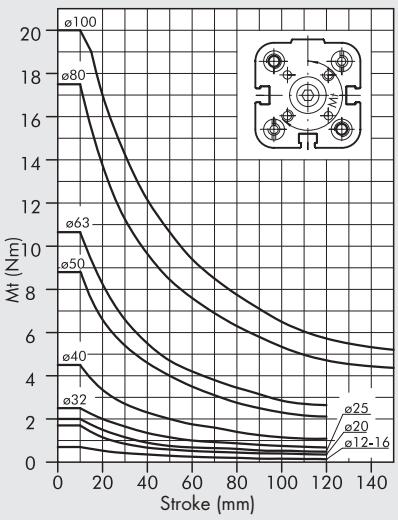
TRANSVERSAL FORCE FOR NON-ROTATING



TRANSVERSAL FORCE FOR NON-ROTATING THROUGH-ROD

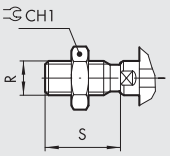


TORQUE DEPENDING ON STROKE

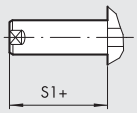


DIMENSIONS OF DOUBLE-ACTING Ø 12 to 25 AND SINGLE-ACTING Ø 12 to 25

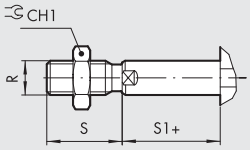
SE-DE MALE PISTON ROD



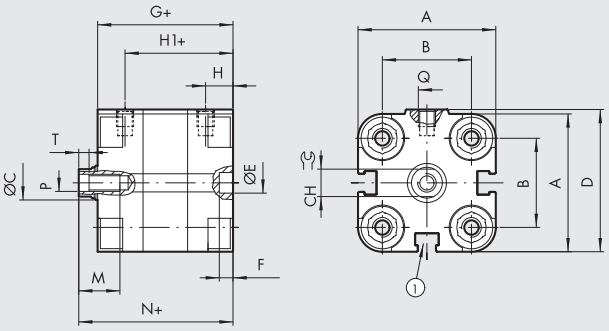
SE EXTENDED PISTON ROD

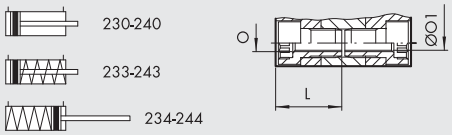


SE MALE EXTENDED PISTON ROD



+ = ADD THE STROKE
1 = SENSOR SLOT

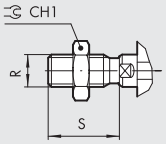




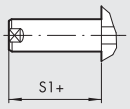
Ø	A	B	ØC	CH	CH1	D	ØE H9	F	G	H	H1	L	M	N	O	ØO1	P	Q	R	S	S1	T	NORM
12	29	18	6	5	10	30	6	4	38	8	30	18.5	8	42.5	M4	3.2	M3	M5	M6	16	4.5	2	-
16	29	18	8	7	13	30	6	4	38	8	30	18.5	10	42.5	M4	3.2	M4	M5	M8	20	4.5	2	-
20	36.5	22	10	8	17	37.5	6	4	38	8	30	18.5	12	42.5	M5	4.2	M5	M5	M10x1.25	22	4.5	2	UNITOP
25	40.5	26	10	8	17	41.5	6	4	39.5	8	31.5	19	12	45	M5	4.2	M5	M5	M10x1.25	22	5.5	2	UNITOP

DIMENSIONS OF DOUBLE-ACTING Ø 32 to 100 AND SINGLE-ACTING Ø 32 to 100

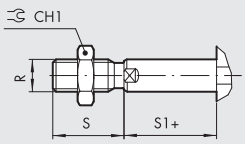
SE-DE MALE PISTON ROD



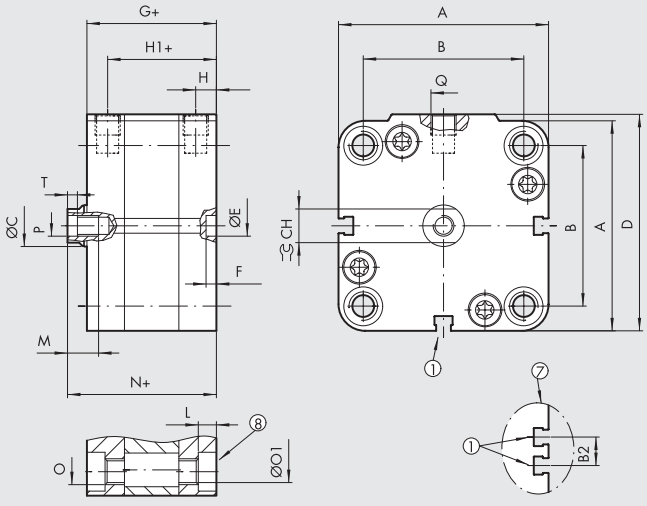
SE EXTENDED PISTON ROD

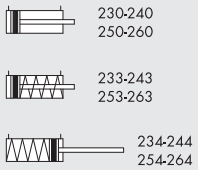


SE MALE EXTENDED PISTON ROD



+ = ADD THE STROKE
1 = SENSOR SLOT
7 = ONLY FOR Ø 63 to Ø 100
8 = SEAT FOR DIN 7984 SCREWS



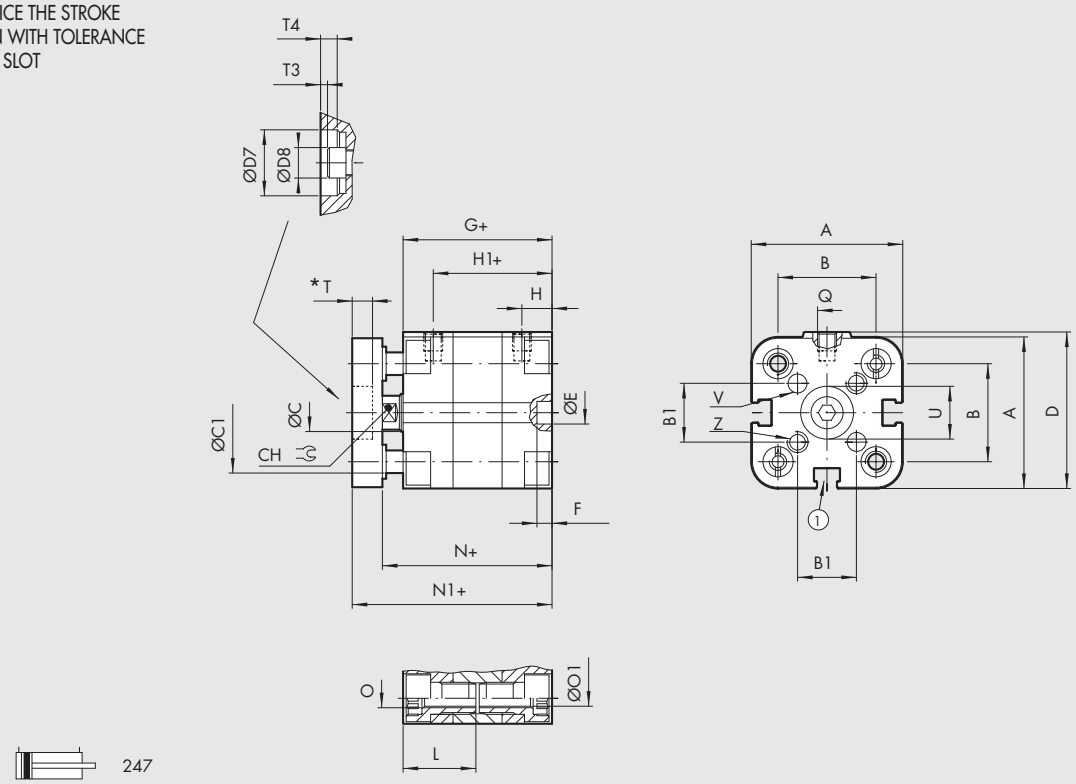


		B															O		ØO1							
Ø	A	ISO	UNITOP	B2	ØC	CH	CH1	D	ØE H9	F	G	H	H1	L	M	N	ISO	UNITOP	ISO	UNITOP	P	Q	R	S	S1	T
32	47	32.5 $^{+0.1}_{-0.4}$	32 $^{+0.4}_{-0.1}$	–	12	10	17	48.5	6	4	44.5	7.5	37	4	14	50.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	6	2.5
40	56	38	42	–	12	10	17	57.5	6	4	45.5	7.5	38	4.5	14	52	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	6.5	2.5
50	67	46.5	50	–	16	13	19	69	6	4	45.5	7.5	38	4.5	16	53	M8	M8	6.2	6.2	M8	G1/8	M12x1.25	24	7.5	3.5
63	80	56.5	62	13	16	13	19	82	8	4	50	7.5	42.5	5.5	16	57.5	M8	M10	6.2	8.5	M8	G1/8	M12x1.25	24	7.5	3.5
80	102	72	82	17	20	17	24	105	8	4	56	8.5	47.5	5.5	20	64	M10	M10	8.5	8.5	M10	G1/8	M16x1.5	32	8	4
100	123	89	103	21	25	22	30	126	8	4	66.5	10.5	56	5.5	24	76.5	M10	M10	8.5	8.5	M12	G1/4	M20x1.5	40	10	5

METAL WORK PNEUMATIC

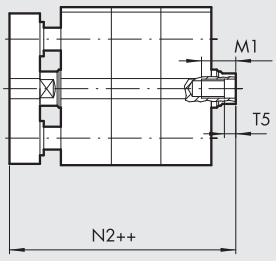
DIMENSIONS OF NON-ROTATING Ø 12 to 25

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE
* = SECTION WITH TOLERANCE
1 = SENSOR SLOT



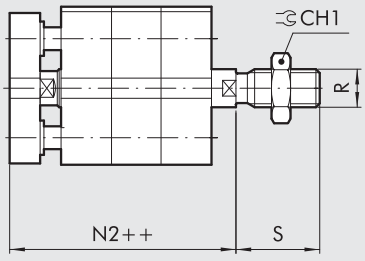
247

NON-ROTATING FEMALE THROUGH-ROD



24A

NON-ROTATING MALE THROUGH-ROD



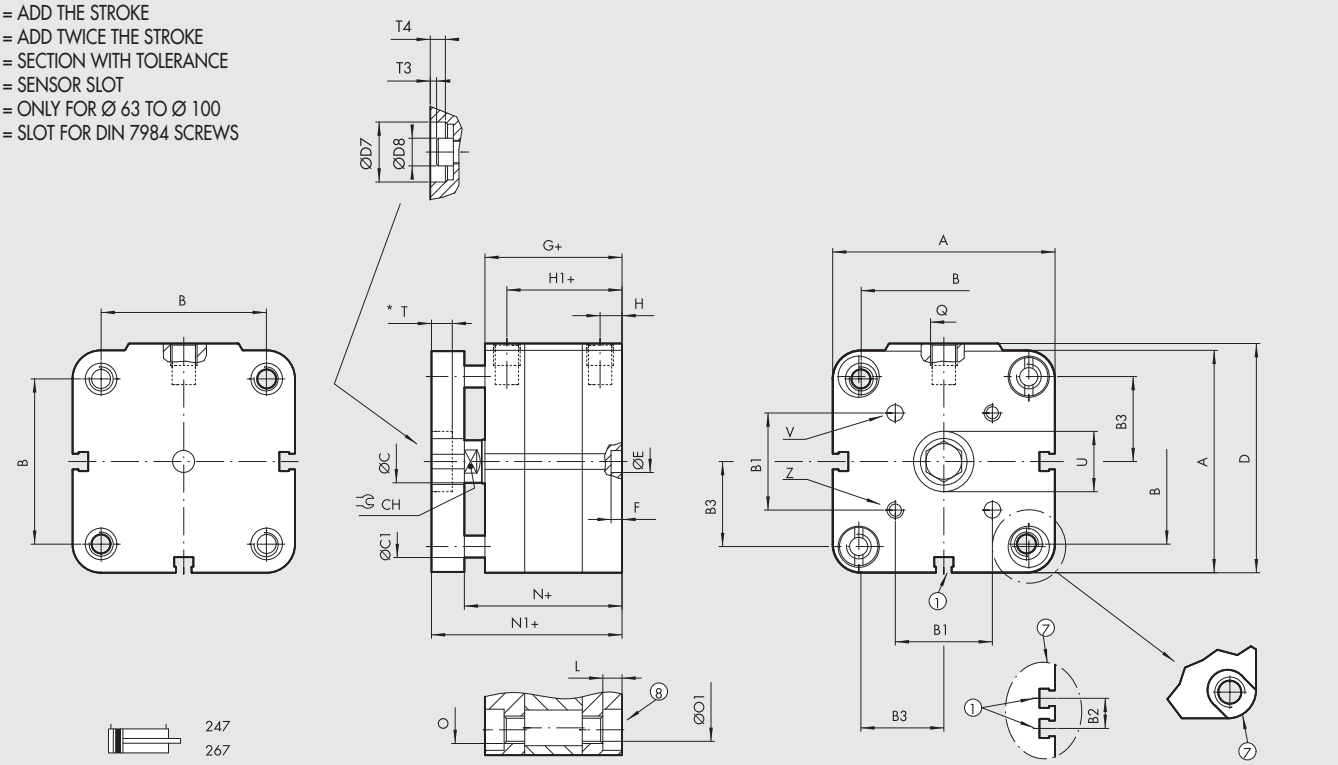
23A

Ø	A	B	B1	ØC	ØC1	CH	CH1	D	ØD7 H9	ØD8	ØE H9	F	G	H	H1	L	M1 x strokes < 5	M1 x strokes ⩾ 5	N	N1	N2	O	ØO1	P	Q	R	S	T
12	29	18	9.9	6	5	5	10	30	6	5.5	6	4	38	8	30	18.5	5	8	42.5	48.5	53	M4	3.2	M3	M5	M6	16	2
16	29	18	9.9	8	5	7	13	30	8	7	6	4	38	8	30	18.5	5	10	42.5	48.5	53	M4	3.2	M4	M5	M8	20	2
20	36.5	22	12	10	6	8	17	37.5	10	8.5	6	4	38	8	30	18.5	7	12	42.5	50.5	55	M5	4.2	M5	M5	M10x1.25	22	3.5
25	40.5	26	15.6	10	6	8	17	41.5	14	8.5	6	4	39.5	8	31.5	19	7	12	45	53	58.5	M5	4.2	M5	M5	M10x1.25	22	4

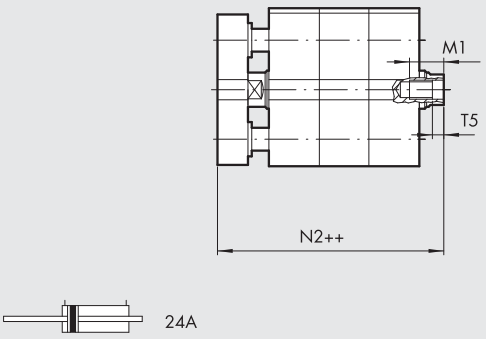
Ø	T3	T4	T5	ØU H9	ØV H8	Z	NORM
12	1	2	2	6	3	M3	-
16	0.5	2	2	8	3	M3	-
20	1.7	3.5	2	10	4	M4	UNITOP
25	2.2	4	2	14	5	M5	UNITOP

DIMENSIONS OF NON-ROTATING Ø 32 to 100

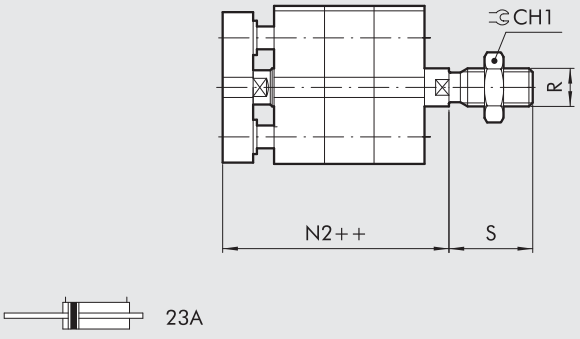
\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE
* = SECTION WITH TOLERANCE
1 = SENSOR SLOT
7 = ONLY FOR Ø 63 TO Ø 100
8 = SLOT FOR DIN 7984 SCREWS



NON-ROTATING FEMALE THROUGH-ROD



NON-ROTATING MALE THROUGH-ROD



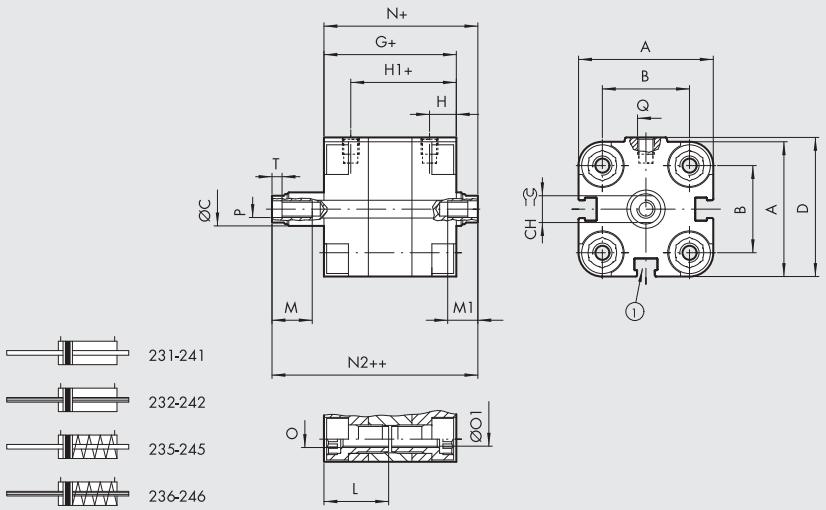
Ø	A	B ISO	B UNITOP	B1	B2	B3	ØC	ØC1	CH	CH1	D	ØD7 H9	ØD8	ØE H9	F	G	H	H1	L
32	47	32.5 +0.1 -0.4	32 +0.4 -0.1	19.8	–	16.1	12	8	10	17	48.5	17	11.5	6	4	44.5	7.5	37	4
40	56	38	42	23.3	–	20	12	8	10	17	57.5	17	11.5	6	4	45.5	7.5	38	4.5
50	67	46.5	50	29.7	–	24	16	10	13	19	69	22	15	6	4	45.5	7.5	38	4.5
63	80	56.5	62	35.4	13	30	16	10	13	19	82	22	15	8	4	50	7.5	42.5	5.5
80	102	72	82	46	17	38.5	20	12	17	24	105	28	18.5	8	4	56	8.5	47.5	5.5
100	123	89	103	56.6	21	48	25	12	22	30	126	30	21	8	4	66.5	10.5	56	5.5

Ø	M1 x strokes < 5	M1 x strokes ⩾ 5	N	N1	N2	O ISO	O UNITOP	ØO1 ISO	ØO1 UNITOP	P	Q	R	S	T	T3	T4	T5	ØU H9	ØV H8	Z
32	14	9	50.5	60.5	66.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	4.5	1	4.5	2.5	17	5	M5
40	14	9	52	62	68.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	4.5	1	4.5	2.5	17	5	M5
50	16	11	53	65	72.5	M8	M8	6.2	6.2	M8	G1/8	M12x1.25	24	6	1	6	3.5	22	6	M6
63	16	11	57.5	69.5	77	M8	M10	6.2	8.5	M8	G1/8	M12x1.25	24	6	1	6	3.5	22	6	M6
80	20	15	64	78	86	M10	M10	8.5	8.5	M10	G1/8	M16x1.5	32	8	1	8	4	28	8	M8
100	24	19	76.5	90.5	100.5	M10	M10	8.5	8.5	M12	G1/4	M20x1.5	40	9	-	8.5	5	30	10	M10

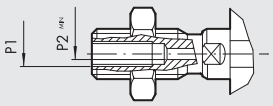
METAL WORK PNEUMATIC

DIMENSIONS OF THROUGH-ROD Ø 12 to 25

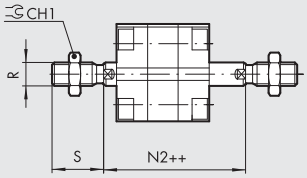
\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE
1 = SENSOR SLOT



SE-DE MALE PERFORATED THROUGH-ROD



SE-DE MALE THROUGH-ROD

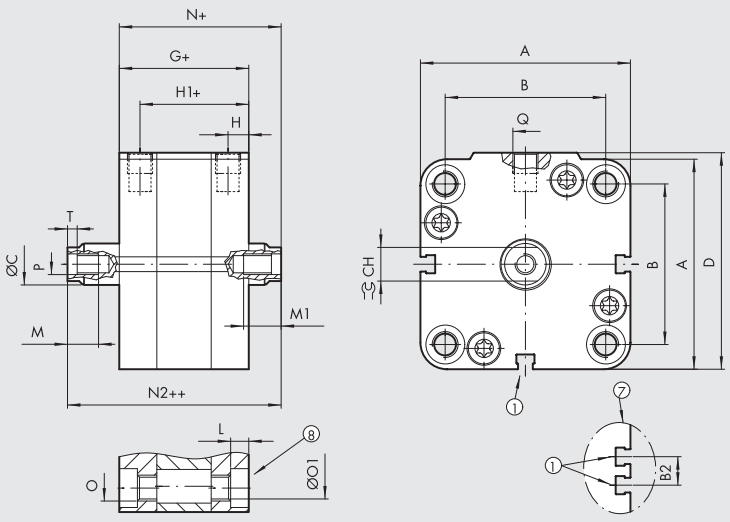


Ø	A	B	ØC	CH	CH1	D	G	H	H1	L	M	M1 x strokes < 5	M1 x strokes ⩾ 5	N	N2	O	ØO1	P	P2	Q	R	S	T	NORM
12	29	18	6	5	10	30	38	8	30	18.5	8	5	8	42.5	47	M4	3.2	M3	–	M5	M6	16	2	-
16	29	18	8	7	13	30	38	8	30	18.5	10	5	10	42.5	47	M4	3.2	M4	–	M5	M8	20	2	-
20	36.5	22	10	8	17	37.5	38	8	30	18.5	12	7	12	42.5	47	M5	4.2	M5	1.5	M5	M10x1.25	22	2	UNITOP
25	40.5	26	10	8	17	41.5	39.5	8	31.5	19	12	7	12	45	50.5	M5	4.2	M5	1.5	M5	M10x1.25	22	2	UNITOP

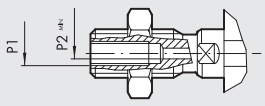
DIMENSIONS OF THROUGH-ROD Ø 32 to 100

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

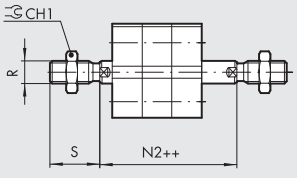
1 = SENSOR SLOT
7 = ONLY FOR Ø 63 TO Ø 100
8 = SLOT FOR DIN 7984 SCREWS

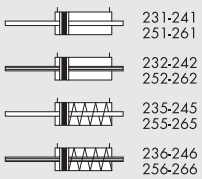


SE-DE MALE PERFORATED THROUGH-ROD



SE-DE MALE THROUGH-ROD





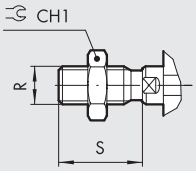
Ø	A	B ISO	B UNITOP	B2	ØC	CH	CH1	D	G	H	H1	L	M	M1 x strokes < 5	M1 x strokes ⩾ 5	N	N2	O ISO	O UNITOP	ØO1 ISO	ØO1 UNITOP	P	P1	P2	Q	R	S	T
32	47	32.5 $^{+0.1}_{-0.4}$	32 $^{+0.4}_{-0.1}$	–	12	10	17	48.5	44.5	7.5	37	4	14	14	9	50.5	56.5	M6	M6	5.2	5.2	M6	–	2.5	G1/8	M10x1.25	22	2.5
40	56	38	42	–	12	10	17	57.5	45.5	7.5	38	4.5	14	14	9	52	58.5	M6	M6	5.2	5.2	M6	–	2.5	G1/8	M10x1.25	22	2.5
50	67	46.5	50	–	16	13	19	69	45.5	7.5	38	4.5	16	16	11	53	60.5	M8	M8	6.2	6.2	M8	–	4	G1/8	M12x1.25	24	3.5
63	80	56.5	62	13	16	13	19	82	50	7.5	42	5.5	16	16	11	57.5	65	M8	M10	6.2	8.5	M8	–	4	G1/8	M12x1.25	24	3.5
80	102	72	82	17	20	17	24	105	56	8.5	47.5	5.5	20	20	15	64	72	M10	M10	8.5	8.5	M10	1/8	5	G1/8	M16x1.5	32	4
100	123	89	103	21	25	22	30	126	66.5	10.5	56	5.5	24	24	19	76.5	86.5	M10	M10	8.5	8.5	M12	1/4	6	G1/4	M20x1.5	40	5

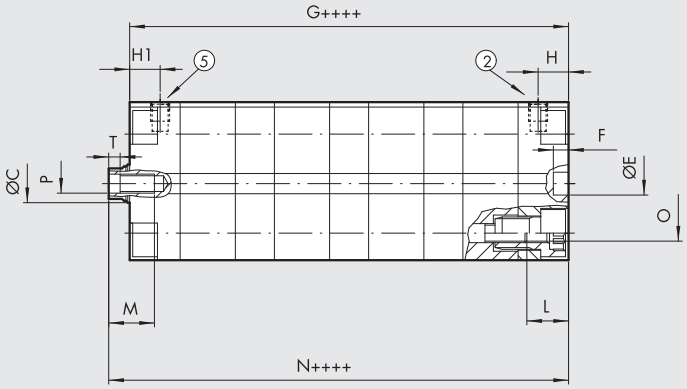
DIMENSIONS OF TANDEM Ø 20 to 25 - 4-STAGES

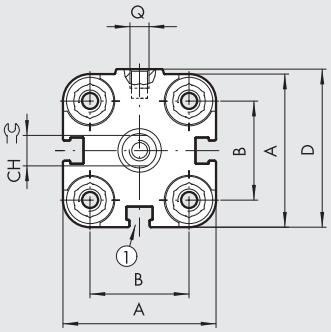
++ = ADD TWICE THE STROKE
+++ = ADD THREE TIMES THE STROKE
++++ = ADD FOUR TIMES THE STROKE

1 = SENSOR SLOT
2 = CYLINDERS OUT
5 = CYLINDERS IN

MALE PISTON ROD

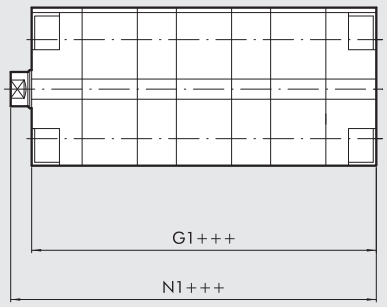






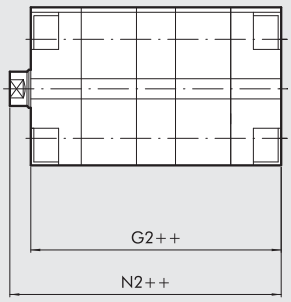
230-240

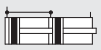
TANDEM 3 STAGES



230-240

TANDEM 2 STAGES





230-240

Ø	A	B	ØC	CH	CH1	D	ØE H9	F	G	G1	G2	H	H1	L	M	N	N1	N2	O	P	Q	R	S	T	NORM
20	36.5	22	10	8	17	37.5	6	4	114.5	89	63.5	8	8	10	12	119	93.5	68	M5	M5	M5	M10x1.25	22	2	UNITOP
25	40.5	26	10	8	17	41.5	6	4	118	92	66	8	8	10	12	123.5	97.5	71.5	M5	M5	M5	M10x1.25	22	2	UNITOP

METAL WORK PNEUMATIC

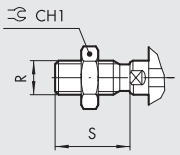
DIMENSIONS OF TANDEM Ø 32 to 100 - 4-STAGES

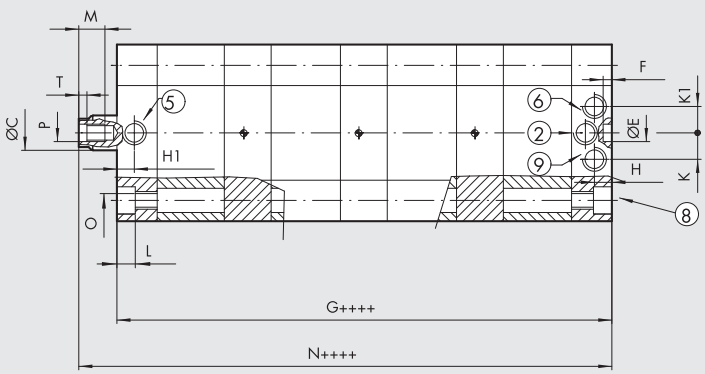
++ = ADD TWICE THE STROKE
+++ = ADD THREE TIMES THE STROKE
++++ = ADD FOUR TIMES THE STROKE

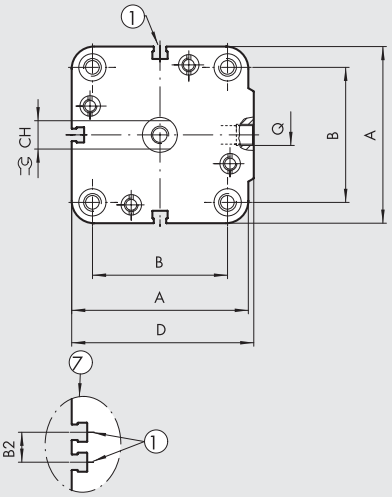
2 = CYLINDERS OUT FOR Ø 32 to 63
5 = CYLINDERS IN FOR Ø 32 to 63
6 = CYLINDERS IN FOR Ø 80; 100
9 = CYLINDERS OUT FOR Ø 80; 100

1 = SENSOR SLOT
7 = ONLY FOR Ø 63 to 100
8 = SLOT FOR DIN 7984 SCREWS

MALE PISTON ROD

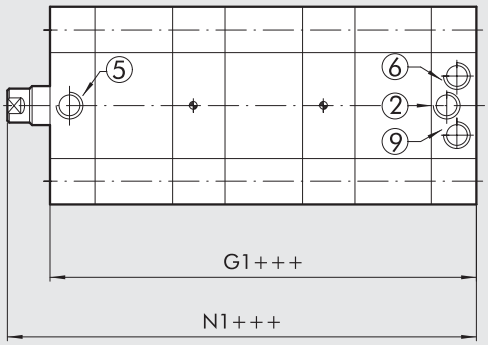






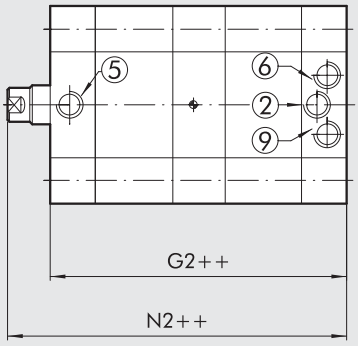
230-240
250-260

TANDEM 3-STAGES



230-240
250-260

TANDEM 2-STAGES



230-240
250-260

Ø	A	B ISO	B UNITOP	B2	ØC	CH	CH1	D	ØE H9	F	G	G1	G2	H	H1	K	K1
32	47	32.5 +0.1 -0.4	32 +0.4 -0.1	–	12	10	17	48.5	6	4	154	117.5	81	7.5	7.5	–	–
40	56	38	42	–	12	10	17	57.5	6	4	162.5	123.5	84.5	7.5	7.5	–	–
50	67	46.5	50	–	16	13	19	69	6	4	163.5	124	85	7.5	7.5	–	–
63	80	56.5	62	13	16	13	19	82	8	4	182	138	94	7.5	7.5	–	–
80	102	72	82	17	20	17	24	105	8	4	204.5	155	105.5	8.5	–	10.5	10.5
100	123	89	103	21	25	22	30	126	8	4	243	184	125.5	10.5	–	14.5	14.5

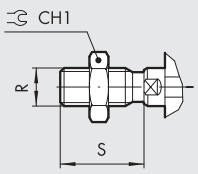
Ø	L	M	N	N1	N2	O ISO	O UNITOP	P	Q	R	S	T
32	4	14	160	123.5	87	M6	M6	M6	G1/8	M10x1.25	22	2.5
40	4.5	14	169	130	91	M6	M6	M6	G1/8	M10x1.25	22	2.5
50	4.5	16	171	131.5	92.5	M8	M8	M8	G1/8	M12x1.25	24	3.5
63	5.5	16	189.5	145.5	101.5	M8	M10	M8	G1/8	M12x1.25	24	3.5
80	5.5	20	212.5	163	113.5	M10	M10	M10	G1/8	M16x1.5	32	4
100	5.5	24	253	194	135.5	M10	M10	M12	G1/4	M20x1.5	40	5

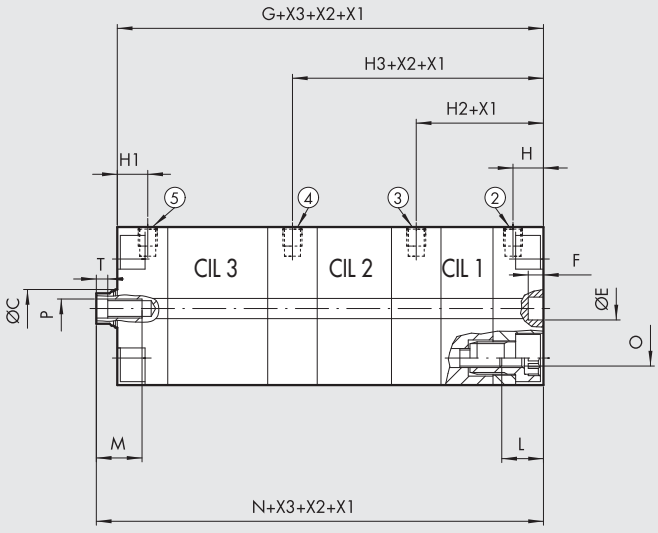
DIMENSIONS OF MULTI-POSITION Ø 12 to 25 - 3-STAGES

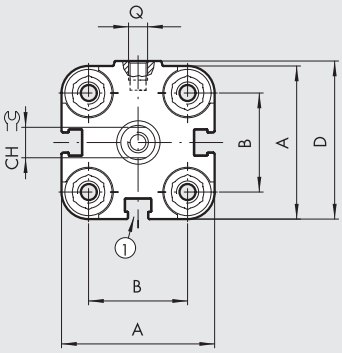
1 = SENSOR SLOT
2 = CYLINDER 1 OUT
3 = CYLINDER 2 OUT
4 = CYLINDER 3 OUT
5 = CYLINDERS 1-2-3 IN

X1 = CYLINDER 1 STROKE
X2 = CYLINDER 2 STROKE
X3 = CYLINDER 3 STROKE

MALE PISTON ROD





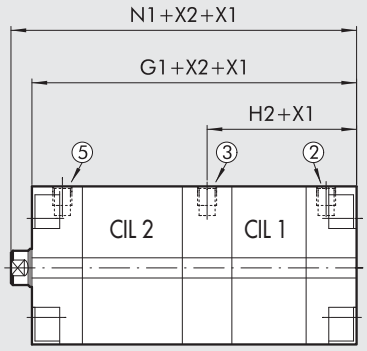


230-240

MULTI-POSITION 2-STAGES

2 = CYLINDER 1 OUT
3 = CYLINDER 2 OUT
5 = CYLINDERS 1-2 IN

X1 = CYLINDER 1 STROKE
X2 = CYLINDER 2 STROKE



230-240

Ø	A	B	ØC	CH	CH1	D	ØE H9	F	G	G1	H	H1	H2	H3	L	M	N	N1	O	P	Q	R	S	T	NORM
12	29	18	6	5	10	30	6	4	89	63.5	8	8	33.5	59	10	8	93.5	68	M4	M3	M5	M6	16	2	-
16	29	18	8	7	13	30	6	4	89	63.5	8	8	33.5	59	10	10	93.5	68	M4	M4	M5	M8	20	2	-
20	36.5	22	10	8	17	37.5	6	4	89	63.5	8	8	33.5	59	10	12	93.5	68	M5	M5	M5	M10x1.25	22	2	UNITOP
25	40.5	26	10	8	17	41.5	6	4	92	66	8	8	34	60	10	12	97.5	71.5	M5	M5	M5	M10x1.25	22	2	UNITOP

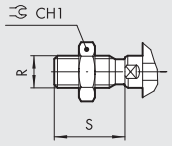
METAL WORK PNEUMATIC

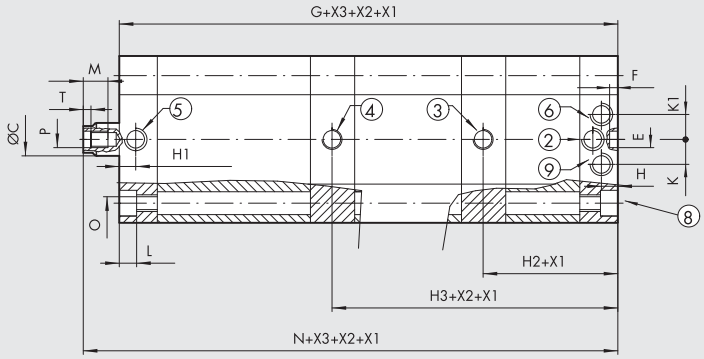
DIMENSIONS OF MULTI-POSITION Ø 32 to 100 - 3-STAGES

1 = SENSOR SLOT
2 = CYLINDER 1 OUT FOR Ø 32 to 63
3 = CYLINDER 2 OUT FOR Ø 32 to 100
4 = CYLINDER 3 OUT FOR Ø 32 to 100
5 = CYLINDER 1-2-3 IN FOR Ø 32 to 63
6 = CYLINDER 1-2-3 IN FOR Ø 80 to 100
7 = ONLY FOR Ø 63 to 100
8 = SLOT FOR DIN 7984 SCREWS
9 = CYLINDER 1 OUT FOR Ø 80 to 100

X1 = CYLINDER 1 STROKE
X2 = CYLINDER 2 STROKE
X3 = CYLINDER 3 STROKE

MALE PISTON ROD

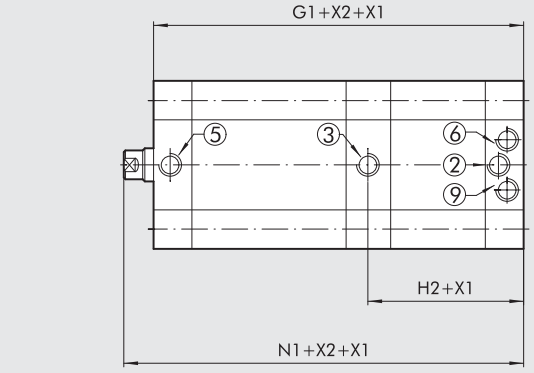




MULTI-POSITION 2-STAGES

2 = CYLINDER 1 OUT FOR Ø 32 to 63
3 = CYLINDER 2 OUT FOR Ø 32 to 100
5 = CYLINDER 1-2 IN FOR Ø 32 to 63
6 = CYLINDER 1-2 IN FOR Ø 80 to 100
9 = CYLINDER 1 OUT FOR Ø 80 to 100

X1 = CYLINDER 1 STROKE
X2 = CYLINDER 2 STROKE

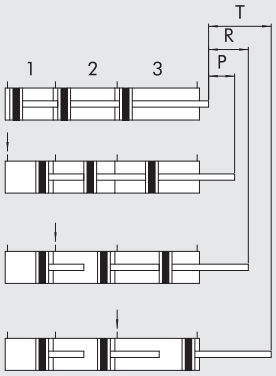


Ø	A	B ISO	B UNITOP	B2	ØC	CH	CH1	D	ØE H9	F	G	G1	H	H1	H2	H3
32	47	32.5 $^{+0.1}_{-0.4}$	32 $^{+0.4}_{-0.1}$	–	12	10	17	48.5	6	4	117.5	81	7.5	7.5	44	80.5
40	56	38	42	–	12	10	17	57.5	6	4	123.5	84.5	7.5	7.5	46.5	85.5
50	67	46.5	50	–	16	13	19	69	6	4	124	85	7.5	7.5	47	86
63	80	56.5	62	13	16	13	19	82	8	4	138	94	7.5	7.5	51.5	95.5
80	102	72	82	17	20	17	24	105	8	4	155	105.5	8.5	–	58	107.5
100	123	89	103	21	25	22	30	126	8	4	184	125.5	10.5	–	69.3	128

Ø	K	K1	L	M	N	N1	O ISO	O UNITOP	P	Q	R	S	T
32	–	–	4	14	123.5	87	M6	M6	M6	G1/8	M10x1.25	22	2.5
40	–	–	4.5	14	130	91	M6	M6	M6	G1/8	M10x1.25	22	2.5
50	–	–	4.5	16	131.5	92.5	M8	M8	M8	G1/8	M12x1.25	24	3.5
63	–	–	5.5	16	145.5	101.5	M8	M10	M8	G1/8	M12x1.25	24	3.5
80	10.5	10.5	5.5	20	163	113.5	M10	M10	M10	G1/8	M16x1.5	32	4
100	14.5	14.5	5.5	24	194	135.5	M10	M10	M12	G1/4	M20x1.5	40	5

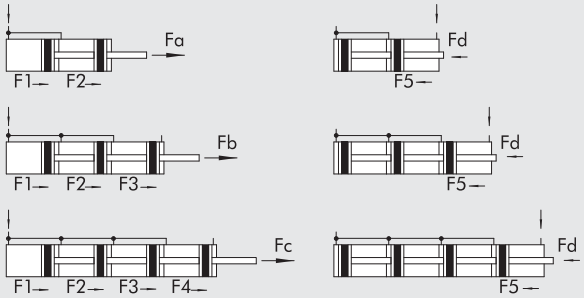
FUNCTIONAL DIAGRAMS

MULTI-POSITION



1 = STAGE 1
2 = STAGE 2
3 = STAGE 3

TANDEM



LEGENDA

P = Stage 1 stroke
R = Stage 2 stroke
T = Stage 3 stroke

Fa = F1+F2 [N]
Fb = F1+F2+F3 [N]
Fc = F1+F2+F3+F4 [N]
Fd = F5 [N]

KEY TO CODE

CYL	23	1	0	25	O	050	X	P
	TYPE			**BORE**		**STROKE ****	**MATERIAL**	**GASKETS**
	23 Compact cylinder centre distances to UNITOP male piston rod **24** Compact cylinder centre distances to UNITOP female piston rod ■ **25** Compact cylinder centre distances to ISO male piston rod ■ **26** Compact cylinder centre distances to ISO female piston rod	**0** Double-acting **1** Double-acting through-rod ✚ **2** Double-acting through-rod perforated ● **3** Single-acting retracting piston rod ● **4** Single-acting extended piston rod ● **5** Single-acting through-rod ●✚ **6** Single-acting through-rod piston rod perforated ▼ **7** Double-acting non-rotating **A** Double-acting through-rod non-rotating	**0** Magnetic □ **S** Non-magnetic ▲ **G** No stick-slip	12 16 20 25 32 40 50 63 80 ◆ 100	**0** Standard ✚ **A** 2-stage tandem ✚ **B** 3-stage tandem ✚ **C** 4-stage tandem **MULTI-POSITION** ●● **P** Stage 1 ●● **R** Stage 2 ●● **T** Stage 3		✱ **C** C45 piston rod chromium-plated ▷ **X** Stainless steel piston rod and nut ◁ **A** C45 chromed rod, aluminium piston ○ **Z** Stainless steel piston rod and nut aluminium piston	**P** Polyurethane gaskets ▶✚ **V** FKM/FPM gaskets

** For the maximum suppliabe stroke, see page **A1**.87

◆ In the code of cylinder with letter in fourth position Ø 100 becomes A1
■ Codes only for cylinders Ø 32 to100
● Can also be used as double-acting with spring return
✚ Available from Ø 20
▼ For versions 24 and 26 only (female piston rod)
▲ For Ø 12 to 25 the standard version (0 or S) it's already No stick-slip
For Ø 20 to 100 version with gaskets in FKM / FPM (0 or S) is already "no sick slip"
For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only
▶ Only for standard double acting and standard through rod double acting version (for Ø20 and Ø25 only "non-magnetic" version provided)
□ Compulsory for Ø 20 and Ø 25 version Z
✱ Only for Ø 32 to 100 P version (Polyurethane gaskets)
▷ Only for Ø 12 to 100 P version (Polyurethane gaskets)
◁ Only for Ø 32 to 100 V version (FKM/FPM gaskets)
○ Only for Ø 20 to 100 V version (FKM/FPM gaskets)

●● The ordering codes for a Multi-position cylinder is a combination of several codes, each describing a stage.

Coding example for a UNITOP multiposition cylinder
2 stages Ø 20 strokes 40 + 10 (total stroke 50 mm) male rod:
1° STADIO (P) : 230020P040XP +
2° STADIO (R): 230020R050XP

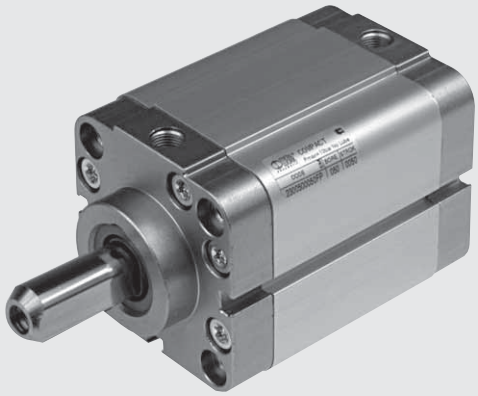
Coding example for a UNITOP multiposition cylinder
3 stages Ø 20 strokes 15 + 30 + 40 (total stroke 85 mm) male rod:
1° STADIO (P): 230025P015XP +
2° STADIO (R): 230025R045XP +
3° STADIO (T): 230025T085XP

COMPACT CYLINDER SERIES CMPC TWO-FLAT

This version is used to keep at an angle the objects fixed onto the piston rod and to apply torques within the specified limits.
The piston rod in Two-Flat cylinders has two opposing longitudinal surfaces and is made entirely of stainless steel. The front head of the cylinder includes a sintered bronze bush that engages the piston rod and prevents it from rotating. A special polyurethane gasket guarantees air-tightness and dirt removal.
This technical solution is more airtight and reliable than square or hexagonal piston rods.
These compact cylinders come in the following versions:

- with or without a magnet
- dual-acting, single piston rod
- dual-acting, through piston rod – one piston rod is Two-Flat, and the other is cylindrical
- fixing centre distances compatible with, ISO 15552 (former ISO 6431), or with French standard NFE 49-004-1 and 2 (UNITOP).

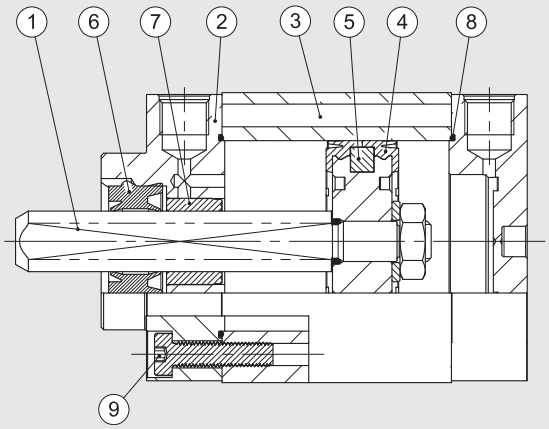
The special profile and the fact that the external heads are screwed onto the liner give an excellent guide. Numerous fixing options are available thanks to wide range of anchor points. Retractable magnetic limit switches can be mounted in slots in the cylinder to measure the position.



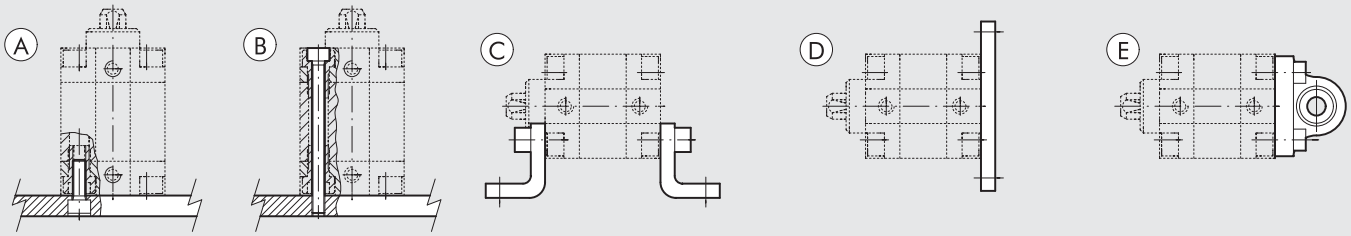
TECHNICAL DATA		POLYURETHANE
Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	-10 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous
Bores	mm	32; 40; 50; 63; 80 with ISO 15552 fixing centre distances
	mm	32; 40; 50; 63; 80 with NFE 49-004-1 and 2 fixing centre distances
Design		With profile, heads with screws
Maximum strokes ✚	mm	Ø 32-40 = 300; Ø 50-63 = 400; Ø 80 = 500
Versions		Double-acting, Double-acting Through-rod
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request
Inrush pressure	bar	Ø 32 = 0.8; from Ø 40 to 80 = 0.6
Max torque on piston rod	Nm	Ø 32 and 40 = 0.2; Ø 50 and 63 = 0.4; Ø 80 = 1
Maximum rotation on the rod	degrees	Ø 32 and 40 = 1° 30'; Ø 50 and 63 = 1° 30'; Ø 80 = 1°
Weights		See cylinder "**General technical data**" at the beginning of the chapter
Notes		✚ Maximum recommended strokes. Higher values can create operating problems
		For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air

COMPONENTS Ø 12 to 25

① PISTON ROD: stainless steel, Two-Flat
② HEAD: extruded anodised aluminium alloy
③ BARREL: drawn anodised and calibrated aluminium alloy
④ PISTON GASKET: polyurethane
⑤ MAGNET: Ø 32 neodymium - Ø 40 to 100 plastoferrite
⑥ PISTON ROD GASKET TWO-FLAT: polyurethane
⑦ GUIDE BUSHING: steel strip with bronze
⑧ STATIC O-rings: NBR
⑨ SECURING SCREWS: zinc-plated steel



FIXING OPTIONS



Ⓐ Fixing to structural work with a through screw, using the thread in the heads
Ⓑ Direct fixing from above using long through screws or tie rods. Non-magnetic stainless steel must be used (e.g. AISI 304)
Ⓒ Fixing with feet; the ordering code covers the supply of one foot and two screws for fixing to the cylinder.
Ⓓ Fixing with a flange mounted on the front or rear head; the ordering code covers the supply of a flange and four screws for fixing to the cylinder
Ⓔ Fixing with articulated hinge to compensate for slight system misalignment and turn freely
The ordering code covers the supply of a hinge and four screws for fixing to the cylinder

KEY TO CODE

CYL	2 3 TYPE	1	0	3 2 BORE	0	0 5 0 STROKE ✱	F MATERIAL	P GASKETS
	23 Compact cylinder centre distances to UNITOP male piston rod **24** Compact cylinder centre distances to UNITOP female piston rod **25** Compact cylinder centre distances to ISO male piston rod **26** Compact cylinder centre distances to ISO female piston rod	**0** Double-acting **1** Double-acting through-rod	**0** Magnetic **S** Non-magnetic ▲**G** No stick-slip	32 40 50 63 80	**0** Standard		**F** "Two-Flat" piston rod AISI 303 stainless steel	**P** Polyurethane gaskets

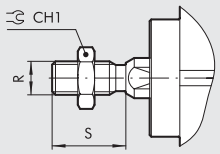
✱ For the maximum suppliable strokes, look at the technical data
▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**

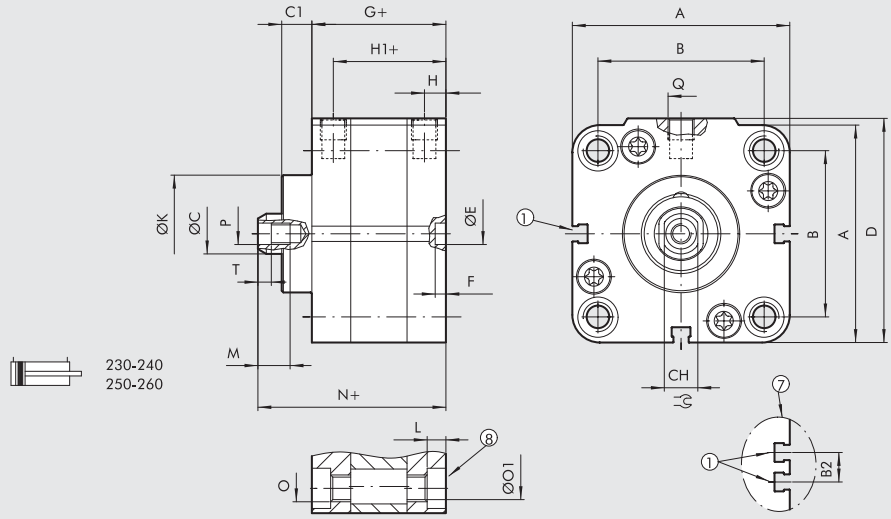
METAL WORK PNEUMATIC

DIMENSIONS OF DOUBLE-ACTING

+ = ADD THE STROKE
1 = SENSOR SLOT
7 = ONLY FOR Ø 63 to 100
8 = SEAT FOR DIN 7984 SCREWS

DE MALE PISTON ROD





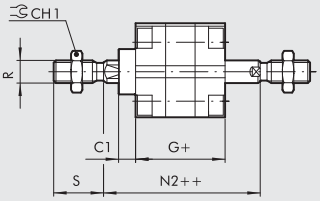
Ø	A	B ISO	B UNITOP	B2	ØC	C1	CH	CH1	D	ØE H9	F	G	H	H1	ØK	L	M	N	O ISO	O UNITOP	ØO1 ISO	ØO1 UNITOP	P	Q	R	S	T
32	47	32.5 $^{+0.1}_{-0.4}$	32 $^{+0.4}_{-0.1}$	–	12	9	10	17	48.5	6	4	44.5	7.5	37	30	4	14	59.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	2.5
40	56	38	42	–	12	9	10	17	57.5	6	4	45.5	7.5	38	35	4.5	14	61	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	2.5
50	67	46.5	50	–	16	11.5	13	19	69	6	4	45.5	7.5	38	40	4.5	16	64.5	M8	M8	6.2	6.2	M8	G1/8	M12x1.25	24	3.5
63	80	56.5	62	13	16	11.5	13	19	82	8	4	50	7.5	42.5	45	5.5	16	69	M8	M10	6.2	8.5	M8	G1/8	M12x1.25	24	3.5
80	102	72	82	17	20	13	17	24	105	8	4	56	8.5	47.5	45	5.5	20	77	M10	M10	8.5	8.5	M10	G1/8	M16x1.5	32	4

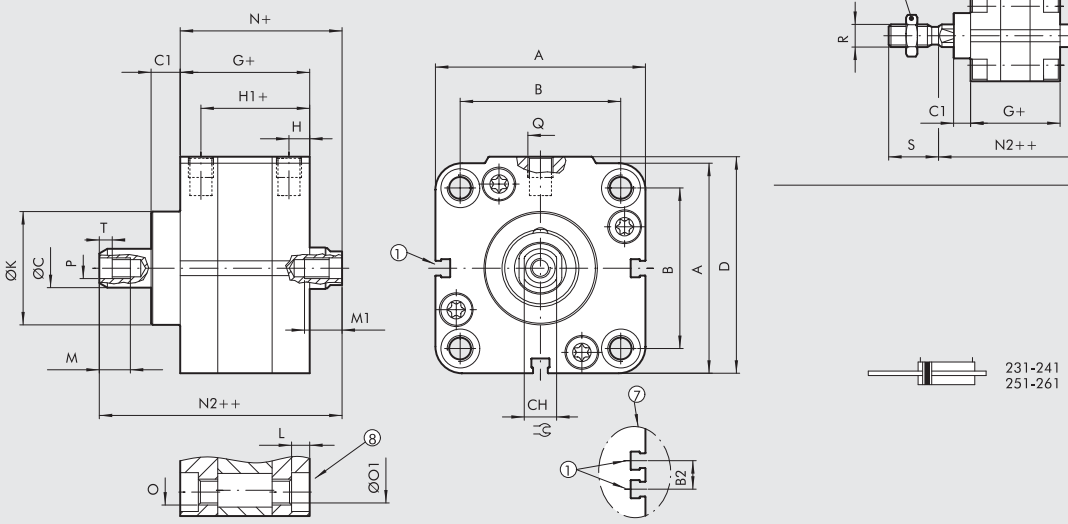
DIMENSIONS OF THROUGH-ROD

+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

1 = SENSOR SLOT
7 = ONLY FOR Ø 63 TO Ø 80
8 = SLOT FOR DIN 7984 SCREWS

DE MALE PISTON ROD





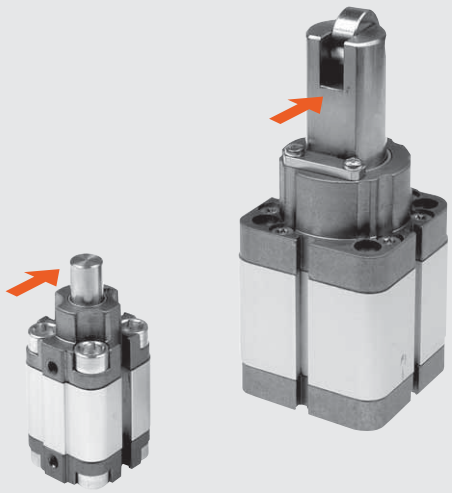
Ø	A	B ISO	B UNITOP	B2	ØC	C1	CH	CH1	D	G	H	H1	ØK	L	M	M1 x strokes ⩾ 5	M1 x strokes < 5	N	N2	O ISO	O UNITOP	ØO1 ISO	ØO1 UNITOP	P	Q	R	S	T
32	47	32.5 $^{+0.1}_{-0.4}$	32 $^{+0.4}_{-0.1}$	–	12	9	10	17	48.5	44.5	7.5	37	30	4	14	14	9	50.5	65.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	2.5
40	56	38	42	–	12	9	10	17	57.5	45.5	7.5	38	35	4.5	14	14	9	52	67.5	M6	M6	5.2	5.2	M6	G1/8	M10x1.25	22	2.5
50	67	46.5	50	–	16	11.5	13	19	69	45.5	7.5	38	40	4.5	16	16	11	53	72	M8	M8	6.2	6.2	M8	G1/8	M12x1.25	24	3.5
63	80	56.5	62	13	16	11.5	13	19	82	50	7.5	42	45	5.5	16	16	11	57.5	76.5	M8	M10	6.2	8.5	M8	G1/8	M12x1.25	24	3.5
80	102	72	82	17	20	13	17	24	105	56	8.5	47.5	45	5.5	20	20	15	64	85	M10	M10	8.5	8.5	M10	G1/8	M16x1.5	32	4

COMPACT STOPPER CYLINDER

Compact stopper cylinders designed for stopping moving parts or chucks.

- With or without magnet execution
- Single-acting, oversize extended piston rod
- Can be also used as double-acting whith spring return
- Fixing centre distances to ISO 15552 for Ø 32, Ø 50, Ø 80 and French standard NFE 49-004-1 and 2 (UNITOP).

In the relevant cylinder slots, it is possible to mount retracting magnetic sensor.

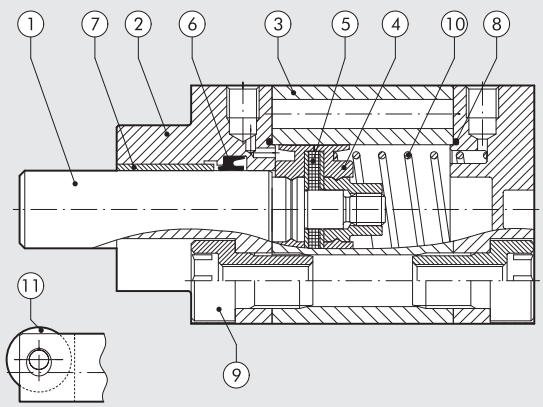


Chuck impact direction

TECHNICAL DATA		
Max operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	–10 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous
Stroke bore	mm	Ø 20 x15; Ø 32 x 20; Ø50 x 30; Ø 80 x 30; Ø 80 x 40 a with NFE 49-004-1 and 2 fixing centre distances (UNITOP)
	mm	Ø 32 x 20; Ø 50 x 30; Ø 80 x 30; Ø 80 x 40 with ISO 15552 fixing centre distances
Design		With profile, heads with screws
Versions		Single-acting extended rod, Can be also used as double-acting whith spring return
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request
Inrush pressure	bar	Ø 20: 1.2; Ø 32-50: 1; Ø 80: 0.5
Weights		See cylinder "**General technical data**" at the beginning of the chapter
Notes		For correct operation, it is advisable to use 50 µm filtered air

COMPONENTS Ø 20

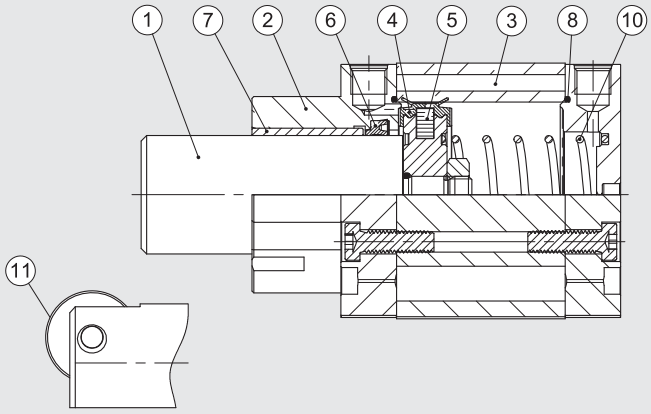
① PISTON ROD: Stainless steel, thick chromed
② HEAD: extruded anodised aluminium alloy
③ BARREL: drawn anodised and calibrated aluminium alloy
④ PISTON GASKET: polyurethane
⑤ MAGNET: neodymium-plastic
⑥ PISTON ROD GASKET: polyurethane
⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑧ STATIC O-RINGS: NBR
⑨ SECURING SCREWS: zinc-plated steel
⑩ RETURN SPRING: spring stainless steel
⑪ WHEEL: zinc-plated steel



METAL WORK PNEUMATIC

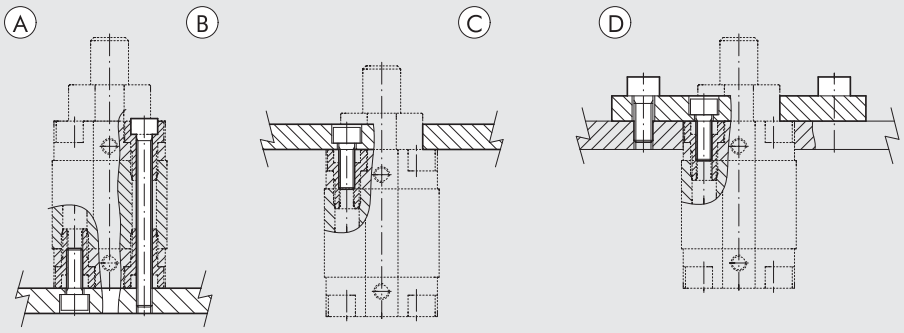
COMPONENTS Ø 32, Ø 50, Ø 80

① PISTON ROD: Stainless steel, thick chromed
② HEAD: extruded anodised aluminium alloy
③ BARREL: drawn anodised and calibrated aluminium alloy
④ PISTON GASKET: polyurethane
⑤ MAGNET: Ø 32 neodymium-plastic - Ø 50 to 80 plastoferrite
⑥ PISTON ROD GASKET: polyurethane
⑦ GUIDE BUSHING: steel strip with bronze and PTFE insert.
⑧ STATIC O-rings: NBR
⑨ SECURING SCREWS: zinc-plated steel
⑩ RETURN SPRING: spring stainless steel
⑪ WHEEL: zinc-plated steel



COMPACT STOPPER CYLINDER FIXING OPTIONS

Ⓐ Fixing with screws, using the thread in the rear heads
Ⓑ Direct fixing from above using long through screws or tie rods. Non-magnetic stainless steel must be used (e.g. AISI 304)
Ⓒ Fixing with screws, using the thread in the front heads.
Ⓓ Fixing using flange fixed onto the cylinder.

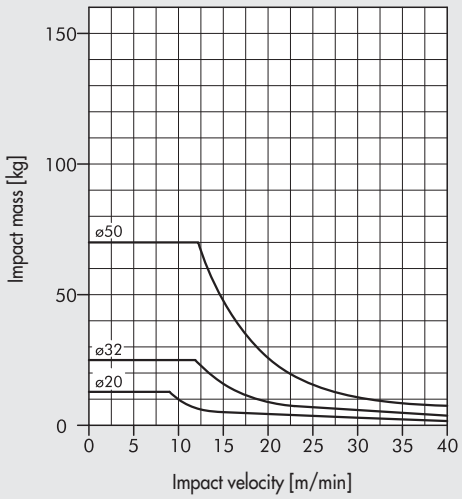


FORCE OF SPRINGS IN COMPACT STOPPER CYLINDERS (THEORETICAL)

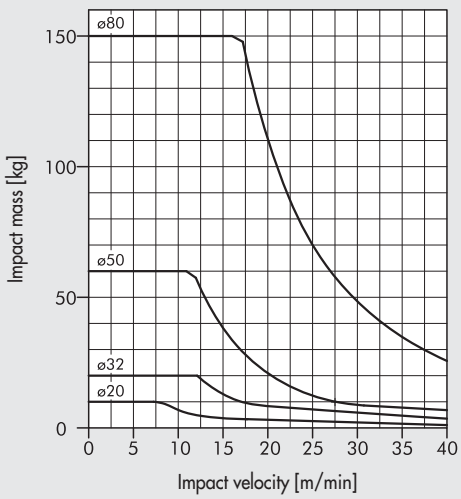
Stroke bore	Ø 20 x 15	Ø 32 x 20	Ø 50 x 30	Ø 80 x 30	Ø 80 x 40
Min. load (N)	13.7	22.4	50.2	97.9	71.0
Max. load (N)	21.2	36.0	115.9	178.5	178.5

LOAD GRAPH

TRUNNION VERSION



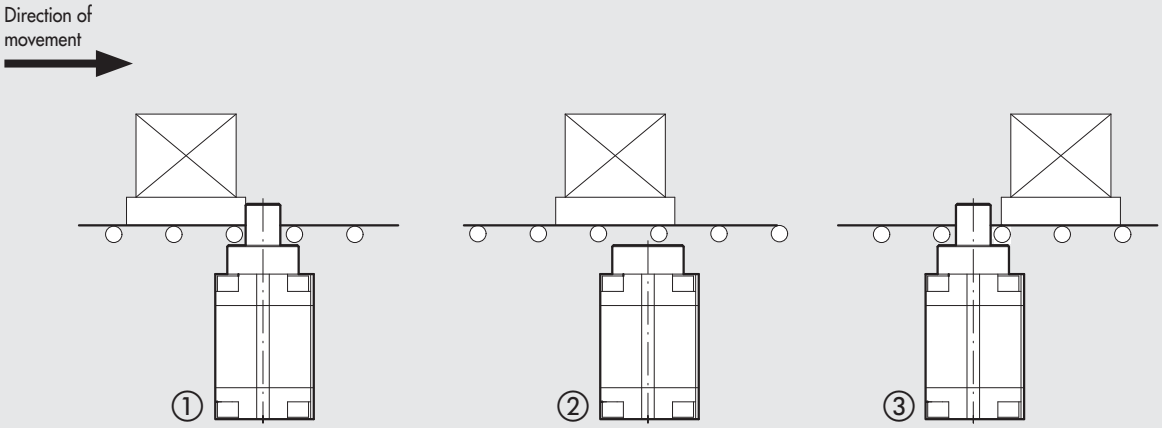
ROLLER VERSION



With stopper cylinders it is important to keep to the values shown in the graph to prevent early breakage of the mechanical parts.
The values shown are only valid with about 1 mm plastic deformation (stopper on chuck).

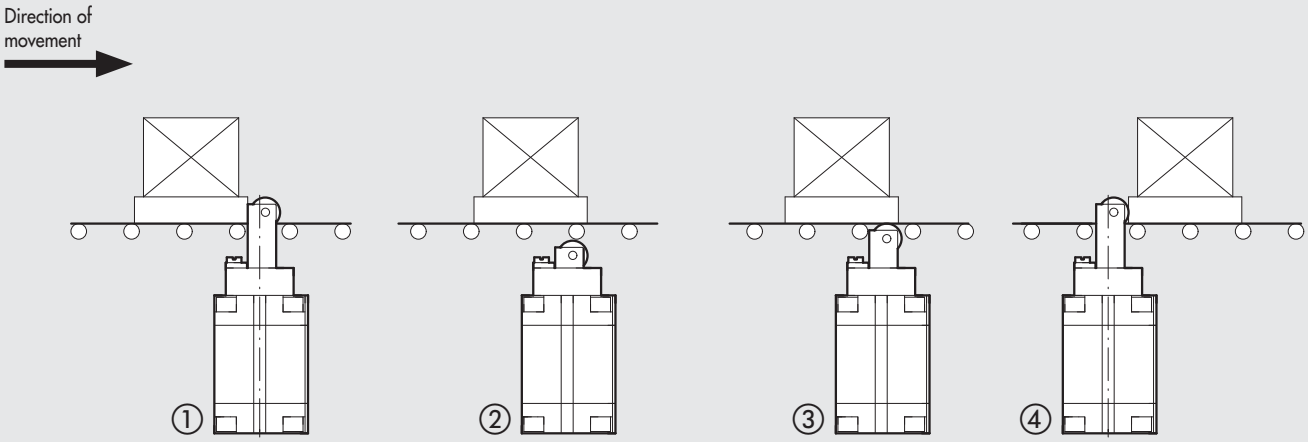
OPERATING DIAGRAMS

TRUNNION VERSION



① Deceleration of the chuck as it comes into contact with the piston rod, with elastic deformation of about 1 mm.
② The cylinder is pressurized to release the chuck.
③ The pressure in the front chamber is maintained until the chuck has passed the stopper cylinder.
The piston rod extends due to the effect of the spring and any pressure in the opposite chamber.
The system is now ready to stop the next chuck.

ROLLER VERSION

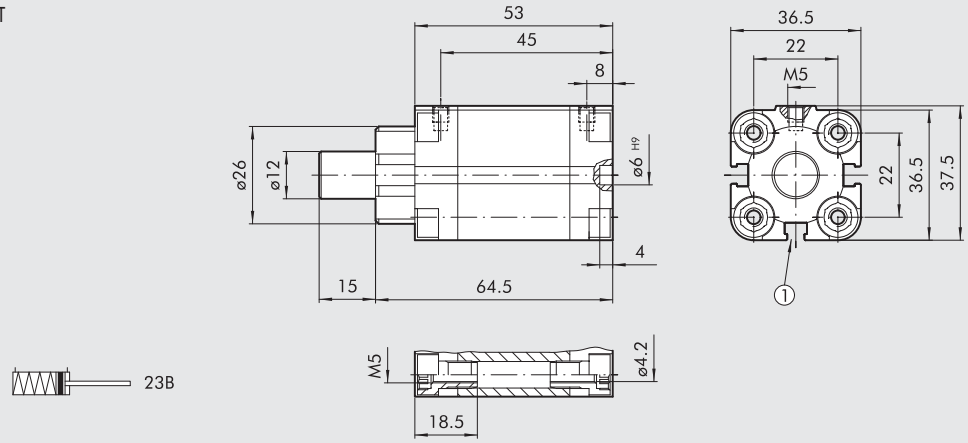


① Deceleration of the chuck as it comes into contact with the piston rod, with elastic deformation of about 1 mm.
② The cylinder is pressurized to release the chuck.
③ When the pressure in the front chamber drops, the piston rod extends due to the effect of the spring or any pressure until the wheel reaches the chuck and moves it on.
④ After the chuck has passed, the cylinder extends the piston rod fully. The system is now ready to stop the next chuck.

METAL WORK PNEUMATIC

Ø 20 STROKE 15 mm TRUNNION VERSION

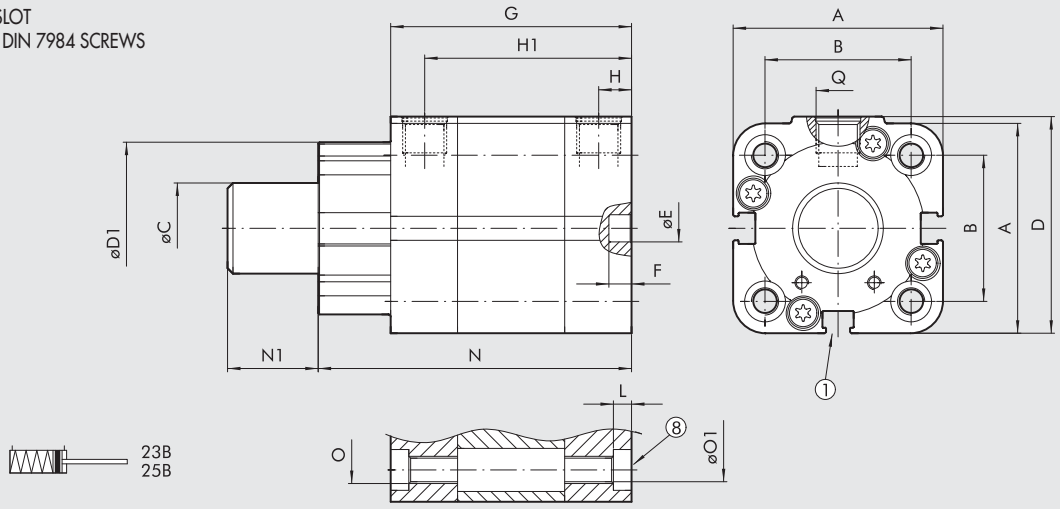
1 = SENSOR SLOT



Code	Description
23B0200015XP	Compact stopper cylinder, trunnion Ø 20, stroke 15
23BS200015XP	Compact stopper cylinder, trunnion Ø 20, stroke 15 (non-magnetic version)

Ø 32 STROKE 20 mm; Ø 50 STROKE 30 mm TRUNNION VERSION

1 = SENSOR SLOT
8 = SEAT FOR DIN 7984 SCREWS

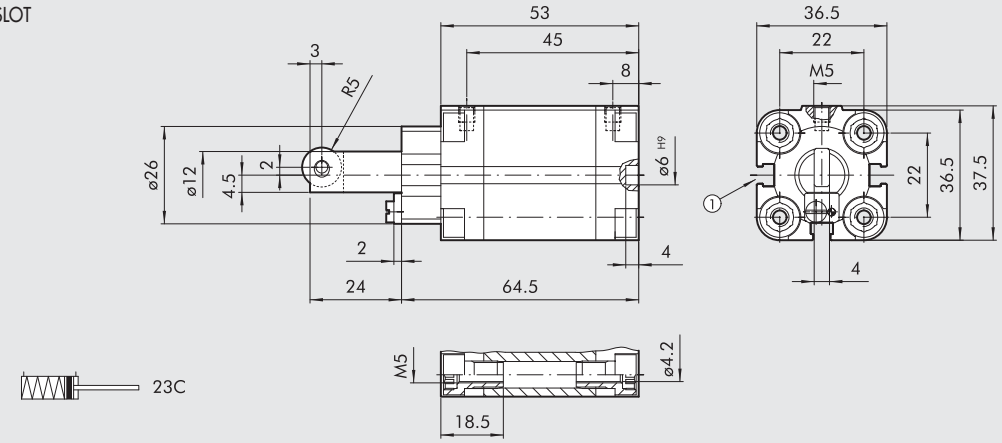


		B													O		ØO1		
Ø	**A**	**ISO**	**UNITOP**	**ØC**	**D**	**D1**	**ØE H9**	**F**	**G**	**H**	**H1**	**L**	**N**	**N1**	**ISO**	**UNITOP**	**ISO**	**UNITOP**	**Q**
32x20	47	32.5 $^{+0.1}_{-0.4}$	32 $^{+0.4}_{-0.1}$	20	48.5	38	6	4	64.5	7.5	57	4	80.5	20	M6	M6	5.2	5.2	G1/8
50x30	67	46.5	50	32	69	53	6	4	75.5	7.5	68	4.5	99.5	30	M8	M8	6.2	6.2	G1/8

Code	Description
23B0320020XP	Compact stopper cylinder, trunnion Ø 32, stroke 20 UNITOP
25B0320020XP	Compact stopper cylinder, trunnion Ø 32, stroke 20 ISO 15552
23BS320020XP	Compact stopper cylinder, trunnion Ø 32, stroke 20 UNITOP (non-magnetic version)
25BS320020XP	Compact stopper cylinder, trunnion Ø 32, stroke 20 ISO 15552 (non-magnetic version)
23B0500030XP	Compact stopper cylinder, trunnion Ø 50, stroke 30 UNITOP
25B0500030XP	Compact stopper cylinder, trunnion Ø 50, stroke 30 ISO 15552
23BS500030XP	Compact stopper cylinder, trunnion Ø 50, stroke 30 UNITOP (non-magnetic version)
25BS500030XP	Compact stopper cylinder, trunnion Ø 50, stroke 30 ISO 15552 (non-magnetic version)

Ø 20 STROKE 15 mm ROLLER VERSION

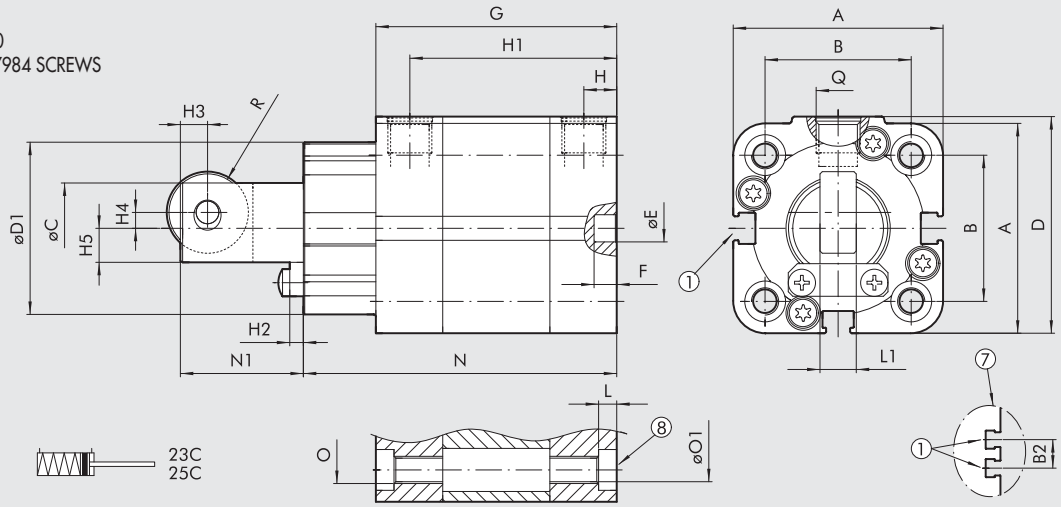
1 = SENSOR SLOT



Code	Description
23C0200015XP	Compact stopper cylinder, roller Ø 20, stroke 15
23CS200015XP	Compact stopper cylinder, roller Ø 20, stroke 15 (non-magnetic version)

Ø 32 STROKE 20 mm; Ø 50 STROKE 30 mm; Ø 80 STROKE 30 AND 40 mm ROLLER VERSION

1 = SENSOR SLOT
7 = ONLY FOR Ø 80
8 = SEAT FOR DIN 7984 SCREWS



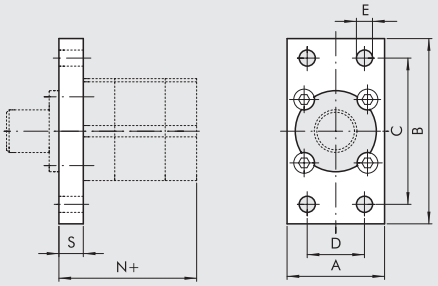
Ø	A	B ISO	B UNITOP	B2	ØC	D	D1	ØE H9	G	F	H	H1	H2	H3	H4	H5	O ISO	O UNITOP	ØO1 ISO	ØO1 UNITOP	L	L1	N	N1	Q	R
32x20	47	32.5 +0.1 -0.4	32 +0.4 -0.1	-	20	48.5	38	6	64.5	4	7.5	57	3	6	3.5	7.5	M6	M6	5.2	5.2	4	8	80.5	38	G1/8	9
50x30	67	46.5	50	-	32	69	53	6	75.5	4	7.5	68	4	6	7	12	M8	M8	6.2	6.2	4.5	10	99.5	50.5	G1/8	12.5
80x30	102	72	82	17	50	105	76	8	126	4	8.5	117.5	8	10	11	18	M10	M10	8.5	8.5	5.5	18	141	63	G1/8	18
80x40	102	72	82	17	50	105	76	8	136	4	8.5	127.5	8	10	11	18	M10	M10	8.5	8.5	5.5	18	151	73	G1/8	18

Code	Description
23C0320020XP	Compact stopper cylinder, roller Ø 32, stroke 20 UNITOP
25C0320020XP	Compact stopper cylinder, roller Ø 32, stroke 20 ISO 15552
23CS320020XP	Compact stopper cylinder, roller Ø 32, stroke 20 UNITOP (non-magnetic version)
25CS320020XP	Compact stopper cylinder, roller Ø 32, stroke 20 ISO 15552 (non-magnetic version)
23C0500030XP	Compact stopper cylinder, roller Ø 50, stroke 30 UNITOP
25C0500030XP	Compact stopper cylinder, roller Ø 50, stroke 30 ISO 15552
23CS500030XP	Compact stopper cylinder, roller Ø 50, stroke 30 UNITOP (non-magnetic version)
25CS500030XP	Compact stopper cylinder, roller Ø 50, stroke 30 ISO 15552 (non-magnetic version)
23C0800030XP	Compact stopper cylinder, roller Ø 80, stroke 30 UNITOP
25C0800030XP	Compact stopper cylinder, roller Ø 80, stroke 30 ISO 15552
23CS800030XP	Compact stopper cylinder, roller Ø 80, stroke 30 UNITOP (non-magnetic version)
25CS800030XP	Compact stopper cylinder, roller Ø 80, stroke 30 ISO 15552 (non-magnetic version)
23C0800040XP	Compact stopper cylinder, roller Ø 80, stroke 40 UNITOP
25C0800040XP	Compact stopper cylinder, roller Ø 80, stroke 40 ISO 15552
23CS800040XP	Compact stopper cylinder, roller Ø 80, stroke 40 UNITOP (non-magnetic version)
25CS800040XP	Compact stopper cylinder, roller Ø 80, stroke 40 ISO 15552 (non-magnetic version)

ACCESSORIES FOR STOPPER CYLINDER

FLANGE Ø 32, Ø 50, Ø 80

+ = ADD THE STROKE



UNITOP

Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950326302	32	50	80	64	32	7	54.5	10	210
W0950506302	50	68	110	90	45	9	57.5	12	502
W0950806302	80	107	160	135	63	12	111	15	1575

ISO

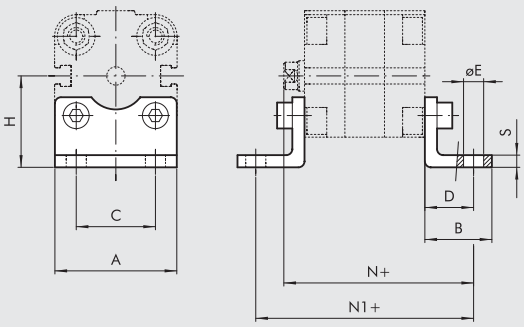
Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950326302	32	50	80	64	32	7	54.5	10	210
W0950506312	50	65	110	90	45	9	57.5	12	447
W0950806312	80	95	153	126	63	12	112	16	1190

Note: Supplied with 4 screws.

ACCESSORIES FOR COMPACT AND COMPACT TWO-FLAT CYLINDERS

FOOT - MODEL A

+ = ADD THE STROKE



CMPC UNITOP, TWO-FLAT UNITOP

Code	Ø	A	B	C	D	ØE	H	N	N1	S	Weight [g]
W0950126001 ▲	12	30	17.5	18	13	5.5	22	55.5	64	3	26
W0950126001 ▲	16	30	17.5	18	13	5.5	22	55.5	64	3	26
W0950206001	20	36	22	22	16	6.6	27	58.5	70	4	46
W0950256001	25	40	22	26	16	6.6	30	58.5	71.5	4	52
W0950322001	32	45	35	32	24	7	31.9	74.5	92.5	4	76
W0950406001	40	60	28	42	20	9	42.5	72	85.5	5	88
W0950406001F ✱	40	60	28	42	20	9	42.5	72	85.5	5	88
W0950506001	50	68	32	50	24	9	47	77	93.5	6	176
W0950506001F ✱	50	68	32	50	24	9	47	77	93.5	6	176
W0950636001	63	84	39	62	27	11	59.5	84.5	104	6	276
W0950636001F ✱	63	84	39	62	27	11	59.5	84.5	104	6	276
W0950806001	80	102	42	82	30	11	65.5	94	116	8	392
W0951006001	100	123	45	103	33	13.5	78	109.5	132.5	8	558

✱ Only for Two-Flat version

CMPC ISO, TWO-FLAT ISO

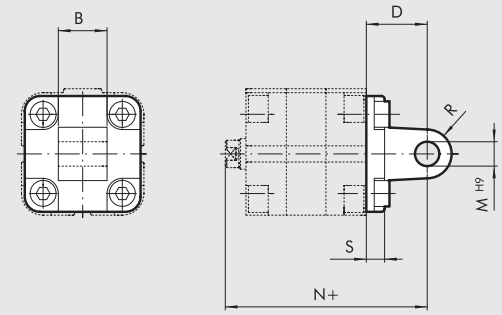
Code	Ø	A	B	C	D	ØE	H	N	N1	S	Weight [g]
W0950322001	32	45	35	32	24	7	31.9	74.5	92.5	4	76
W0950402001	40	52	43	36	28	9	36	80	101.5	4	100
W0950502001	50	65	47	45	32	9	45	85	109.5	4	162
W0950632001	63	75	47	50	32	9	50	89.5	114	6	266
W0950802001	80	95	61	63	41	12	63	105	138	6	456
W0951002001	100	115	65	75	41	14	71	117.5	148.5	6	572

Note: Individually packed with 2 screws.

▲ Non UNITOP norm fixing distance

MALE HINGE-MODEL BA

+ = ADD THE STROKE



CMPC UNITOP, TWO-FLAT UNITOP

Code	Ø	B	D	M	N	R	S	Weight [g]
W0950126004 ▲	12	12	16	6	58.5	6	6	24
W0950126004 ▲	16	12	16	6	58.5	6	6	24
W0950206004	20	16	20	8	62.5	8	8	44
W0950256004	25	16	20	8	62.5	8	8	48

CMPC ISO, TWO-FLAT ISO

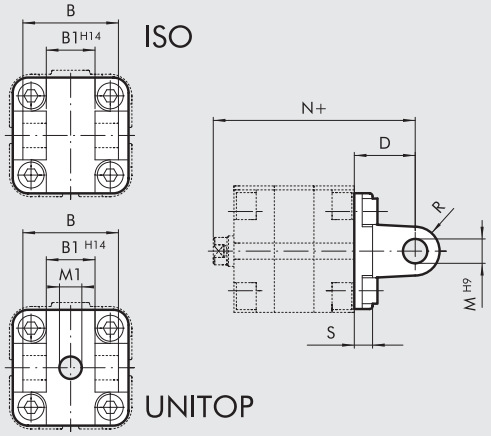
Code	Ø	B	D	M	N	R	S	Weight [g]
W0950322004	32	26	22	10	72.5	11	10	94
W0950402004	40	28	25	12	77	13	10	124
W0950502004	50	32	27	12	80	13	12	220
W0950632004	63	40	32	16	89.5	17	12	316
W0950802004	80	50	36	16	100	17	16	578
W0951002004	100	60	41	20	117.5	21	16	850

Note: Supplied with 4 screws, 4 washers

▲ Non UNITOP norm fixing distance

FEMALE HINGE-MODEL B

+ = ADD THE STROKE



CMPC UNITOP, TWO-FLAT UNITOP

Code	Ø	B	B1	D	M	M1	N	R	S	Weight [g]
W0950322003	32	45	26	22	10	14	72.5	11	10	116
W0950406003	40	52	28	25	12	14	77	12.5	9	184
W0950506003	50	60	32	27	12	18	80	12.5	11	266
W0950636003	63	70	40	32	16	-	89.5	15	11	470
W0950806003	80	90	50	36	16	23	100	15	13	670
W0951006003	100	110	60	41	20	28	117.5	20	15	1110

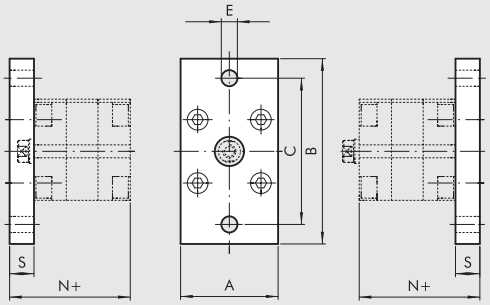
CMPC ISO, TWO-FLAT ISO

Code	Ø	B	B1	D	M	N	R	S	Weight [g]
W0950322003	32	45	26	22	10	72.5	11	10	116
W0950402003	40	52	28	25	12	77	13	10	160
W0950502003	50	60	32	27	12	80	13	12	252
W0950632003	63	70	40	32	16	89.5	17	12	394
W0950802003	80	90	50	36	16	100	17	16	670
W0951002003	100	110	60	41	23	117.5	21	16	1085

Note: Supplied with 4 screws, 4 washers, 2 snap-rings and 1 pin.

FLANGE Ø 12 to 25 - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE



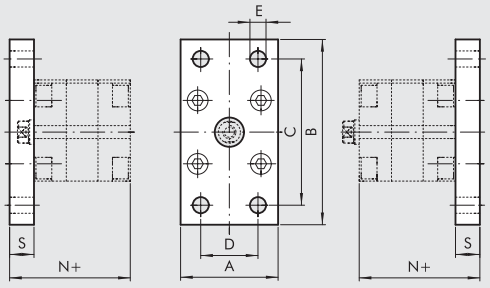
CMPC

Code	Ø	A	B	C	E	N	S	Weight [g]
W0950126002 ▲	12	29	55	43	5.5	48	10	112
W0950126002 ▲	16	29	55	43	5.5	48	10	112
W0950206002	20	36	70	55	6.6	48	10	184
W0950256002	25	40	76	60	6.6	49.5	10	226

Note: Supplied with 4 screws
▲ Non UNITOP norm fixing distance

FLANGE Ø 32 to 100 - MODEL C (FRONT AND REAR)

+ = ADD THE STROKE



CMPC UNITOP

Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950322002	32	50	80	64	32	7	54.5	10	246
W0950406002	40	60	102	82	36	9	55.5	10	454
W0950506002	50	68	110	90	45	9	57.5	12	655
W0950636002	63	87	130	110	50	9	65	15	1255
W0950806002	80	107	160	135	63	12	71	15	1900
W0951006002	100	128	190	163	75	14	81.5	15	2700

TWO-FLAT UNITOP

Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950322002	32	50	80	64	32	7	54.5	10	246
W0950406002F	40	60	102	82	36	9	55.5	10	454
W0950506002F	50	68	110	90	45	9	57.5	12	655
W0950636002F	63	87	130	110	50	9	65	15	1255
W0950806002F	80	107	160	135	63	12	71	15	1900

CMPC ISO, TWO-FLAT ISO

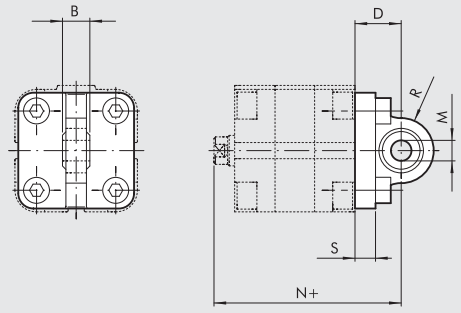
Code	Ø	A	B	C	D	E	N	S	Weight [g]
W0950322002	32	50	80	64	32	7	54.5	10	246
W0950402002	40	55	90	72	36	9	55.5	10	290
W0950502002	50	65	110	90	45	9	57.5	12	522
W0950632002	63	75	120	100	50	9	62	12	670
W0950802002	80	95	153	126	63	12	72	16	1420
W0951002002	100	115	178	150	75	14	82.5	16	2040

Note: Supplied with 4 screws

METAL WORK PNEUMATIC

ARTICULATED MALE HINGE - MODEL BAS

+ = ADD THE STROKE

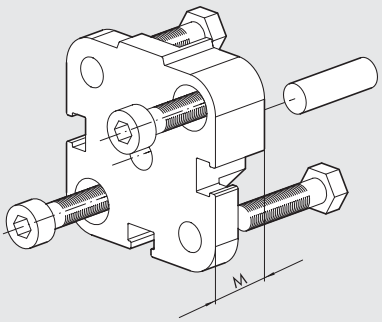


CMPC ISO, TWO-FLAT ISO

Code	Ø	B	D	M	N	R	S	Weight [g]
W0950322006	32	14	22	10	72.5	16	10	106
W0950402006	40	16	25	12	77	18	10	142
W0950502006	50	16	27	12	80	21	12	236
W0950632006	63	21	32	16	89.5	23	12	336
W0950802006	80	21	36	16	100	28	16	572
W0951002006	100	25	41	20	117.5	30	16	840

Note: Supplied with 4 screws, 4 washers

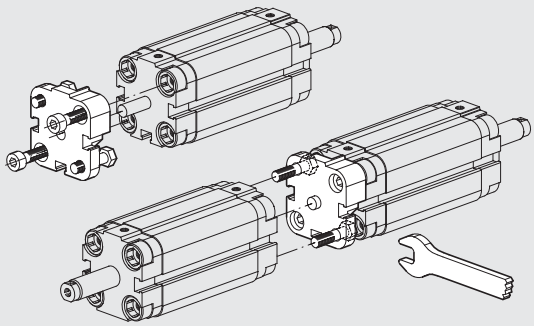
FLANGE FOR OPPOSITE CYLINDERS



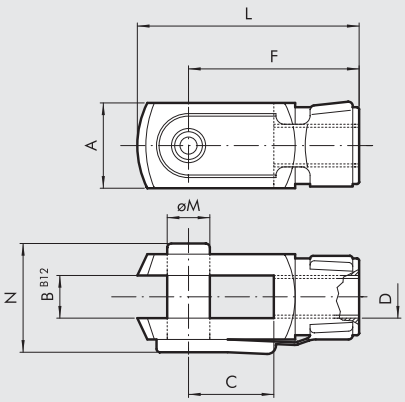
CMPC UNITOP Code	CMPC ISO Code	Ø	M	Weight [g] UNITOP	ISO
0950123060 ▲	–	12	12.5	29	–
0950123060 ▲	–	16	12.5	29	–
0950203060	–	20	12.5	45	–
0950253060	–	25	13	57	–
0950323060	0950323060	32	14.5	88	88
0950403060	0950403061	40	14.5	106	106
0950503060	0950503061	50	14.5	172	158
0950633060	0950633061	63	14.5	274	258
0950803060	0950803061	80	16.5	470	452
0951003060	0951003061	100	19.5	826	801

Note: Supplied complete with 1 pin, 4 screws
▲ Non UNITOP norm fixing distance

ASSEMBLING OPPOSING CYLINDERS



FORK - MODEL GK-M

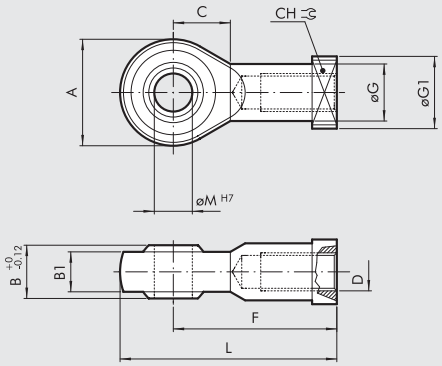


CMPC UNITOP AND ISO, TWO-FLAT UNITOP AND ISO

Code	Ø	A	B	C	D	F	L	ØM	N	Weight [g]
W0950120020	12	12	6	12	M6	24	31	6	16	20
W0950200020	16	16	8	16	M8	32	42	8	22	48
W0950322020	20	20	10	20	M10x1.25	40	52	10	26	92
W0950322020	25	20	10	20	M10x1.25	40	52	10	26	92
W0950322020	32	20	10	20	M10x1.25	40	52	10	26	92
W0950322020	40	20	10	20	M10x1.25	40	52	10	26	92
W0950402020	50	24	12	24	M12x1.25	48	62	12	32	148
W0950402020	63	24	12	24	M12x1.25	48	62	12	32	148
W0950502020	80	32	16	32	M16x1.5	64	83	16	40	340
W0950802020	100	40	20	40	M20x1.5	80	105	20	48	690

Note: Individually packed

ROD EYE - MODEL GA-M

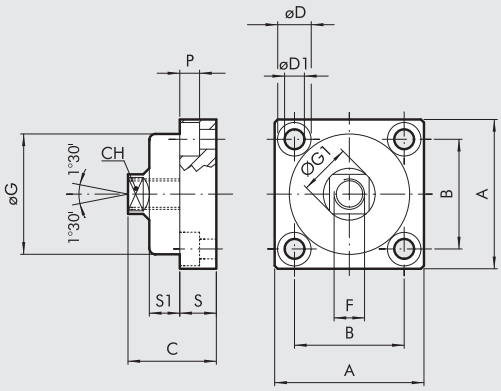


CMPC UNITOP AND ISO, TWO-FLAT UNITOP AND ISO

Code	Ø	A	B	B1	C	CH	D	F	ØG	ØG1	L	ØM	Weight [g]
W0950120025	12	20	9	6.75	11	11	M6	30	10	13	40	6	28
W0950200025	16	24	12	9	13	14	M8	36	12.5	16	48	8	50
W0950322025	20	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950322025	25	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950322025	32	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950322025	40	28	14	10.5	15	17	M10x1.25	43	15	19	57	10	78
W0950402025	50	32	16	12	17	19	M12x1.25	50	17.5	22	66	12	116
W0950402025	63	32	16	12	17	19	M12x1.25	50	17.5	22	66	12	116
W0950502025	80	42	21	15	23	22	M16x1.5	64	22	27	85	16	226
W0950802025	100	50	25	18	27	30	M20x1.5	77	27.5	34	102	20	404

Note: Individually packed.

COMPENSATION JOINT - MODEL GA

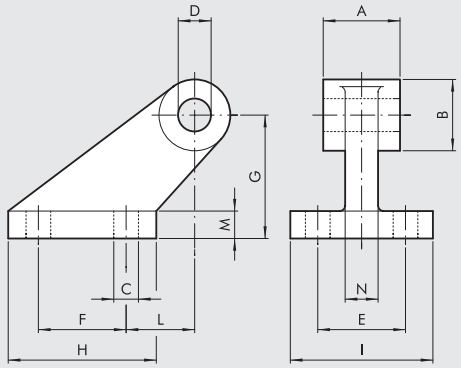


CMPC UNITOP, ISO, TWO-FLAT

Code	Ø	A	B	C	CH	ØD	ØD1	F	ØG	ØG1	P	S	S1	Weight [g]
W0950326021	20	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950326021	25	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950326021	32	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950326021	40	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950406021	50	59	42	36	15	14	8.5	M12x.125	44	19	8.5	15	13.5	286
W0950406021	63	59	42	36	15	14	8.5	M12x1.25	44	19	8.5	15	13.5	286
W0950506021	80	79	58	44	22	17	10.5	M16x1.5	59	26	10.5	20	15	628
W0950806021	100	89	65	51	27	19	12.5	M20x1.5	69	31	12.5	20	20	1200

Note: Individually packed.

COUNTER-HINGE CETOP Ø 32 to 100

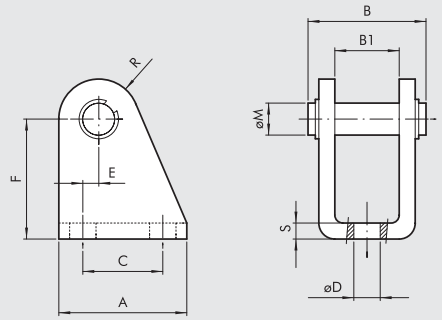


CMPC UNITOP AND ISO, TWO-FLAT UNITOP AND ISO

Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96
W0950402008	40	28	26	9	12	32	32	45	54	52	25	10	12	216
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440
W0950802008	80	50	33	11	16	40	50	63	75	63	32	12	15	464
W0951002008	100	60	44	14	20	50	70	90	103	80	40	16	22	985

Note: Supplied complete with 4 screws, 4 washers

COUNTER-HINGE Ø 12 to 25 - MODEL BC



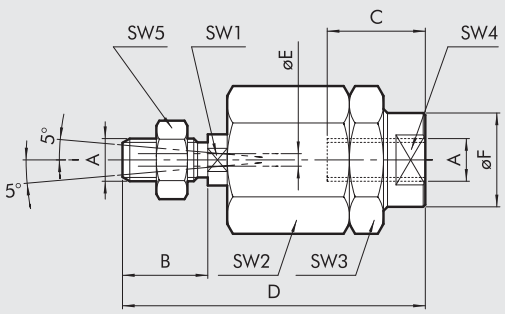
CMPC UNITOP

Code	Ø	A	B	B1	C	ØD	E	F	ØM	R	S	Weight [g]
W0950120005	12	25	25	12	15	5.5	2	27	6	7	3	40
W0950120005	16	25	25	12	15	5.5	2	27	6	7	3	40
W0950200005	20	32	30	16	20	6.5	4	30	8	10	4	78
W0950200005	25	32	30	16	20	6.5	4	30	8	10	4	78

Note: Supplied complete with 1 pin and and 2 snap rings

METAL WORK PNEUMATIC

SELF ALIGNING ROD COUPLER - MODEL GA-K



CMPC UNITOP, ISO, TWO-FLAT UNITOP E ISO

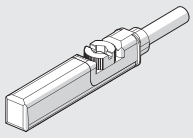
Code	Ø	A	B	C	D	ØE	ØF	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950120030	**12**	M6	10	10	35	2	8.5	5	13	13	7	10	24
W0950200030	**16**	M8	20	20	57	4	12.5	7	17	17	11	13	56
W0950322030	**20**	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950322030	**25**	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950322030	**32**	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950322030	**40**	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950402030	**50**	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950402030	**63**	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950502030	**80**	M16x1.5	32	32	103	4	32	20	41	41	30	24	620
W0950802030	**100**	M20x1.5	40	40	119	4	32	20	41	41	30	30	680

Note: Individually packed.

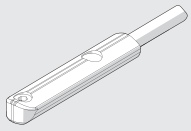
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

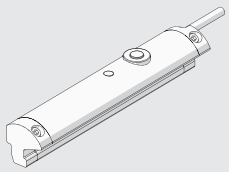


SENSOR, OVAL TYPE
Traditional



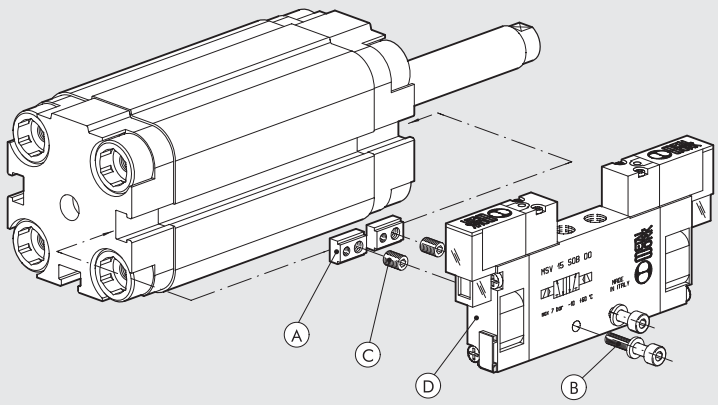
LTS POSITION SENSORS

For technical data and usage strokes see **chapter A6**.



VALVE ASSEMBLY ON CYLINDER

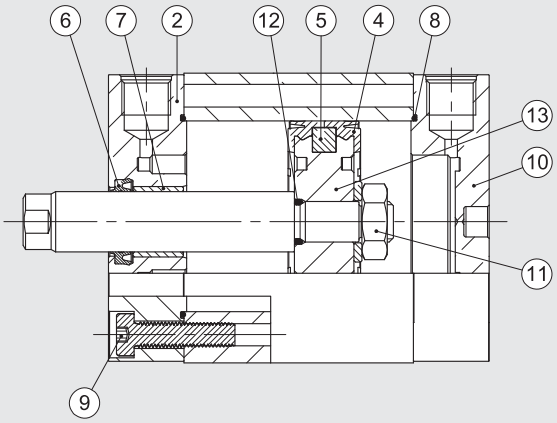
With this type of cylinder, the valves (D) can be mounted directly using the retracting sensor slot, without requiring the use of intermediate brackets.This can be done using the special plates (A) which come with both M3 and M4 threads, and screws (B) of the size, type and quantity shown in the table below.
The plates are supplied complete with 2 stud pins, one M3 and one M4 (C).
After the valve centre distance and the position of the valve have been determined, the plates can be secured to the cylinder.
A "position memory" will be created to facilitate subsequent maintenance on the valve.



Type of valve to mount (D)	Fixing plate (A) CODE 0950003000	Position memory: grub screw (C) to be used	Screw (B) for connection to the cylinder (one per plate)	Washer (B) (one per screw)
MINIMACH	n° 2	M4	M3x16 UNI 5931 (DIN 912)	A3.2 UNI 1751 (DIN 127A)
MACH 11	n° 2	M4	M3x16 UNI 5931 (DIN 912)	A3.2 UNI 1751 (DIN 127A)
SERIE 70 1/8	n° 2	M3	M4x25 UNI 5931 (DIN 912)	–
SERIE 70 1/4	n° 2	M3	M4x30 UNI 5931 (DIN 912)	A4.3 UNI 1751 (DIN 127A)

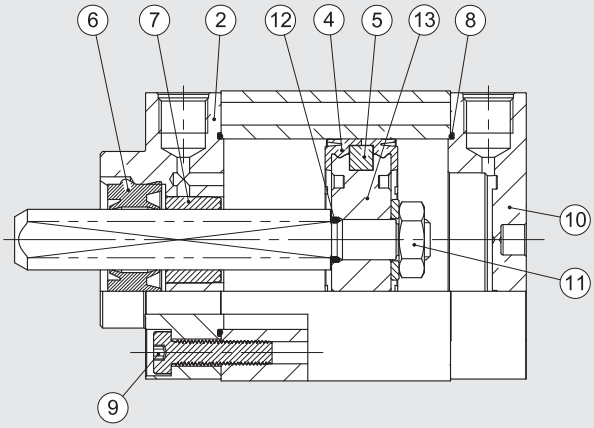
SPARE PARTS

COMPACT CYLINDERS, SERIES CMPC



Code	Bores	Type	Parts
009 . . . 7001	Ø 12 to 100	Complete set of gaskets polyurethane	④⑥⑧
009 . . . 7008	Ø 20 to 100	Complete set of (high temperature) FKM/FPM gaskets	④⑥⑧
009 . . . 7013	Ø 12 to 100	Polyurethane piston rod gasket kit	⑥
009 . . . 7014	Ø 20 to 100	FKM/FPM piston rod gasket kit	⑥
009 . . . 7101	Ø 12 to 100	Front cylinder head kit for UNITOP polyurethane	②⑦⑥⑧⑨
0090327101	Ø 32	Front cylinder head kit for ISO Ø 32 polyurethane	②⑦⑥⑧⑨
009 . . . 8101	Ø 40 to 100	Front cylinder head kit for ISO polyurethane	②⑦⑥⑧⑨
009 . . . 7201	Ø 12 to 100	Rear cylinder head kit for UNITOP polyurethane	⑧⑨⑩
0090327201	Ø 32	Rear cylinder head kit for ISO Ø 32 polyurethane	⑧⑨⑩
009 . . . 8201	Ø 40 to 100	Rear cylinder head kit for ISO polyurethane	⑧⑨⑩
009 . . . 7401	Ø 12 to 100	Piston kit polyurethane	④⑤⑪⑫⑬
009 . . . 7501	Ø 12 to 100	Magnet	⑤
009 . . . 7901	Ø 12 to 100	Front + rear cylinder head + piston kit for UNITOP polyurethane	②④⑤⑥⑦⑧⑨⑩⑪⑫⑬
0090327901	Ø 32	Front + rear cylinder head + piston kit for ISO Ø 32 polyurethane	②④⑤⑥⑦⑧⑨⑩⑪⑫⑬
009 . . . 8901	Ø 40 to 100	Front + rear cylinder head + piston kit for ISO polyurethane	②④⑤⑥⑦⑧⑨⑩⑪⑫⑬

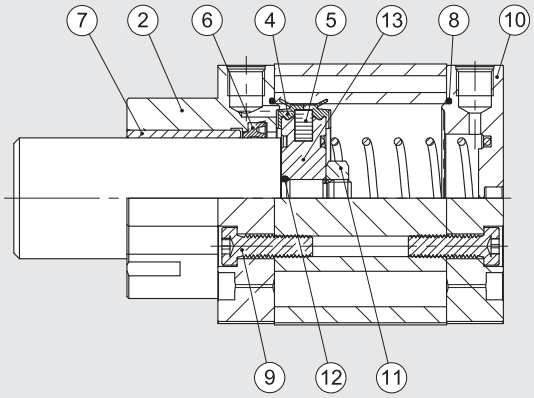
COMPACT CYLINDERS, SERIES CMPC TWO-FLAT



Code	Bores	Type	Parts
009 . . . 7001F	Ø 32 to 80	Set of gaskets	④⑧⑫
009 . . . 7101F	Ø 40 to 80	Front cylinder head kit for UNITOP	②⑦⑥⑧⑨
0090327101F	Ø 32	Front cylinder head kit for ISO Ø 32	②⑦⑥⑧⑨
009 . . . 8101F	Ø 40 to 80	Front cylinder head kit for ISO	②⑦⑥⑧⑨
009 . . . 7201	Ø 40 to 80	Rear cylinder head kit for UNITOP	⑧⑨⑩
0090327201	Ø 32	Rear cylinder head kit for ISO Ø 32	⑧⑨⑩
009 . . . 8201	Ø 40 to 80	Rear cylinder head kit for ISO	⑧⑨⑩
009 . . . 7401	Ø 32 to 80	Piston kit	④⑤⑪⑫⑨⑬
009 . . . 7501	Ø 32 to 80	Magnet	⑤
009 . . . 7901F	Ø 40 to 80	Front + rear cylinder head + piston kit for UNITOP	②④⑤⑥⑦⑧⑨⑩⑪⑫⑬
0090327901F	Ø 32	Front + rear cylinder head + piston kit for ISO Ø 32	②④⑤⑥⑦⑧⑨⑩⑪⑫⑬
009 . . . 8901F	Ø 40 to 80	Front + rear cylinder head + piston kit for ISO	②④⑤⑥⑦⑧⑨⑩⑪⑫⑬

METAL WORK PNEUMATIC

COMPACT CYLINDERS, STOPPER



Code	Bores	Type	Parts
009 . . . 7060	Ø 20; 32; 50; 80	Complete set of gaskets	④⑥⑧
009 . . . 7160	Ø 20; 32; 50; 80	Front cylinder head kit for UNITOP	②⑦⑥⑧⑨
0090327160	Ø 32	Front cylinder head kit for ISO Ø 32	②⑦⑥⑧⑨
009 . . . 8160	Ø 50; 80	Front cylinder head kit for ISO	②⑦⑥⑧⑨
009 . . . 7201	Ø 20; 32	Rear cylinder head kit for UNITOP Ø 20 - Ø 32	⑧⑨⑩
009 . . . 7260	Ø 50; 80	Rear cylinder head kit for UNITOP	⑧⑨⑩
0090327201	Ø 32	Rear cylinder head kit for ISO Ø 32	⑧⑨⑩
009 . . . 8260	Ø 50; 80	Rear cylinder head kit for ISO	⑧⑨⑩
0090207401	Ø 20	Piston kit Ø 20	④⑤⑪
009 . . . 7460	Ø 32; 50; 80	Piston kit	④⑤⑪⑫⑬
009 . . . 7501	Ø 20; 32; 50; 80	Magnet	⑤
009 . . . 7960	Ø 20; 32; 50; 80	Front + rear cylinder head + piston kit for UNITOP	②④⑤⑥⑦⑧⑨⑩⑪⑫⑬
0090327960	Ø 32	Front + rear cylinder head + piston kit for ISO Ø 32	②④⑤⑥⑦⑧⑨⑩⑪⑫⑬
009. . . 8960	Ø 50; 80	Front + rear cylinder head + piston kit for ISO	②④⑤⑥⑦⑧⑨⑩⑪⑫⑬

NOTES

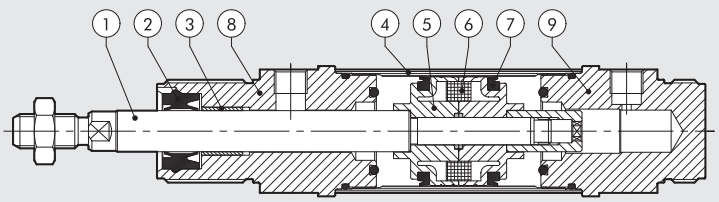
ROUND CYLINDER SERIES RNDC

Clean profile cylinders available in different versions:
- configuration with or without magnet
- single- and double-acting - single or through-rod
- pneumatic cushioning on request
- range of gaskets available in NBR, POLYURETHANE and FKM/FPM (for high temperatures)

TECHNICAL DATA		POLYURETHANE	NBR	FKM/FPM	LOW TEMPERATURE
Max operating pressure	bar	10	10	10	10
	MPa	1	1	1	1
	psi	145	145	145	145
Temperature range	°C	–10 to +80	–10 to +80	–10 to +150 (non-magnetic cylinders)	–35 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous			
Bores	mm	32; 40; 50			
Design		Screwed heads			
Versions		Double-acting, Double-acting through-rod, Double-acting cushioned, Double-acting through-rod cushioned,			
		Single-acting, Single-acting through-rod, No stick-slip			
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request			
Standard strokes ✚	mm	Single-acting: for bores Ø 32 to 50 strokes from 1 to 250			
		Double-acting: for bores Ø 32 to 50 strokes from 1 to 500			
		✚ Maximum recommended strokes. Higher values can create operating problems			
Inrush pressure	bar	Ø 32 and 40: 0.4 - Ø 50: 0.3			
Forces generated at 6 bar thrust/retraction		See cylinder "**General technical data**" at the beginning of the chapter			
Weights		See cylinder "**General technical data**" at the beginning of the chapter			
Notes		**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air**			

COMPONENTS

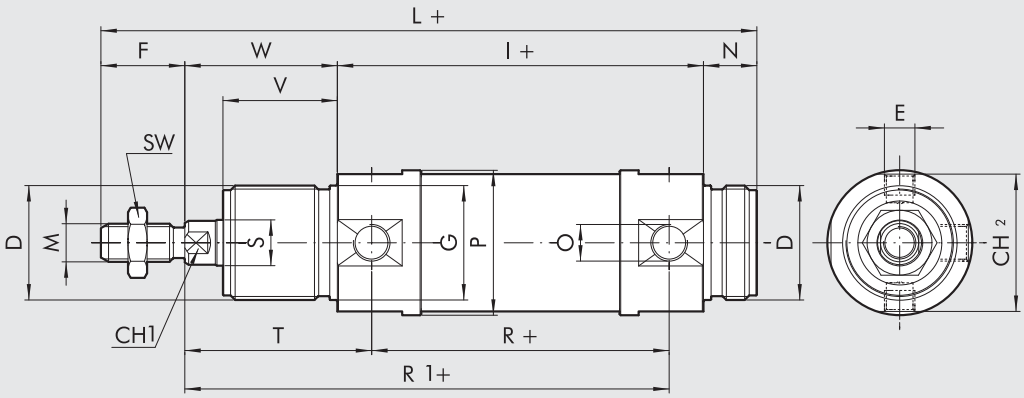
① PISTON ROD: C45 steel or stainless steel, thick chromed
② PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
③ GUIDE BUSHING: steel strip with bronze and PTFE insert
④ BARREL: drawn anodised aluminium alloy
⑤ HALF-PISTON: self-lubricating technopolymer with integrated cushioning olives
⑥ MAGNET: plastoferrite
⑦ PISTON GASKET: polyurethane, NBR or FKM/FPM
⑧ HEAD: anodised aluminium alloy
⑨ HEAD: anodised aluminium alloy

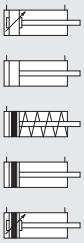


METAL WORK PNEUMATIC

DIMENSIONS OF STANDARD VERSIONS

+ = ADD STROKE

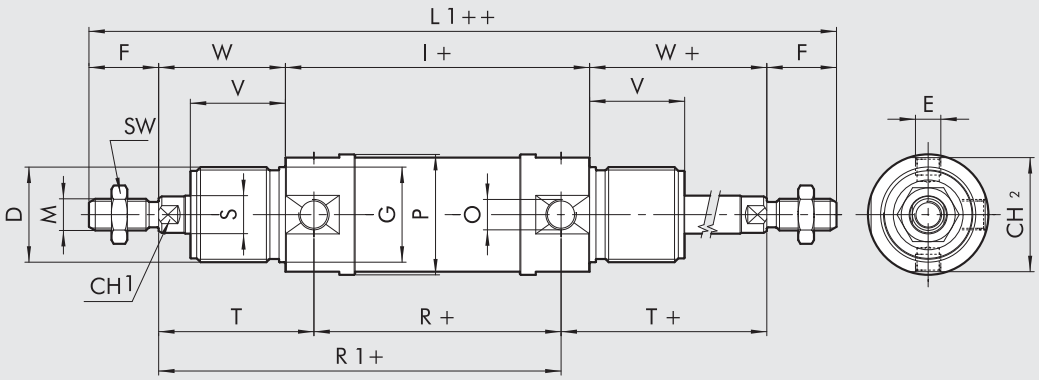


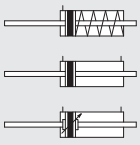


109
110
111
112
113

DIMENSIONS OF THROUGH-ROD VERSIONS

+ = ADD STROKE
++ = ADD TWICE THE STROKE





104
114
115

DIMENSIONS OF STANDARD DOUBLE-ACTING AND THROUGH-ROD

Ø	D	E	F	Ø G	CH1	I	L	M	N	O	Ø P	R	Ø S	SW	T	CH2	V	W	L1
32	M30x1.5	M8x1	22	30	10	96	172	M10x1.25	14	G1/8	38	78	12	17	49	36	30	40	220
40	M38x1.5	M10x1	24	38	13	113	198	M12x1.25	16	G1/4	46	89	16	19	57	43	35	45	251
50	M45x1.5	M12x1.5	32	45	17	120	220	M16x1.5	18	G1/4	57	96	20	24	62	54	38	50	284

DIMENSIONS OF STANDARD SINGLE-ACTING AND THROUGH-ROD

			I			L			R1			L1		
Lower limit	Stroke	Upper limit	Ø 32	Ø 40	Ø 50	Ø 32	Ø 40	Ø 50	Ø 32	Ø 40	Ø 50	Ø 32	Ø 40	Ø 50
0	< C ≤	50	96	113	120	172	198	220	127	146	158	220	251	284
50	< C ≤	100	125	145.5	155.5	201	230.5	255.5	156	178.5	193.5	249	283.5	319.5
100	< C ≤	150	154	178	191	230	263	291	185	211	229	278	316	355
150	< C ≤	200	183	210.5	226.5	259	295.5	326.5	214	243.5	264.5	307	348.5	390.5
200	< C ≤	250	212	243	262	288	328	362	243	276	300	336	381	426

For all the other values, see previous table, except for T and R which are both replaced by R1

KEY TO CODES

CYL	1 1 2 TYPE	0	3 2 BORE	0 0 2 5 STROKE	C MATERIAL	P GASKETS
	■ **104** SE through-rod **109** DEA **110** DE ■ **111** SE **112** DEM **113** DEMA **114** DEM through-rod **115** DEMA through-rod	**0** Standard ▲ **G** No stick-slip **S** Non-magnetic	32 40 50	For the maximum suppliable strokes, look at the technical data	**A** C45 chrome rod, aluminium piston rod **C** C45 chrome rod, technopolymer piston rod **Z** Stainless steel piston rod and nut aluminium piston **X** Stainless steel piston rod and nut technopolymer piston	**P** polyurethane **N** NBR ● **V** FKM/FPM ● **B** low temperature

DE: Double-acting (non-cushioned, not magnetic)
DEM: Magnetic double-acting (non-cushioned)
DEMA: Magnetic double-acting (cushioned)
DEA: Cushioned double-acting (non-magnetic)
SE: Single-acting (magnetic)

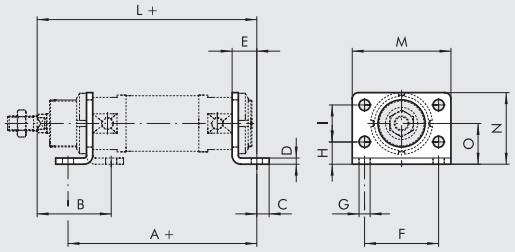
● Only available for non-magnetic versions (S) and with aluminium piston (A or Z)
▲ **For speeds lower than 0.2m/s, to prevent surging.**
Use no-lubricated air only
■ Only available for versions with aluminium piston (A or Z)

NOTES

ACCESSORIES FOR ROUND CYLINDER: FIXINGS

FOOT MODEL AC

+ = ADD STROKE

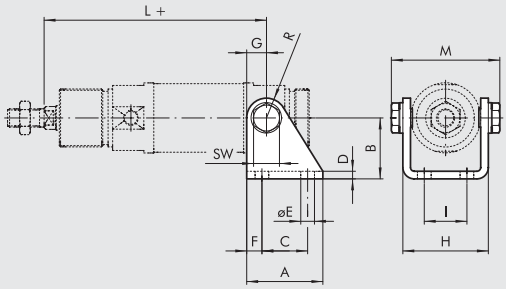


Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	O	Weight [g]
W0950320002	32	124	50	7	4	14	52	7	14	28	150	66	49	28	104
W0950400002	40	153	60	10	5	20	60	9	18	30	178	80	58	33	190
W0950500002	50	160	64	10	6	20	70	9	20	40	190	90	70	40	296

Note: Individually packed

COUNTER-HINGE MODEL BC

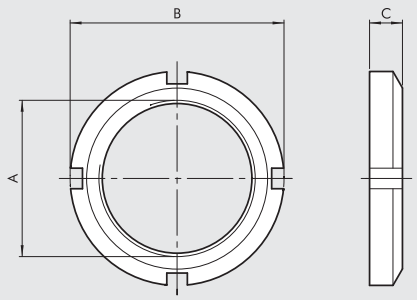
+ = ADD STROKE



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	R	SW	Weight [g]
W0950320005	32	40	35	24	4	7	8	12	46.1	20	127	60	12	13	152
W0950400005	40	50	40	30	5	9	10	13	57.5	28	146	74	13	17	262
W0950500005	50	54	45	34	6	9	10	14	69.1	36	158	89	14	19	401

Note: Supplied with 2 screws

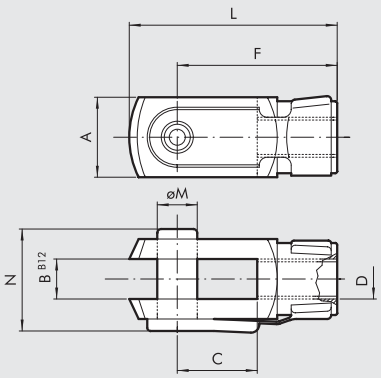
HEAD LOCK RING MODEL G



Code	Ø	A	B	C	Weight [g]
W0950320010	32	M30x1.5	45	7	46
W0950400010	40	M38x1.5	50	8	56
W0950500010	50	M45x1.5	58	9	124

Note: Individually packed

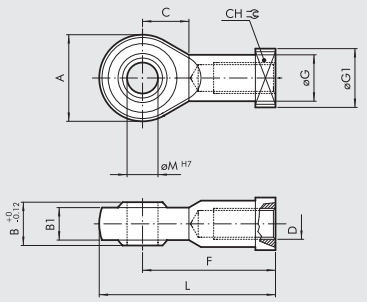
FORK MODEL GK-M



Code	Ø	ØM	C	B	A	L	F	D	N	Weight [g]
W0950322020	32	10	20	10	20	52	40	M10x1.25	26	92
W0950402020	40	12	24	12	24	62	48	M12x1.25	32	148
W0950502020	50	16	32	16	32	83	64	M16x1.5	40	340

Note: Individually packed

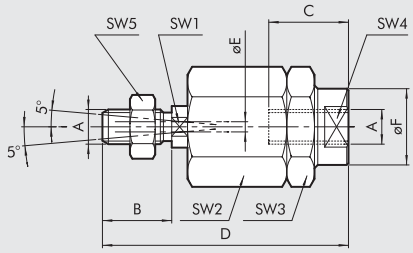
SPHERICAL JOINT MODEL GA-M



Code	Ø	øM	C	B1	B	A	L	F	D	øG	CH	Weight [g]
W0950322025	32	10	15	10.5	14	28	57	43	M10x1.25	15	17	78
W0950402025	40	12	17	12	16	32	66	50	M12x1.25	17.5	19	116
W0950502025	50	16	22	15	21	42	85	64	M16x1.5	22	22	226

Note: Individually packed

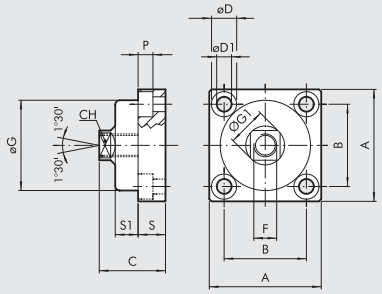
ARTICULATED JOINT MODEL GA-K



Code	Ø	A	B	C	D	øE	øF	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950322030	32	M10x1.25	20	20	71	4	22	12	30	30	19	17	216
W0950402030	40	M12x1.25	24	20	75	4	22	12	30	30	19	19	220
W0950502030	50	M16x1.5	32	32	103	4	32	20	41	41	30	24	620

Note: Individually packed

FLEXIBLE COLLAR - MODEL GA



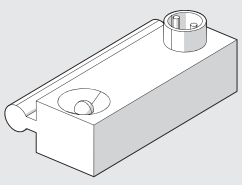
Code	Ø	A	B	C	CH	øD	øD1	F	øG	ØG1	P	S	S1	Weight [g]
W0950326021	32	49	36	30	13	11	6.5	M10x1.25	39.5	17	6.5	12	10	172
W0950406021	40	59	42	36	15	14	8.5	M12x.125	44	19	8.5	15	13.5	286
W0950506021	50	79	58	44	22	17	10.5	M16x1.5	59	26	10.5	20	15	628

Note: Individually packed

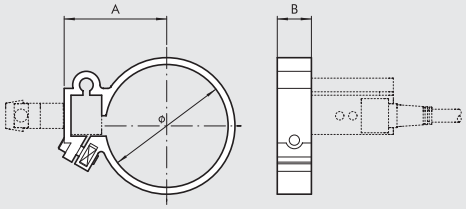
ACCESSORIES FOR ROUND CYLINDER: MAGNETIC SENSORS

SENSOR SERIES DSM

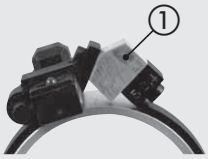
For codes and technical data, see **chapter A6**.



SENSOR CIRCLIP



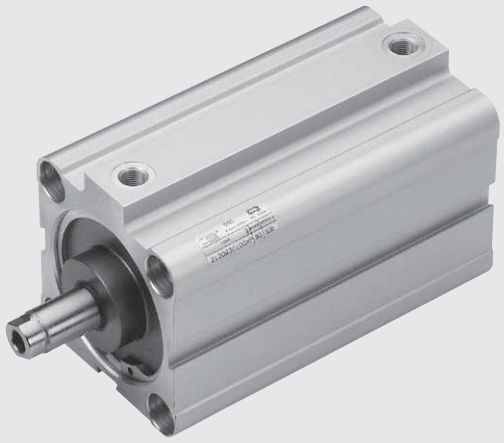
Code	Bore	Model	Ø	A	B
W0950000132	32	Circlip DXF 36 - 32	36	29.5	10
W0950000140	40	Circlip DXF 45 - 40	45	34.5	10
W0950000150	50	Circlip DXF 52 - 50	55	38.5	10



FOR MOUNTING ON THE CYLINDER Ø 50 INSERT
THE ALUMINIUM SPACER ① YOU FIND IN THE PACKAGE

SHORT-STROKE CYLINDER SERIES SSCY

Compact cylinders suitable for installation in limited spaces:
- configuration with or without magnet
- single or double-acting - single or through-rod
- anti-rotation version and with built-in fixings
- possible choice of NBR, POLYURETHANE or FKM/FPM gaskets
- special design on request.



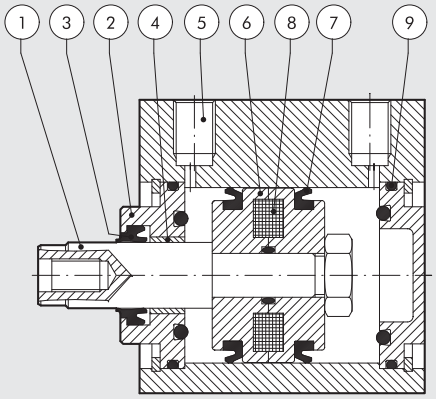
TECHNICAL DATA		Polyurethane	NBR	FKM/FPM	Low Temperature
Max operating pressure	bar	10	10	10	10
	MPa	1	1	1	1
Temperature range	°C	–10 to +80	–10 to +80	–10 to +150 (non-magnetic cylinders)	–35 to +80
Fluid		Unlubricated air. Lubrication, if used, must be continuous			
Bores	mm	12; 16; 20; 25; 32; 40; 50; 63; 80; 100			
Design		With profile			
Standard strokes ✚	mm	Double acting:	Ø 12 to Ø 25, stroke 5 to 50 mm		
			Ø 32 to Ø 40, stroke 5 to 70 mm		
			Ø 50 to Ø 63, stroke 5 to 110 mm		
			Ø 80 to Ø 100, stroke 5 to 150 mm		
		Single-acting:	Ø 12 to Ø 25, stroke 5 to 25 mm		
			Ø 32 to Ø 63, stroke 5 to 50 mm		
		Anti-rotation:	Ø 12 to Ø 63, stroke 5 to 120 mm		
			Ø 80 to Ø 100, stroke 5 to 150 mm		
		Perforated through-rod:	Ø 20 to Ø 40, stroke 5 to 100 mm		
			Ø 50 to Ø 63, stroke 5 to 130 mm		
			Ø 80 to Ø 100, stroke 5 to 165 mm		
		✚ Maximum recommended strokes. Higher values can create operating problems			
Versions		Double-acting, Double-acting through-rod, Single-acting retracted piston rod, Single acting extended piston rod, Single-acting through-rod, Perforated through-rod, Anti-rotation, Oscillating male, Oscillating female, No stick-slip			
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request			

Inrush pressure		Ø 12	Ø 16	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
single piston rod	bar	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4
through-rod	bar	1	0.8	0.8	0.8	0.6	0.4	0.4	0.4	0.4	0.4

Forces generated at 6 bar thrust/retraction	See cylinder "**General technical data**" at the beginning of the chapter
Weight	See cylinder "**General technical data**" at the beginning of the chapter
Notes	**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air**

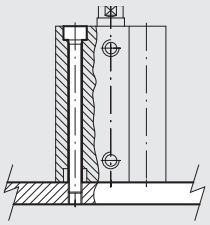
COMPONENTS

① PISTON ROD: C45 steel or stainless steel, thick chromed
② HEAD:
Ø 12 to 25 nichel-plated brass
Ø 32 to 100 anodised aluminium
③ PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
④ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑤ BARREL: drawn anodised aluminium alloy
⑥ HALF-PISTON:
Ø 12 to 63 acetal resin
Ø 80 to 100 in aluminium with PTFE guide pad
⑦ PISTON GASKET: polyurethane, NBR or FKM/FPM
⑧ MAGNET: Ø 12 to 25 neodymium - Ø 32 to 100 plastoferrite
⑨ Static O-rings: NBR or FKM/FPM



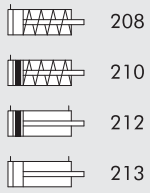
FIXING METHOD

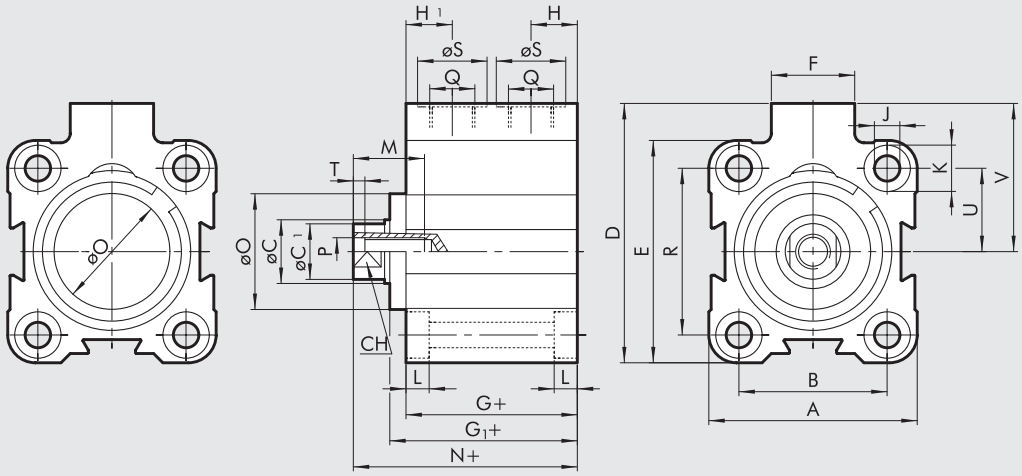
Fix directly from above using long through-screws or tie rods.
Non-magnetic stainless steel must be used (e.g. AISI 304).



DIMENSIONS STANDARD VERSIONS

+ = ADD THE STROKE





DIMENSIONS OF DOUBLE ACTING

Ø	A	B	øC	øC1	D	E	F	G	G1	H	H1	J	K	L	M	N	øO	P	Q	R	øS	CH	T	U	V
12	23.5	13	6	5.5	28	26	11	32.5	-	6.5	10.5	3.7	6	3.7	7	38	-	M3	M5	-	8	5	2	9.5	16.5
16	28	20	8	7.5	33	28	11	33	-	6.7	10.5	3.7	6	3.7	10	37.5	-	M5	M5	20	8	7	2	10	19
20	32	22	10	9	37	32	11	32	-	6.5	10.5	4.6	7.5	4.6	10	37.6	-	M5	M5	22	8	8	2	11	21
25	37	26	10	9	47.5	39	18	33	36.5	8.5	8.5	4.6	7.5	4.6	10	42.5	20	M5	G1/8	28	15	8	2	14	28
32	45	32	12	11	56	48	18	37	40.8	10	10	5.5	10	5.7	15	48.3	25	M6	G1/8	36	15	10	2.5	18	32
40	54.5	40	12	11	62.7	54.5	18	39.5	44.7	10	10	5.5	10	5.7	15	53.2	30	M6	G1/8	40	15	10	2.5	20	35.5
50	66	50	16	15	73	66	18	39.5	46.2	11	11	6.6	11	6.8	18	54.3	35	M8	G1/8	50	15	13	3.5	25	40
63	80	62	16	15	88	80	23	42	48.7	12	12	9	15	9	18	57.7	35	M8	G1/8	62	15	13	3.5	31	48
80	100	82	20	19	110	100	26	57	67.2	14	14	9	15	9	18	75.2	44	M10	G1/4	82	19	17	4	41	60
100	124	103	25	24	134	124	26	64	74.7	15	15	11	18	11	20	84.3	56	M12	G1/4	103	19	22	5	51.5	72

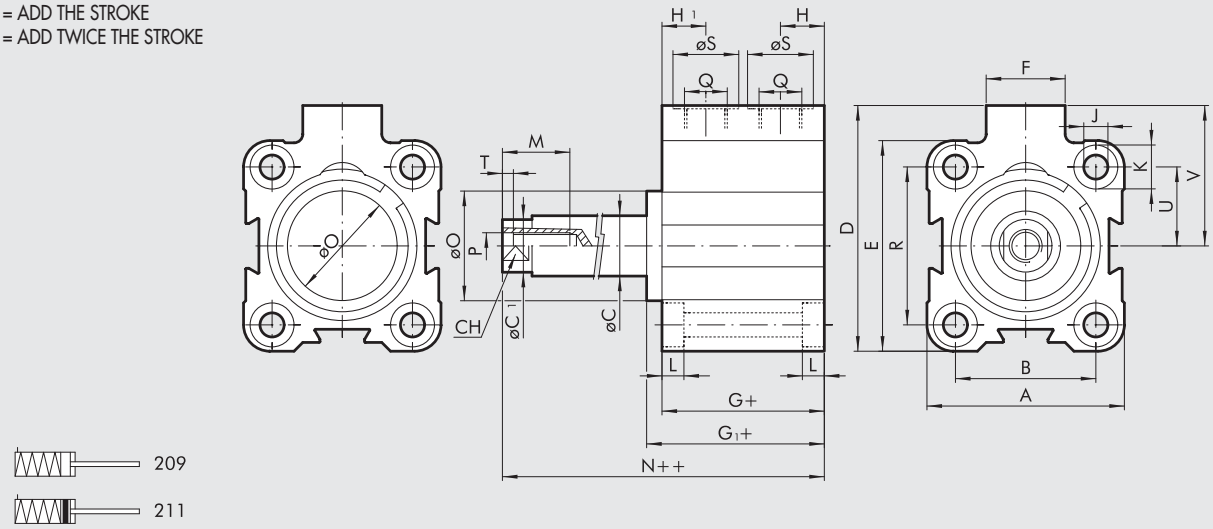
DIMENSIONS OF SINGLE-ACTING, RETRACTED PISTON ROD

Ø	stroke	A	B	øC	øC1	D	E	F	G	G1	H	H1	J	K	L	M	N	øO	P	Q	R	øS	CH	T	U	V
12	5 to 25	23.5	13	6	5.5	28	26	11	32.5	-	6.5	10.5	3.7	6	3.7	7	38	-	M3	M5	-	8	5	2	9.5	16.5
16	5 to 25	28	20	8	7.5	33	28	11	33	-	6.7	10.5	3.7	6	3.7	10	37.5	-	M5	M5	20	8	7	2	10	19
20	5 to 25	32	22	10	9	37	32	11	32	-	6.5	10.5	4.6	7.5	4.6	10	37.6	-	M5	M5	22	8	8	2	11	21
25	5 to 25	37	26	10	9	47.5	39	18	33	36.5	8.5	8.5	4.6	7.5	4.6	10	42.5	20	M5	G1/8	28	15	8	2	14	28
32	5 to 25	45	32	12	11	56	48	18	37	40.8	10	10	5.5	10	5.7	15	48.3	25	M6	G1/8	36	15	10	2.5	18	32
	> 25 to 50								45	48.8							56.3									
40	5 to 25	54.5	40	12	11	62.7	54.5	18	39.5	44.7	10	10	5.5	10	5.7	15	53.2	30	M6	G1/8	40	15	10	2.5	20	35.5
	> 25 to 50								47.5	52.7							61.2									
50	5 to 25	66	50	16	15	73	66	18	39.5	46.2	11	11	6.6	11	6.8	18	54.3	35	M8	G1/8	50	15	13	3.5	25	40
	> 25 to 50								47.5	54.2							62.3									
63	5 to 25	80	62	16	15	88	80	23	42	48.7	12	12	9	15	9	18	62.3	35	M8	G1/8	62	15	13	3.5	31	48
	> 25 to 50								50	56.7							65.7									

METAL WORK PNEUMATIC

DIMENSIONS OF SINGLE-ACTING EXTENDED PISTON ROD

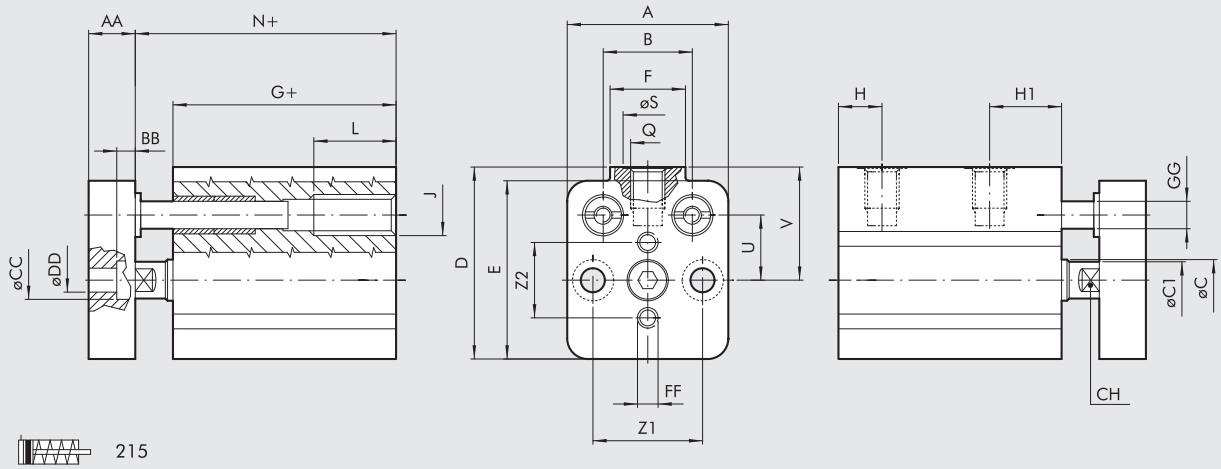
\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

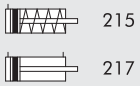


Ø	stroke	A	B	øC	øC1	D	E	F	G	G1	H	H1	J	K	L	M	N	øO	P	Q	R	øS	CH	T	U	V
12	5 to 25	23.5	13	6	5.5	28	26	11	32.5	-	6.5	10.5	3.7	6	3.7	7	38	-	M3	M5	-	8	5	2	9.5	16.5
16	5 to 25	28	20	8	7.5	33	28	11	33	-	6.7	10.5	3.7	6	3.7	10	37.5	-	M5	M5	20	8	7	2	10	19
20	5 to 25	32	22	10	9	37	32	11	32	-	6.5	10.5	4.6	7.5	4.6	10	37.6	-	M5	M5	22	8	8	2	11	21
25	5 to 25	37	26	10	9	47.5	39	18	33	36.5	8.5	8.5	4.6	7.5	4.6	10	42.5	20	M5	G1/8	28	15	8	2	14	28
32	5 to 25	45	32	12	11	56	48	18	37	40.8	10	10	5.5	10	5.7	15	48.3	25	M6	G1/8	36	15	10	2.5	18	32
	> 25 to 50								45	48.8							56.3									
40	5 to 25	54.5	40	12	11	62.7	54.5	18	39.5	44.7	10	10	5.5	10	5.7	15	53.2	30	M6	G1/8	40	15	10	2.5	20	35.5
	> 25 to 50								47.5	52.7							61.2									
50	5 to 25	66	50	16	15	73	66	18	39.5	46.2	11	11	6.6	11	6.8	18	54.3	35	M8	G1/8	50	15	13	3.5	25	40
	> 25 to 50								47.5	54.2							62.3									
63	5 to 25	80	62	16	15	88	80	23	42	48.7	12	12	9	15	9	18	57.7	35	M8	G1/8	62	15	13	3.5	31	48
	> 25 to 50								50	56.7							65.7									

DIMENSIONS OF Ø 12 ANTI-ROTATION

\+ = ADD THE STROKE

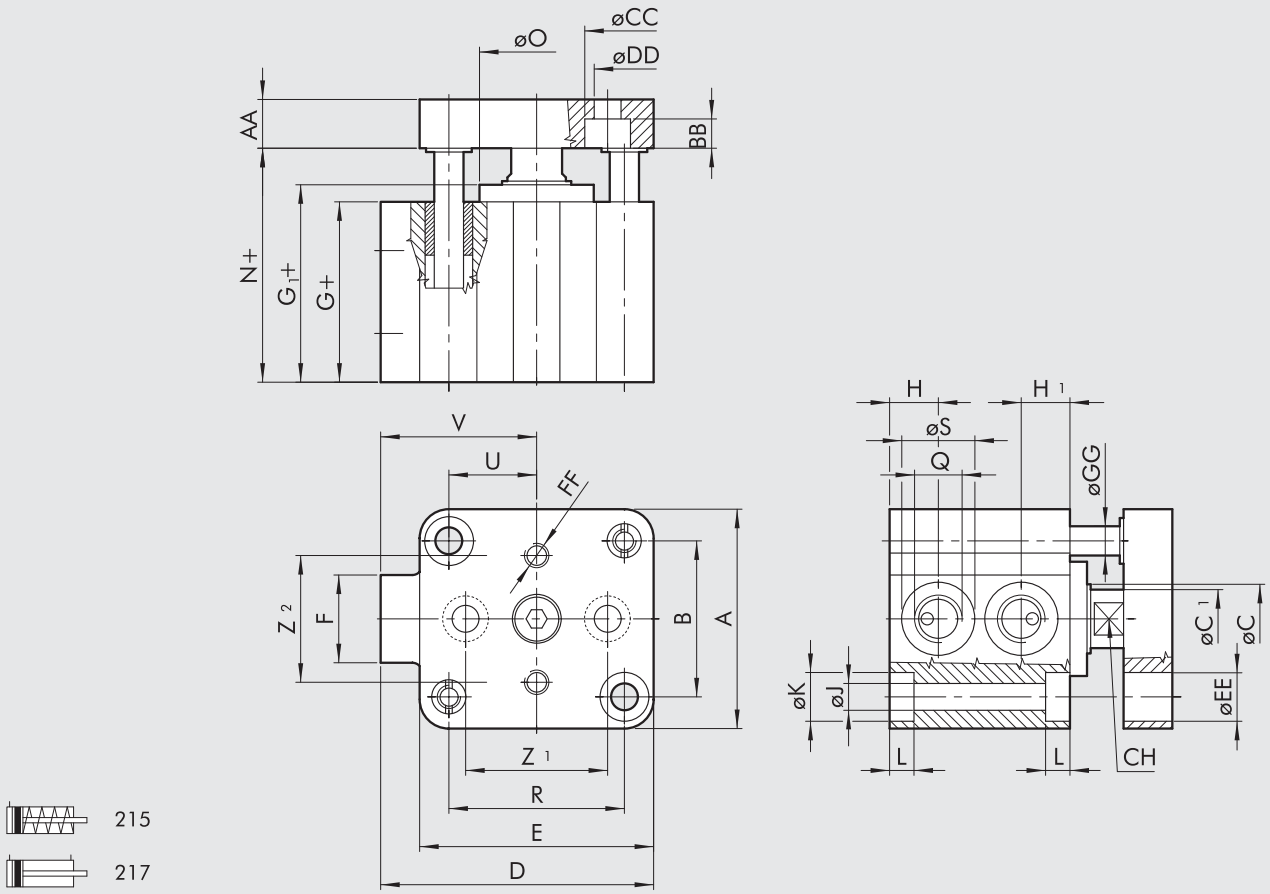




Ø	A	B	øC	øC1	D	E	F	G	H	H1	J	L	N	Z1	Z2	Q	øS	CH	U	V	AA	BB	øCC	øDD	FF	øGG
12	23.5	13	6	5.5	28	26	11	32.5	6.5	10.5	M6	12	38	16	11	M5	8	5	9.5	16.5	8	3.5	6	3.5	M3	4

DIMENSIONS OF Ø 16 TO Ø 100 ANTI-ROTATION

+ = ADD THE STROKE



DOUBLE ACTING VERSION (217)

Ø	A	B	øC	øC1	D	E	F	G	G1	H	H1	J	K	L	N	Z1	Z2	Q	R	øS	CH	U	V	AA	BB	øCC	øDD	øEE	FF	øGG	øO
16	28	20	8	7.5	33	28	11	33	-	6.7	10.5	3.7	6	3.7	37.5	20	15	M5	20	8	7	10	19	8	3.5	6	3.5	6	M3	4	-
20	32	22	10	9	37	32	11	32	-	6.5	10.5	4.6	7.5	4.6	37.6	22	18	M5	22	8	8	11	21	8	5	7.5	4.5	7.5	M4	6	-
25	37	26	10	9	47.5	39	18	33	36.5	8.5	8.5	4.6	7.5	4.6	42.5	22	22	G1/8	28	15	8	14	28	8	5	7.5	4.5	8	M4	6	20
32	45	32	12	11	56	48	18	37	40.8	10	10	5.5	10	5.7	48.3	26	26	G1/8	36	15	10	18	32	10	6	10	5.5	10	M5	8	25
40	54.5	40	12	11	62.7	54.5	18	39.5	44.7	10	10	5.5	10	5.7	53.2	34	34	G1/8	40	15	10	20	35.5	10	6	10	5.5	10	M5	8	30
50	66	50	16	15	73	66	18	39.5	46.2	11	11	6.6	11	6.8	54.3	43	43	G1/8	50	15	13	25	40	12	7	11	6.5	11	M6	10	35
63	80	62	16	15	88	80	23	42	48.7	12	12	9	15	9	57.7	55	55	G1/8	62	15	13	31	48	12	9	14	9	15	M6	10	35
80	100	82	20	19	110	100	26	57	67.2	14	14	9	15	9	75.2	70	70	G1/4	82	19	17	41	60	14	9	14	9	15	M8	12	44
100	124	103	25	24	134	124	26	64	74.7	15	15	11	18	11	84.3	94	94	G1/4	103	19	22	51.5	72	17	9	14	9	18	M8	12	56

SINGLE-ACTING THROUGH-ROD VERSION (215)

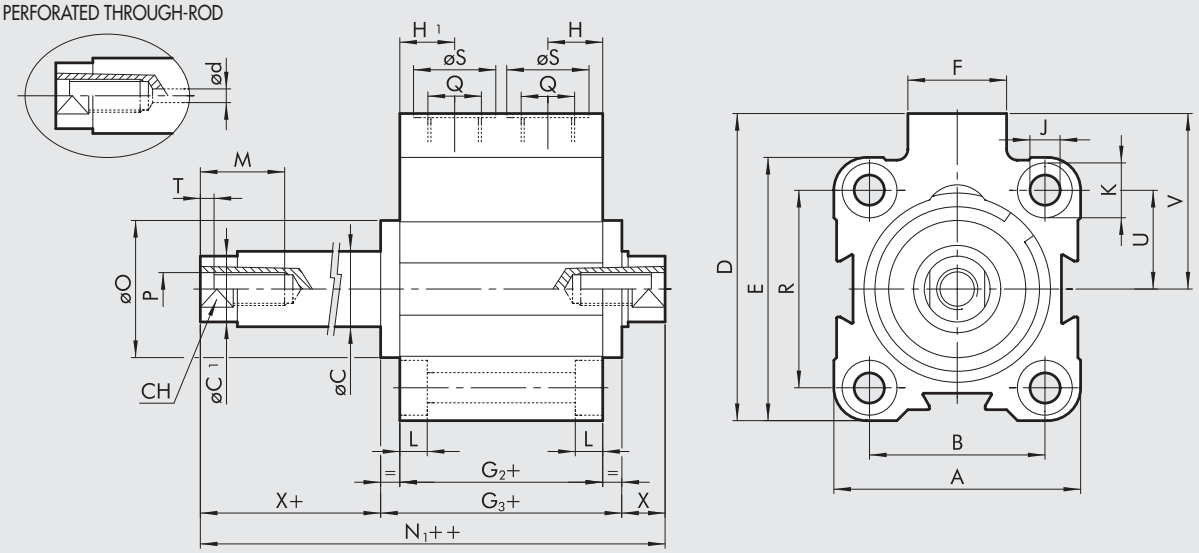
Ø	Hub	A	B	øC	øC1	D	E	F	G	G1	H	H1	J	K	L	M	N	øO	P	Q	R	øS	CH	T	U	V
16	5 - 25	28	20	8	7.5	33	28	11	33	-	6.7	10.5	3.7	6	3.7	10	37.5	-	M5	M5	20	8	7	2	10	19
20	5 - 25	32	22	10	9	37	32	11	32	-	6.5	10.5	4.6	7.5	4.6	10	37.6	-	M5	M5	22	8	8	2	11	21
25	5 - 25	37	26	10	9	47.5	39	18	33	36.5	8.5	8.5	4.6	7.5	4.6	10	42.5	20	M5	G1/8	28	15	8	2	14	28
32	5 - 25	45	32	12	11	56	48	18	37	40.8	10	10	5.5	10	5.7	15	48.3	25	M6	G1/8	36	15	10	2.5	18	32
	> 25 - 50								45	48.8							56.3									
40	5 - 25	54.5	40	12	11	62.7	54.5	18	39.5	44.7	10	10	5.5	10	5.7	15	53.2	30	M6	G1/8	40	15	10	2.5	20	35.5
	> 25 - 50								47.5	52.7							61.2									
50	5 - 25	66	50	16	15	73	66	18	39.5	46.2	11	11	6.6	11	6.8	18	54.3	35	M8	G1/8	50	15	13	3.5	25	40
	> 25 - 50								47.5	54.2							62.3									
63	5 - 25	80	62	16	15	88	80	23	42	48.7	12	12	9	15	9	18	57.7	35	M8	G1/8	62	15	13	3.5	31	48
	> 25 - 50								50	56.7							65.7									

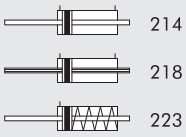
METAL WORK PNEUMATIC

DIMENSIONS OF THROUGH-ROD

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

PERFORATED THROUGH-ROD





DIMENSION OF DOUBLE ACTING THROUGH-ROD AND PERFORATED THROUGH-ROD

Ø	A	B	øC	øC1	D	ød**	E	F	G2	G3	H	H1	J	K	L	M	N1	øO	P	Q	R	øS	CH	T	U	V	X*
12	23.5	13	6	5.5	28	-	26	11	36.7	-	10.5	10.5	3.7	6	3.7	7	47.7	-	M3	M5	-	8	5	2	9.5	16.5	5.5
16	28	20	8	7.5	33	-	28	11	36.8	-	10.5	10.5	3.7	6	3.7	10	45.8	-	M5	M5	20	8	7	2	10	19	4.5
20	32	22	10	9	37	1.5	32	11	36	-	10.5	10.5	4.6	7.5	4.6	10	47.2	-	M5	M5	22	8	8	2	11	21	5.6
25	37	26	10	9	47.5	1.5	39	18	35.7	42.7	8.5	8.5	4.6	7.5	4.6	10	54.7	20	M5	G1/8	28	15	8	2	14	28	6
32	45	32	12	11	56	2.5	48	18	37	44.5	10	10	5.5	10	5.7	15	59.5	25	M6	G1/8	36	15	10	2.5	18	32	7.5
40	54.5	40	12	11	62.7	2.5	54.5	18	39.5	49.9	10	10	5.5	10	5.7	15	66.9	30	M6	G1/8	40	15	10	2.5	20	35.5	8.5
50	66	50	16	15	73	2.5	66	18	39.5	52.9	11	11	6.6	11	6.8	18	69.1	35	M8	G1/8	50	15	13	3.5	25	40	8.1
63	80	62	16	15	88	4	80	23	42	55.4	12	12	9	15	9	18	73.4	35	M8	G1/8	62	15	13	3.5	31	48	9
80	100	82	20	19	110	5	100	26	57	77.4	14	14	9	15	9	18	93.4	44	M10	G1/4	82	19	17	4	41	60	8
100	124	103	25	24	134	6	124	26	64	85.4	15	15	11	18	11	20	104.6	56	M12	G1/4	103	19	22	5	51.5	72	9.6

* for Ø 12, 16, 20: $(N_1++) = (G_2+) + (X) + (X+)$
** column for perforated through-rod only

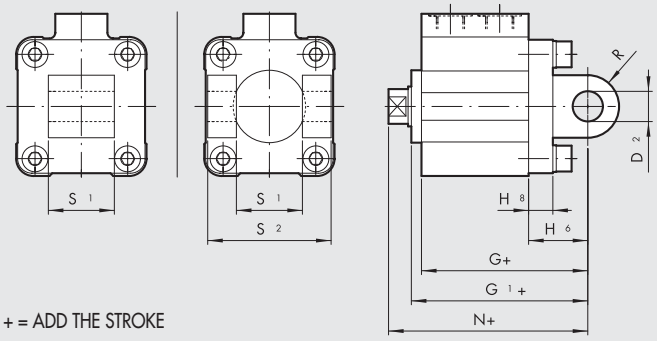
DIMENSION OF SINGLE-ACTING THROUGH-ROD

Ø	stroke	A	B	øC	øC1	D	E	F	G2	G3	H	H1	J	K	L	M	N1	øO	P	Q	R	øS	CH	T	U	V	X*
12	5 to 25	23.5	13	6	5.5	28	26	11	36.7	-	10.5	10.5	3.7	6	3.7	7	47.7	-	M3	M5	-	8	5	2	9.5	16.5	5.5
16	5 to 25	28	20	8	7.5	33	28	11	36.8	-	10.5	10.5	3.7	6	3.7	10	45.8	-	M5	M5	20	8	7	2	10	19	4.5
20	5 to 25	32	22	10	9	37	32	11	36	-	10.5	10.5	4.6	7.5	4.6	10	47.2	-	M5	M5	22	8	8	2	11	21	5.6
25	5 to 25	37	26	10	9	47.5	39	18	35.7	42.7	8.5	8.5	4.6	7.5	4.6	10	57.7	20	M5	G1/8	28	15	8	2	14	28	6
32	5 to 25	45	32	12	11	56	48	18	37	44.5	10	10	5.5	10	5.7	15	59.5	25	M6	G1/8	36	15	10	2.5	18	32	7.5
	> 25 to 50								45	52.5							67.5										7.5
40	5 to 25	54.5	40	12	11	62.7	54.5	18	39.5	49.9	10	10	5.5	10	5.7	15	66.9	30	M6	G1/8	40	15	10	2.5	20	35.5	8.5
	> 25 to 50								47.5	57.9							74.9										8.5
50	5 to 25	66	50	16	15	73	66	18	39.5	52.9	11	11	6.6	11	6.8	18	69.1	35	M8	G1/8	50	15	13	3.5	25	40	8.1
	> 25 to 50								47.5	60.9							77.1										8.1
63	5 to 25	80	62	16	15	88	80	23	42	55.4	12	12	9	15	9	18	73.4	35	M8	G1/8	62	15	13	3.5	31	48	9
	> 25 to 50								50	63.4							81.4										9

* for Ø 12, 16, 20: $(N_1++) = (G_2+) + (X) + (X+)$

DIMENSIONS: SAME AS 221 VERSION (MALE HINGE MOD. BA) - SAME AS 222 VERSION (FEMALE HINGE MOD. B)

VERSION 221 VERSION 222



+ = ADD THE STROKE

Ø	Stroke	D_2	G	G_1	H_6	H_8	N	R	S_1	S_2
32	5 to 70	10	59	62.8	22	10	70.3	11	26	45
40	5 to 70	12	64.5	69.7	25	10	78.2	13	28	52
50	5 to 110	12	66.5	73.2	27	12	80.2	13	32	60
63	5 to 110	16	74	80.7	32	12	89.7	17	40	70

Note: For other dimensions, refer to the standard version

KEY TO CODES

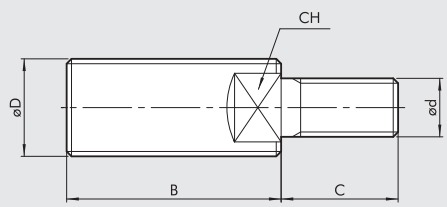
CYL	2 1 2 TYPE	0	4 0 BORE	0 0 1 0 STROKE	C MATERIAL	P GASKETS
	■ **208** Single-acting retracted rod, non-magnetic	**0** Standard	12	For the maximum suppliable strokes, look at the technical data	**C** C45 chrome rod, technopolymer piston rod Ø 12 to 63 mm	**P** Polyurethane gaskets
	■ **209** Single-acting extended rod, non-magnetic	**S** Non-magnetic	16		**A** C45 chrome rod, aluminium piston rod (standard Ø 80 to 100 mm)	**N** NBR gaskets
	■ **210** Single-acting, retracted rod	▲ **G** No stick-slip	20		**X** Stainless steel piston rod and nut technopolymer piston Ø 12 to 63 mm	● **V** FKM/FPM gaskets
	■ **211** Single acting, extended rod		25		**Z** Stainless steel piston rod and nut aluminium piston (standard Ø 80 to 100 mm)	● **B** Low temperature
	212 Double acting, magnetic		32			
	213 Double acting, non-magnetic		40			
	214 Double acting, through-rod		50			
	■ **215** Single-acting, retracted, anti-rotation		63			
	217 Double acting, anti-rotation		80			
	▼ **218** Double acting, perforated through-rod		◆ 100			
	221 Oscillating male hinge (up to Ø 63 only)					
	222 Oscillating female hinge (up to Ø 63 only)					
	■ **223** Single-acting, through-rod					

◆ In the code of cylinder with letter in fourth position Ø 100 becomes A1
■ Available up to Ø 63
▼ Available from Ø 20

● Only available for non-magnetic versions (S) and with aluminium piston (A or Z)
▲ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only**

ACCESSORIES

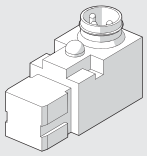
MALE NIPPLE FOR PISTON ROD



Code	Ø	Ø D	Ø d	B	C	CH	Weight [g]
219001200	**12**	M6	M3	16	6	4	3
219001600	**16**	M8	M5	20	9	6	8
219001600	**20**	M8	M5	20	9	6	8
219002500	**25**	M10x1.25	M5	22	9	7	12
219003200	**32**	M10x1.25	M6	22	12	7	14
219004000	**40**	M12x1.25	M6	24	12	10	14
219005000	**50**	M16x1.5	M8	32	15	13	20
219005000	**63**	M16x1.5	M8	32	15	13	20
219008000	**80**	M20x1.5	M10	40	15	17	96
219010000	**100**	M20x1.5	M12	40	18	17	102

MAGNETIC SENSORS

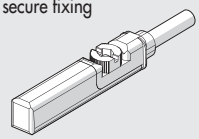
SENSOR SERIES DCB



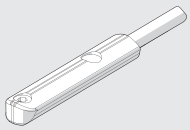
For codes and technical data, see **chapter A6**.

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

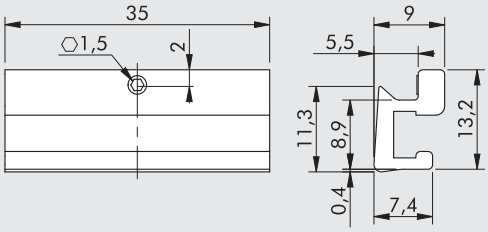


SENSOR, OVAL TYPE
Traditional



For codes and technical data, see **chapter A6**.

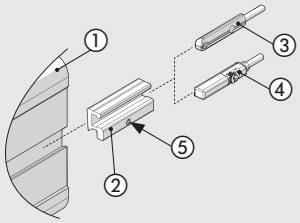
ADAPTER FOR RETRACTABLE SENSOR SQUARE AND OVAL TYPES



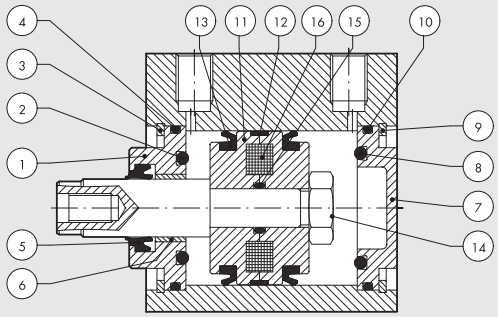
Code	Ø	Description
W0950001801	Ø 12 to 100	Sensor Adapter for SSC cylinders

ASSEMBLY DIAGRAM

① SSCY cylinder
② Sensor adapter for SSCY cylinders
③ Retractable sensor "oval type"
④ Retractable sensor "square type"
⑤ Grub screw for fixing adapter on profile



SPARES PARTS FOR SHORT-STROKE CYLINDERS



Code	Bores	Type	Parts
009 . . . 0010	Ø 12 to 100	Complete polyurethane front head kit	① ② ③ ④ ⑤ ⑥
009 . . . 0011	Ø 12 to 100	Complete NBR front head kit	① ② ③ ④ ⑤ ⑥
009 . . . 0015	Ø 12 to 100	Complete NBR rear head kit	⑦ ⑧ ⑨ ⑩
009 . . . 0021	Ø 12 to 100	Complete polyurethane piston kit	⑪ ⑫ ⑬ ⑭ ⑮
009 . . . 0023	Ø 12 to 100	Complete NBR piston kit	⑪ ⑫ ⑬ ⑭ ⑮
009 . . . 0005	Ø 12 to 100	Complete set of polyurethane gaskets	② ④ ⑤ ⑧ ⑩ ⑬ ⑮
009 . . . 0006	Ø 12 to 100	Complete set of NBR gaskets	② ④ ⑤ ⑧ ⑩ ⑬ ⑮
009 . . . 0007	Ø 12 to 100	Complete set of (high temperature) FKM/FPM gaskets	② ④ ⑤ ⑧ ⑩ ⑬ ⑮
009 . . . 2008	Ø 12 to 63	Polyurethane piston rod gasket kit	⑤
009 . . . 2008	Ø 80 to 100	Polyurethane piston rod gasket kit + seeger	⑤
009 . . . 2009	Ø 12 to 63	NBR piston rod gasket kit	⑤
009 . . . 2009	Ø 80 to 100	NBR piston rod gasket kit + seeger	⑤
009 . . . 2010	Ø 12 to 63	FKM/FPM piston rod gasket kit	⑤
009 . . . 2010	Ø 80 to 100	FKM/FPM piston rod gasket kit + seeger	⑤
009 . . . 0031	Ø 12 to 100	Complete polyurethane front+rear head kit + piston	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮
009 . . . 0033	Ø 12 to 100	Complete NBR front + rear head kit + piston	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮
009 . . . 0001	Ø 12 to 100	Magnet	⑯

CARTRIDGE MICRO-CYLINDER SERIES CRTC

Single-acting micro-cylinders with threaded body for fixing in small space or directly inside the machine body, owing to the external O-ring which ensures perfect seal.

ATTENTION: in case of cycles with high frequences it's advisable that the piston doesn't reach the end of the stroke during the rod coming out stage.

TECHNICAL DATA

Operating pressure	bar	2 to 6
	MPa	0.2 to 0.6
Temperature range	°C	–10 to +80
Fluid		Lubricated or unlubricated air.
		Lubrication, if used, must be continuous
Bores	mm	6; 10; 16
Strokes	mm	5; 10; 15
Port		M5
Versions		Single-acting
Design		Mechanically edged

Seal OR on the body (not included in the supply)

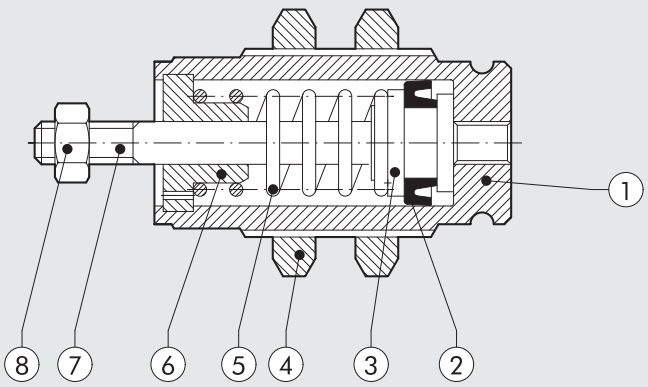
Ø	OR
6	7x1
10	9.5x1.5
16	16x1.5

Weight g

Ø	STROKE		
	5	10	15
6	14	16	19
10	30	35	40
16	76	84	90

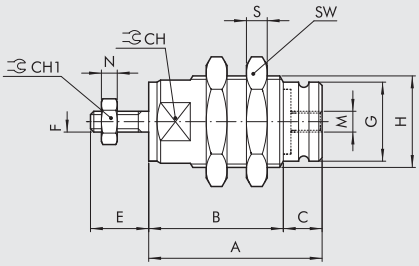
COMPONENTS

① Nickel-plated brass body
② NBR rubber piston rod gasket (for Ø 6), polyurethane (for Ø 10 - Ø 16)
③ AISI 303 steel piston/piston rod (for Ø 6 - Ø 10) Brass piston (for Ø 16)
④ Steel spring
⑤ Zinc-plated steel nut
⑥ Brass bushing
⑦ AISI 303 steel piston rod (for Ø 16)
⑧ Zinc-plated steel nut



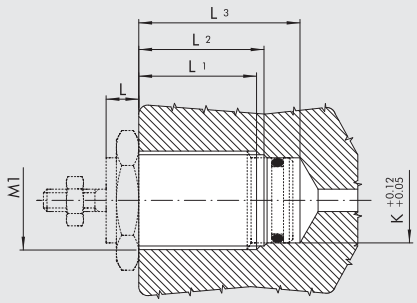
METAL WORK PNEUMATIC

CARTRIDGE CYLINDER DIMENSIONS, Ø 6, 10, 16



Ø	A Stroke 5	A Stroke 10	A Stroke 15	B Stroke 5	B Stroke 10	B Stroke 15	C	CH	CH1	E	F	G	H	M	N	S	SW
6	19.5	26.5	33.5	14.5	21.5	28.5	5	9	5.5	8	M3	8.5	M10x1	M5	2.4	3	14
10	23	29.5	36.5	16	22.5	29.5	7	14	7	10.5	M4	12	M15x1.5	M5	2	4	19
16	27	32	37	21	26	31	6	20	8	13	M5	19	M22x1.5	M5	4	5	27

ASSEMBLY SEAT DIMENSIONS



Ø	L Stroke 5	L Stroke 10	L Stroke 15	L1 Stroke 5	L1 Stroke 10	L1 Stroke 15	L2 Stroke 5	L2 Stroke 10	L2 Stroke 15	L3 Stroke 5	L3 Stroke 10	L3 Stroke 15	K	Hole	M1
6	5	5	5	10	17	24	11	18	25	16	24	31	8.5	9	M10x1
10	6	6	6	10	17	24	12	18.5	25.5	20	26	34	12	13.5	M15x1.5
16	7	7	7	14	19	24	15	20	25	26	31	36	19	20.5	M22x1.5

KEY TO CODES

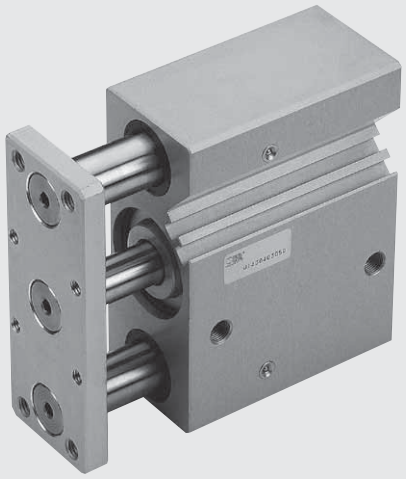
Code	Description
W1000060005	CYL. CRTC-006-0005-S000-00
W1000060010	CYL. CRTC-006-0010-S000-00
W1000060015	CYL. CRTC-006-0015-S000-00
W1000100005	CYL. CRTC-010-0005-S000-00
W1000100010	CYL. CRTC-010-0010-S000-00
W1000100015	CYL. CRTC-010-0015-S000-00
W1000160005	CYL. CRTC-016-0005-S000-00
W1000160010	CYL. CRTC-016-0010-S000-00
W1000160015	CYL. CRTC-016-0015-S000-00

KEY TO CODES

CYL	C R T C	0 1 0	0 0 1 0	S 0 0 0	0 0	0 0
	TYPE	DIAMETER	STROKE	TYPE	FURTHER DESCRIPTION	SPECIAL DESIGN
	Cartridge microcylinder	006 010 016	0005 0010 0015	Single-acting retracted piston rod		

COMPACT GUIDED CYLINDER SERIES CMPG

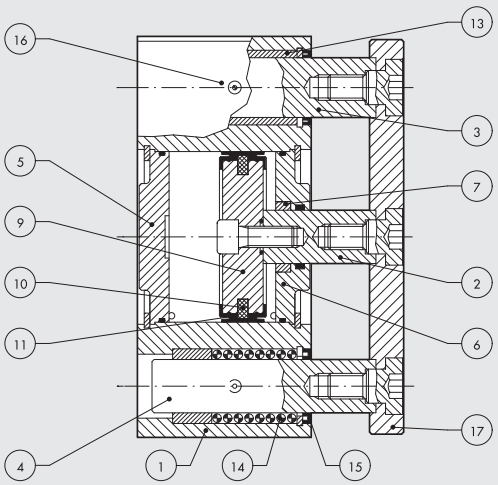
The guided compact cylinder series CMPG is a robust and practical solution with a built-in guide unit. The rod guiding bushes are mounted directly in the anodized aluminium alloy lining.
Two guiding solutions are available: sintered bronze bushes coupled with ground carbon chromed steel rods, or ball recirculation bushes coupled with tempered, chromed and ground steel rods.
There are grooves on one side of the body to house the retractable sensors.
In the non-cushioned version, the stop is silenced by NBR front gaskets, and the cushioned version has adjustable pins to graduate braking.
Threaded holes and calibrated holes are provided for fixing the dowel pins.



TECHNICAL DATA		CUSHIONED	NO-CUSHIONED
Operating pressure	bar	1 to 10	
	MPa	0.1 to 1	
	psi	14.5 to 145	
Temperature range	°C	-10 to +80	
	°F	14 to 176	
Fluid		Unlubricated air. Lubrication, if used, mast be continuos	
Bores	mm	16; 20; 25; 32; 40; 50; 63	16; 20; 25; 32; 40; 50; 63; 80; 100
Strokes	mm	**Ø 16:** 20 - 30-40-50	**Ø 16:** 10-20-25-30-40-50-75-100-150-200
		Ø 20; Ø 25: 20-30-40-50-75-100-150	**Ø 20; Ø 25:** 20-25-30-40-50-75-100-150-200
		Ø 32 to Ø 63: 25-50-75-100-150-175	**Ø 32 to Ø 100:** 25-50-75-100-150-200
			Other strokes on request but with the same cylinder dimensions as the standard stroke immediately above
Version		With bronze bushings With ball bearings	
Weights		See cylinder "**General technical data**" at the beginning of the chapter	

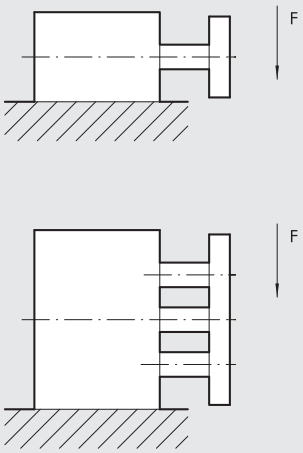
COMPONENTS

① BARREL: anodized aluminium alloy
② PISTON ROD: grinded chrome steel
③ GUIDE ROD: grinded chrome steel
④ GUIDE ROD: hardened and tempered chrome steel
⑤ REAR BASE: anodized aluminium alloy
⑥ FRONT BASE: anodized aluminium alloy
⑦ GUIDE BUSHING: self-lubricating bronze
⑨ PISTON: aluminium alloy
⑩ MAGNET: plastoferrite
⑪ PISTON GASKET: polyurethane
⑬ SLIDE BUSHING: sintered bronze
⑭ BALL BEARINGS
⑮ DUST SCRAPER RING: NBR or FKM/FPM
⑯ GREASE NIPPLES: zinc-plated or stainless steel
⑰ FLANGE: anodized aluminium alloy



METAL WORK PNEUMATIC

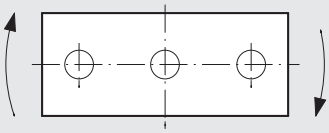
MAXIMUM SIDE LOAD



Ø	Guide unit	Stroke (mm)										
mm		10	20	25	30	40	50	75	100	150	175	200
16	Bushes	35	29	27	26	23	20	16	14	10	–	8
	Balls	29	31	–	27	38	34	29	24	12	–	8
20	Bushes	–	52	50	45	39	35	58	49	38	–	31
	Balls	–	56	–	48	79	70	54	50	27	–	32
25	Bushes	–	71	67	61	54	48	78	66	50	–	41
	Balls	–	72	–	62	78	73	60	52	37	–	30
32	Bushes	–	–	197	–	–	168	138	109	78	70	65
	Balls	–	–	89	–	–	60	276	217	138	122	110
40	Bushes	–	–	197	–	–	168	138	109	78	70	65
	Balls	–	–	89	–	–	60	276	217	138	122	110
50	Bushes	–	–	295	–	–	256	216	177	125	112	103
	Balls	–	–	138	–	–	89	393	314	184	163	148
63	Bushes	–	–	295	–	–	256	216	177	125	112	103
	Balls	–	–	138	–	–	89	393	314	184	163	148
80	Bushes	–	–	354	–	–	305	256	207	153	–	128
	Balls	–	–	236	–	–	158	864	687	413	–	335
100	Bushes	–	–	540	–	–	471	413	344	254	–	213
	Balls	–	–	471	–	–	314	1374	1074	629	–	511

N.B.: Forces are expressed in N

MAXIMUM TORQUE ON PLATE

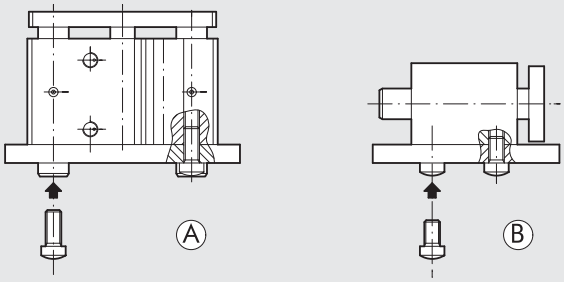


Ø	Guide unit	Stroke (mm)										
mm		10	20	25	30	40	50	75	100	150	175	200
16	Bushes	0.51	0.45	0.40	0.36	0.32	0.28	0.24	0.20	0.46	–	0.12
	Balls	0.74	0.60	–	0.50	0.72	0.65	0.54	0.45	0.35	–	0.25
20	Bushes	–	0.92	0.85	0.79	0.72	0.64	1.05	0.90	0.69	–	0.56
	Balls	–	1.28	–	1.08	1.78	1.59	1.24	1	0.61	–	0.49
25	Bushes	–	1.55	1.42	1.32	1.18	1.04	1.70	1.44	1.10	–	0.90
	Balls	–	1.98	–	1.70	2.16	2.20	1.66	1.4	1.02	–	0.82
32	Bushes	–	–	3.94	–	–	2.95	2.46	1.97	1.55	1.38	1.24
	Balls	–	–	1.97	–	–	1	2.96	2.44	2.40	2.43	2.18
40	Bushes	–´	–	4.40	–	–	3.45	2.96	2.46	1.70	1.55	1.40
	Balls	–	–	2.46	–	–	1.45	6.38	5.4	3	2.73	2.40
50	Bushes	–	–	7.36	–	–	5.9	4.90	4.4	3	2.78	2.50
	Balls	–	–	3.45	–	–	2.44	10.8	8.35	4.5	4.06	3.60
63	Bushes	–	–	7.85	–	–	6.38	5.40	4.9	3.4	3.05	2.80
	Balls	–	–	3.94	–	–	2.46	11.77	9.3	5	4.46	4
80	Bushes	–	–	11.78	–	–	9.80	7.84	6.88	5.30	–	4.40
	Balls	–	–	9.34	–	–	5.88	31.38	24.5	10.40	–	11.7
100	Bushes	–	–	22.55	–	–	19.62	16.68	14.7	10.65	–	8.90
	Balls	–	–	21.56	–	–	13.73	63.72	49.1	26.6	–	21.6

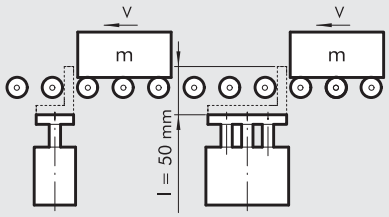
N.B.: Forces are expressed in Nm

ASSEMBLY OPTIONS

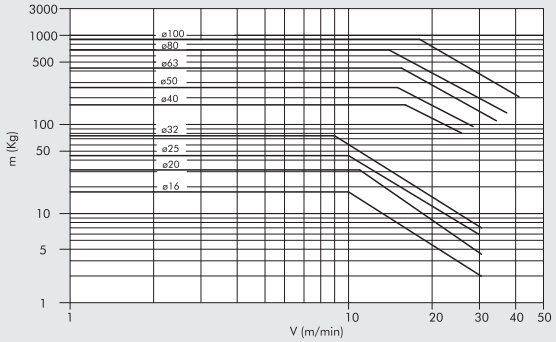
If the compact guided cylinder is mounted as shown in figure A, there need to be two through holes in the frame for the guide columns.



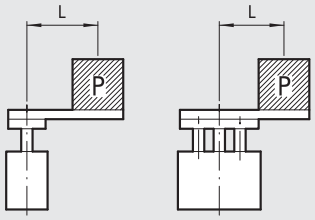
STOPPER FUNCTIONS



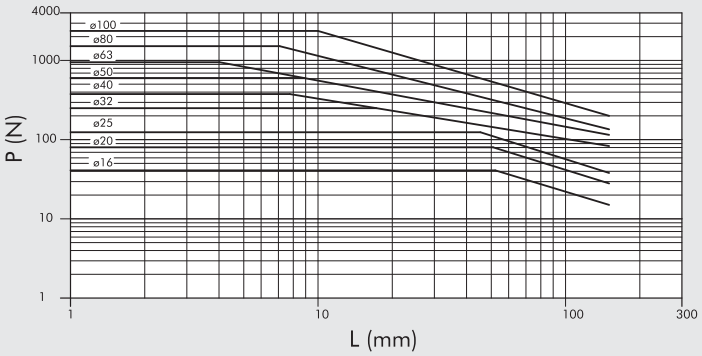
The graph refers to a 50mm-stroke cylinder with bushing guide unit



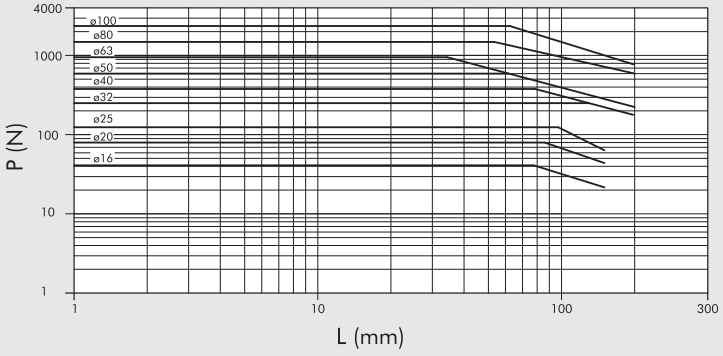
LIFTING FUNCTIONS



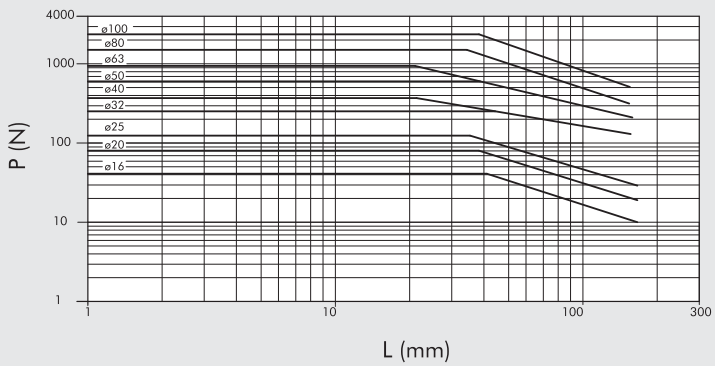
The graph refers from 25 to 50 mm-stroke cylinders with ball re-circulation guide unit



The graph refers from 75 to 100 mm-stroke cylinders with ball re-circulation guide unit



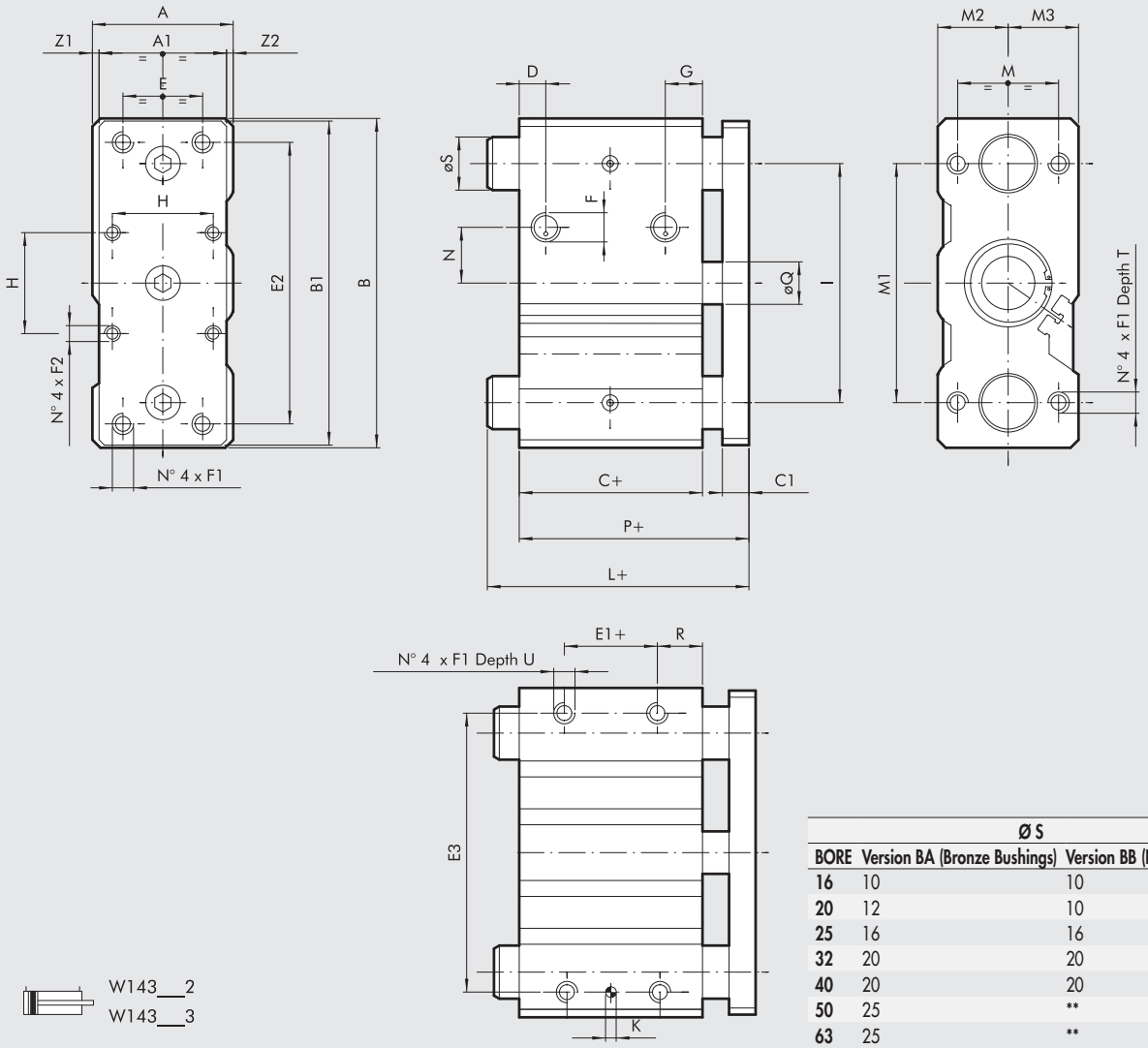
The graph refers to 50 mm-stroke cylinders with bushing guide unit



METAL WORK PNEUMATIC

DIMENSIONS OF NO-CUSHIONED COMPACT GUIDED CYLINDERS

+ = ADD THE STROKE



W143___2
W143___3

	Ø S	
BORE	**Version BA (Bronze Bushings)**	**Version BB (Ball Bearings)**
16	10	10
20	12	10
25	16	16
32	20	20
40	20	20
50	25	**
63	25	**
80	28	25
100	35	30

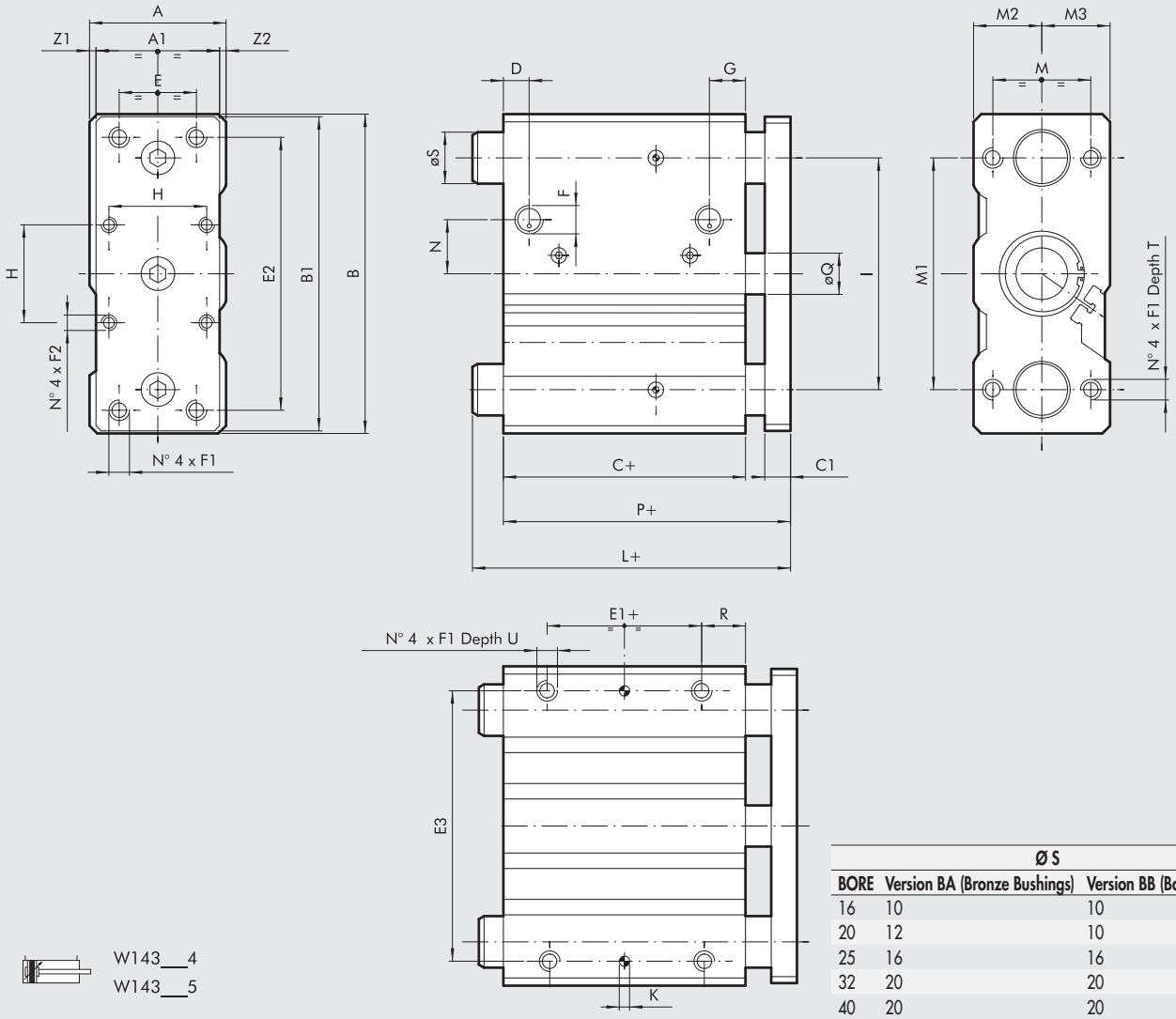
** for strokes 25 and 50 = 20
for strokes ≥75 = 25

* =	stroke	
BORE	**0 to 50**	**75 to 200**
16	55	74.5
20	49	79
25	49.5	79.5

Ø	A	A1	B	B1	C	C1	D	E	E1	E2	E3	F	F1	F2	G	H	K^{H7}	I	L	M	M1	M2	M3	N	P	ØQ	R	T	U	Z1	Z2
16	33	25	64	62	33	10	9	16	7	52	54	M5	M5	–	10.5	–	4	40	*	22	42	15	18	6	46	8	13	20	8	5.5	2.5
20	36	29	74	72	37	10	9	18	10	60	64	1/8	M5	–	11	–	5	46	*	26	52	17	19	8	49	10	13	20	8	4.5	2.5
25	42	38	88	86	37.5	10	9	26	10	70	76	1/8	M6	–	11.5	–	5	56	*	32	62	21	21	8	49.5	12	14	25	9	2	2
32	51	48	114	112	37.5	10	9	30	5	96	100	1/8	M8	M6	12.5	32.5	6	80	73.5	38	80	25.5	25.5	14	49.5	16	16	20	11	1.5	1.5
40	51	48	124	122	44	10	11	30	10	106	110	1/8	M8	M6	14	38	6	90	73.5	38	90	25.5	25.5	21	56	16	17	20	11	1.5	1.5
50	59	56	140	138	44	12	11	40	10	120	124	1/4	M10	M8	14	46.5	6	100	83	44	100	29.5	29.5	27	58	20	17	25	12.5	1.5	1.5
63	72	69	150	148	49	12	11	50	10	130	132	1/4	M10	M8	14	56.5	6	110	83	44	110	36	36	33	63	20	20	25	15	1.5	1.5
80	92	88	188	185	56.5	16	15.5	60	15	160	166	3/8	M12	M10	19	72	6	140	93	56	140	46	46	36	74.5	25	21	30	18	2	2
100	112	108	224	221	66	16	19	80	15	190	200	3/8	M14	M10	23	89	8	170	105	62	170	56	56	40	84	30	25	35	21	2	2

DIMENSIONS OF CUSHIONED COMPACT GUIDED CYLINDERS

+ = ADD THE STROKE



W143__4
W143__5

	Ø S	
BORE	Version BA (Bronze Bushings)	Version BB (Ball Bearings)
16	10	10
20	12	10
25	16	16
32	20	20
40	20	20
50	25	**
63	25	**

** for strokes 25 and 50 = 20
for strokes ≥75 = 25

* =	stroke	
BORE	0 to 50	75 to 200
16	73	–
20	78	105.5
25	78.5	108.5

Ø	A	A1	B	B1	C	C1	D	E	E1	E2	E3	F	F1	F2	G	H	K^{H7}	I	L	M	M1	M2	M3	N	P	ØQ	R	T	U	Z1	Z2
16	33	25	64	62	58	10	9	16	32	52	54	M5	M5	–	10.5	–	4	40	*	22	42	15	18	8	73	8	13	20	8	5.5	2.5
20	36	29	74	72	62	10	9	18	35	60	64	1/8	M5	–	11	–	5	46	*	26	52	16.5	19.5	8.5	78	10	13	20	8	4.5	2.5
25	42	38	88	86	62.5	10	9	26	35	70	76	1/8	M6	–	11.5	–	5	56	*	32	62	21	21	13.5	78.5	12	14	25	9	2	2
32	51	48	114	112	62.5	10	9	30	30	96	100	1/8	M8	M6	12.5	32.5	6	80	106.5	38	80	25.5	25.5	15	82.5	16	16.5	20	11	1.5	1.5
40	51	48	124	122	69	10	11	30	35	106	110	1/8	M8	M6	14	38	6	90	106.5	38	90	25.5	25.5	20.5	89	16	17	20	11	1.5	1.5
50	59	56	140	138	69	12	11	40	35	120	124	1/4	M10	M8	14	46.5	6	100	118	44	100	29.5	29.5	37	93	20	17	25	12.5	1.5	1.5
63	72	69	150	148	74	12	11	50	35	130	132	1/4	M10	M8	14	56.5	6	110	118	44	110	36	36	31.5	98	20	20	25	15	1.5	1.5

METAL WORK PNEUMATIC

KEY TO CODES

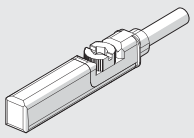
W 1 4 3	0 3 2	2	0 2 5
TYPE	**DIAMETER**	**VERSION**	**STROKE**
	16 20 25 32 40 50 63 ✱ 80 ✱ A1=100	**2** Bronze bushings **3** Ball bearings **4** Cushioned with bronze bushings **5** Cushioned with ball bearings	CUSHIONED VERSION **Ø 16:** 20, 30, 40, 50 **Ø 20 to 25:** 20, 30, 40, 50, 75, 100, 150 **Ø 32 to 63:** 25, 50, 75, 100, 150, 175 NOT CUSHIONED VERSION ◆ **Ø 16:** 10, 20, 25, 30, 40, 50, 75, 100, 150, 200 **Ø 20 to 25:** 20, 25, 30, 40, 50, 75, 100, 150, 200 **Ø 32 to 100:** 25, 50, 75, 100, 150, 200 ◆ Other strokes on request but with the same cylinder dimensions as the standard stroke immediately above.

✱ Not cushioned version only

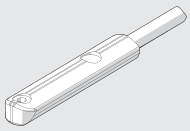
ACCESSORIES FOR COMPACT GUIDED CYLINDER: MAGNETIC SENSORS

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation, secure fixing



SENSOR, OVAL TYPE
Traditional



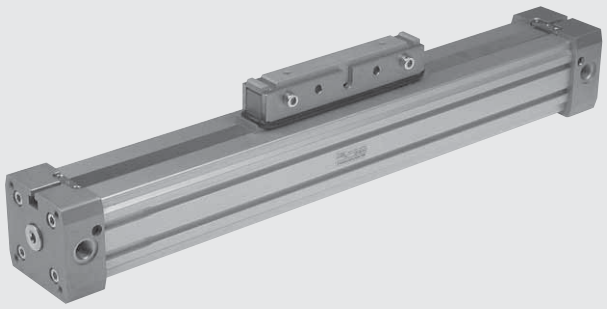
For codes and technical data, see **chapter A6**.

NOTES

RODLESS CYLINDER SERIES STD

Rodless cylinders come in five different bores - Ø 16, 25, 32, 40 and 63 mm – and the design incorporates numerous innovations.

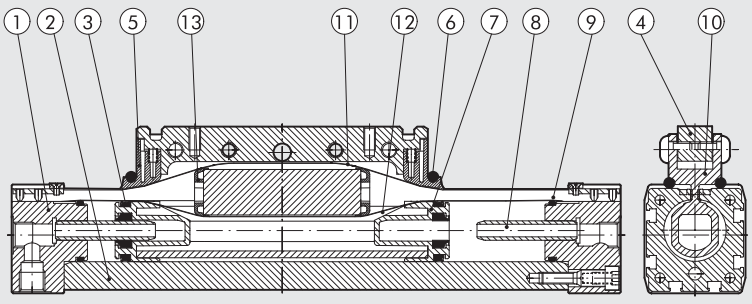
- Calibrated extruded anodized aluminium alloy barrel
- Sensor slots and accessory slots in the barrel itself
- Longitudinal seal by means of specially-shaped indeformable stainless steel strips
- Strokes 100 to 5700 mm with 1mm intervals
- Adjustable integrated pneumatic cushioning
- Adjustable limit switches and decelerations can be applied at any time
- For this type of cylinder (size 32 and upwards), the valves can be fitted directly using the retracting sensors without requiring any intermediate brackets. Refer to the table on page **A1**.48



TECHNICAL DATA		NBR	FKM/FPM
Operating pressure	bar	1 to 8	
	MPa	0.1 to 0.8	
	psi	14.5 to 116	
Temperature range	°C	–10 to +80	
	°F	14 to 176	
Fluid		50 µm unlubricated filtered air Lubrication, if used, must be continuous	
Bores	mm	Ø 16, 25, 32, 40, 63	
Type of construction		Double-acting rodless cylinder with direct transmission system	
Strokes	mm	Ø 16: from 100 to 5000 with 1mm interval	
		Ø 25, 32 e 40: from 100 to 5700 with 1mm interval	
		Ø 63: from 100 to 5500 with 1mm interval	
Recommended speeds	m/s	<1	≥1
Max. speed with decelerators	m/s	<1	2
Weight		See cylinder "**General technical data**" at the beginning of the chapter	
Notes		**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air**	

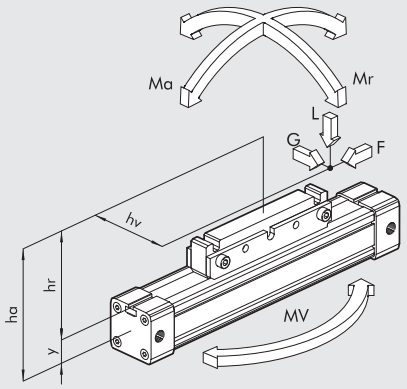
COMPONENTS

① CYLINDER HEAD: aluminium alloy
② BARREL: profiled anodized aluminium alloy
③ PISTON GASKET: NBR or FKM/FPM
④ CENTRAL ELEMENT: aluminium alloy
⑤ SCRAPER: Hostaform®
⑥ O-RING: FKM/FPM
⑦ PISTON: Hostaform®
⑧ CUSHIONING CONE: aluminium alloy
⑨ STATIC O-RINGS: NBR or FKM/FPM
⑩ SLIDE: aluminium alloy
⑪ OUTER STRIP: stainless steel
⑫ INNER STRIP: stainless steel
⑬ BAND SUPPORT: Hostaform®



METAL WORK PNEUMATIC

DIMENSIONING - FORCE AND TORQUE



Bore	Centre Distance Y	Actual Force F at 6 bar [N]	Cushioning stroke [mm]	Max. load L [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
16	9	110	15	120	4	0.3	0.5
25	14	250	21	300	15	1	3
32	18	420	26	450	30	2	4
40	22	640	32	750	60	4	8
63	44	1550	40	1650	200	8	24

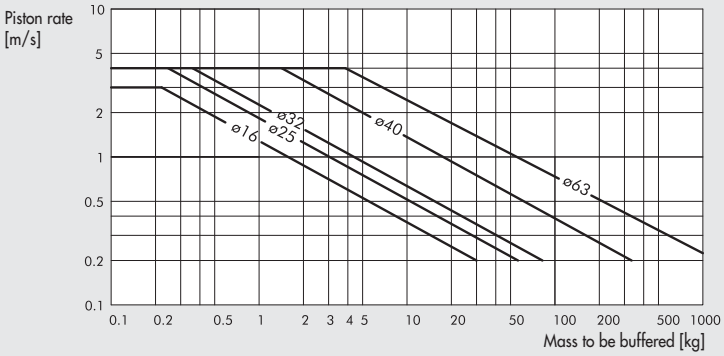
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

$Ma = F \times ha \qquad Mr = L \times hv + G \times hr \qquad Mv = F \times hv$

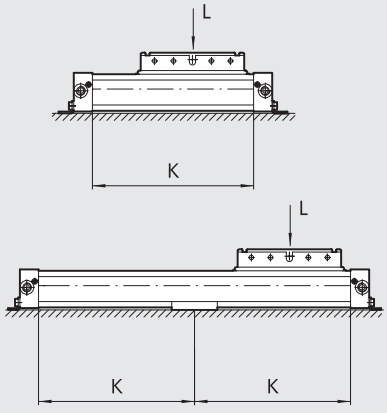
$$\frac{Mv}{Mv\ max} \leq 1; \qquad \frac{L}{L\ max} \leq 1; \qquad \frac{Ma}{Ma\ max} + \frac{Mr}{Mr\ max} + 0.22 \times \frac{Mv}{Mv\ max} + 0.4\,\frac{L}{L\ max} \leq 1$$

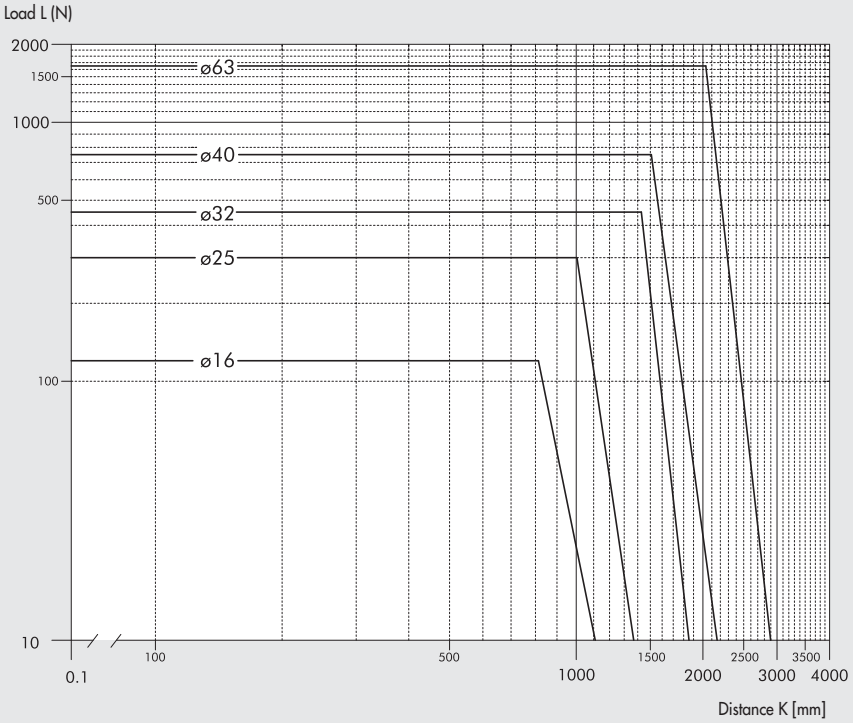
DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated. The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders. The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.

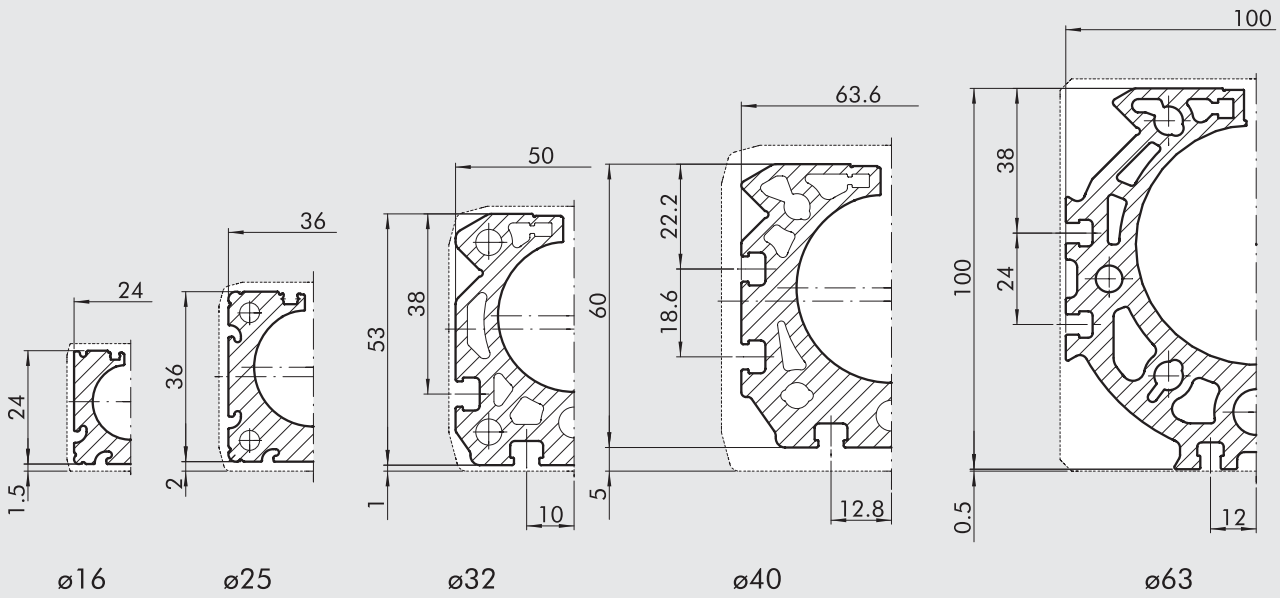


MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS



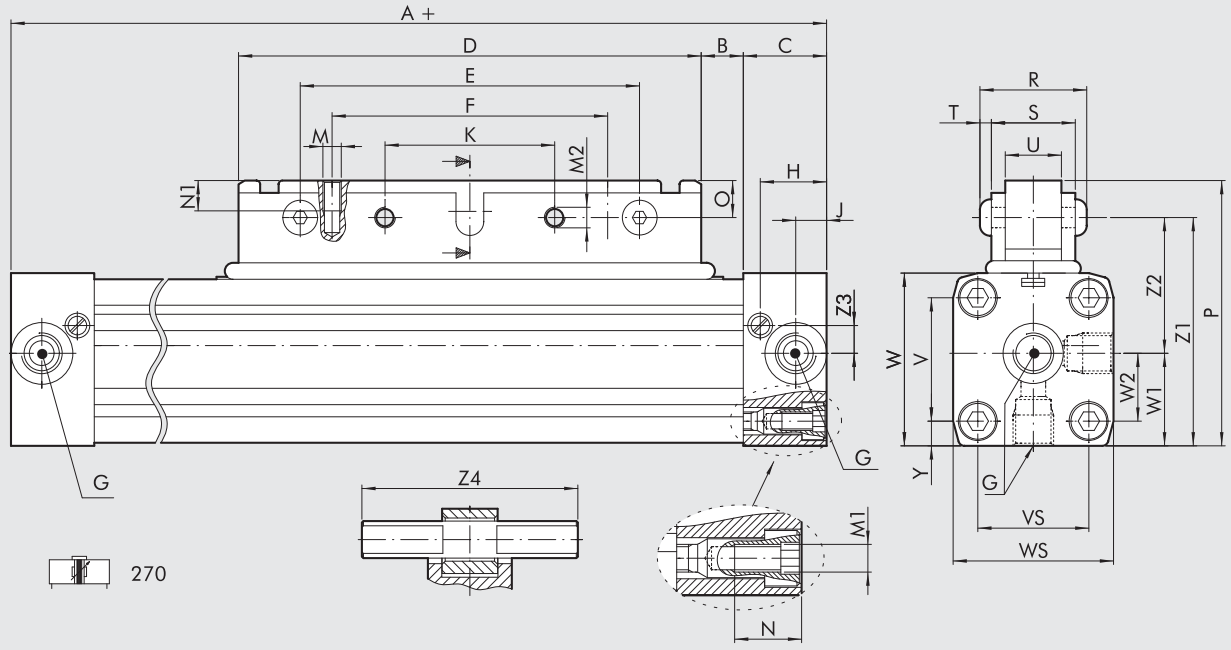


BARREL CROSS SECTION



DIMENSIONS Ø 16 to 40

+ = ADDED STROKE

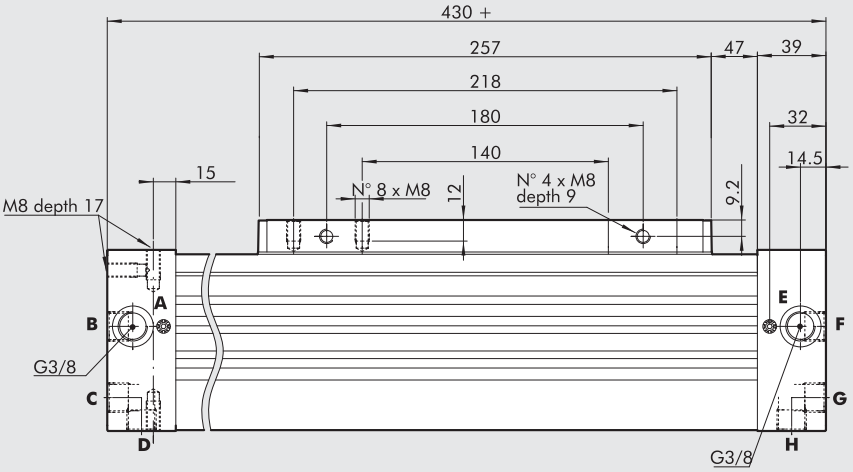


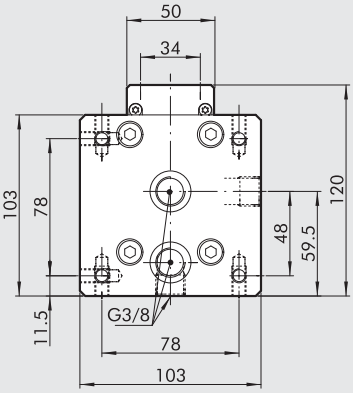
Ø	A	B	C	D	E	F	G	H	J	K	M	M1	M2	N	N1	O	P	R	S	T	U	V	VS	W	WS	W1	W2	Y	Z1	Z2	Z3	Z4
16	130	12	15	76	64	48	M5	12	6.4	32	M4	M3	M5	7	8	6	43.5	23.5	18	2.75	10	18	18	27	27	13.5	9	4.5	37.5	24	4.5	28
25	200	17	23	120	100	80	1/8	18.5	8.5	50	M5	M5	M6	12	11	13	66	29.6	23	3.3	15	27	27	40	40	20	13.5	6.5	53	33	6.5	42
32	250	23	27	150	110	90	1/4	22	10.5	55	M6	M6	M8	14	12	12	86	36	27	4.4	18	40	36	56	52	30	22	8	74	44	8	70
40	300	45	30	150	110	90	1/4	24	15	55	M6	M6	M8	17.5	12	12	97	36.8	28	4.4	18	54	54	69	72	36	27	9	85	49	11.8	70

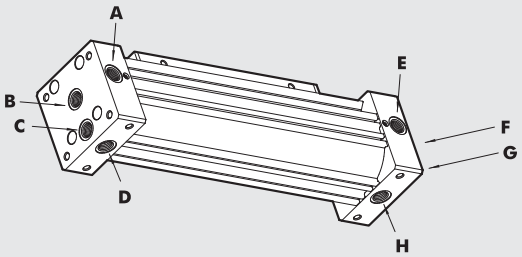
METAL WORK PNEUMATIC

DIMENSIONS Ø 63

+ = ADDED STROKE





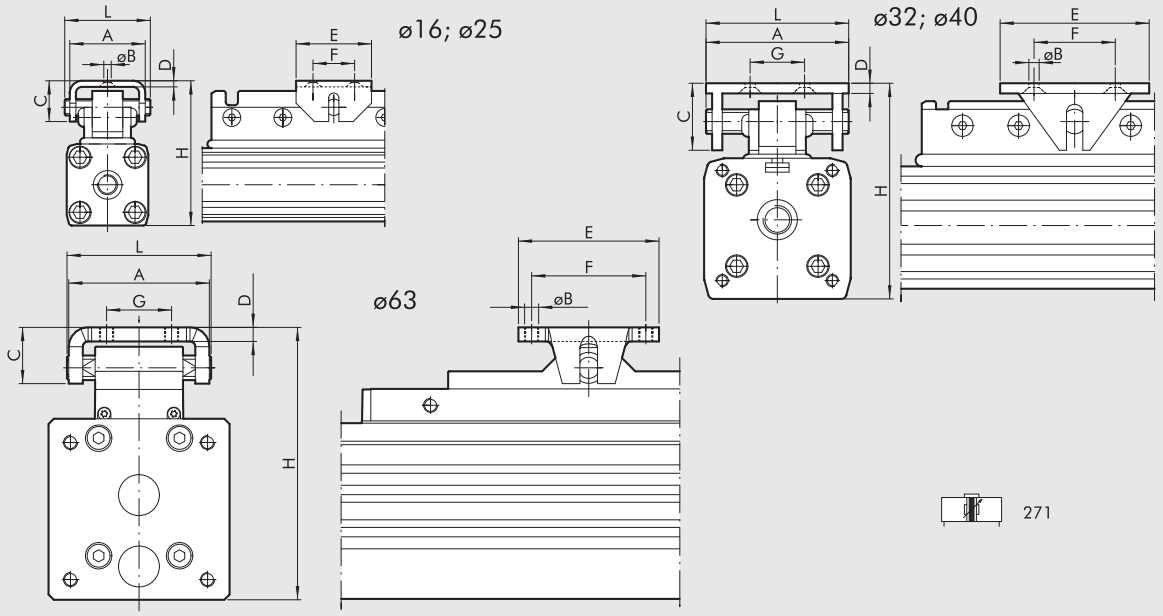


Basic supply
A, B, C, D to feed to left chambers
E, F, G, H to feed the right chambers
Note: B, C, D, F, G and H are supplied closed with threaded plugs

If you modify the position of an inner plug following the instructions provided with the cylinder, you can arrange:

all feeds from the left	**all feeds from the right**
A, B feed the left chambers	E, F feed the right chambers
C, D feed the right chambers	G, H feed the left chambers

VERSION WITH SWING CARRIAGE

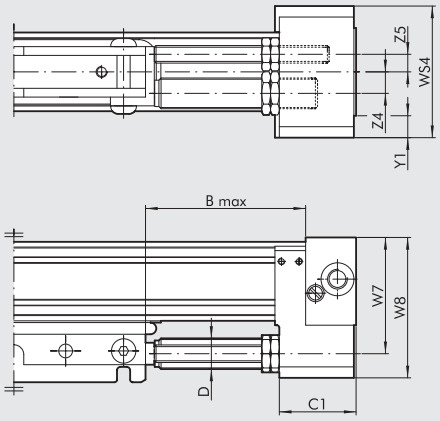


NOTE: For other dimensions see code 270

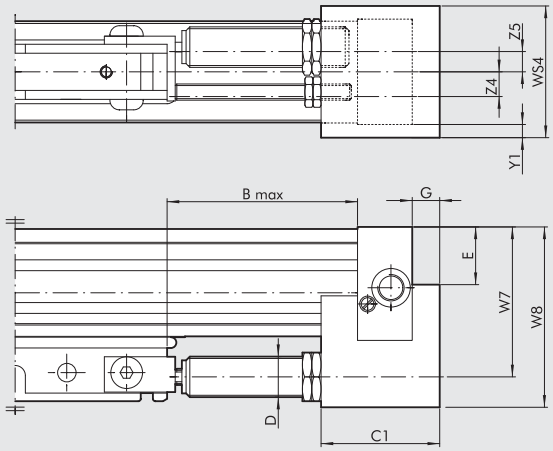
Ø	A	ØB	C	D	E	F	G	H	L
16	25	4.5	13	2	20	10	–	47-50	28
25	37	5.5	20	3	30	16	–	72-75	42
32	70	6.5	38	5	90	75	55	91-100	70
40	70	6.5	38	5	90	75	55	111-120	70
63	80	M8	32	8	80	65	37	155-162	82

DIMENSIONS VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS

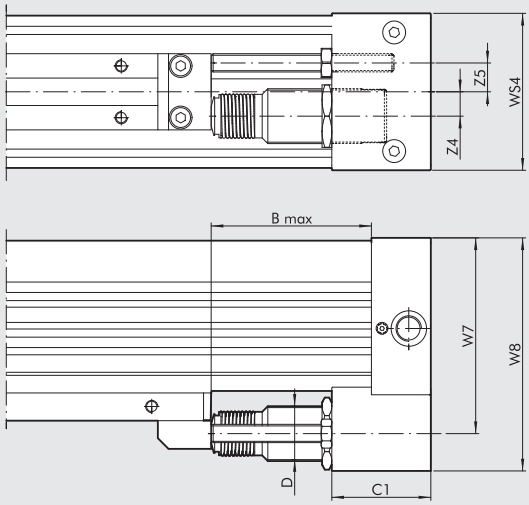
ø16



ø25÷ø40



ø63



Ø	B Max	C1	D	E	G	W7	W8	WS4	Y1	Z4	Z5	Stroke	Max. cushioned force For stroke [J]	Max. cushioned force For hour [J]	Max. impact force [N]	Max. thrust force [N]
16	42	22	M12x1	–	–	38	46	42	7.5	7	7.5	10.4	10	14125	1000	220
25	72	44	M14x1.5	17	9	53	67	50	5	8	9.8	16	26	34000	2800	530
32	90	56	M20x1.5	29	11	74	89	60	4	10	12.2	22	54	53700	3750	890
40	105	74	M25x1.5	32.8	14	89	108	75	1.5	12.5	12.7	25	90	70000	5500	1550
63	105	65	M36x1.5	–	–	128.5	153	103	–	16	19	25	160	91000	11120	2220

For graphs to help choose shock absorbers see page **A1**.151

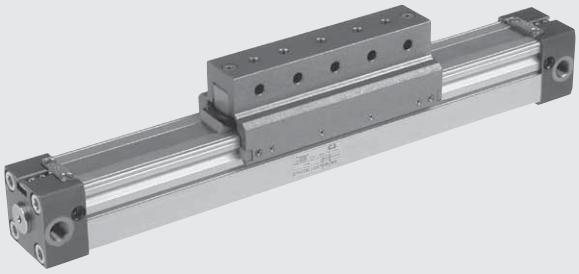
KEY TO CODES

CYL	27 TYPE	0	0	25 BORE	0150 STROKE	C	N GASKETS
	27 Rodless cylinder	**0** Double-acting cushioned magnetic **1** Double-acting with swing carriage ✚ **2** Twin cushioned series "Double" **3** Double-acting Magnetic + adjustable limit switches and shock absorbers	**0** Magnetic **S** Non-magnetic ■ **G** No stick-slip	16 25 32 40 63	Ø 16: from 100 to 5000 mm Ø 25 to 40: from 100 to 5700 mm Ø 63 from 100 to 5500 mm		**N** NBR gasket ● **V** FKM/FPM gasket

■ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only** ● For speed ≥ 1/m/s ✚ Available up to Ø 32

RODLESS CYLINDER WITH "V" GUIDE

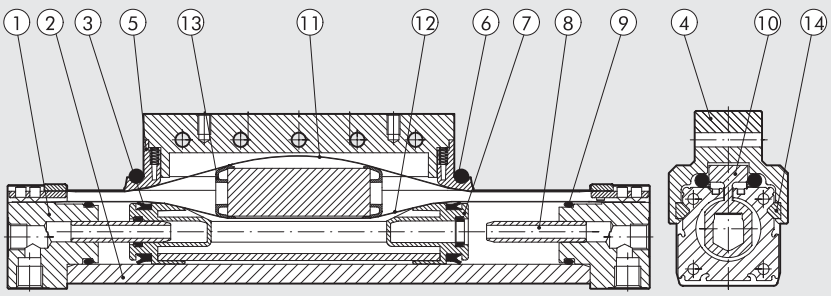
Two opposed V-shaped guide units are obtained directly in the anodized aluminium cylinder liner, on which a cover with two acetalic resin wear-resistant pads slides.
The cover has a tip-up-type carriage-piston rod coupling. In this way the carriage only transfers loads axially and does not support loads and moments in other directions.
The play of the pads can be adjusted by means of side threaded grub screws. Therefore, it is possible to recover the wear of pads, which can be replaced without the need for dismantling the cylinder.
This family of rodless cylinders has the same features as the basic versions: such as an integrated adjustable pneumatic cushioning, sensor slots and accessory holding slots.
A version is available with adjustable limit switches and hydraulic decelerators. They can be purchased separately and applied at any time to the basic cylinders as well.



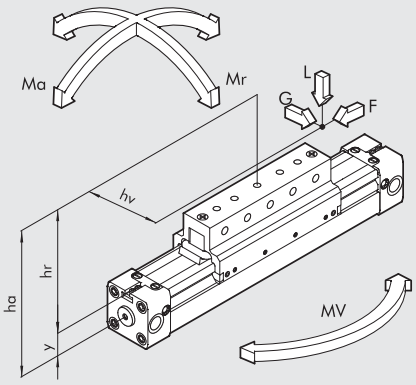
TECHNICAL DATA		NBR	FKM/FPM
Operating pressure	bar	1.5 to 8	
	MPa	0.15 to 0.8	
	psi	21.8 to 116	
Temperature range	°C	–10 to +80	
	°F	14 to 176	
Fluid		50 µm unlubricated filtered air Lubrication, if used, must be continuous	
Bores	mm	Ø 25, 32, 40, 63	
Type of construction		Double-acting rodless cylinder with direct transmission system	
Strokes	mm	Ø 25, 32 and 40: from 100 to 5700 with 1 mm interval Ø 63: from 100 to 5500 with 1mm interval	
Recommended speeds	m/s	<1	≥1
Max. speed with decelerators	m/s	<1	2
Weight		See cylinder "**General technical data**" at the beginning of the chapter	
Notes		**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air**	

COMPONENTS

① CYLINDER HEAD: aluminium alloy
② BARREL: profiled anodized aluminium alloy
③ PISTON GASKET: NBR or FKM/FPM
④ CENTRAL ELEMENT: aluminium alloy
⑤ SCRAPER: Hostaform®
⑥ O-RING: FKM/FPM
⑦ PISTON: Hostaform®
⑧ CUSHIONING CONE: aluminium alloy
⑨ STATIC O-RINGS: NBR or FKM/FPM
⑩ SLIDE: aluminium alloy
⑪ OUTER STRIP: stainless steel
⑫ INNER STRIP: stainless steel
⑬ BAND SUPPORT: Hostaform®
⑭ "V" GUIDE PLATE: Hostaform®



DIMENSIONING - FORCE AND TORQUE



Bore	Centre Distance Y	Actual Force F at 6 bar [N]	Cushioning stroke [mm]	Max. load L [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
25	14	200	21	350	22	5	22
32	18	300	26	400	40	10	40
40	22	490	32	700	70	26	70
63	44	1300	40	1800	250	80	250

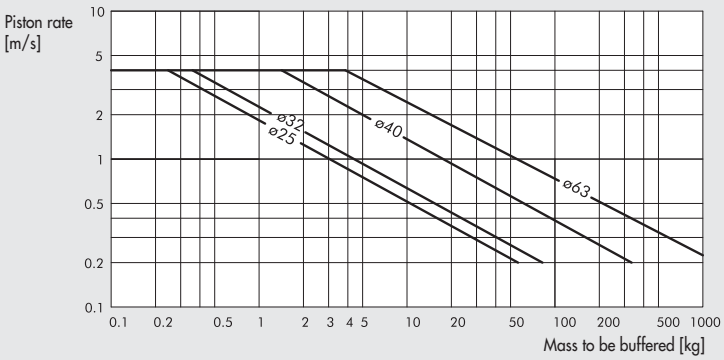
N.B.: The loads can be applied for speeds below 0.2 m/s. For higher speeds, it is advisable not to exceed 1 m/s
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

$Ma = F \times ha \qquad Mr = L \times hv + G \times hr \qquad Mv = F \times hv$

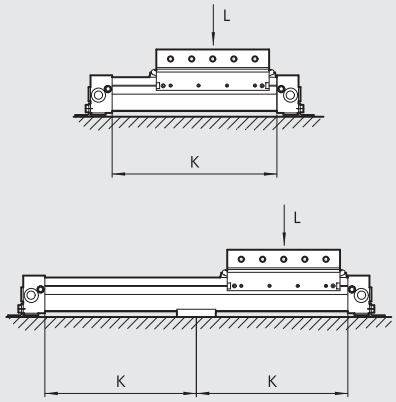
$$\frac{Mv}{Mv\ max} \leq 1; \qquad \frac{L}{L\ max} \leq 1; \qquad \frac{Ma}{Ma\ max} + \frac{Mr}{Mr\ max} + 0.22 \times \frac{Mv}{Mv\ max} + 0.4\,\frac{L}{L\ max} \leq 1$$

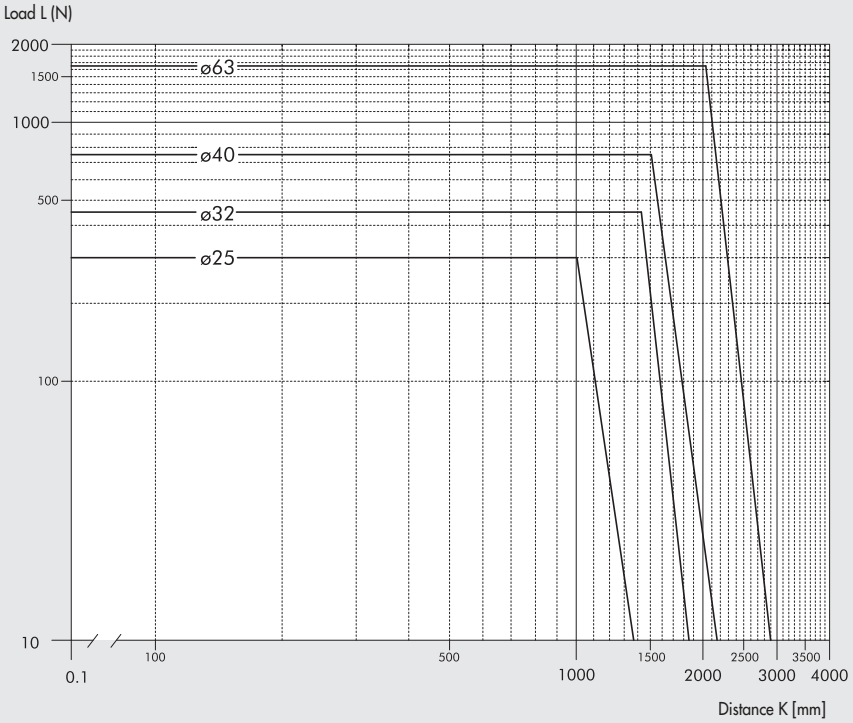
DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated. The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders. The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



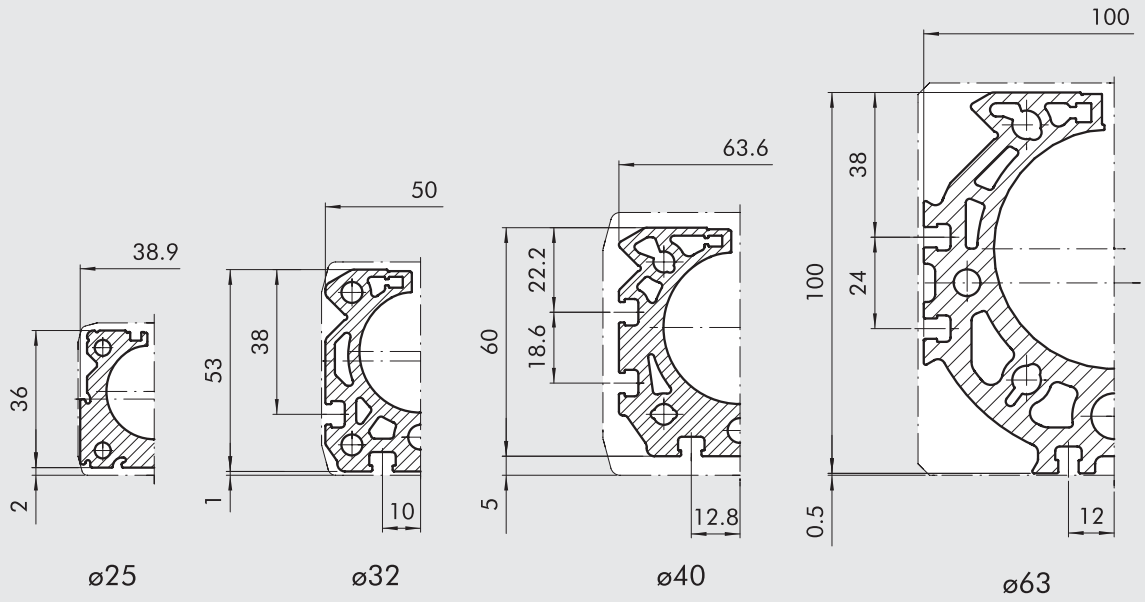
MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS





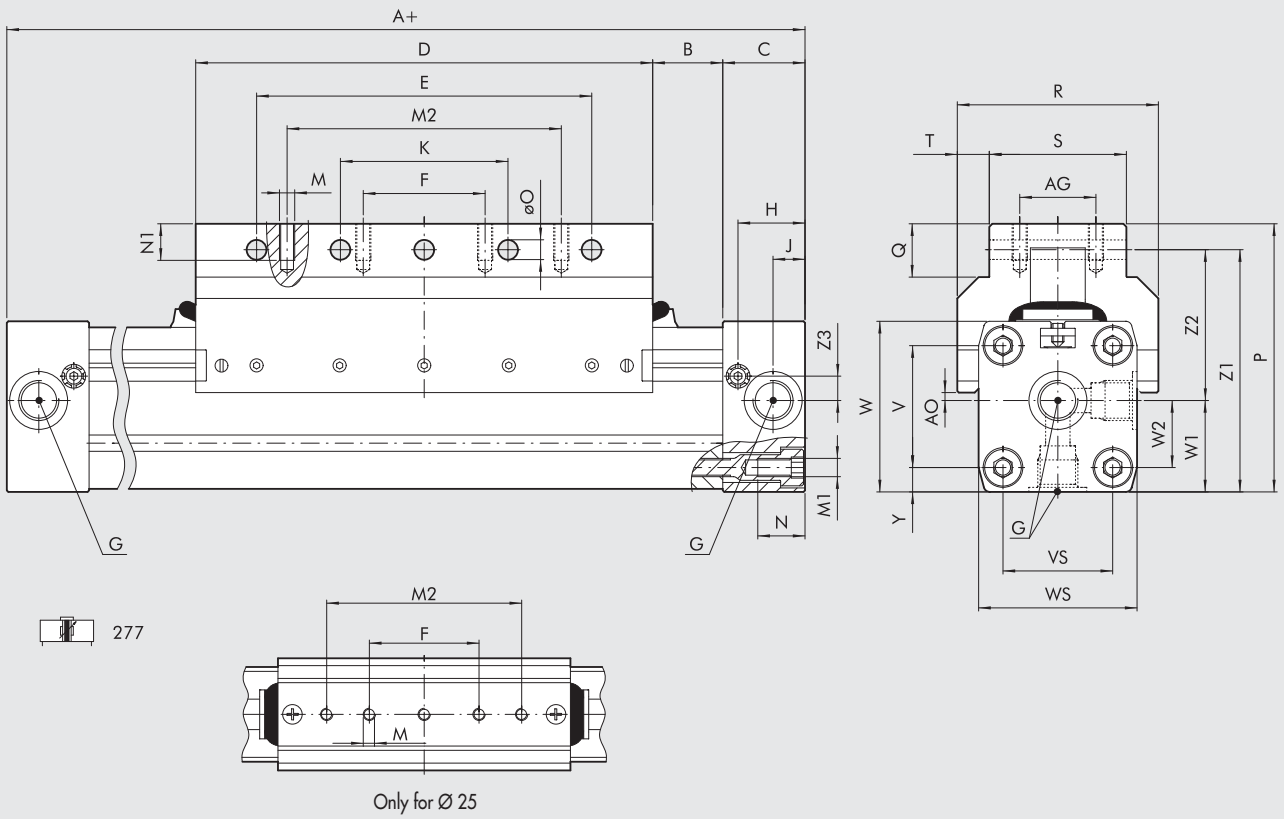
METAL WORK PNEUMATIC

BARREL CROSS SECTION



DIMENSIONS Ø 25 to 40

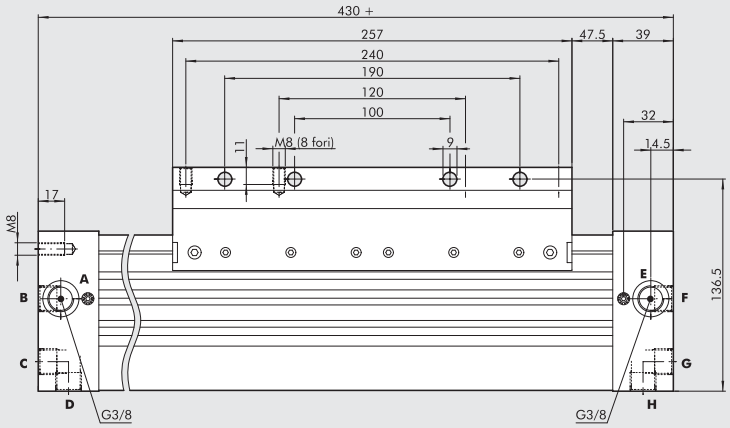
+ = ADDED STROKE

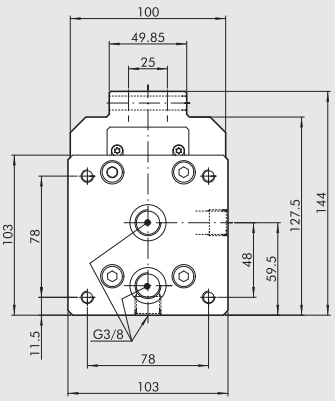


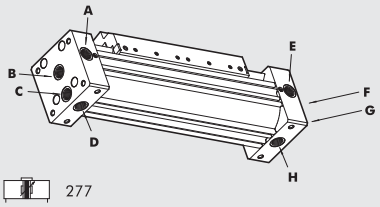
Ø	A	AG	AO	B	C	D	E	F	G	H	J	K	M	M1	M2	N	N1	øO	P	Q	R	S	T	V	VS	W	WS	W1	W2	Y	Z1	Z2	Z3
25	200	-	2	17	23	120	90	45	1/8	18.5	8.5	45	M5	M5	80	12	8	5.5	67.5	21	46	26	10	27	27	40	40	20	13.5	6.5	57.5	37.5	6.5
32	250	25	2.6	23	27	150	110	40	1/4	22	10.5	55	M5	M6	90	15	12	6.4	88	17.5	66	45	10.5	40	36	56	52	30	22	8	79.5	49.5	8
40	300	25	9.4	45	30	150	110	40	1/4	24	15	55	M6	M6	90	17.5	12	6.4	98.5	17.5	80	45	17.5	54	54	69	72	36	27	9	89.9	53.9	11.8

DIMENSIONS Ø 63

+ = ADDED STROKE







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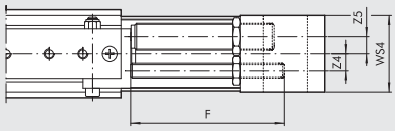
Basic supply
A, B, C, D to feed to left chambers
E, F, G, H to feed the right chambers
Note: B, C, D, F, G and H are supplied closed with threaded plugs

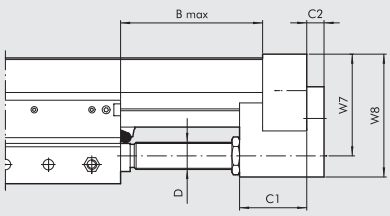
If you modify the position of an inner plug following the instructions provided with the cylinder, you can arrange:

all feeds from the left	**all feeds from the right**
A, B feed the left chambers	E, F feed the right chambers
C, D feed the right chambers	G, H feed the left chambers

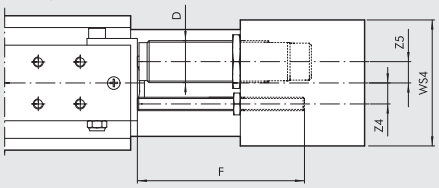
DIMENSIONS VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS

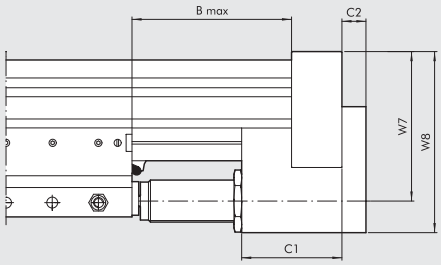
Ø 25



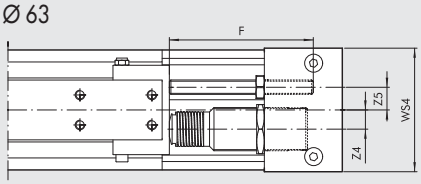


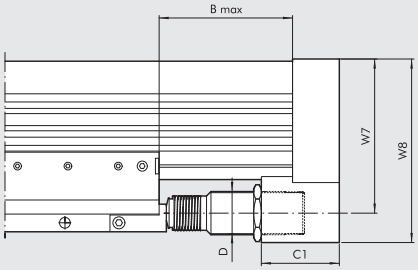
Ø 32; Ø 40





Ø 63





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Ø	B Max	C1	C2	D	F	W7	W8	WS4	Z4	Z5	Stroke	Max. cushioned force For stroke [J]	Max. cushioned force For hour [J]	Max. impact force [N]	Max. thrust force [N]
25	84	35	9	M14x1.5	80	53	67	50	8	9.8	16	26	34000	2800	530
32	110	45	11	M20x1.5	100	74	89	60	10	12.2	22	54	53700	3750	890
40	120	60	14	M25x1.5	100	89	108	75	12.5	12.7	25	90	70000	5500	1550
63	122	65	-	M36x1.5	120	128.5	153	103	16	19	25	160	91000	11120	2220

For graphs to help choose shock absorbers see page **A1**.151

KEY TO CODES

CYL	27	7	0	25	0150	C	N
	TYPE			**BORE**	**STROKE**		**GASKETS**
	27 Rodless cylinder	**7** Double-acting cushioned Magnetic with "V" guide **8** Double-acting cushioned Magnetic with "V" guide + adjustable limit switches and decelerator	**0** Magnetic **S** Non-magnetic ✱ **G** No stick-slip	25 32 40 63	Ø 25 to 40: from 100 to 5700 mm Ø 63 from 100 to 5500 mm		**N** NBR gasket ● **V** FKM/FPM gasket

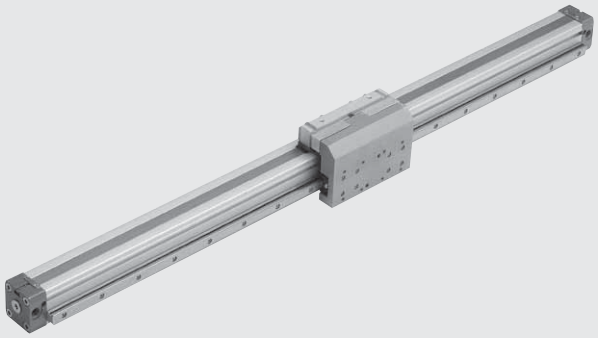
✱ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only** ● For speed ≥ 1/m/s

RODLESS CYLINDER WITH BALL RECIRCULATING GUIDE

The range of rodless cylinders with ball circulation guides is available with five different bores Ø 16, 25, 32, 40 and 63. The bore 63 can be supplied in two versions: the "standard" one for intermediate loads and the "heavy" one for considerably weighty loads. Besides the general features specified for standard rodless cylinders, the other main features are:

- Very high load capacity, acting in all directions without discharging onto the cylinder slide.
- Hardened steel guide connected firmly to the cylinder barrel.
- Ball circulation pads constructed using special technology that make them very silent when the guide slides, with very long maintenance intervals. For example, they only need lubricating every 2000 km or once a year, using type 2 grease, preferably containing lithium soap.
- Extra sturdy slide support with various holes for fixing the loads. Holes for centring pins are also provided.
- 100 to 2650 stroke at intervals of 1 mm.
- Integrated pneumatic adjustable cushioning.
- Adjustable limit switches and decelerations can be applied at any time.

For this type of cylinder (size 32 and upwards), the valves can be fitted directly using the retracting sensors without requiring any intermediate brackets.
Refer to the table on page **A1**.48



TECHNICAL DATA		NBR	FKM/FPM
Operating pressure	bar	1 to 8	
	MPa	0.1 to 0.8	
	Psi	14.5 to 116	
Temperature range	°C	-10 to +80	
	°F	14 to 176	
Fluid		50 µm unlubricated filtered air lubrication, if used, must be continuous	
Bores	mm	Ø 16, 25, 32, 40, 63	
Type of construction		Doubl-acting rodless cylinder with direct transmission system	
Strokes	mm	Ø 16: from 100 to 1350 with 1 interval	
		Ø 25: from 100 to 2300 with 1 interval	
		Ø 32: from 100 to 2300 with 1 interval	
		Ø 40: from 100 to 2250 with 1 interval	
		Ø 63 standard: from 100 to 2100 with 1 interval	
		Ø 63 heavy: from 100 to 2650 with 1 interval	
Threaded ports		M5, G1/8", G1/4", G3/8"	
Assembly		As required	
Recommended speed	m/s	<1	≥1
Max. speed with decelerators	m/s	<1	2
Weight		See cylinder "**General technical data**" at the beginning of the chapter	
Notes		**For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip**	

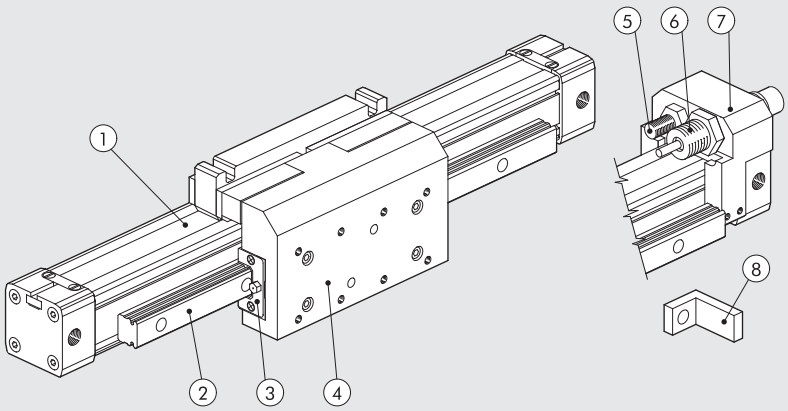
COMPONENTS

For version 275

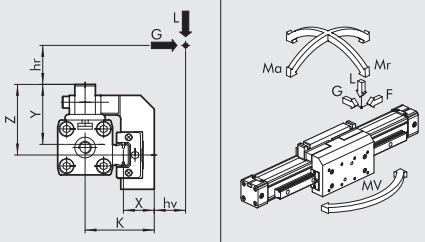
① CYLINDER: see components of **rodless cylinders - series STD**
② GUIDE: hardened steel
③ PAD: steel with hardened ball circulation
④ SLIDE SUPPORT: anodised aluminium

For version 276

Besides the details specified above:
⑤ END-OF-STROKE STUD PIN: zinc-plated steel, complete with 2 zinc-plated nuts for fixing
⑥ DECELERATOR: burnished steel, complete with 2 zinc-plated or burnished nuts for fixing
⑦ DECELERATOR SUPPORT: anodised aluminium
⑧ BRACKET: hardened-and-tempered and zinc-plated steel



DIMENSIONING - FORCES AND MOMENTS



Ø	Version	Actual force F at 6 bar [N]	Cushioning stroke [mm]	K [mm]	X [mm]	Y [mm]	Z [mm]	Max load L [N]	Max load G [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
16	–	110	15	35	16	29	33	500	500	16	15	16
25	–	250	21	50.5	21	44	51.5	1500	1500	100	50	100
32	–	420	26	59	22.5	53.5	70	3000	3000	200	100	200
40	–	640	32	68	24.7	58	73	4000	4000	200	140	200
63	standard	1550	40	84	23.1	79	100	6000	6000	400	140	400
63	heavy	1550	40	91	29.2	79	88	10000	10000	600	400	600

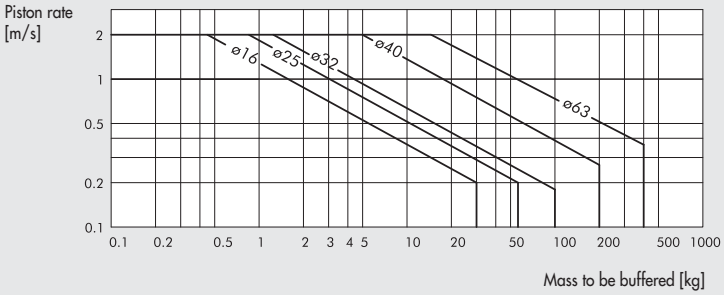
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

$Ma = F \times (hr + Y)$ $\quad Mr = G \times (hr + z) + Lx (hv + X)$ $\quad Mv = F \times (K + hv)$

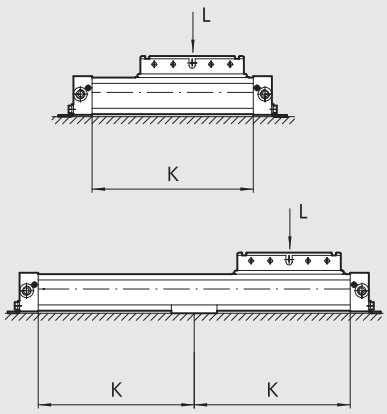
$$\frac{Ma}{Ma\ max} + \frac{Mr}{Mr\ max} + \frac{Mv}{Mv\ max} + \frac{L}{L\ max} + \frac{G}{G\ max} \leq 1$$

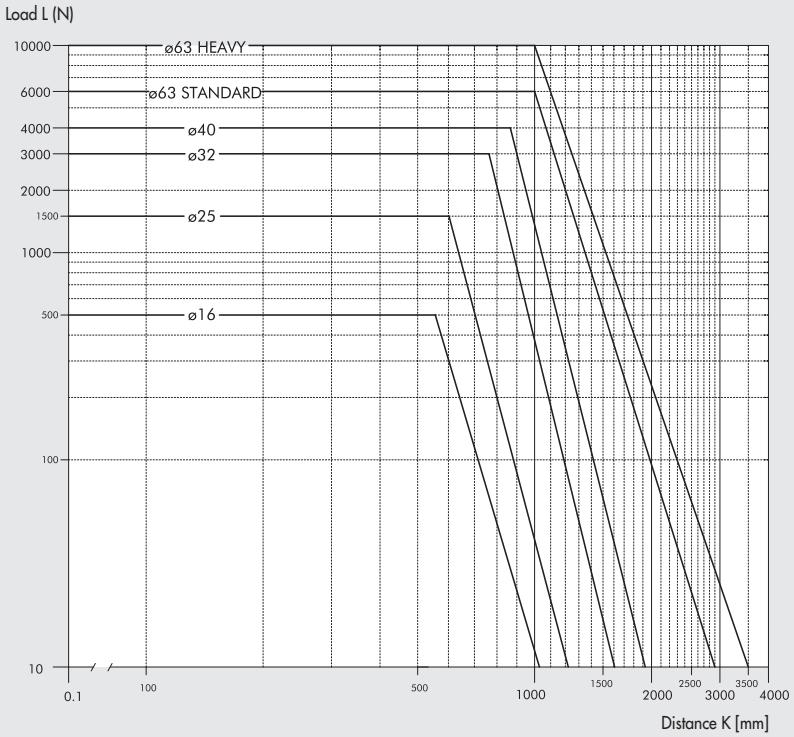
DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated.
The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders.
The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS

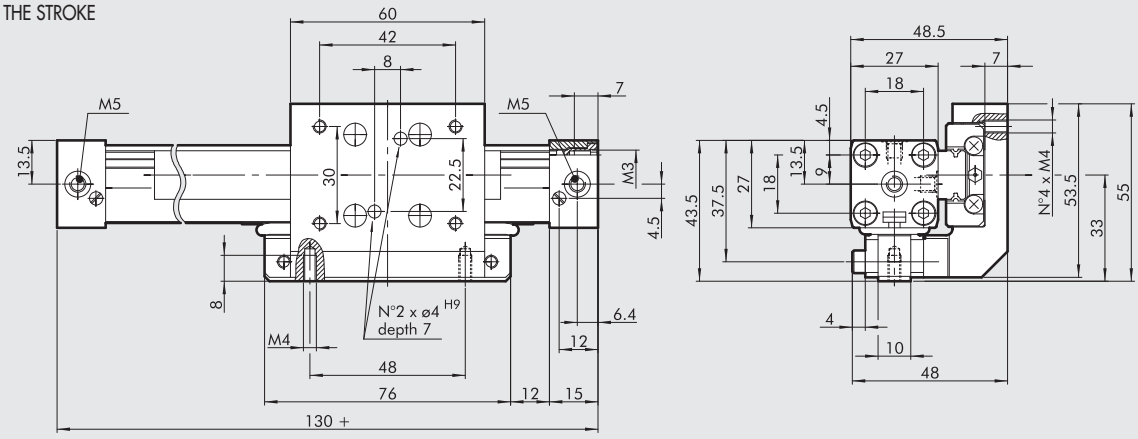




METAL WORK PNEUMATIC

DIMENSIONS Ø 16

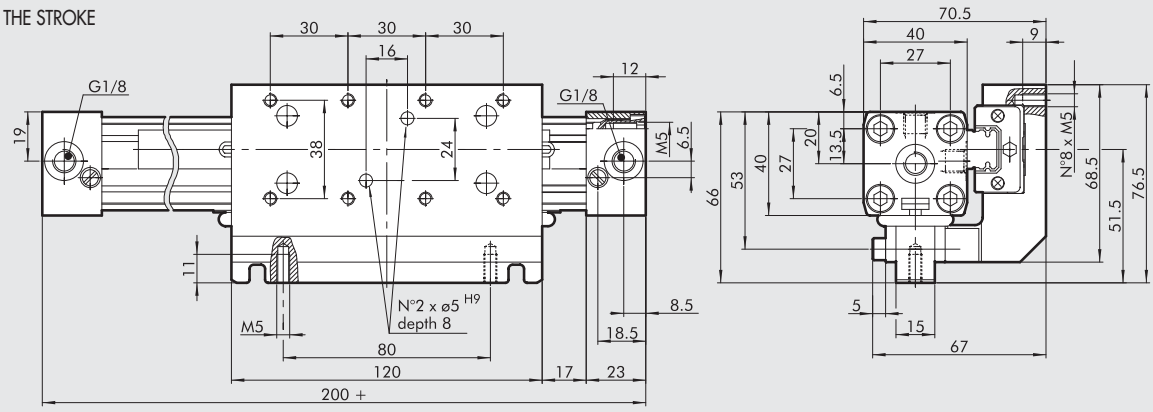
+ = ADD THE STROKE



275

DIMENSIONS Ø 25

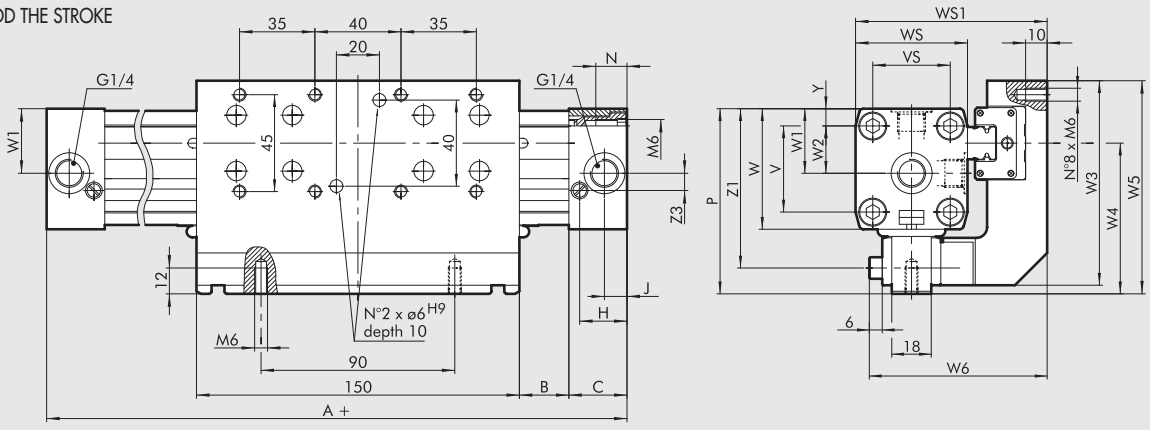
+ = ADD THE STROKE



275

DIMENSIONS Ø 32; Ø 40

+ = ADD THE STROKE

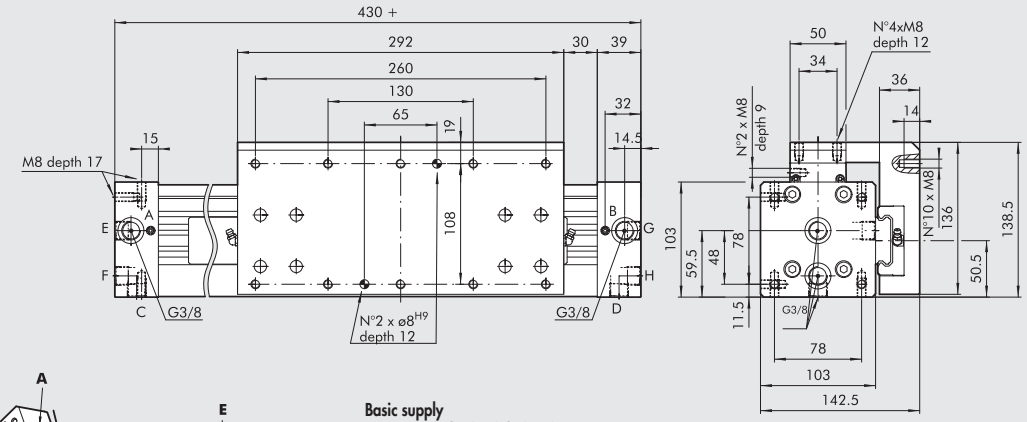


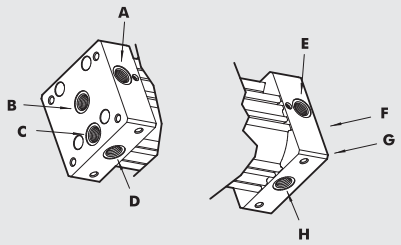
275

Ø	A	B	C	H	J	N	P	V	VS	W	WS	WS1	W1	W2	W3	W4	W5	W6	Y	Z1	Z3
32	250	23	27	22	10.5	14	86	40	36	56	52	85	30	22	95	70	99	78.5	8	74	8
40	300	45	30	24	15	17.5	97	54	54	69	72	104	36	27	98	73	102	88	9	85	11.8

DIMENSIONS Ø 63

HEAVY



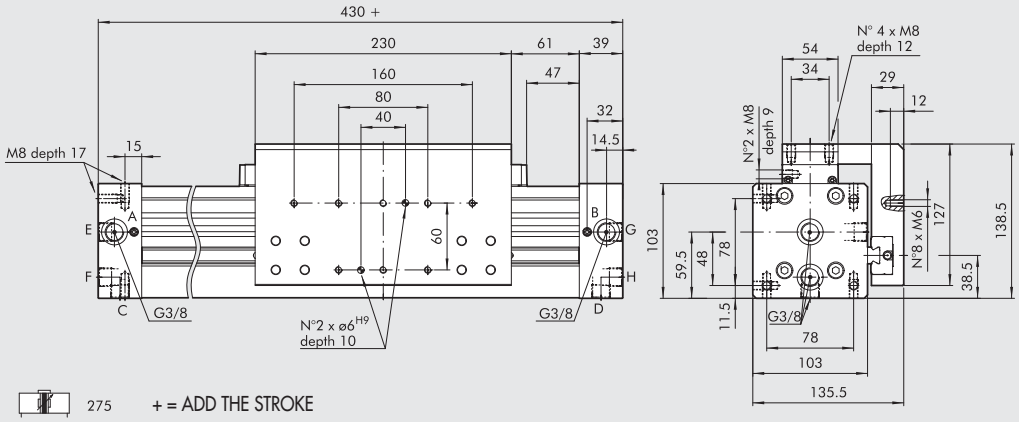


Basic supply
A, B, C, D to feed to left chambers
E, F, G, H to feed the right chambers
Note: B, C, D, F, G and H are supplied closed with threaded plugs.

If you modify the position of an inner plug following the instructions provided with the cylinder, you can arrange:

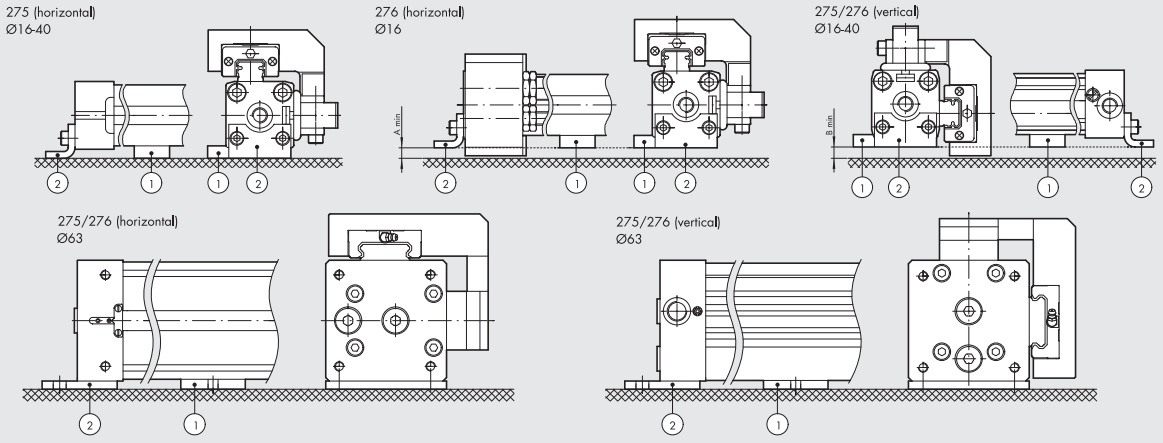
all feeds from the left	**all feeds from the right**
A, B feed the left chambers	E, F feed the right chambers
C, D feed the right chambers	G, H feed the left chambers

STANDARD



275 + = ADD THE STROKE

ASSEMBLY DIAGRAMS

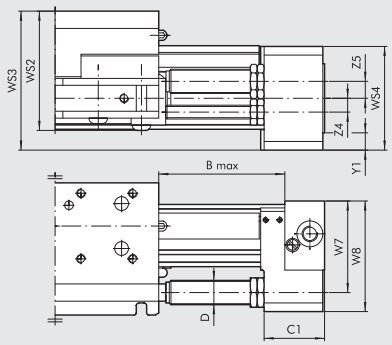


Ø	A min	Horizontal layout Interm. support code (1)	Leg code (2)	B min	Vertical layout Interm. support code (1)	Leg code (2)
16	8	W0950164004	W0950167001	12	W0950164004	W0950167001
25	10	W0950254004	W0950257001	10	W0950254004	W0950257001
32	4	W0950324004	W0950328035	11	W0950324004	W0950327001
40	3	W0950404004	W0950407001	5	W0950404004	W0950407001
63	–	W0950637036	W0950637001	–	W0950637033	W0950637001

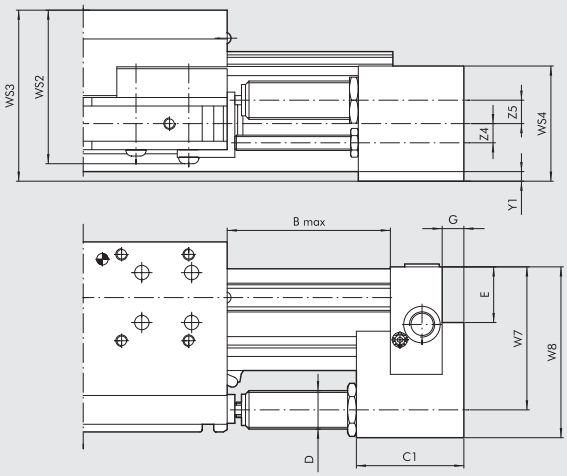
METAL WORK PNEUMATIC

DIMENSION VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS Ø 16 to 63

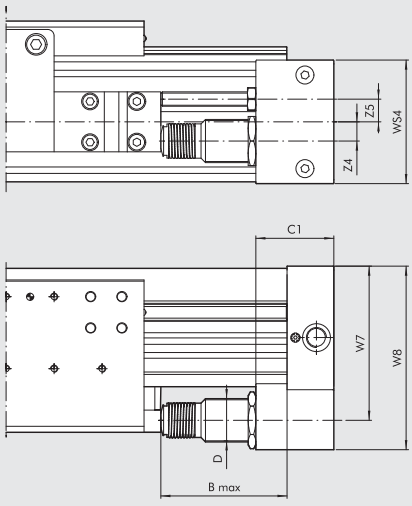
ø16



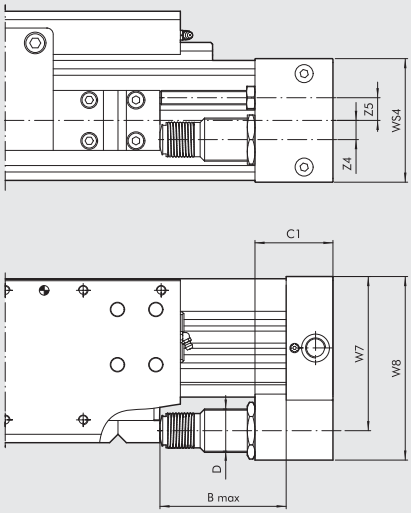
ø25; ø32; ø40



ø63 STD



ø63 HEAVY



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Ø	Version	B max	C1	D	E	G	W7	W8	WS2	WS3	WS4	Y1	Z4	Z5	Stroke	Max. cushioned force		Max. impact force [N]	Max. thrust force [N]
																Per stroke [J]	Per hour [J]		
16	–	50	22	M12x1	–	–	38	46	52	56	42	7.5	7	7.5	10.4	10	14125	1000	220
25	–	72	44	M14x1.5	17	9	53	67	71	80.5	50	5	8	9.8	16	26	34000	2800	530
32	–	90	56	M20x1.5	29	11	74	89	82.5	91	60	4	10	12.2	22	54	53700	3750	890
40	–	105	74	M25x1.5	32.8	14	89	108	92	108	75	1.5	12.5	12.7	25	90	70000	5500	1550
63	standard	105	65	M36x1.5	–	–	128.5	153	–	–	103	–	16	19	25	160	91000	11120	2220
63	heavy	105	65	M36x1.5	–	–	128.5	153	–	–	103	–	16	19	25	160	91000	11120	2220

For graphs to help choose shock absorbers see page **A1**.151

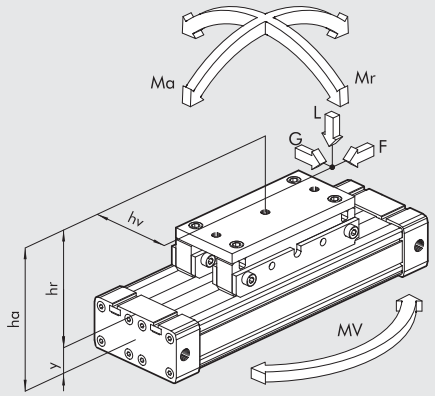
KEY TO CODES

CYL	2 7	5	0	2 5	0 1 5 0	C	N
	TYPE			**BORE**	**STROKE**		**GASKETS**
	27 Rodless cylinder	**5** Double-acting cushioned magnetic with ball circulation guides **6** Double-acting cushioned magnetic with ball circulation guides + adjustable limit switch and shock absorbers	**0** STD Magnetic **S** STD Non-magnetic ■ **G** STD No stick-slip **A** HEAVY Magnetic ■ **B** HEAVY No stick-slip **C** HEAVY Non-magnetic	16 25 32 40 63	Ø 16: 100 to 1350 mm Ø 25 - 32: 100 to 2300 mm Ø 40: 100 to 2250 mm Ø 63 std: 100 to 2100 mm Ø 63 heavy: 100 to 2650 mm		**N** NBR gasket ● **V** FKM/FPM gasket

■ **For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only** ● For speed ≥ 1/m/s

RODLESS CYLINDER SERIES DOUBLE

DIMENSIONING – FORCES AND MOMENTS



Bore Ø	Actual force F at 6 bar [N]	Cushioning stroke [mm]	Max load L [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
2x16	200	15	240	8	2.4	1
2x25	480	21	600	30	8	6
2x32	820	26	900	60	16.5	10

N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

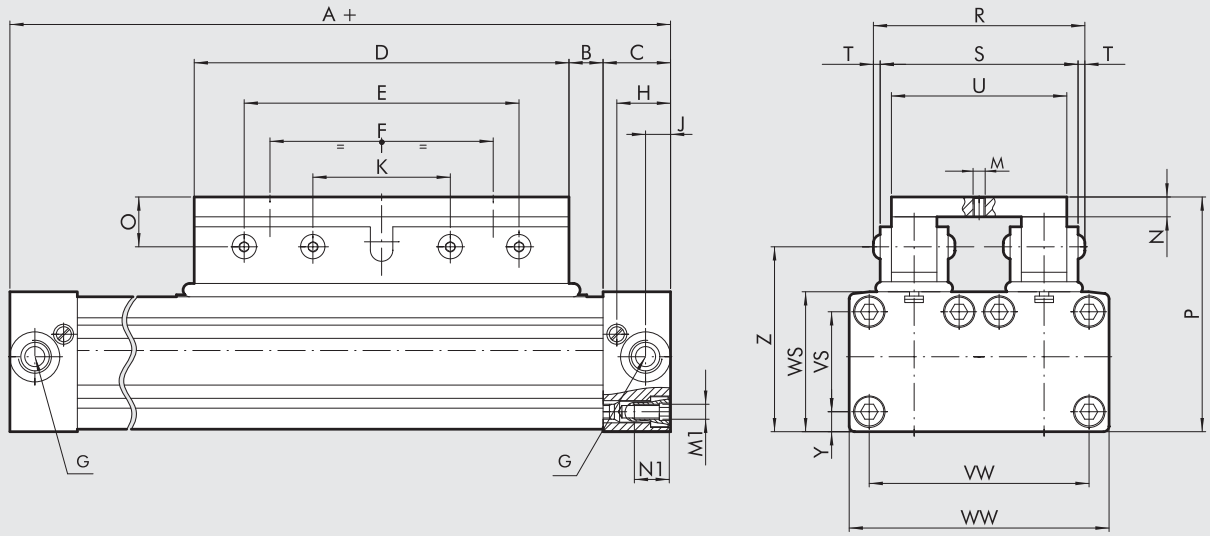
$Ma = F \times ha \qquad Mr = L \times hv + G \times hr \qquad Mv = F \times hv$

$$\frac{Mv}{Mv\ max} \leq 1; \qquad \frac{L}{L\ max} \leq 1; \qquad \frac{Ma}{Ma\ max} + \frac{Mr}{Mr\ max} + 0.22 \times \frac{Mv}{Mv\ max} + 0.4\,\frac{L}{L\ max} \leq 1$$

For technical data, see **rodless cylinders - series STD**.
For weights, see cylinder "**General technical data**" at the beginning of the chapter.

DIMENSIONS OF RODLESS CYLINDER, DOUBLE SERIES

+ = ADD THE STROKE



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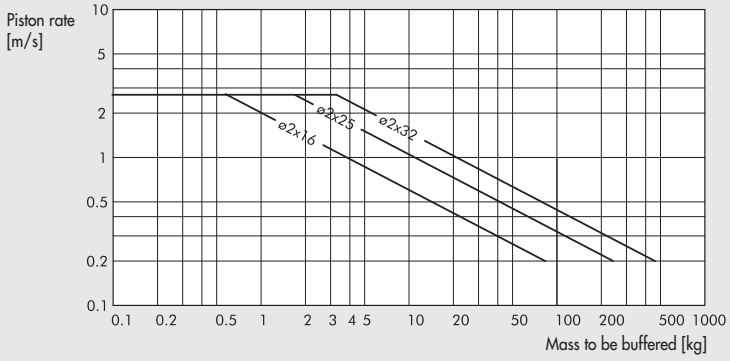
Ø	A	B	C	D	E	F	G	H	J	K	M	N	M1	N1	O	P	R	S	T	U	VW	VS	WW	WS	Y	Z
2x16	130	12	15	76	64	48	M5	12	6.4	32	M5	10	M3	7	16	53.5	48	42	3	34	42	18	51	27	4.5	37.5
2x25	200	17	23	120	100	80	1/8	18.5	8.5	50	M6	15	M5	12	20	74	66	59	3.5	50	63	27	72	41	7	53.5
2x32	250	23	27	150	110	90	1/4	22.5	10.5	55	M6	12	M6	14	20	95	86.5	77.5	4.5	70	86	40	100	56	8	74

DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated.
The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders.
The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.

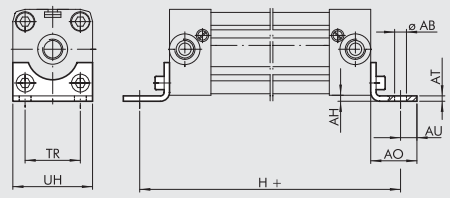


ACCESSORIES AND SPARE PARTS FOR RODLESS CYLINDERS

FIXINGS FOR RODLESS STD, "V" GUIDE, WITH BALL RECIRCULATING GUIDE CYLINDERS

FOOT Ø 16; 25

+ = ADDED STROKE

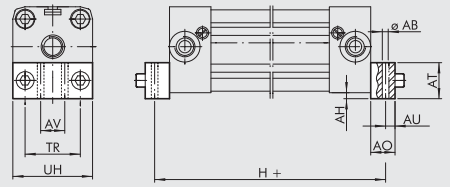


Code	Ø	ØAB	AH	AO	AT	AU	TR	UH	H	Weight [g]
W0950167001	16	3.6	1.5	14	1.6	4	18	26	150	10
W0950257001	25	5.5	2	22	2.5	6	27	40	232	32

Note: Individually packed with 2 screws

FOOT Ø 32; 40

+ = ADDED STROKE

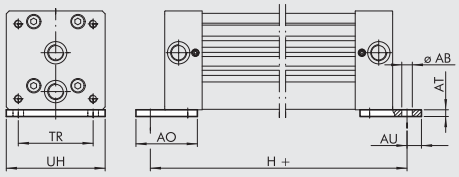


Code	Ø	ØAB	AH	AO	AT	AU	AV	TR	UH	H	Weight [g]
W0950327001	32	6.6	4	25	20	8	20	36	51	284	88
W0950407001	40	9	2	25	20	11.5	30	54	71	327	112

Note: Individually packed with 2 screws

FOOT Ø 63

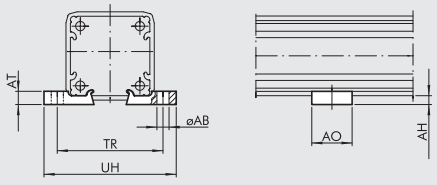
+ = ADDED STROKE



Code	Ø	ØAB	AT	AO	AU	TR	UH	H	Weight [g]
W0950637001	63	11	7	64	15	78	103	460	360

Note: Individually packed with 2 screws

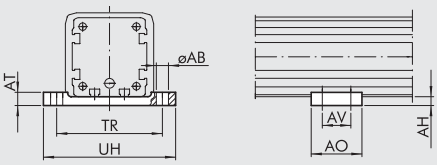
INTERMEDIATE FOOT Ø 16; 25 FOR STD AND "V" GUIDE



Code	Ø	ØAB	AH	AO	AT	TR	UH	Weight [g]
W0950167031	16	5.5	3	20	5	41	53	4
W0950257031	25	5.5	4	20	6	48	60	6
0950254094*	25	5.5	4	20	6	48	60	6

Note: Individually packed.
* For the "V" guide version only

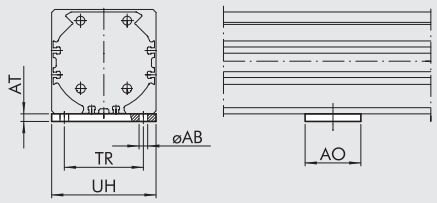
INTERMEDIATE FOOT Ø 32; 40 FOR STD AND "V" GUIDE



Code	Ø	ØAB	AH	AO	AT	AV	TR	UH	Weight [g]
W0950327032	32	6.5	5	55	8	40	61.5	73	72
W0950407032	40	6.5	7	60	8	45	70-75	85	104

Note: plate supplied complete with 4 screws, 4 fixing plates

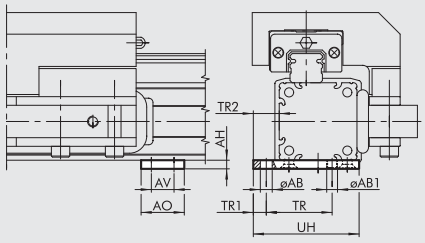
INTERMEDIATE SUPPORT Ø 63 FOR VERSION STD, "V" GUIDE AND VERTICAL POSITION BALL RECIRCULATING



Code	Ø	ØAB	AO	AT	TR	UH	Weight [g]
W0950637032	63	8.5	55	7.5	78	103	330

Note: plate supplied complete with 4 screws, 4 fixing plates

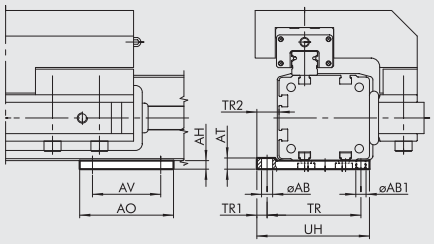
INTERMEDIATE SUPPORT Ø 16 to 25 FOR BALL RECIRCULATING



Code	Ø	ØAB	ØAB1	AH	AO	AV	TR	TR1	TR2	UH
W0950164004	16	3.5	M3	3	12	6	20	4	8	32.5
W0950254004	25	5.5	M5	4	20	10.5	30.5	6	12	49

Note: Supplied complete with 4 screws

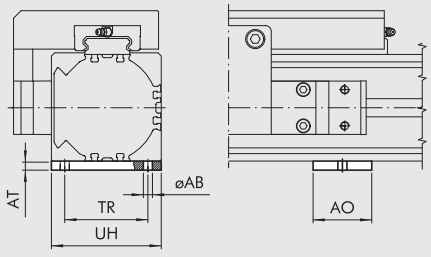
INTERMEDIATE SUPPORT Ø 32 to 40 FOR BALL RECIRCULATING



Code	Ø	ØAB	ØAB1	AH	AO	AT	AV	TR	TR1	TR2	UH
W0950324004	32	6.5	M6	5	55	5	40	55	6	13	66
W0950404004	40	6.5	M6	6.6	60	8	45	63	7.5	15	77

Note: Supplied complete with 4 screws, 4 plates.

INTERMEDIATE SUPPORT KIT Ø 63 FOR HORIZONTAL POSITION BALL RECIRCULATING



Code	Ø	ØAB	AH	AO	AT	TR	UH
W0950637036	63	8.5	7.5	55	8.5	78	103

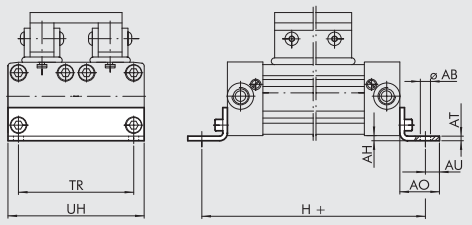
Note: Supplied complete with 4 screws, 4 plates.

NOTES

FIXINGS FOR RODLESS CYLINDER SERIE DOUBLE

FOOT Ø 16; 25

+ = ADD STROKE

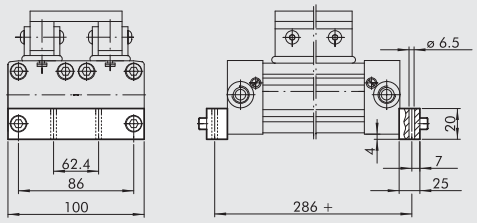


Code	Ø	ØAB	AH	AO	AT	AU	TR	UH	H	Weight [g]
W0950168001	2x16	3.6	1.5	14	1.6	4	42	51	150	18
W0950258001	2x25	5.5	2	22	2.5	6	63	72	232	54

Note: Individually packed complete with 2 screws

FOOT Ø 32

+ = ADD STROKE

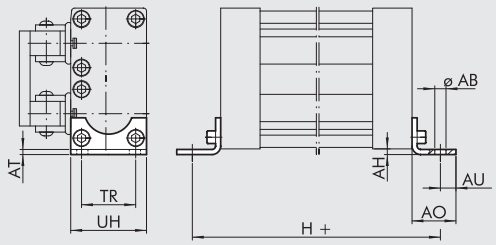


Code	Description	Weight [g]
W0950328036	Foot DOUBLE Ø 32	156

Note: Individually packed complete with 2 screws

VERTICAL FOOT Ø 16; 25

+ = ADD STROKE

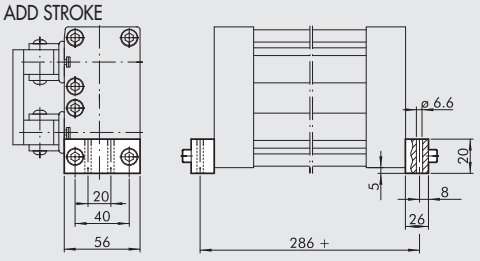


Code	Ø	ØAB	AH	AO	AT	AU	TR	UH	H	Weight [g]
W0950167001	2x16	3.6	1.5	14	1.6	4	18	26	150	10
W0950257001	2x25	5.5	4	22	2.5	6	27	40	232	32

Note: Individually packed complete with 2 screws

VERTICAL FOOT Ø 32

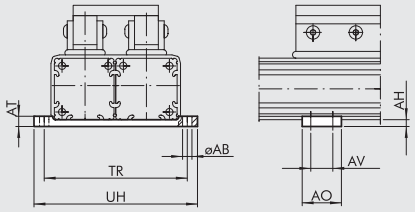
+ = ADD STROKE



Code	Description	Weight [g]
W0950328035	Vertical foot Ø 32	92

Note: Individually packed complete with 2 screws

INTERMEDIATE FOOT Ø 16 to 32



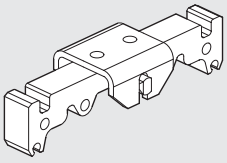
Code	Ø	ØAB	AH	AO	AT	AV	TR	UH	Weight [g]
W0950168037	2x16	3.5	3	12	6	6	60.5	64	16
W0950258037	2x25	5.5	4	20	6	10.5	84.5	96	34
W0950328037	2x32	6.5	5	55	8	40	111.5	123	96

Note: Supplied complete with 8 screws, 8 fixing plates (plates for Ø 32 only)

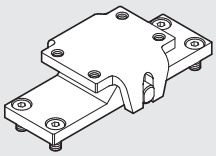
ACCESSORIES FOR CONVERTING STD RODLESS CYLINDERS INTO SWING CYLINDERS

KIT TO TRANSFORM INTO SWING VERSION

Ø16 to 40



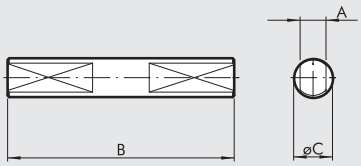
Ø63



Code	Ø	Weight [g]
W0950167035	16	34
W0950257035	25	118
W0950327035	32	450
W0950327035	40	450
W0950637035	63	810

Note: Ø 16 to 40: Supplied complete with 1 adaptor, 1 support, 1 pin, 1 bushing
Ø 63: Supplied complete with 1 plate, 1 support, 1 pin, 2 bushings, 4 screws

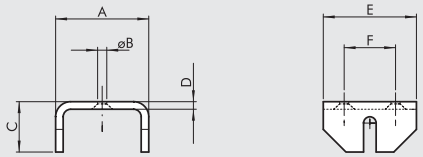
DRIVE PIN



Code	Ø	A	B	ØC	Weight [g]
W0950167034	16	2.9	28	5	6
W0950257034	25	5	42	8	16
W0950327034	32	8	70	12	52
W0950327034	40	8	70	12	52
W0950637034	63	10	82	14	100

Note: Individually packed

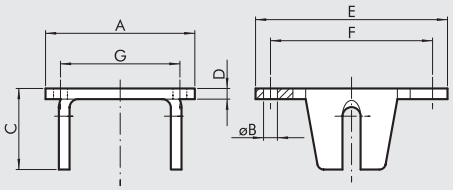
SWING SUPPORT Ø 16; 25



Code	Ø	A	ØB	C	D	E	F	Weight [g]
W0950167033	16	25	4.5	13	2	20	10	14
W0950257033	25	37	5.5	20	3	30	16	40

Note: Individually packed

SWING SUPPORT Ø 32; 40; 63



Code	Ø	A	ØB	C	D	E	F	G	Weight [g]
W0950327033	32	70	6.5	38	5	90	75	55	274
W0950327033	40	70	6.5	38	5	90	75	55	274
W0950637033	63	80	M8	32	8	80	65	37	400

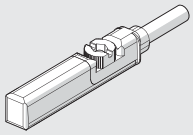
Note: Individually packed

SENSOR MAGNETIC

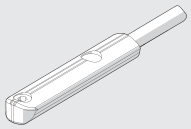
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

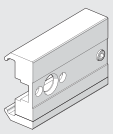
SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



SENSOR SUPPORT Ø 16; 25

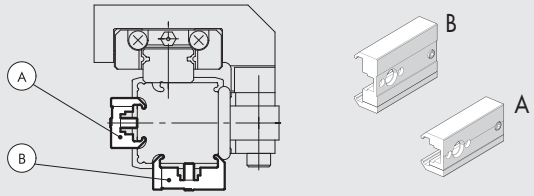


Code	Description
0950164001	Sensor support STD

Note: Supplied with 1 stud pin, 2 screws

METAL WORK PNEUMATIC

SENSOR SUPPORT Ø 16 FOR RODLESS CYLINDER WITH BALL RECIRCULATING

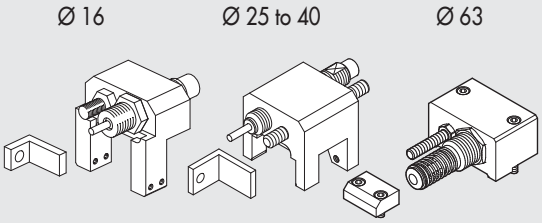


Code sensor support	Description sensor support	Type sensor support	Mounting on the carriage opposite side	Mounting on the guide opposite side
0950164003	Sensor support short	A	•	
0950164001	Sensor support std	B		•

Note: Supplied complete with 2 screws, 1 pin

SHOCK ABSORBERS

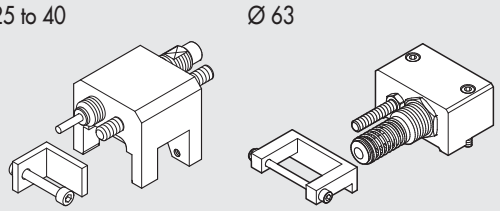
ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS KIT



Code	Description	Weight [g]
0950164002	Rodless cylinder limit switch and shock absorbers Ø 16	125
0950254002	Rodless cylinder limit switch and shock absorbers Ø 25	260
0950324002	Rodless cylinder limit switch and shock absorbers Ø 32	460
0950404002	Rodless cylinder limit switch and shock absorbers Ø 40	730
0950634002	Rodless cylinder limit switch and shock absorbers Ø 63	1620

Note: Supplied complete with 1 shock absorber support, 1 standard shock absorber, 1 shock absorber nut, 1 limit switch grub screw, 1 grub screw nut (2 for Ø 63), 1 bracket, 1 bracket screw, 4 locking grub screws (for Ø 16 and Ø 25), 4 locking plates and 4 screws (for Ø 32 and Ø 40)

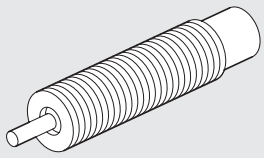
ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS KIT FOR RODLESS CYLINDER WITH "V" GUIDE



Code	Description	Weight [g]
0950254004	Rodless cylinder limit switch and shock absorbers Ø 25	260
0950324004	Rodless cylinder limit switch and shock absorbers Ø 32	460
0950404004	Rodless cylinder limit switch and shock absorbers Ø 40	730
0950634004	Rodless cylinder limit switch and shock absorbers Ø 63	1620

Note: Supplied complete with 1 shock absorber support, 1 standard shock absorber, 1 shock absorber nut, 1 limit switch grub screw, 1 grub screw nut (2 for Ø 63) , 1 bracket, 1 bracket screw, 4 locking grub screws (for Ø 25), 4 locking plates and 4 screws (for Ø 32 and Ø 40)

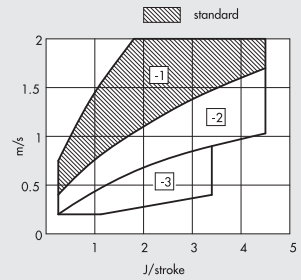
SHOCK ABSORBERS



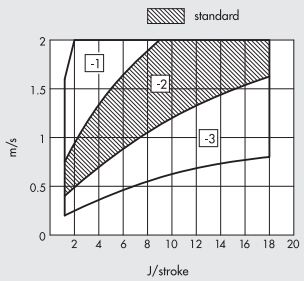
Code	Description	Ø
0950004003	Shock absorbers ECO15 MF1 + nut M12x1	16
0950004004	Shock absorbers ECO25 MC2 + nut M14x1.5	25
0950004005	Shock absorbers ECO50 MC2 + nut M20x1.5	32
0950004006	Shock absorbers ECO100 MF2 + nut M25x1.5	40
0950004007	Shock absorbers ECO125 MF3 + nut M36x1.5	63

GRAPHS TO HELP CHOOSE THE RIGHT SHOCK ABSORBERS

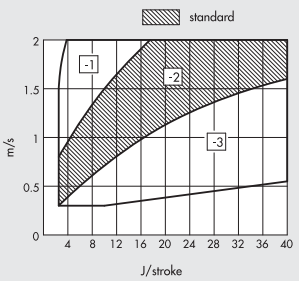
Ø 16



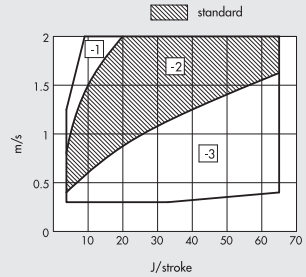
Ø 25



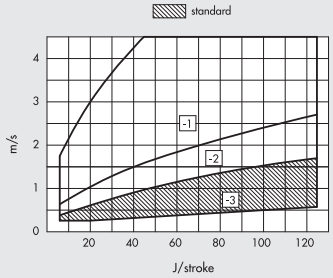
Ø 32



Ø 40



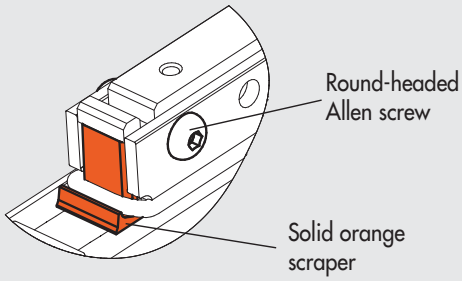
Ø 63

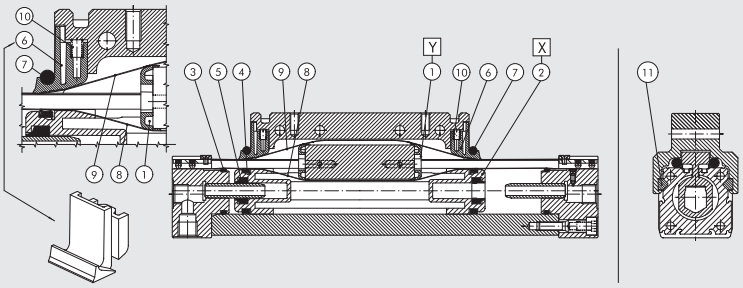


The dotted areas indicate that the SHOCK ABSORBERS is supplied standard. Other options can be selected depending on the speed [m/sec] and the maximum work force [J/stroke] to dissipate at each stroke. Refer to the diagrams above to select the correct option.

SPARE PARTS FOR STD RODLESS CYLINDERS, "V" GUIDE, BALL RECIRCULATING GUIDE, DOUBLE

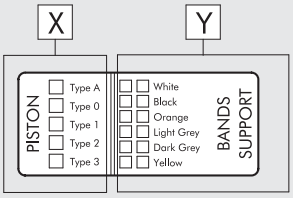
"LAST RELEASE" CYLINDER





① Bands support Kit
② Piston kit
③ ④ ⑤ ⑥ ⑦ ⑩ NBR gaskets Kit (FKM/FPM for ⑦)
③ ④ ⑤ ⑥ ⑦ ⑩ FKM/FPM gaskets Kit
⑧ ⑨ Bands Kit (inner/outer)
⑪ "V" guide plate kit

Spare parts label
on one cylinder side



BANDS SUPPORT KIT POS 1 (Y)

Ø	Code White	Code Black	Code Orange	Code Light grey	Code Dark grey	Code Yellow
16	0090165080	0090165081	0090165082	0090165083	0090165084	0090165085
25	0090255080	0090255081	0090255082	0090255083	0090255084	0090255085
32	0090325080	0090325081	0090325082	0090325083	0090325084	0090325085
40	0090405080	0090405081	0090405082	0090405083	0090405084	0090405085
63	0090635080	0090635081	0090635082	0090635083	0090635084	0090635085

BANDS KIT (INNER AND OUTER) POS 8-9

Ø	Code
16	0090166...
25	0090256...
32	0090326...
40	0090406...
63	0090636...

Complete the code with the 4 figure cylinder stroke

"V" GUIDE PLATE KIT POS 11

Ø	Code
25	0090255060
32	0090325060
40	0090325060
63	0090635060

PISTON KIT POS 2 (X)

Ø	Code Type 0 (0 rings)	Code Type 1 (1 rings)	Code Type 2 (2 rings)	Code Type 3 (3 rings)	Code Type A (4 rings)
16	0090165015	0090165016	0090165017	0090165018	–
25	0090255015	0090255016	0090255017	0090255018	0090255019
32	0090325015	0090325016	0090325017	0090325018	0090325019
40	0090405015	0090405016	0090405017	0090405018	–
63	0090635015	0090635016	0090635017	0090635018	–

NBR GASKET KIT POS 3-4-5-6-7-10

Ø	Code
16	0090165022
25	0090255022
32	0090325022
40	0090405022
63	0090635022

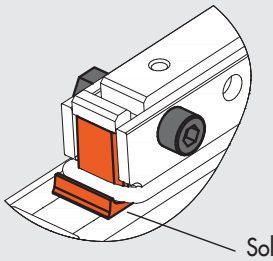
FKM/FPM GASKET KIT POS 3-4-5-6-7-10

Ø	Code
16	0090165023
25	0090255023
32	0090325023
40	0090405023
63	0090635023

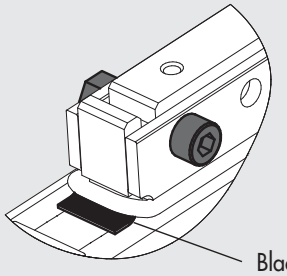
NOTES

If the ends of the carriage appear as below indicated, please contact our commercial department for the spare parts

"INTERMEDIATE RELEASE"



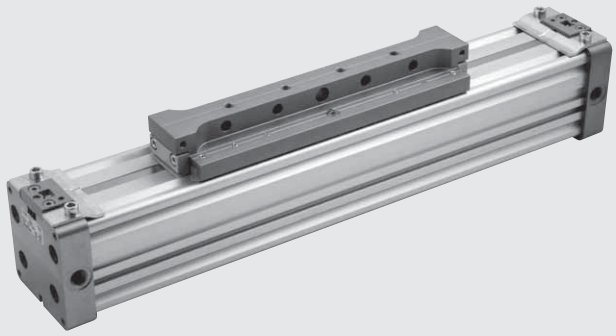
"OLD RELEASE"



RODLESS CYLINDER SERIES PU

METAL WORK PNEUMATIC

Series PU rodless cylinders have an internal strip for longitudinal tightness made of polyurethane (PU) with a harmonic steel wire core. This solution gives excellent air tightness values. It is particularly suitable for high-speed and highly cyclical applications, even with long strokes.
The external strip, which merely provides protection against of foreign bodies entry, is made of harmonic steel. The anodised aluminium cylinder liner has a T-slot on either side for housing the retracting sensors.
Cylinder control solenoid valves can also be housed in these slots and secured by means of plates and screws (see page **A1**.48). There are plastic anti-wear guide pads on either side of the carriage to increase the load capacity. They engage V-slots in the cylinder liner. All the cylinders incorporate adjustable pneumatic cushioning.
One version has hydraulic decelerators + adjustable limit switches.
These can also be added at a later stage by purchasing the relevant kit.
The balanced drive version avoids having to transmit transverse torques and forces to the carriage whenever the load is supported by guides outside the cylinder.

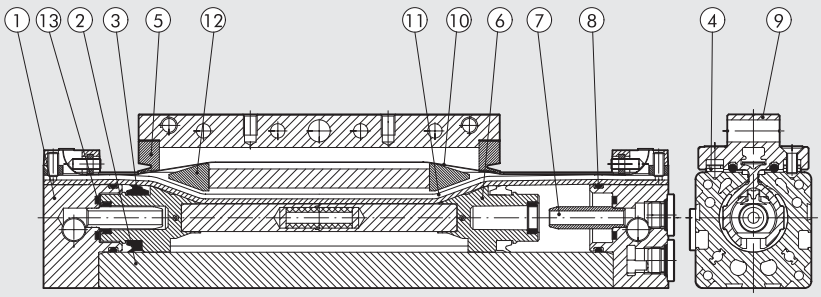


TECHNICAL DATA

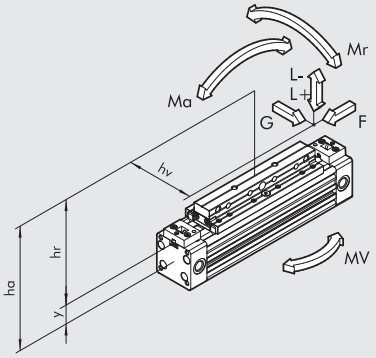
Operating pressure	bar	1 to 8
	MPa	0.1 to 0.8
	psi	14.5 to 116
Temperature range	°C	-10 to +80
	°F	14 to +176
Fluid		50 µm unlubricated filtered air Lubrication, if used, must be continuous
Bores	mm	Ø 25, 32, 40, 50
Type of construction		Double-acting rodless cylinder with direct transmission system
Strokes	mm	Ø 25 to 40: from 100 to 5700 mm with 1mm interval
		Ø 50: from 100 to 5600 with 1mm interval
Recommended speeds	m/s	< 2
Max. speed with decelerators	m/s	< 2
Weight		See cylinder "**General technical data**" at the beginning of the chapter
Notes		**For speeds lower than 0.2 m / s to prevent surging, use the version No stick-slip and non-lubricated air**

COMPONENTS

① CYLINDER HEAD: anodized aluminium alloy
② BARREL: profiled anodized aluminium alloy
③ PISTON GASKET: polyurethane
④ V-SHAPED GUIDE PAD: Hostaform®
⑤ DUST SCRAPER: Hostaform®
⑥ PISTON: Hostaform®
⑦ CUSHIONING CONE: anodized aluminium alloy
⑧ STATIC O-RINGS: NBR
⑨ SLIDE: anodized aluminium alloy
⑩ OUTER STRIP: stainless steel
⑪ INTERNAL STRAP: polyurethane + steel strands
⑫ DIRECTION CHANGE: Hostaform®
⑬ BUFFER: polyurethane



DIMENSIONING - FORCE AND TORQUE



Bore	Centre Distance Y	Cushioning stroke [mm]	Actual Force F at 6 bar [N]	G [N]	Max. load L + [N]	Max. load L - [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
25	16.5	20	250	350	480	350	22	5	10
32	20.1	24	420	450	650	450	40	10	20
40	25.3	33	640	750	900	750	70	26	35
50	30.4	39	1000	900	1100	900	90	32	45

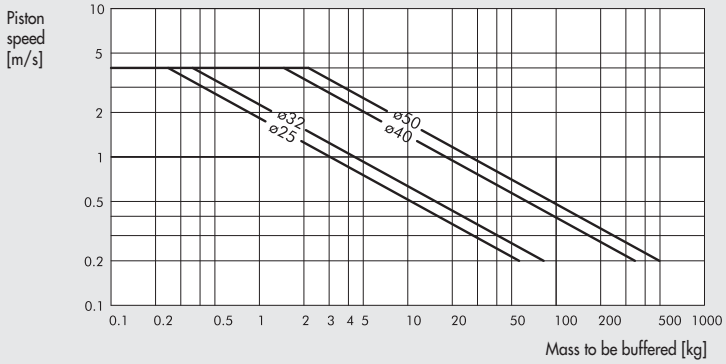
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

$Ma = F \times ha \qquad Mr = L \times hv + G \times hr \qquad Mv = F \times hv$

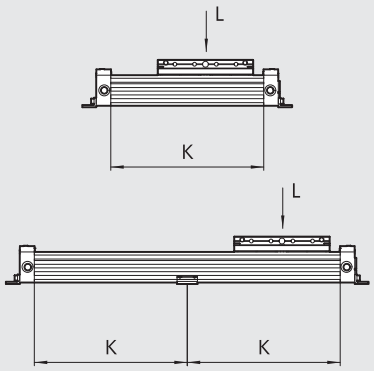
$$\frac{Mv}{Mv\ max} \leq 1; \qquad \frac{L}{L\ max} \leq 1; \qquad \frac{Ma}{Ma\ max} + \frac{Mr}{Mr\ max} + 0.22 \times \frac{Mv}{Mv\ max} + 0.4\,\frac{L}{L\ max} \leq 1$$

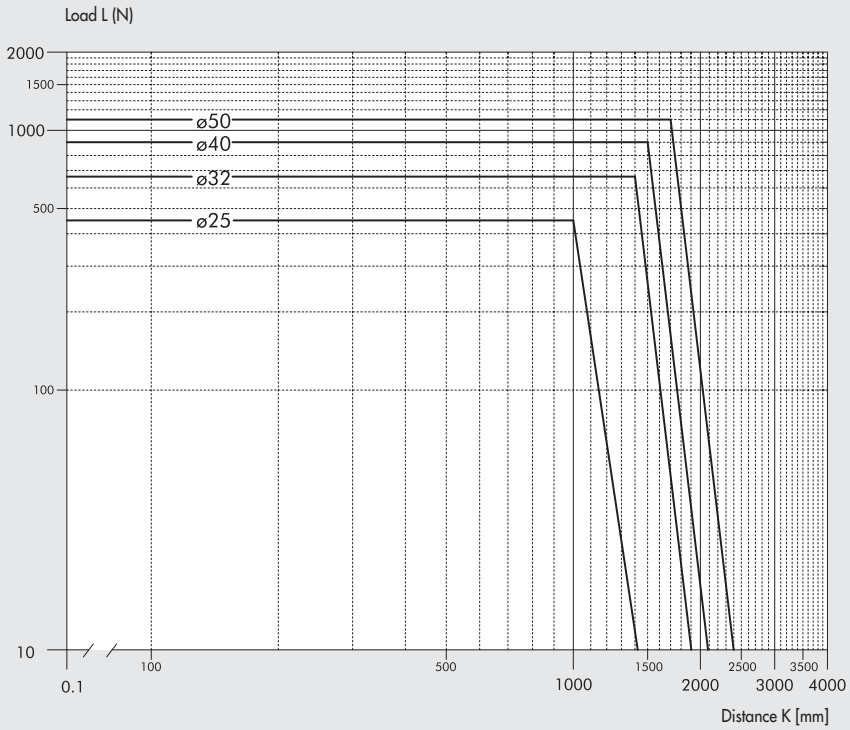
DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated.
The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders.
The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



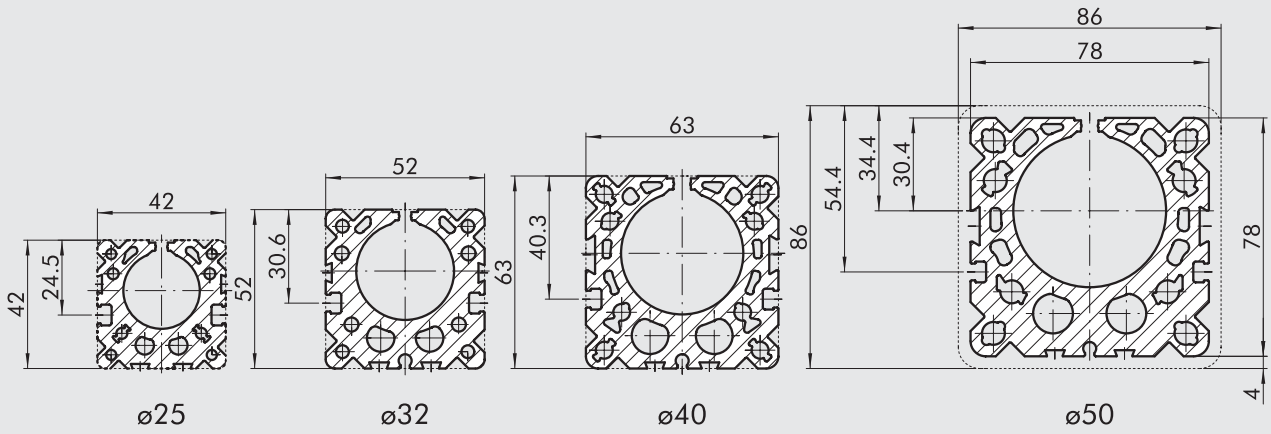
MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS





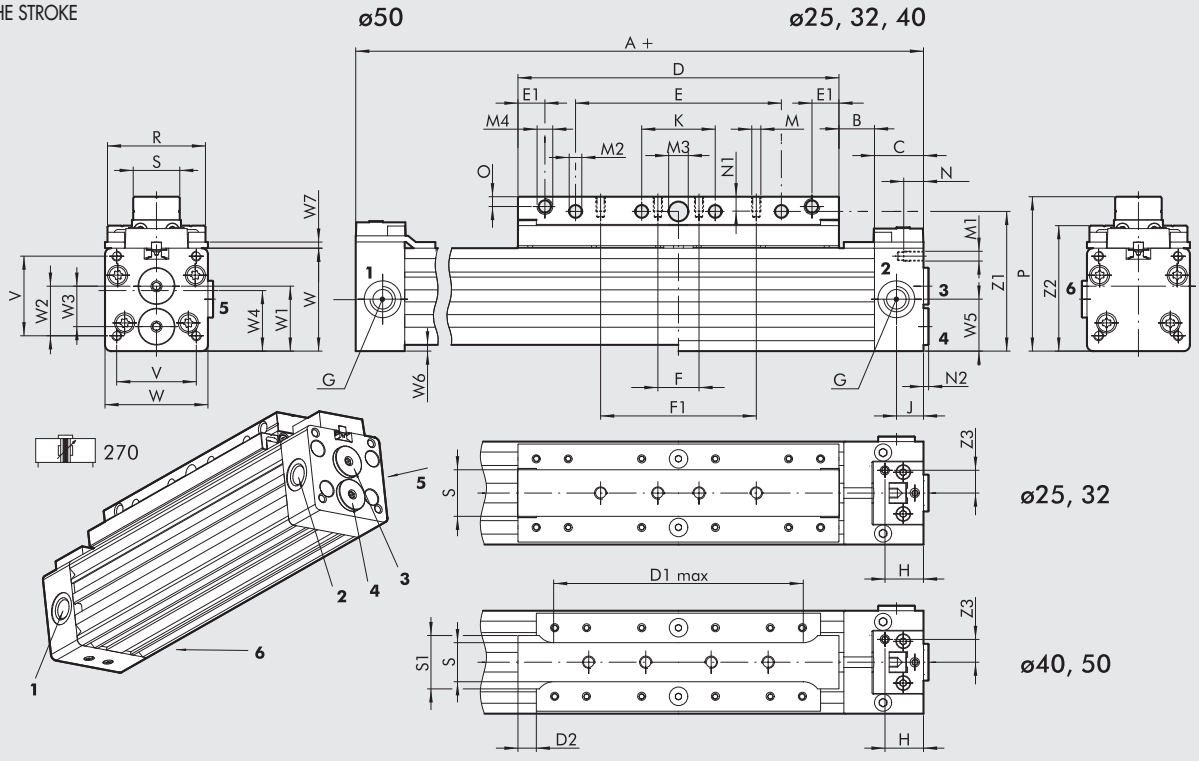
METAL WORK PNEUMATIC

BARREL CROSS SECTION



DIMENSIONS

+ = ADD THE STROKE



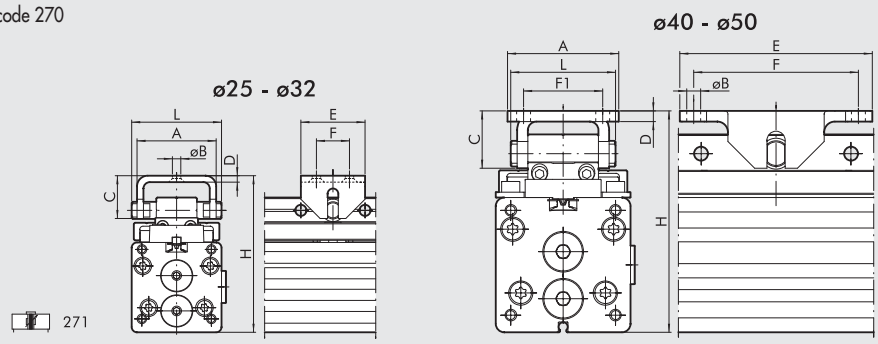
1 and **6** feed the left-hand chamber from the left side
4 feeds the left-hand chamber from the right side
2, **3** and **5** feed the right-hand chamber from the right side
NOTE: **3**, **4**, **5** and **6** are closed with threaded caps

Ø	A	B	C	D	D1 max	D2	E	E1	F	F1	G	H	J	K	M	M1	M2	M3 H10	M4	N	N1	N2	O	P	R	S	S1	V	W	W1	W2
25	200	14.5	20	131	-	-	84	11	50	-	G1/8	15.7	11	30	M5	M4	5.2	8	M6	13	7.5	2.1	4	63	40	19	-	32.5	42	26.5	20.3
32	250	19.5	20	171	-	-	124	11	30	100	G1/8	15.7	11	50	M5	M5	5.2	8	M6	13.5	7.5	2.1	4	73	48	19	-	40	52	31.2	24.3
40	300	19.8	23	214.5	168	10	150	5.2	40	130	G1/4	18	12.5	70	M6	M5	6.5	10	M5	15	11	2	5.5	92.5	60	21	33	49	63	37.7	29.7
50	350	19.9	23	264.3	198	10	170	6.2	50	150	G1/4	18	12.5	80	M8	M6	8.5	12	M6	16	12.5	2	6.5	115	74	24	42	72	86	53.4	46.4

Ø	W3	W4	W5	W6	W7	Z1	Z2	Z3
25	16.5	25.5	21.2	-	2.5	57	51.2	9.3
32	19	31.9	27	-	2.5	67	61	9.3
40	22	37.7	31.5	-	2.5	83.5	75.7	11
50	31.8	51.6	43	4	2.5	106	97	11

RODLESS CYLINDER WITH SWING CARRIAGE

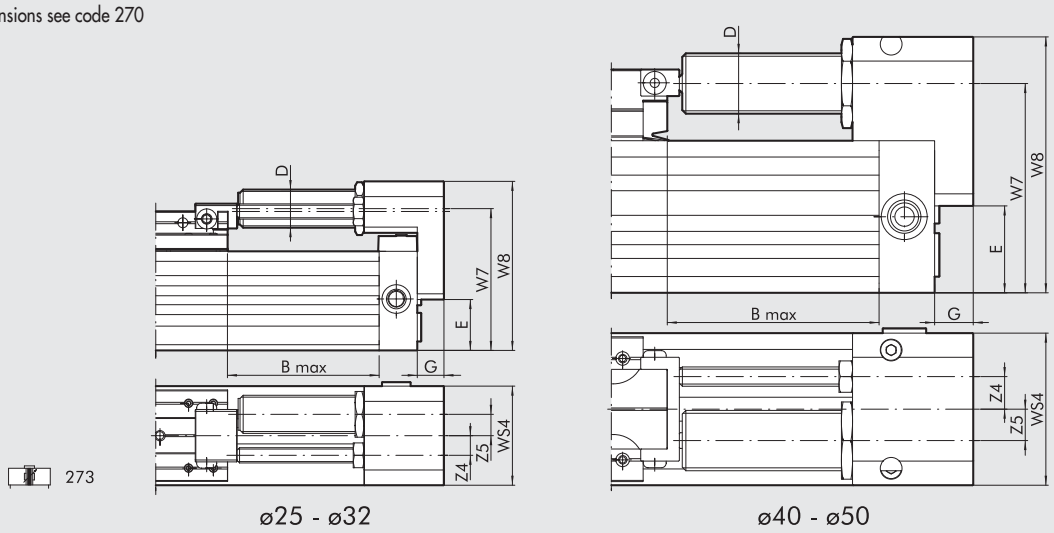
NOTE: For other dimensions see code 270



Ø	A	ØB	C	D	E	F	F1	H	L
25	37	5.5	20	3	30	16	-	73 - 75	42
32	37	5.5	20	3	30	16	-	83 - 85	42
40	52	6.5	26.8	5	90	77	37	103.5 - 105.5	49
50	52	6.5	26.8	5	90	77	37	125.3 - 128.3	49

DIMENSIONS VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS

NOTE: For other dimensions see code 270



Ø	B Max	D	E	G	W7	W8	WS4	Z4	Z5	Stroke	Max. cushioned force For stroke [J]	Max. cushioned force For hour [J]	Max. impact force [N]	Max. thrust force [N]
25	50	M14x1.5	21.5	12	61.5	72	42	9.2	6	16	26	34000	2800	530
32	75	M20x1.5	26.7	14	74.4	88.7	52	10.3	11.2	22	54	53700	3750	890
40	88	M25x1.5	36	16	86.7	106	63	13.5	13	25	90	70000	5500	1550
50	82	M25x1.5	49	20	108.5	129	86	17.5	9	25	90	70000	5500	1550

For graphs to help choose shock absorbers see page **A1**.167

KEY TO CODES

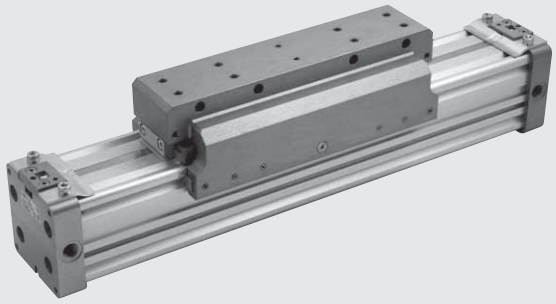
CYL	27	0	3	25	0100	C	P
	TYPE			**BORE**	**STROKE**		**GASKETS**
	27 Rodless cylinder	**0** Double-acting cushioned magnetic **1** Double-acting with swing carriage **3** Double-acting + adjustable limit switch and shock absorbers	**3** Magnetic ■ **4** No stick-slip **5** Non-magnetic	25 32 40 50	Ø 25 to 40: from 100 to 5700 mm Ø 50: from 100 to 5600 mm		**P** Polyurethane gaskets

■ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only.

RODLESS CYLINDER WITH "V" GUIDE SERIES PU

METAL WORK PNEUMATIC

Series PU rodless cylinders have an internal strip for longitudinal tightness made of polyurethane (PU) with a harmonic steel wire core. This solution gives excellent air tightness values. It is particularly suitable for high-speed and highly cyclical applications, even with long strokes.
The external strip, which merely provides protection against of foreign bodies entry, is made of harmonic steel. The anodised aluminium cylinder liner has a T-slot on either side for housing the retracting sensors.
Cylinder control solenoid valves can also be housed in these slots and secured by means of plates and screws (see page **A1**.48).
In order to increase the load capacity, side pads are mounted in addition to the guide pads normally present on the standard PU version. They run in grooves and support the central element (cap), which has a carriage-piston rocking coupling.
This means the carriage only transmits axial loads; it does not support loads and moments in other directions. Pad clearance can be adjusted by means of lateral threaded screws to reduce wear. The pads can be replaced without having to remove the cylinder. This family of cylinders has the same features as described for the basic version, such as built-in adjustable pneumatic cushioning and sensor and accessory slots. A version with adjustable limit switches and hydraulic decelerators is available. They can be purchased and added at any time, even to basic cylinders.

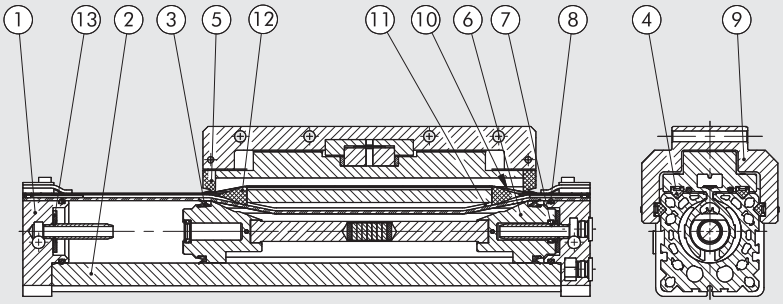


TECHNICAL DATA

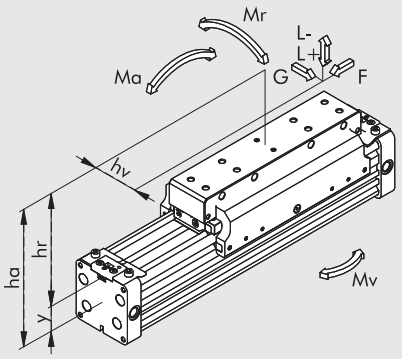
Operating pressure	bar	1 to 8
	MPa	0.1 to 0.8
	psi	14.5 to 116
Temperature range	°C	-10 to +80
	°F	14 to +176
Fluid		50 µm unlubricated filtered air Lubrication, if used, must be continuous
Bores	mm	Ø 50
Type of construction		Double-acting rodless cylinder with direct transmission system
Strokes	mm	from 100 to 5600 mm with 1mm interval
Recommended speeds	m/s	< 2
Max. speed with decelerators	m/s	< 2
Weight		See cylinder "**General technical data**" at the beginning of the chapter
Notes		**For speeds lower than 0.2 m / s to prevent surging, use the version No stick-slip and non-lubricated air**

COMPONENTS

① CYLINDER HEAD: anodized aluminium alloy
② BARREL: profiled anodized aluminium alloy
③ PISTON GASKET: polyurethane
④ V-SHAPED GUIDE PAD: Hostaform®
⑤ DUST SCRAPER: Hostaform®
⑥ PISTON: Hostaform®
⑦ CUSHIONING CONE: anodized aluminium alloy
⑧ STATIC O-RINGS: NBR
⑨ CENTRAL ELEMENT: anodized aluminium alloy
⑩ OUTER STRIP: stainless steel
⑪ INTERNAL STRAP: polyurethane + steel strands
⑫ DIRECTION CHANGE: Hostaform®
⑬ BUFFER: polyurethane



DIMENSIONING - FORCE AND TORQUE



Bore	Centre Distance Y	Cushioning stroke [mm]	Actual Force F at 6 bar [N]	G [N]	Max. load L + [N]	Max. load L - [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
50	30.4	39	850	1100	1400	1100	100	40	100

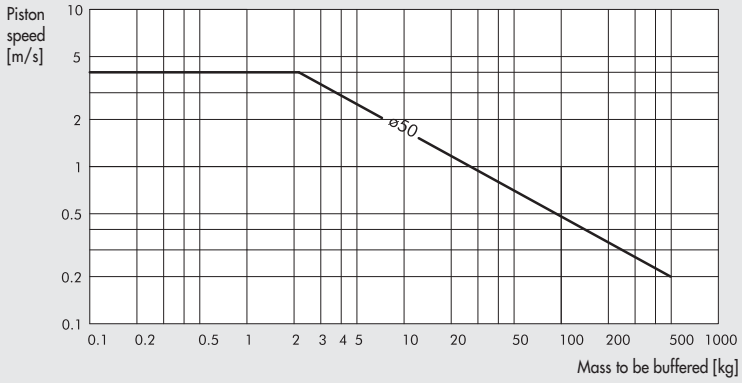
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

Ma = F x ha Mr = L x hv + G x hr Mv = F x hv

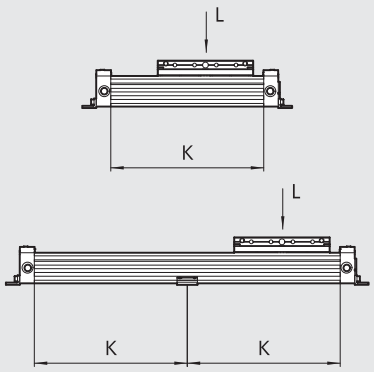
$$\frac{Mv}{Mv\ max} \leq 1; \quad \frac{L}{L\ max} \leq 1; \quad \frac{Ma}{Ma\ max} + \frac{Mr}{Mr\ max} + 0.22 \times \frac{Mv}{Mv\ max} + 0.4\frac{L}{L\ max} \leq 1$$

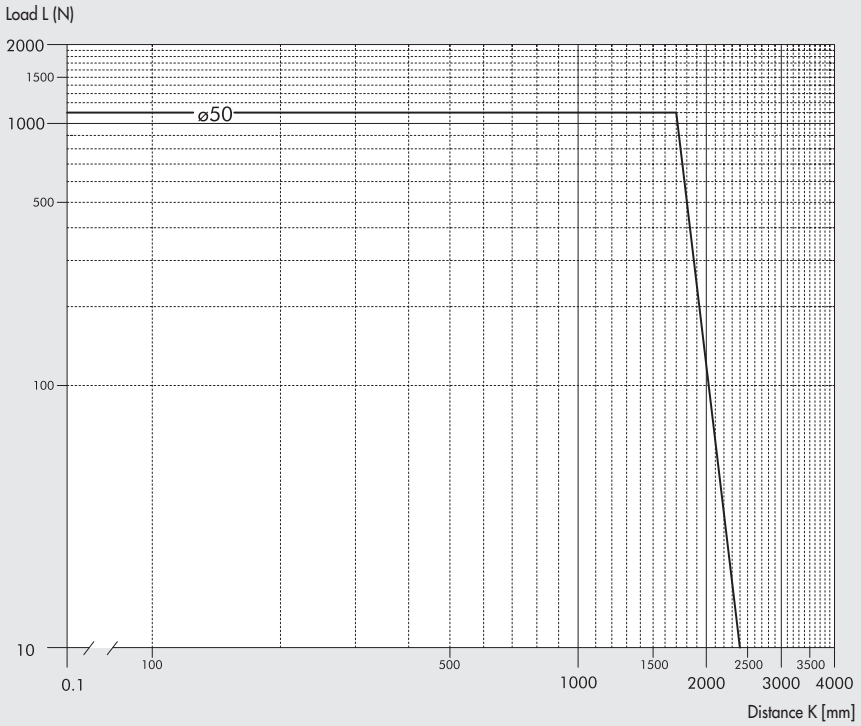
DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated.
The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders.
The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



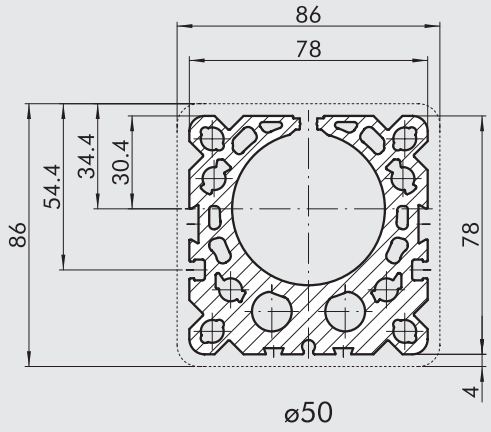
MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS





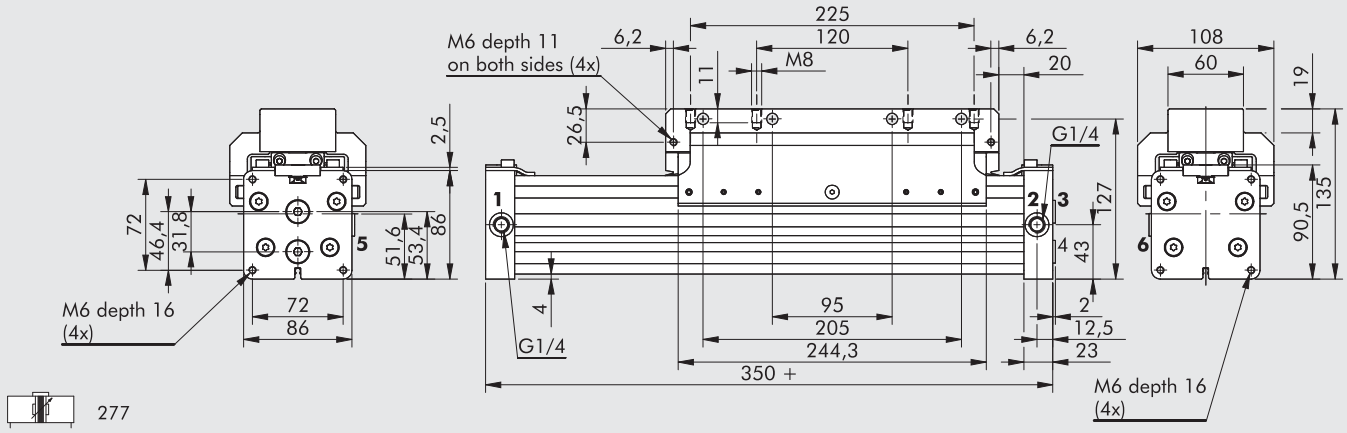
METAL WORK PNEUMATIC

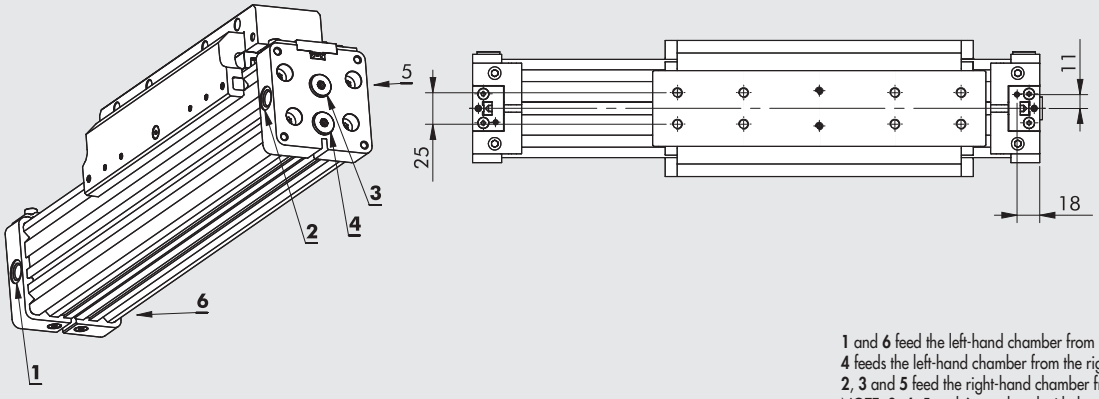
BARREL CROSS SECTION



DIMENSIONS

+ = ADD THE STROKE

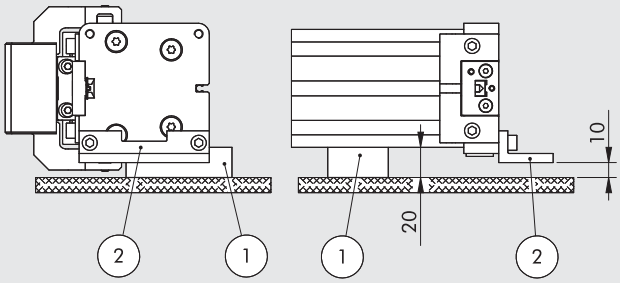




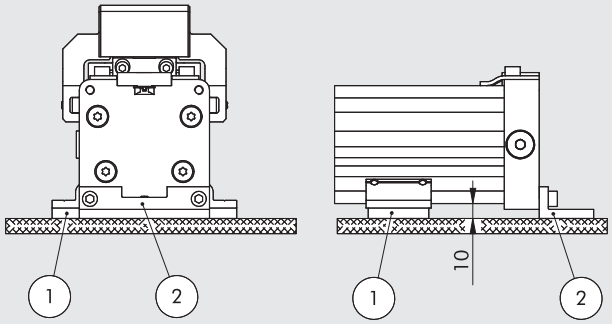
1 and **6** feed the left-hand chamber from the left side
4 feeds the left-hand chamber from the right side
2, **3** and **5** feed the right-hand chamber from the right side
NOTE: **3**, **4**, **5** and **6** are closed with threaded caps

ASSEMBLY DIAGRAMS

277 (horizontal)



277/278 (vertical)

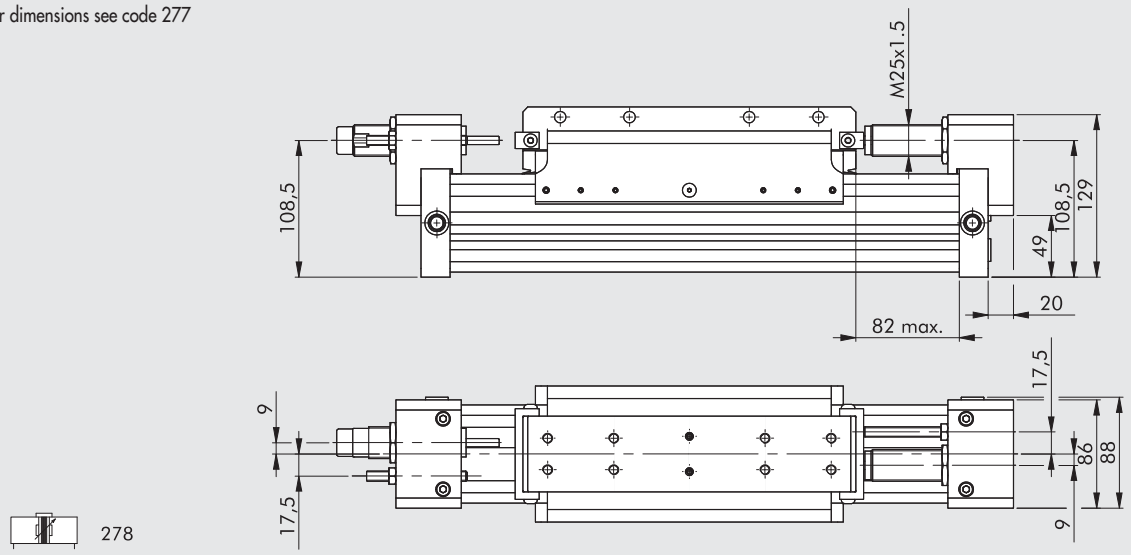


HORIZONTAL LAYOUT	
0950504052	Intermediate support code (1)
0950504041	Leg code (2)

VERTICAL LAYOUT	
0950507038	Intermediate support code (1)
0950504041	Leg code (2)

DIMENSIONS VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS

NOTE: For other dimensions see code 277



Ø	Cushioning stroke [mm]	Max. cushioned force For stroke [J]	Max. cushioned force For hour [J]	Max. impact force [N]	Max. thrust force [N]
50	25	65	70000	5550	1500

For graphs to help choose shock absorbers see page **A1**.167.

KEY TO CODES

CYL	27	7	3	50	0100	C	P
	TYPE			**BORE**	**STROKE**		**GASKETS**
	27 Rodless cylinder	**7** Double acting cushioned magnetic with "V" guide **8** Double acting cushioned magnetic with "V" guide + adjustable limit switch and shock absorbers	**3** Magnetic ■ **4** No stick-slip **5** Non-magnetic	50	from 100 to 5600 mm		**P** Polyurethane gaskets

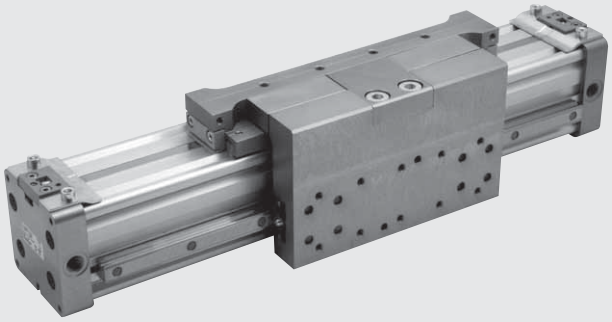
■ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only.

RODLESS CYLINDER WITH BALL RECIRCULATING GUIDE SERIES PU

Series PU rodless cylinders have an internal strip for longitudinal tightness made of polyurethane (PU) with a harmonic steel wire core. This solution gives excellent air tightness values. It is particularly suitable for high-speed and highly cyclical applications, even with long strokes.
The external strip, which merely provides protection against of foreign bodies entry, is made of harmonic steel. The anodised aluminium cylinder liner has a T-slot on either side for housing the retracting sensors.
Cylinder control solenoid valves can also be housed in these slots and secured by means of plates and screws (see page **A1**.48).
A hardened and tempered steel guide is firmly connected to the side of the liner to increase overall performance. This gives the following features:

- very high load capacity with forces acting in any direction and no transmission to the cylinder carriage;
- ball recirculation pads constructed using special technology that makes them very silent during movement of the guide and gives very long maintenance time intervals; lubrication must be performed every 2000 km or once a year, using type 2 grease, preferably with a lithium soap base;
- extra-sturdy carriage support with numerous load fixing holes and centring pin holes;
- stroke range 100-2470 mm with 1mm intervals.

One version has shock absorbers + adjustable limit switches.
These can also be added at a later stage by purchasing the relevant kit.



TECHNICAL DATA

Operating pressure	bar	1 to 8
	MPa	0.1 to 0.8
	psi	14.5 to 116
Temperature range	°C	-10 to +80
	°F	14 to 176
Fluid		50 µm unlubricated filtered air lubrication, if used, must be continuous
Bores	mm	Ø 50
Type of construction		Doubl-acting rodless cylinder with direct transmission system
Strokes	mm	from 100 to 2470 with 1 interval
Threaded ports		G1/4"
Assembly		As required
Recommended speed	m/s	<2
Max. speed with decelerators	m/s	<2
Weight		See cylinder "**General technical data**" at the beginning of the chapter
Notes		**For speeds lower than 0.2 m / s to prevent surging, use the version No stick-slip and non-lubricated air**

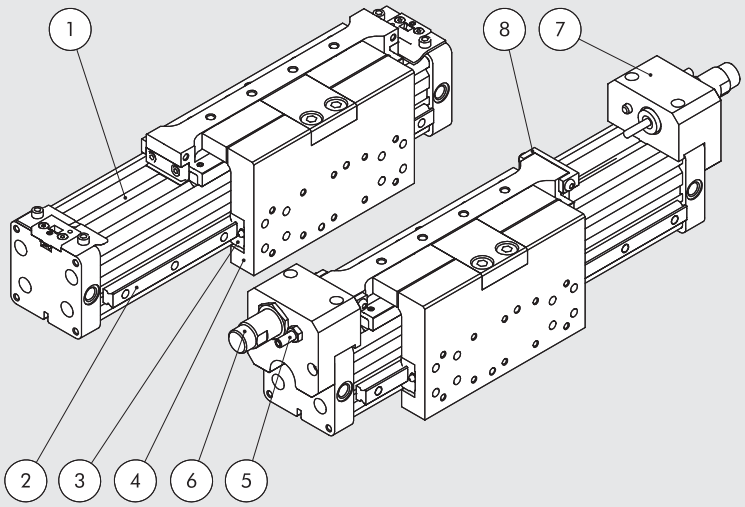
COMPONENTS

For version 275

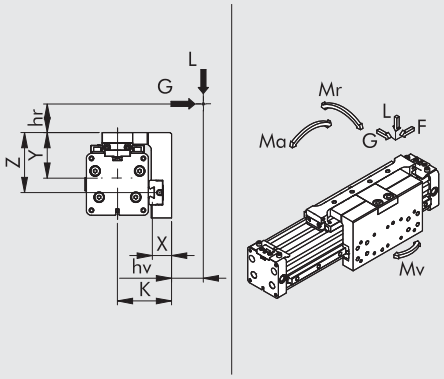
① CYLINDER: see components of **rodless cylinders - series PU**
② GUIDE: hardened steel
③ PAD: steel with hardened ball circulation
④ SLIDE SUPPORT: anodised aluminium

For version 276
Besides the details specified above:

⑤ END-OF-STROKE STUD PIN: zinc-plated steel, complete with 2 zinc-plated nuts for fixing
⑥ SHOCK ABSORBER: burnished steel, complete with 2 zinc-plated or burnished nuts for fixing
⑦ DECELERATOR SUPPORT: anodised aluminium
⑧ BRACKET: hardened-and-tempered and zinc-plated steel



DIMENSIONING - FORCES AND MOMENTS



Bore	Actual force F at 6 bar [N]	Cushioning stroke [mm]	K [mm]	X [mm]	Y [mm]	Z [mm]	Max load L [N]	Max load G [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
50	1000	39	75.1	26.6	63.3	83.3	4500	4500	260	140	260

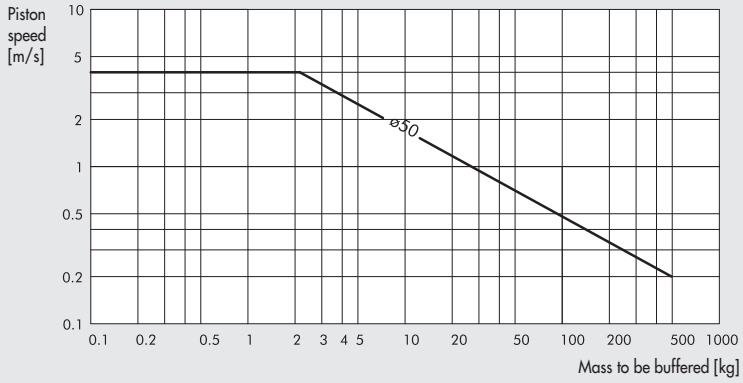
N.B.: When the cylinder is subjected simultaneously to torque and force, it is advisable to keep to the following equations, where the lengths have to be given in metres.

$Ma = F \times (hr + Y)$ $\quad Mr = G \times (hr + z) + Lx (hv + X)$ $\quad Mv = F \times (K + hv)$

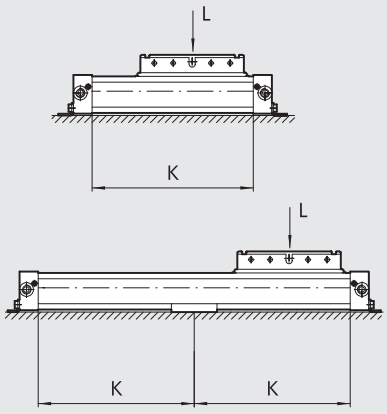
$$\frac{Ma}{Ma_{max}} + \frac{Mr}{Mr_{max}} + \frac{Mv}{Mv_{max}} + \frac{L}{L_{max}} + \frac{G}{G_{max}} \leq 1$$

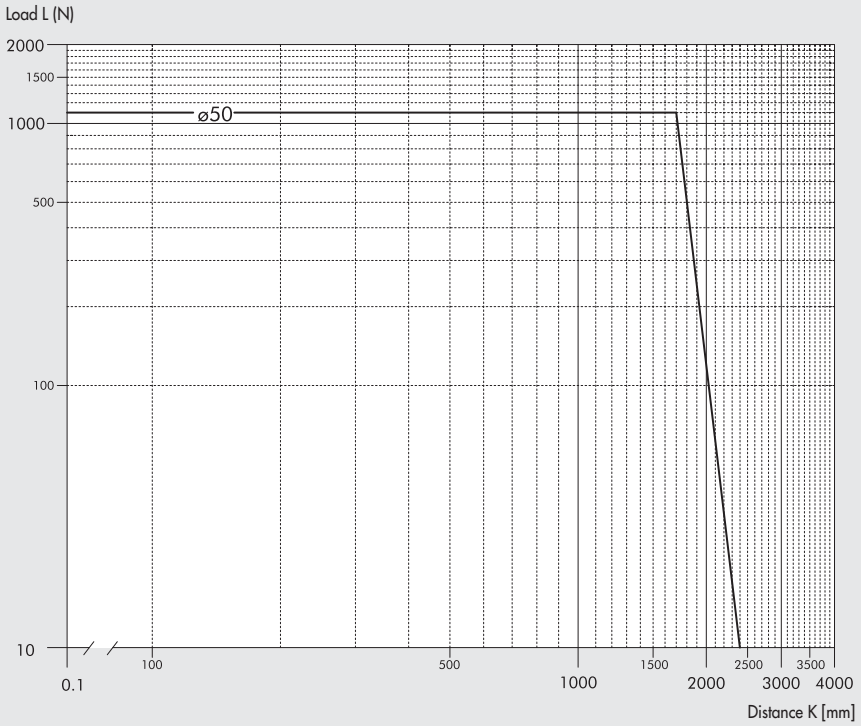
DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated.
The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders.
The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



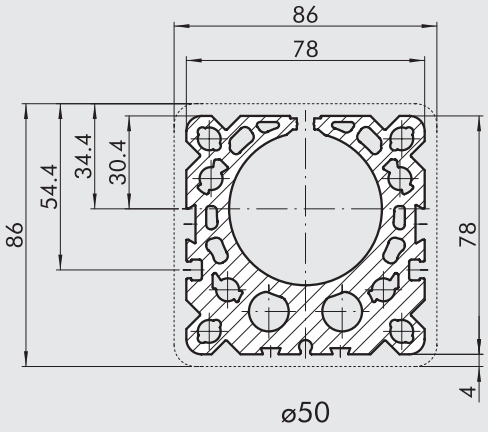
MAXIMUM LOAD ACCORDING TO THE DISTANCE BETWEEN SUPPORTS





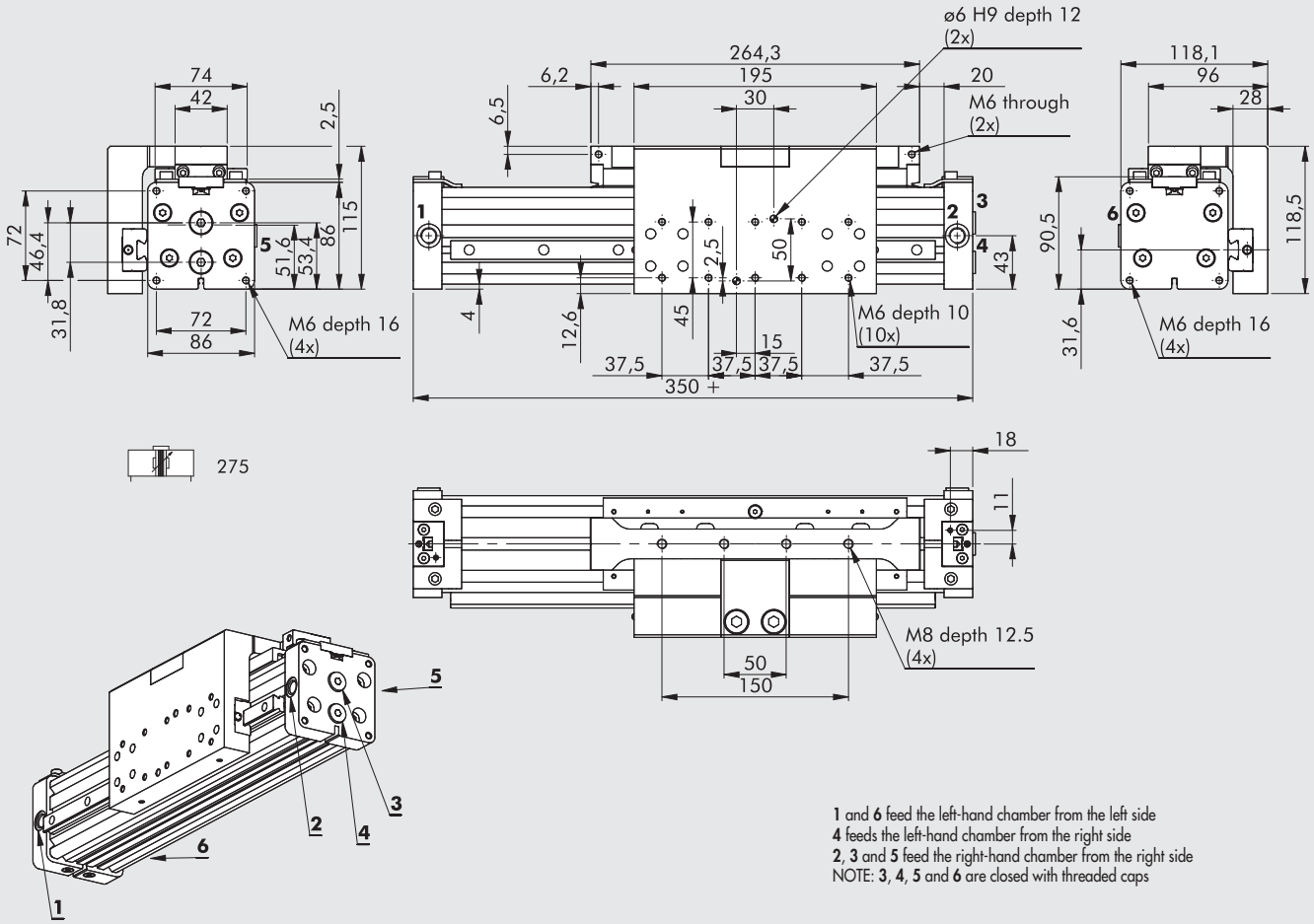
METAL WORK PNEUMATIC

BARREL CROSS SECTION



DIMENSIONS

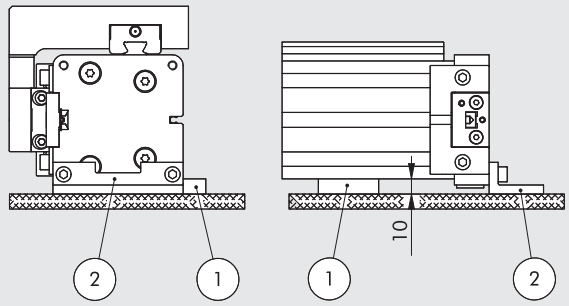
+ = ADD THE STROKE



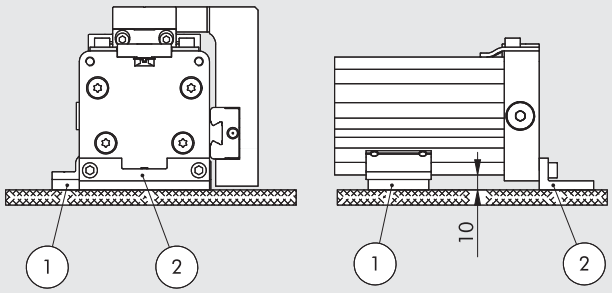
1 and **6** feed the left-hand chamber from the left side
4 feeds the left-hand chamber from the right side
2, **3** and **5** feed the right-hand chamber from the right side
NOTE: **3**, **4**, **5** and **6** are closed with threaded caps

ASSEMBLY DIAGRAMS

275 (horizontal)



275/276 (vertical)

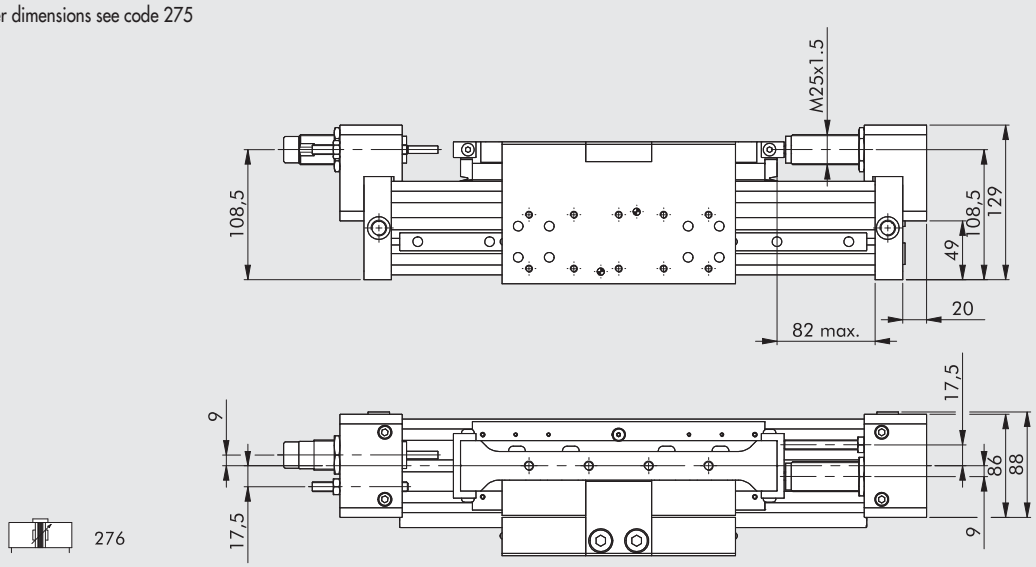


HORIZONTAL LAYOUT	
0950504051	Intermediate support code (1)
0950504041	Leg code (2)

VERTICAL LAYOUT	
0950504053	Intermediate support code (1)
0950504041	Leg code (2)

DIMENSION VERSION WITH ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS

NOTE: For other dimensions see code 275



Ø	Cushioning stroke [mm]	Max. cushioned force Per stroke [J]	Max. cushioned force Per hour [J]	Max. impact force [N]	Max. thrust force [N]
50	25	65	70000	5550	1500

For graphs to help choose shock absorbers see page **A1**.167.

KEY TO CODES

CYL	27	5	3	50	0100	C	P
	TYPE			**BORE**	**STROKE**		**GASKETS**
	27 Rodless cylinder	**5** Double-acting cushioned magnetic with ball circulation guides **6** Double-acting cushioned magnetic with ball circulation guides + adjustable limit switch and shock absorbers	**3** Magnetic ■ **4** No stick-slip **5** Non-magnetic	50	from 100 to 2470 mm		**P** Polyurethane gaskets

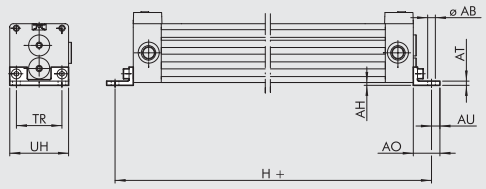
■ For speeds lower than 0.2 m/s, to prevent surging. Use no-lubricated air only.

ACCESSORIES AND SPARE PARTS FOR RODLESS CYLINDER SERIES PU

FIXINGS

FOOT

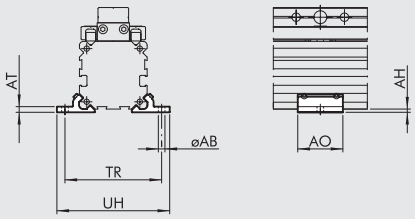
+ = ADD THE STROKE



Code	Ø	ØAB	AH	AO	AT	AU	TR	UH	H	Weight [g]
0950254041	25	5.5	2	19	3	6	32.5	42	226	30
0950324041	32	6.6	3	24	4	7	40	52	284	60
0950404041	40	6.6	3	26	5	8.5	49	63	335	90
0950504041	50	9	6 - 10	36	6	11	72	86	400	203

Note: Individually packed with 2 screws

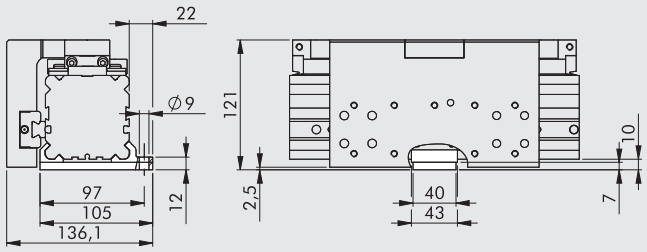
INTERMEDIATE SUPPORT FOR VERSION STD, "V" GUIDE



Code	Ø	ØAB	AH	AO	AT	TR	UH	Weight [g]
W0950257038	25	5.5	2	28	3.5	60	70	16
W0950327038	32	6.6	3	33	4	73	85	30
W0950407038	40	9	3	38	4.5	90	105	42
W0950507038	50	9	10	43	12	106	122	121

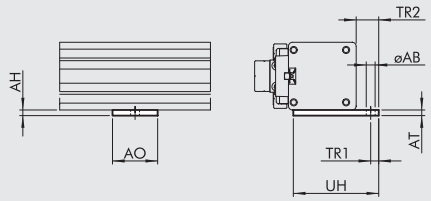
Note: 2 support and 4 grub screws for pack (Ø 25-32-40);
2 support, 4 grub screws and 2 plates for pack (Ø 50)

INTERMEDIATE SUPPORT FOR BALL RECIRCULATING", CODE 0950504053



Weight = 132 g
Note: Individually packed with 4 grub screws, 3 screws, 1 plate, 2 intermediate supports

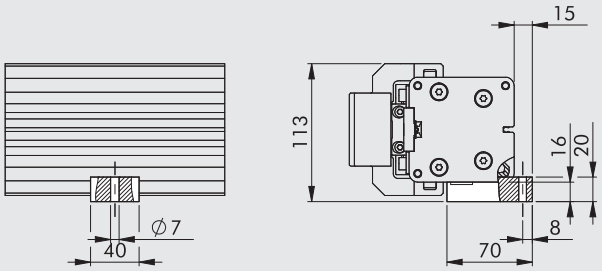
INTERMEDIATE SIDE SUPPORT FOR STD AND BALL RECIRCULATING VERSIONS



Code	Ø	ØAB	AH	AO	AT	TR1	TR2	UH	Weight [g]
0950254051	25	5.5	3.5	28	3.5	5	14	57.5	20
0950324051	32	5.5	4	40	4	5	12	61	32
0950404051	40	7	4	40	4	8	16	75	36
0950504051	50	7	10	40	10	8	19	90	101

Note: Individually packed with 2 screws, 2 plates

INTERMEDIATE SIDE SUPPORT FOR "V" GUIDE VERSION CODE 0950504052

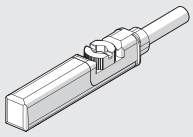


Weight = 162 g
Note: Individually packed with 2 screws, 2 plates

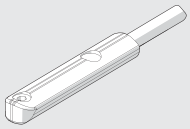
SENSOR

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



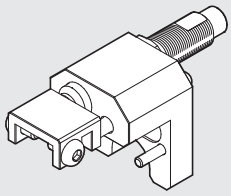
SENSOR, OVAL TYPE
Traditional



For codes and technical data, see **chapter A6**.

SHOCK ABSORBERS

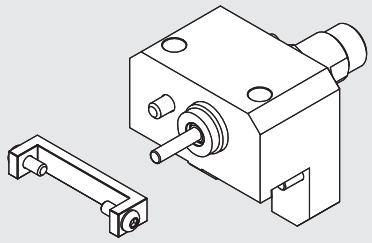
ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS KIT



Code	Ø	Description	Weight [g]
0950254013	**25**	Rodless cylinder limit switch and shock absorbers Ø 25 series PU	220
0950324013	**32**	Rodless cylinder limit switch and shock absorbers Ø 32 series PU	420
0950404013	**40**	Rodless cylinder limit switch and shock absorbers Ø 40 series PU	675
0950504013	**50**	Rodless cylinder limit switch and shock absorbers Ø 50 series PU	967

Note: supplied complete with 1 decelerator bracket, 1 standard decelerator, 1 decelerator nut, 1 limit switch grub screw, 1 limit switch grub screw nut, 1 limit switch block, 2 block screws and 2 decelerator bracket screws (nr 4 decelerator bracket screw for Ø 40 and Ø 50)

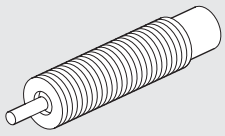
ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS KIT FOR VERSION "V" GUIDE



Code	Ø	Description	Weight [g]
0950504014	**50**	Rodless cylinder limit switch and shock absorbers Ø 50	967

Note: supplied complete with 1 decelerator bracket, 1 standard decelerator, 1 decelerator nut, 1 limit switch grub screw, 1 limit switch grub screw nut, 1 limit switch block, 2 block screws and 4 decelerator bracket screws

SHOCK ABSORBERS

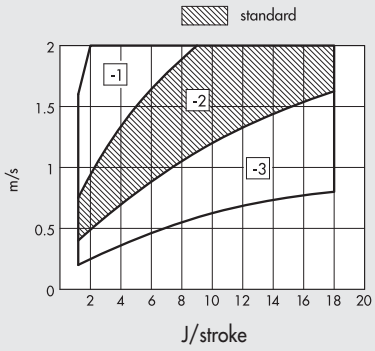


Code	Ø	Description
0950004004	**25**	Shock absorbers ECO 25 MC2 + nut M14x1.5
0950004005	**32**	Shock absorbers ECO 50 MC2 + nut M20x1.5
0950004006	**40-50**	Shock absorbers ECO 100 MF2 + nut M25x1.5

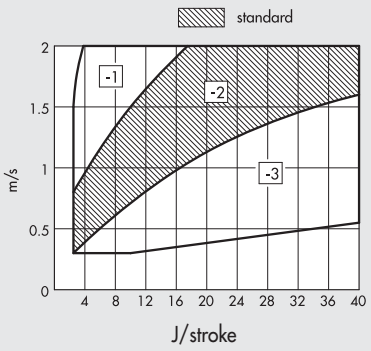
NOTES

GRAPHS TO HELP CHOOSE THE RIGHT SHOCK ABSORBERS

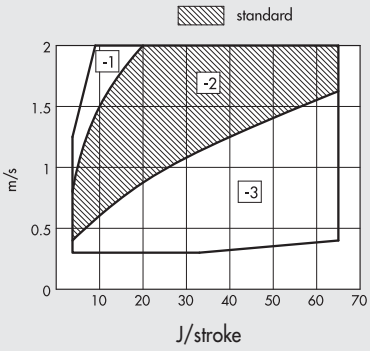
Ø 25



Ø 32

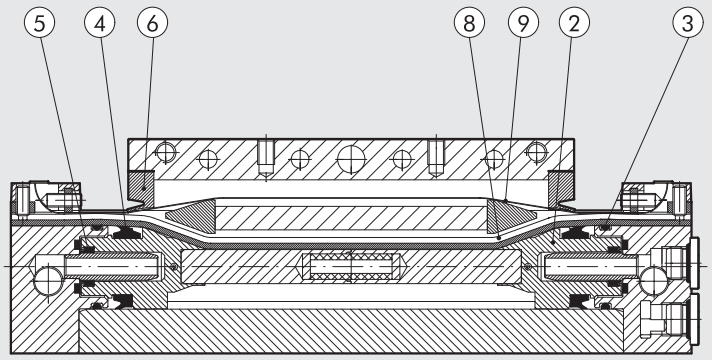


Ø 40-50



The dotted areas indicate that the SHOCK ABSORBERS is supplied standard.
Other options can be selected depending on the speed [m/sec] and the maximum work force [J/stroke] to dissipate at each stroke.
Refer to the diagrams above to select the correct option.

SPARE PARTS



DUST SCRAPER KIT POS 6	
Code	**Ø**
0090255025P	25
0090255025P	32
0090405025P	40
0090505025P	50
Note: 2 dust scrapers	

GASKET KIT POS 3-4-5	
Code	**Ø**
0090255024P	25
0090325024P	32
0090405024P	40
0090505024P	50
Note: 2 gasket for position	

BANDS KIT (inner and outer) POS 8-9	
Code	**Ø**
0090256____P	25
0090326____P	32
0090406____P	40
0090506____P	50
Complete the code with the 4-figure cylinder stroke	

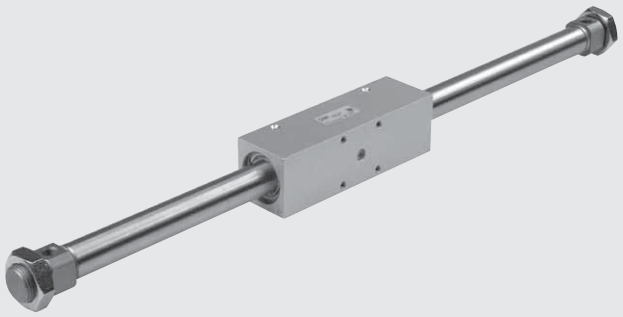
PISTON KIT POS 2	
Code	**Ø**
0090255009P	25
0090325009P	32
0090405009P	40
0090505009P	50
Note: 2 pistons	

NOTES

RODLESS CYLINDER WITH MAGNETIC SLIDING SERIES MAGNETIC SLIDE

The magnetic-slide rodless cylinder operates pneumatically and is equipped with a piston and a slide with magnets. The slide runs freely along the liner, following the piston movements, thanks to the magnetic coupling force between the two. If an axial force exceeding the magnetic coupling force is applied to the slide, it disengages. It is therefore important to operate within the pressure, force and speed ranges shown in the catalogue.
The load is fixed onto the slide using four threaded holes.
The cylinder is secured at the ends by means of nuts, flanges and brackets.
This solution is recommended when there is limited space for assembly, there must be no air leaks or impurities must be prevented from entering.
Available with three bores Ø 16-20-25, in the basic or swinging versions, with adjustable pneumatic cushioning or non-adjustable cushioning.
Designed for use with magnetic sensors.

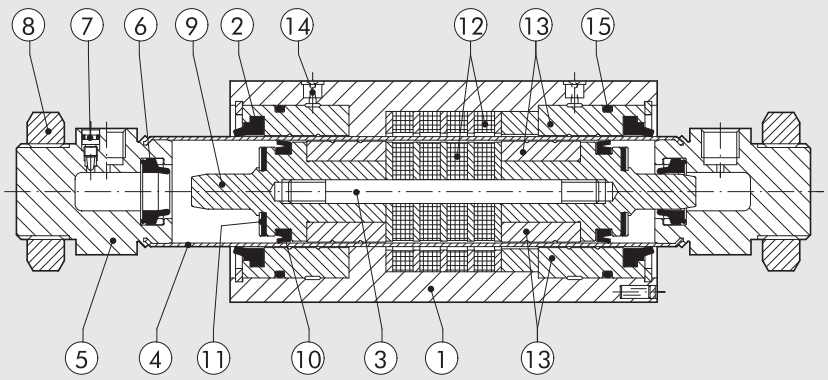
N.B.: We always suggest to use flow microregulators. During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.



TECHNICAL DATA		Ø 16	Ø 20	Ø 25
Operating pressure	bar	2 to 7		
	MPa	0.2 to 0.7		
	psi	29 to 101		
Temperature range	°C	-10 to 60		
	°F	14 to 140		
Fluid		Unlubricated 50 µm filtered air. Lubrication, if used, must be continuous		
Bores	mm	16; 20; 25		
Strokes	mm	from 10 to 1000 with 1 intervals		
Versions		Magnetic uncushioned/cushioned		
		Swinging magnet uncushioned/cushioned		
Design		Double-acting rodless cylinder, with magnetic coupling transmission system		
Position sensing		Magnet for limit switch sensor		
Fixing		Hex nuts (supplied standard) - Legs - Flanges		
Theoretic force at 6 bar	N	118	185	288
Magnetic coupling force (static condition)	N	200	300	500
Max speed	m/s	0.4	0.4	0.4
Weight		See cylinder "**General technical data**" at the beginning of the chapter		
Notes		Lubricate the slide every 2000 km or once a year, through the lubricators		

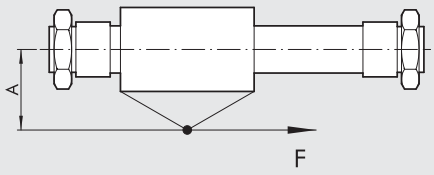
COMPONENTS

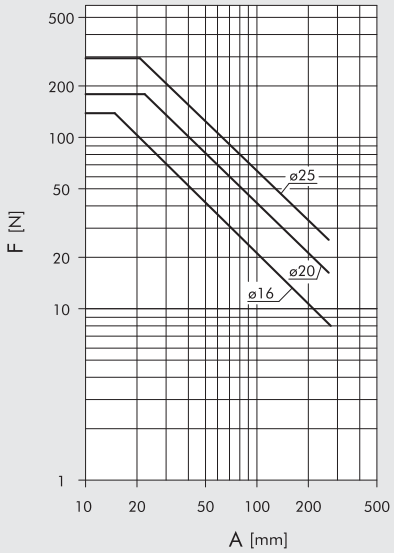
① SLIDE: anodized aluminium alloy
② WIPER RING: polyurethane
③ TIE ROD: stainless steel, thick-chromed
④ BARREL: AISI 304 stainless steel
⑤ HEAD: anodized aluminium alloy
⑥ CUSHIONING GASKET: NBR
⑦ NEEDLE: OT 58 with needle-out movement safety system, even when fully open
⑧ HEAD NUT: OT 58 nickel-plated
⑨ HALF-PISTON: aluminium alloy
⑩ PISTON GASKET: polyurethane
⑪ BUFFER: NBR
⑫ INT/EXT MAGNETS: neodymium
⑬ INT/EXT GUIDES: thermoplastic resin with lubricating additive
⑭ GREASE NIPPLE: steel
⑮ Static O-rings: NBR



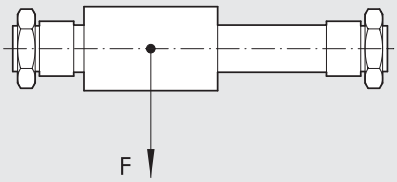
METAL WORK PNEUMATIC

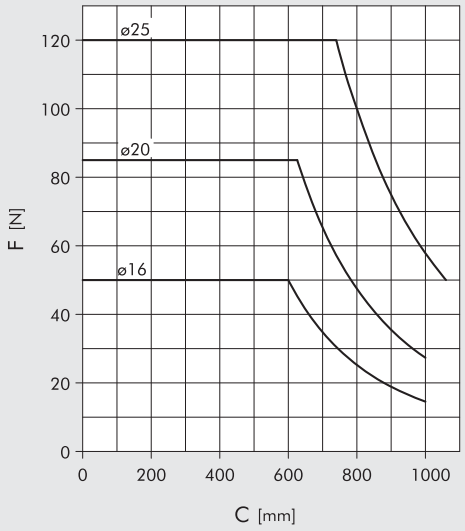
ADMISSIBLE AXIAL FORCE "F" AS A FUNCTION OF THE LEVER ARM "A"





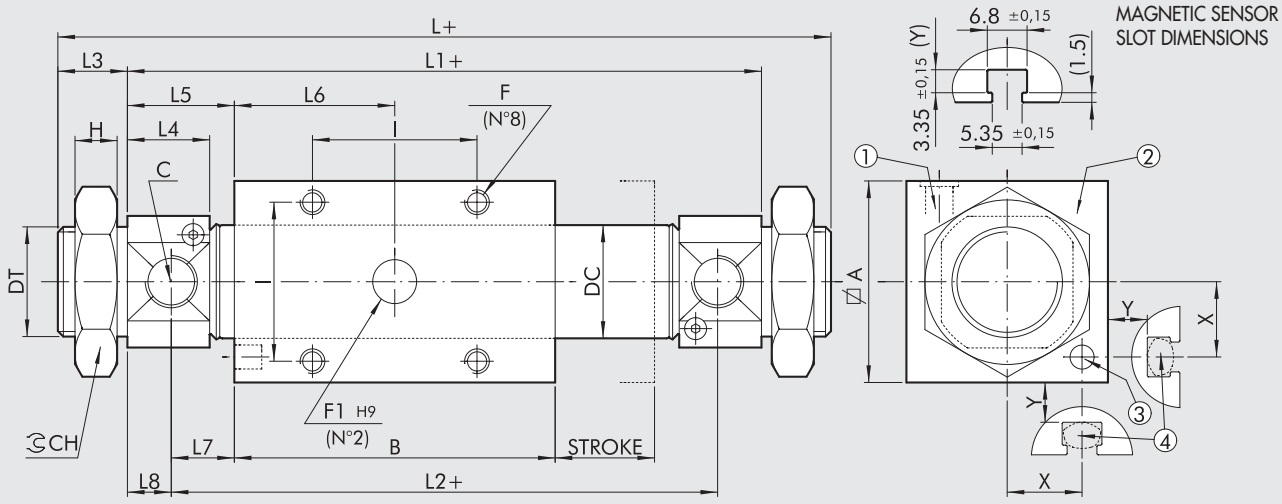
ADMISSIBLE AXIAL FORCE "F" AS A FUNCTION OF THE STROKE "C"

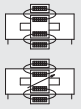




DIMENSIONS

+ = ADD STROKE





① Grease nipple
② External cursor, 360° adjustment
③ Sensor magnet
④ Position for magnetic sensors
(N.B. customer must provide supports)

Ø	A	B	C	DC	DT	F	F1	I	L	L1	L2	L3	L4	L5	L6	L7	L8	CH	H	X	Y
16	35	125	M5	17.3	M16x1.5	M5x7	8x3	26	205	181	169	12	10	28	62.5	22	6	24	8	14	9
20	42	135	G1/8	21.3	M22x1.5	M5x10	8x3	32	217	185	169	16	15.5	25	67.5	17	8	32	7	17.5	9
25	50	150	G1/8	26.5	M22x1.5	M6x11	10x4	36	238	206	188	16	17.1	28	75	19	9	32	7	21.5	9

KEY TO CODES

CYL	27 TYPE	A VERSION	0	16 BORE	0050 STROKE	X MATERIAL	P GASKETS
	27 Rodless cylinder	**A** Magnetic sliding DEM **B** Magnetic sliding DEMA **C** Magnetic sliding swinging DEM **D** Magnetic sliding swinging DEMA	**0** Magnetic	16 20 25	For the maximum suppliable strokes, look at the technical data	**X** Standard	**P** Polyurethane

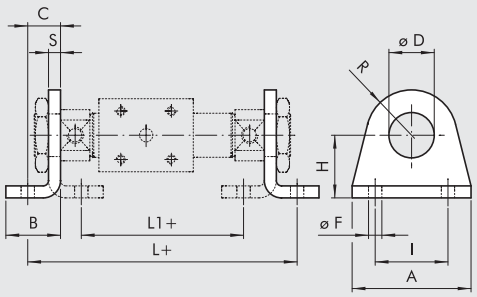
DEM: Magnetic double-acting (non-cushioned)
DEMA: Magnetic double-acting (cushioned)

NOTES

ACCESSORIES FOR RODLESS CYLINDER WITH MAGNETIC SLIDING: FIXING

FOOT

+ = ADD STROKE

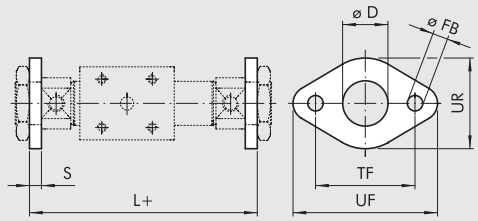


Code	Ø	D	A	B	C	H ±0.3	R	F ±0.2	I Js	L	L1	S	Weight [g]
0950164040	16	16	42	20	14	27	13	5.5	32	209	161	4	50
0950204040	20	22	54	25	17	30	20	6.5	40	219	161	5	105
0950204040	25	22	54	25	17	30	20	6.5	40	240	182	5	105

Note: individually pocket

FLANGE MODEL C

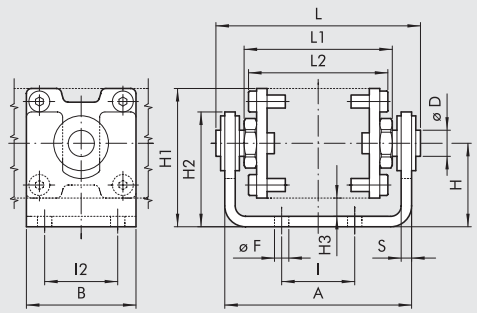
+ = ADD STROKE



Code	Ø	D	FB H13	TF Js14	UF	UR	L	S	Weight [g]
W0950120002	16	16	5.5	40	52	30	189	4	26
W0950200002	20	22	6.5	50	66	40	195	5	52
W0950200002	25	22	6.5	50	66	40	216	5	52

Note: individually pocket

KIT FOR SWING VERSION



Code	Ø	A	B	D	F ±0.1	H	H1	H2	H3	I	I2	L	L1	L2	S	Weight [g]
0950164050	16	67	40	10	5.5	28.5	46	40	7	26	26	73.5	53	52	4	288
0950204050	20	74	42	10	5.5	32	53	43	7	32	32	80.5	60	59	4	345
0950254050	25	87	50	12	6.5	38	63	50	8	36	36	96.5	68	68	5	576

Note: individually pocket. Supplied with 8 screws.

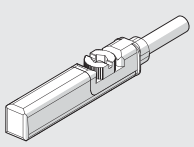
The swinging version kit can be used to avoid bending moments and lateral loads on the slide.
It can also be used to compensate for misalignments with respect to the load guide.
Max alignment error ±1mm.

ACCESSORIES: MAGNETIC SENSOR

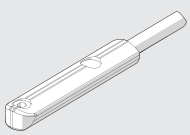
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



STAINLESS STEEL ISO 6432 MINI-CYLINDER

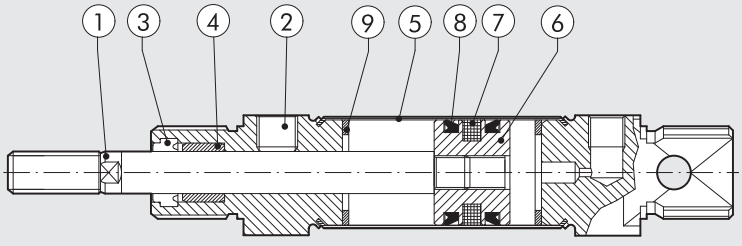
ISO 6432 stainless steel micro-cylinders are available in various versions with a wide range of accessories

- with or without magnet execution
- double-acting - single or through-rod
- gaskets: Polyurethane or FKM/FPM (for high temperatures)
- fixing accessories

TECHNICAL DATA		POLYURETHANE	FKM/FPM
Max operating pressure	bar	10	
	MPa	1	
Temperature range	°C	–10 to +80	–10 to +150 (non-magnetic cylinders)
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	16; 20; 25	
Design		Chamfered heads	
Standard strokes ✚	mm	max 500	
Versions		Double-acting, Double-acting through-rod	
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request	
Weight		See cylinder "**General technical data**" at the beginning of the chapter	
Notes		✚ Maximum recommended strokes. Higher values can create operating problems	

COMPONENTS

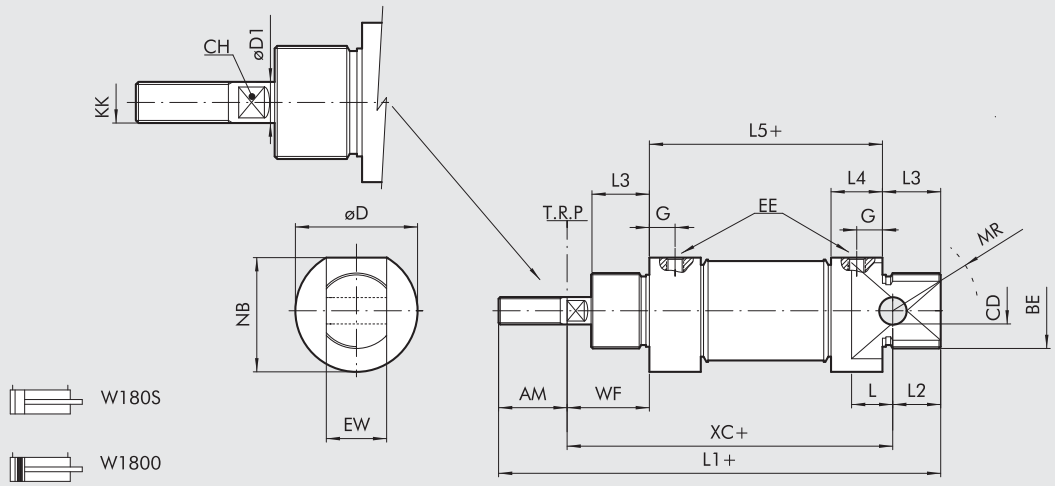
① PISTON ROD: AISI 316 steel
② HEAD: AISI 304 steel
③ PISTON ROD GASKET: polyurethane or FKM/FPM
④ GUIDE BUSHING: sintered bronze
⑤ BARREL: AISI 304 steel
⑥ PISTON: brass
⑦ PISTON GASKET: polyurethane or FKM/FPM
⑧ MAGNET: plastoferrite
⑨ Static O-rings: NBR or FKM/FPM



METAL WORK PNEUMATIC

DIMENSIONS OF DOUBLE-ACTING

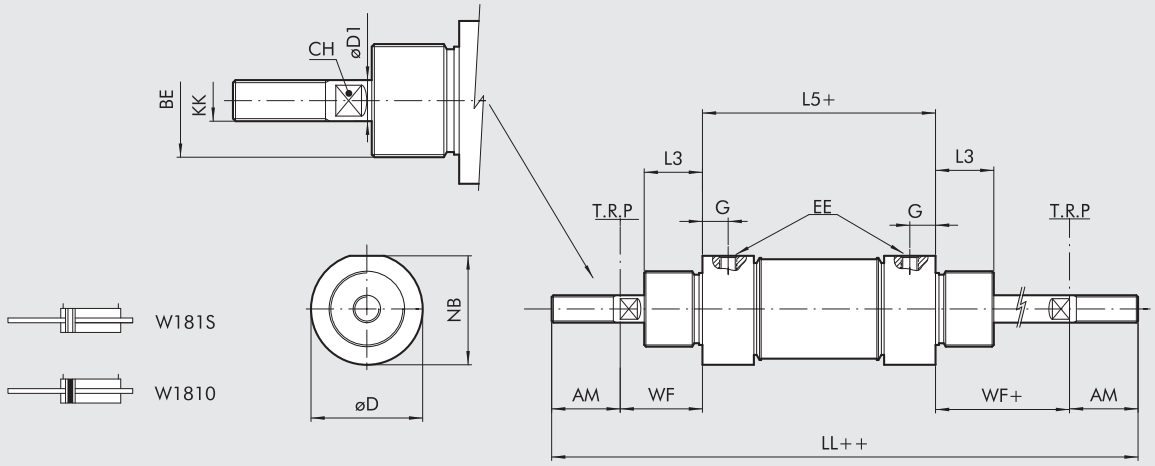
+ = ADD STROKE



Ø	AM	BE	øCD H9	CH	øD	øD1	EE	EW d13	G	KK	L	L1	L2	L3	L5	MR	NB	WF	XC
16	16	M16x1.5	6	5	19	6	M5	12	5	M6	9	109	11	18	53	16	18	22	82
20	20	M22x1.5	8	7	27	8	G 1/8	16	8	M8	12	131	16	20	67	18	25.5	24	95
25	22	M22x1.5	8	9	30	10	G 1/8	16	8	M10x1.25	12	140	14	22	68	21	28.5	28	104

DIMENSIONS DOUBLE-ACTING THROUGH-ROD

+ = ADD STROKE
++ = ADD TWICE THE STROKE



Ø	AM	BE	CH	øD	øD1	EE	G	KK	LL	L3	L5	NB	WF ±1,2
16	16	M16x1.5	5	19	6	M5	5	M6	129	18	53	18	22
20	20	M22x1.5	7	27	8	G 1/8	8	M8	155	20	67	25.5	24
25	22	M22x1.5	9	30	10	G 1/8	8	M10x1.25	168	22	68	28.5	28

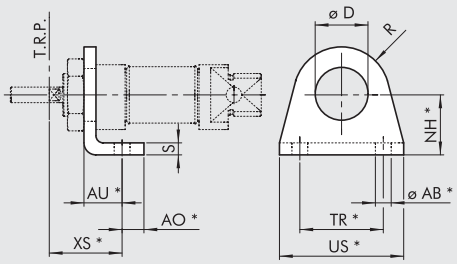
KEY TO CODES

W 1 8	0	0	1 6	0 0 2 0
	TYPE	**VERSION**	**DIAMETER**	**STROKE**
Stainless steel cylinder	**0** DEM **1** DEM through-rod	**0** Standard (magnetic) **S** Non-magnetic ● **V** FKM/FPM gasket	16 20 25	✚ 0 to 500 mm

DEM: Magnetic double-acting (non-cushioned)
✚ Maximum recommended strokes. Higher values can create operating problems
● For this version the cylinder will be not magnetic

ACCESSORIES FOR STAINLESS STEEL ISO 6432 MINI-CYLINDER: FIXINGS

STAINLESS STEEL LEG MODEL A

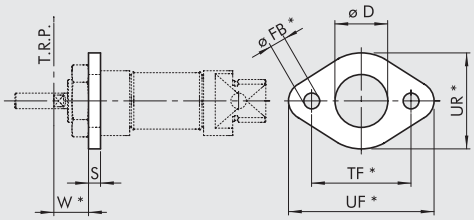


Code	Ø	ØAB	AU	AO	D	NH	XS ±1.4	R	S	TR	US	Weight [g]
W095X120001	16	5.5	14	6	16.1	20	22	13	4	32	42	42
W095X200001	20	6.6	17	8	22.1	25	36	20	5	40	54	90
W095X200001	25	6.6	17	8	22.1	25	40	20	5	40	54	90

*ISO 6432 values

Note: Individually packed

STAINLESS STEEL FLANGE MODEL C

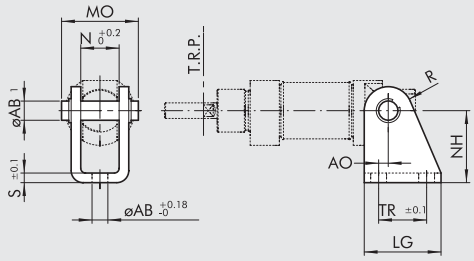


Code	Ø	D	FB	W ±1.4	S	TF	UF	UR	Weight [g]
W095X120002	16	16	5.5	18	4	40	52	30	26
W095X200002	20	22	6.6	19	5	50	66	40	52
W095X200002	25	22	6.6	23	5	50	66	40	52

*ISO 6432 values

Note: Individually packed

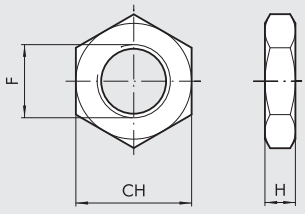
STAINLESS STEEL COUNTER-HINGE MODEL BC



Code	Ø	AB1	AB	AO	LG	MO	N	NH	R	S	TR	Weight [g]
W095X120005	16	6	5.5	2	25	24	12.1	27	7	3	15	40
W095X200005	20	8	6.6	4	32	31	16.1	30	10	4	20	78
W095X200005	25	8	6.6	4	32	31	16.1	30	10	4	20	78

Note: Supplied complete with 1 pin and 2 snap rings

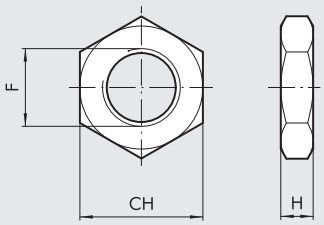
STAINLESS STEEL NUT FOR HEADS



Code	Ø	CH	F	H
W095X120010	16	22	M16x1.5	5
W095X200010	20	27	M22x1.5	8
W095X200010	25	27	M22x1.5	8

Note: Individually packed

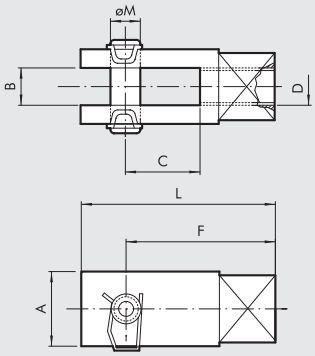
STAINLESS STEEL NUT FOR PISTON RODS



Code	Ø	CH	F	H	Weight [g]
W095X120011	**16**	10	M6	4	1
W095X200011	**20**	13	M8	5	3
W095X322011	**25**	17	M10x1.25	6	7

Note: Individually packed

STAINLESS STEEL FORK-MODEL GK-M



Code	Ø	A	B	C	D	F	L	Ø M
W095X120020	**16**	12	6	12	M6	24	31	6
W095X200020	**20**	16	8	16	M8	32	42	8
W095X322020	**25**	20	10	20	M10x1.25	40	52	10

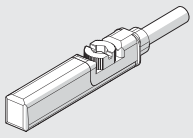
Note: Individually packed

ACCESSORIES: MAGNETIC SENSORS

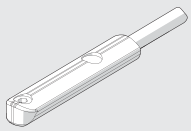
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

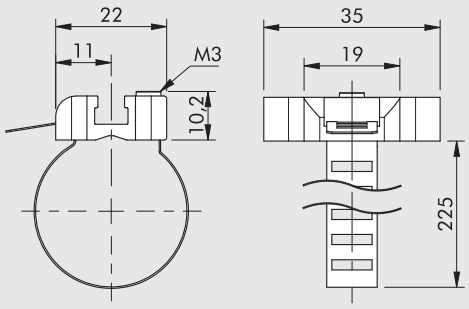
SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



SENSOR CIRCLIP



Code	Bore	Description
W0950001103	8 to 63	Sensor circlip

Note: Individually packed

MATERIAL
Circlip: stainless steel
Sensor holder: zamak

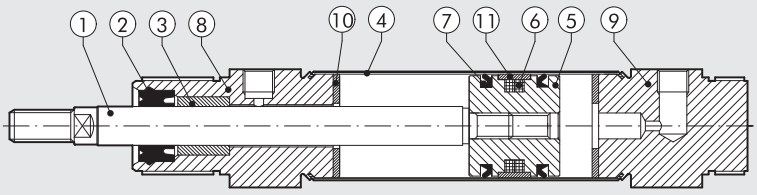
STAINLESS STEEL ROUND CYLINDER RNDC

Stainless steel clean profile cylinders available in different versions:
- with or without magnet execution
- double-acting - single or through-rod
- gaskets: Polyurethane or FKM/FPM (for high temperatures)

TECHNICAL DATA		POLYURETHANE	FKM/FPM
Max operating pressure	bar	10	
	MPa	1	
	psi	145	
Temperature range	°C	–10 to +80	–10 to +150 (non-magnetic cylinders)
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	32; 40; 50; 63	
Design		Chamfered heads	
Versions		Double-acting, Double-acting through-rod	
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request	
Standard strokes ✚	mm	max 500	
Weight		See cylinder "**General technical data**" at the beginning of the chapter	
Notes		✚ Maximum recommended strokes. Higher values can create operating problems	

COMPONENTS

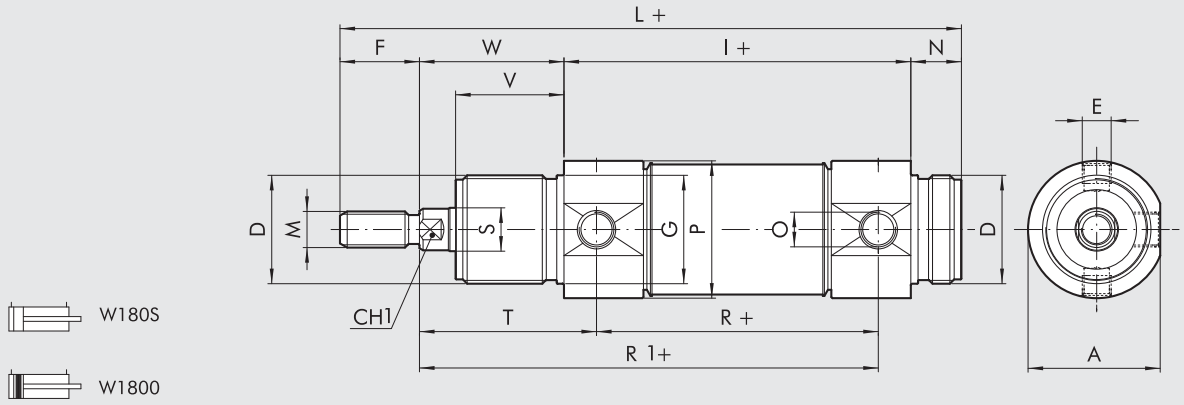
① PISTON ROD: AISI 316 steel
② PISTON ROD GASKET: polyurethane or FKM/FPM
③ GUIDE BUSHING: sintered bronze
④ BARREL: AISI 304 steel
⑤ PISTON: aluminium
⑥ MAGNET: plastoferrite
⑦ PISTON GASKET: polyurethane or FKM/FPM
⑧ ⑨ HEAD:AISI 304 steel
⑩ BUFFER: polyurethane
⑪ GUIDE RING: PTFE



METAL WORK PNEUMATIC

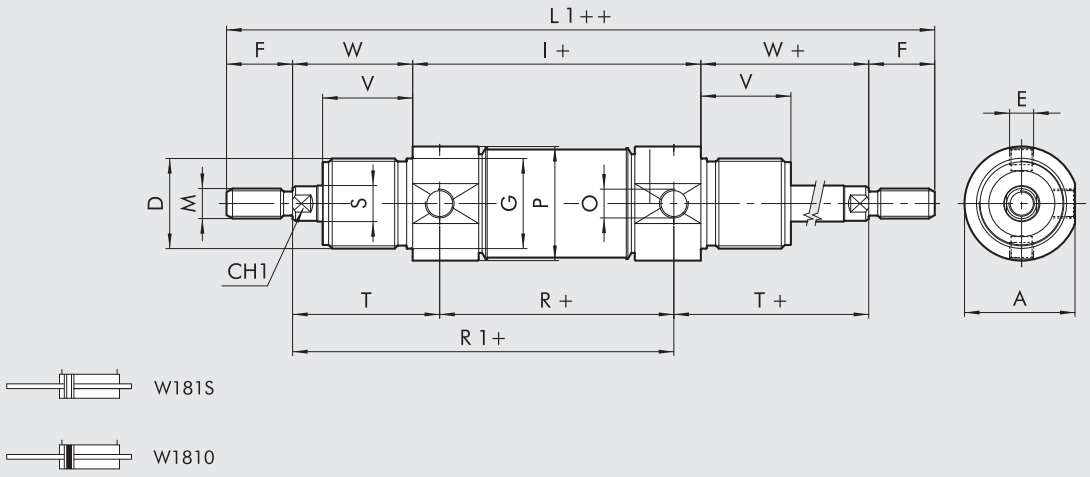
DIMENSIONS OF DOUBLE-ACTING

+ = ADD STROKE



DIMENSIONS DOUBLE-ACTING THROUGH-ROD

+ = ADD STROKE
++ = ADD TWICE THE STROKE



Ø	A	CH1	D	E	F	Ø G	I	L	L1	M	N	O	Ø P	R	Ø S	T	V	W
32	36.5	10	M30x1.5	M8x1	20	30	96	168	212	M10x1.5	14	G1/8	38	78	12	47	30	38
40	44	13	M38x1.5	M10x1	24	38	113	198	251	M12x1.75	16	G1/4	46	89	16	57	35	45
50	55	17	M45x1.5	M12x1.5	32	45	120	220	284	M16x2	18	G1/4	57	96	20	62	38	50
63	67.5	17	M45x1.5	M14x1.5	32	45	124	224	288	M16x2	18	G3/8	70	98	20	63	38	50

KEY TO CODES

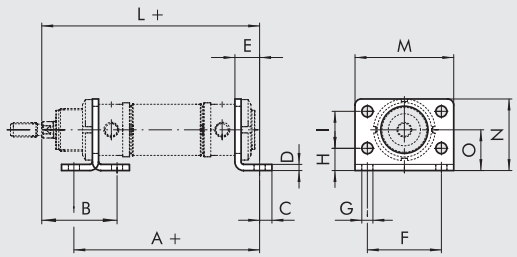
W 1 8	**0**	**0**	**3 2**	**0 0 3 2**
	TYPE	**VERSION**	**DIAMETER**	**STROKE**
Stainless steel cylinder	**0** DEM **1** DEM through-rod	**0** Standard (magnetic) **S** Non-magnetic ● **V** FKM/FPM gasket	32 40 50 63	✚ Ø 32 to 63 stroke 0 to 500 mm

DEM: Magnetic double-acting (non-cushioned)
✚ Maximum recommended strokes. Higher values can create operating problems
● For this version the cylinder will be not magnetic

ACCESSORIES FOR STAINLESS STEEL ROUND CYLINDER: FIXINGS

STAINLESS STEEL LEG MODEL AC

+ = ADD STROKE

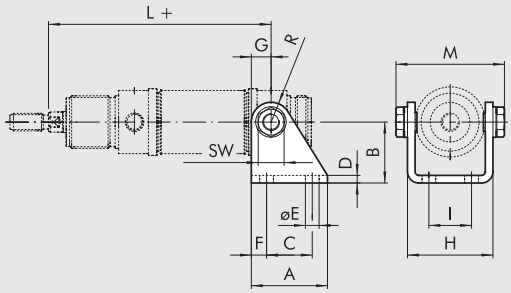


Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	O
W095X320002	**32**	124	48	7	4	14	52	7	14	28	148	66	49	28
W095X400002	**40**	153	60	10	5	20	60	9	18	30	178	80	58	33
W095X500002	**50**	160	64	10	6	20	70	9	20	40	190	90	70	40
W095X630002	**63**	164	64	10	6	20	76	9	20	50	194	96	80	45

Note: Individually packed

STAINLESS STEEL COUNTER-HINGE MODEL BC

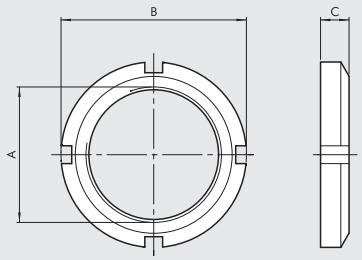
+ = ADD STROKE



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	R
W095X320005	**32**	40	35	24	4	7	8	12	46.1	20	125	58.1	12
W095X400005	**40**	50	40	30	5	9	10	13	56.1	28	146	70.1	13
W095X500005	**50**	54	45	34	6	9	10	14	69.1	36	158	86.1	14
W095X630005	**63**	65	50	35	6	9	15	16	82.1	42	161	99.1	16

Nota: Supplied complete with 2 screws

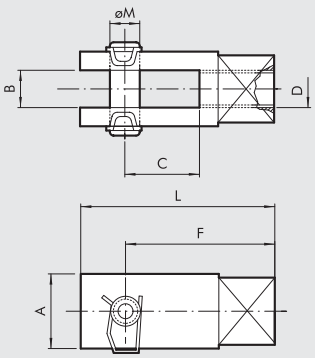
STAINLESS STEEL HEAD RING NUT MODEL G



Code	Ø	A	B	C
W095X320010	**32**	M30x1.5	45	7
W095X400010	**40**	M38x1.5	52	8
W095X500010	**50**	M45x1.5	58	9
W095X500010	**63**	M45x1.5	58	9

Note: Individually packed

STAINLESS STEEL FORK-MODEL GK-M

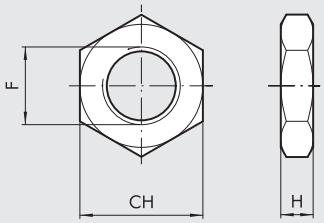


Code	Ø	A	B	C	D	F	L	Ø M
W095X320020	**32**	20	10	20	M10x1.5	40	52	10
W095X400020	**40**	24	12	24	M12x1.75	48	62	12
W095X500020	**50**	32	16	32	M16x2	64	83	16
W095X500020	**63**	32	16	32	M16x2	64	83	16

Note: Individually packed

METAL WORK PNEUMATIC

STAINLESS STEEL NUT FOR PISTON RODS

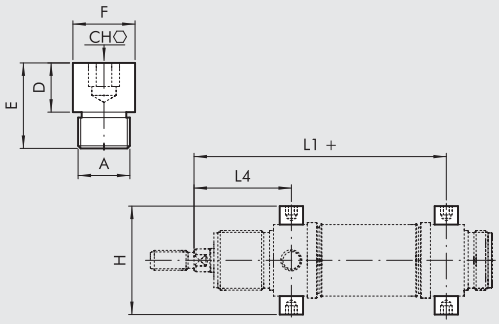


Code	Ø	F	CH	H	Weight [g]
W095X320011	32	M10x1.5	17	6	6
W095X400011	40	M12x1.75	19	7	12
W095X500011	50	M16x2	24	8	20
W095X500011	63	M16x2	24	8	20

Note: Individually packed

STAINLESS STEEL OSCILLATING PIN

+ = ADD STROKE



Code	Ø	A	CH	D	E	øF	H	L1	L4
W095X320007	32	M8X1	5	8	14	10	51	125	47
W095X400007	40	M10X1	6	9.5	16.5	12	61	146	57
W095X500007	50	M12X1.5	6	11	20	14	75	158	62
W095X630007	63	M14X1.5	8	13	26	16	92	161	63

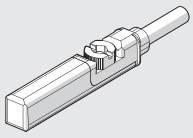
Note: 2- piece pack

ACCESSORIES: MAGNETIC SENSORS

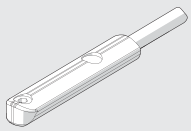
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

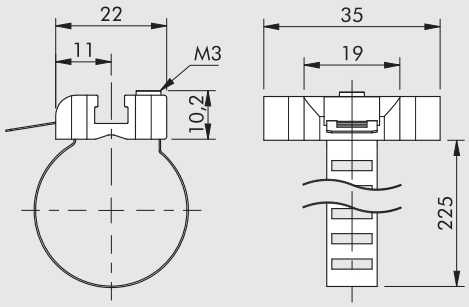
SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



SENSOR CIRCLIP



Code	Bore	Description
W0950001103	8 to 63	Sensor circlip

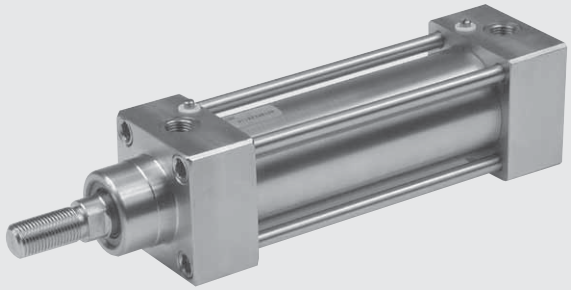
Note: Individually packed

MATERIAL
Circlip: stainless steel
Sensor holder: zamak

STAINLESS STEEL ISO 15552 CYLINDER (EX ISO 6431)

Stainless steel cylinders made to ISO 15552 available in various versions and with a wide range of accessories:

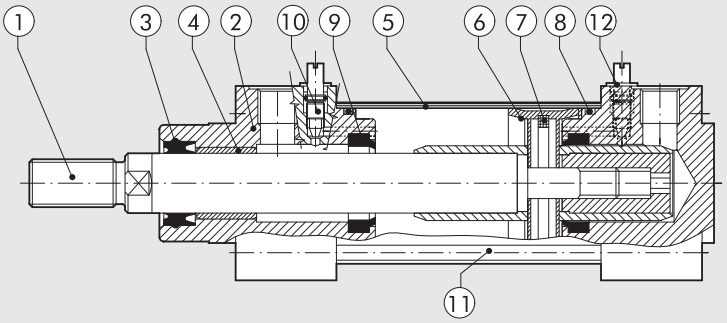
- with or without magnet execution
- double-acting – single- or through-rod
- gaskets: Polyurethane or FKM/FPM (for high temperatures)
- fixing accessories, guide units and mechanical piston rod lock



TECHNICAL DATA		POLYURETHANE	FKM/FPM
Max operating pressure	bar	10	
	MPa	1	
	psi	145	
Temperature range	°C	–10 to +80	–10 to +150 (non magnetic cylinders)
Fluid		Unlubricated air. Lubrication, if used, must be continuous	
Bores	mm	32; 40; 50; 63; 80; 100; 125	
Design		Heads with tie rods	
Standard strokes ✚	mm	max 1000	
Versions		Double-acting cushioned, Double-acting through-rod cushioned	
Magnet for sensors		All versions come complete with magnet. Supplied without magnet on request	
Weight		See cylinder "**General technical data**" at the beginning of the chapter	
Notes		✚ Maximum recommended strokes. Higher values can create operating problems	

COMPONENTS

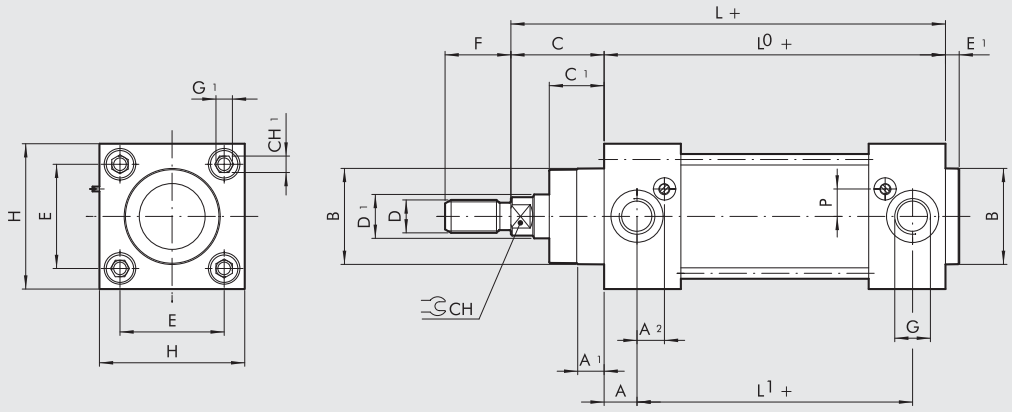
① PISTON ROD: AISI 316 steel
② HEAD: AISI 304 steel
③ PISTON ROD GASKET: polyurethane or FKM/FPM
④ GUIDE BUSHING: sintered bronze
⑤ BARREL: AISI 304 steel
⑥ ENBLOC GASKET: NBR or FKM/FPM
⑦ MAGNET: plastoferrite
⑧ Static O-rings: NBR or FKM/FPM
⑨ CUSHIONING GASKET: polyurethane or FKM/FPM
⑩ CUSHIONING NEEDLE: AISI 304 steel
⑪ TIE ROD: AISI 316 steel
⑫ NEEDLE-RETAINING RING: technopolymer



METAL WORK PNEUMATIC

DIMENSIONS OF DOUBLE-ACTING

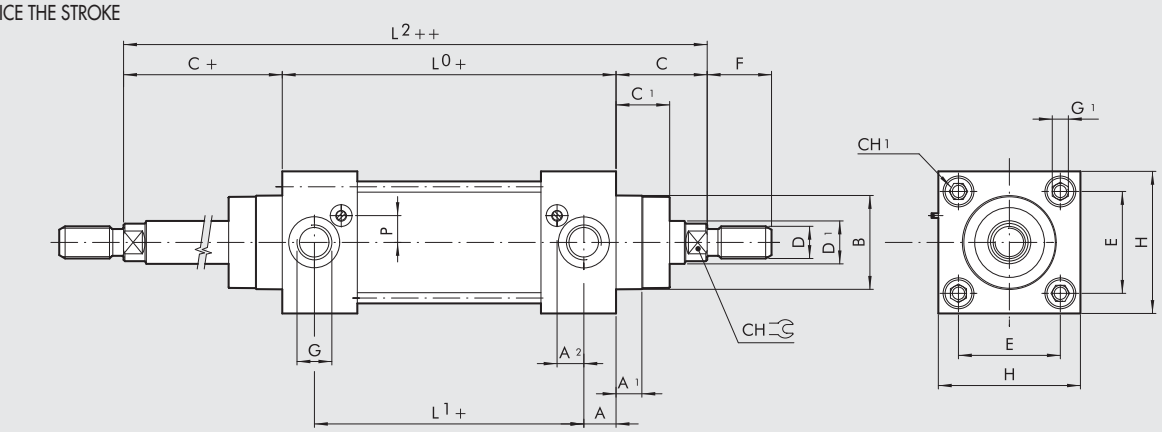
+ = ADD STROKE

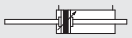


W184

DIMENSIONS DOUBLE-ACTING THROUGH-ROD

+ = ADD STROKE
++ = ADD TWICE THE STROKE





W185

Ø.	A	A_1	A_2	B	C	C_1	CH	CH_1	D	D_1	E	E_1	F	G	G_1	H	L	L_0	L_1	L_2	P
32	13	9	11.3	30	26	18	10	6	M10x1.25	12	32.5	4	22	G1/8	M6	50	120	94	68	146	6
40	14	9	13	35	30	22	13	6	M12x1.25	16	38	4	24	G1/4	M6	55	135	105	77	165	8
50	14	9	12.7	40	37	25.5	17	8	M16x1.5	20	46.5	4	32	G1/4	M8	65	143	106	78	180	11.8
63	16	9	15.8	45	37	25	17	8	M16x1.5	20	56.5	4	32	G3/8	M8	75	158	121	89	195	11.7
80	17	10	16.3	45	46	35	22	-	M20x1.5	25	72	4	40	G3/8	M10	95	174	128	94	220	15.5
100	18	10	15.5	55	51	38	22	-	M20x1.5	25	89	4	40	G1/2	M10	110	189	138	102	240	15.5
125	18	11	20	60	65	46	27	-	M27x2	32	110	6	54	G1/2	M12	140	225	160	124	290	15

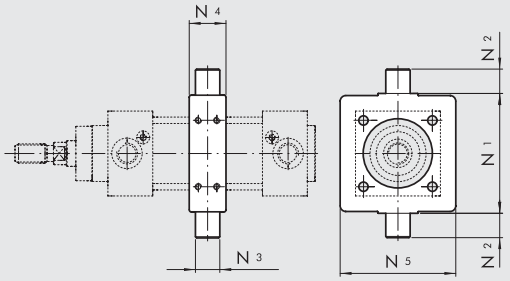
KEY TO CODES

W 1 8	4	0	3 2	0 0 3 2
	TYPE	**VERSION**	**DIAMETER**	**STROKE**
Stainless steel cylinder	**4** DEMA **5** DEMA through-rod	**0** Standard (magnetic) **S** Non-magnetic ● **V** FKM/FPM gasket	32 40 50 63 80 ■ 100 ■ 125	✚ 0 to 1000 mm

DEMA: Magnetic double-acting (cushioned)
✚ Maximum recommended strokes. Higher values can create operating problems
● For this version the cylinder will be not magnetic
■ In the code of cylinder with letter in fifth position Ø 100 becomes A1; Ø 125 becomes A2

ACCESSORIES FOR STAINLESS ISO 15552 CYLINDER: FIXINGS

STAINLESS STEEL INTERMEDIATE HINGE - MODEL EN

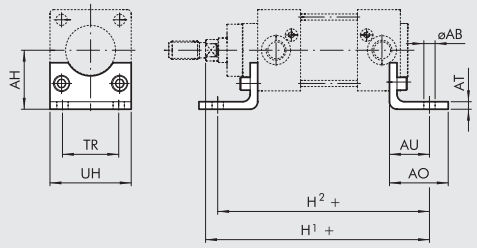


Code	Ø	N_1	N_2	N_3	N_4	N_5	Weight [g]
W095X322007	**32**	50	12	12	15	46	140
W095X402007	**40**	63	16	16	20	59	330
W095X502007	**50**	75	16	16	20	69	390
W095X632007	**63**	90	20	20	25	84	730
W095X802007	**80**	110	20	20	25	102	925
W095XA12007	**100**	132	25	25	30	125	1700
W095XA22007	**125**	160	25	25	32	155	2580

Note: Supplied complete with 8 grub screws

STAINLESS STEEL SHORT FOOT MOUNTING

+ = ADD THE STROKE

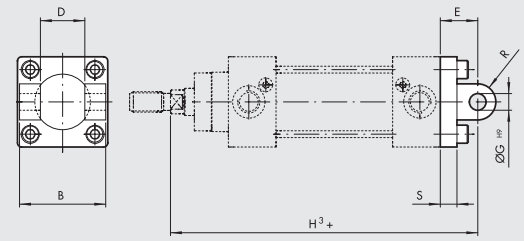


Code	Ø	Ø AB	AH	AO	AT	AU	TR	UH	H_1	H_2	Weight [g]
W095X322001	**32**	7	32	35	4	24	32	45	145	143	85
W095X402001	**40**	9	36	36	4	28	36	52	163	161	95
W095X502001	**50**	9	45	47	5	32	45	65	175	170	200
W095X632001	**63**	9	50	45	5	32	50	75	190	185	225
W095X802001	**80**	12	63	55	6	41	63	95	215	210	435
W095XA12001	**100**	14	71	57	6	41	75	115	230	220	555
W095XA22001	**125**	16	90	70	8	45	90	140	270	250	1145

Note: Individually packed with 2 screws

STAINLESS STEEL FEMALE HINGE - MODEL B

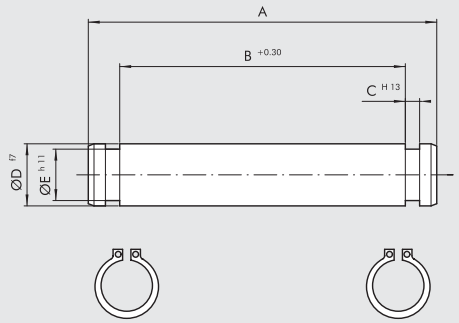
+ = ADD THE STROKE



Code	Ø	B	D	E	Ø G	H_3	R	S	Weight [g]
W095X322003	**32**	45	26	22	10	142	10	9	175
W095X402003	**40**	52	28	25	12	160	12	9	250
W095X502003	**50**	60	32	27	12	170	12	11	425
W095X632003	**63**	70	40	32	16	190	16	11	635
W095X802003	**80**	90	50	36	16	210	16	14	1270
W095XA12003	**100**	110	60	41	20	230	20	14	2000
W095XA22003	**125**	130	70	50	25	275	25	20	3715

Note: Supplied with 4 screws, 4 washers. **WITHOUT PIN.**

STAINLESS STEEL FEMALE HINGE PIN



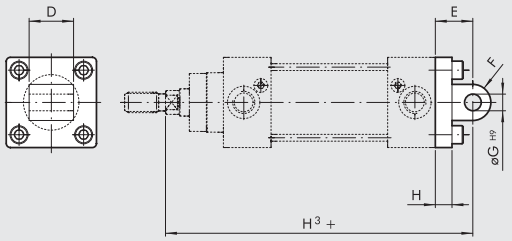
Code	Ø	A	B	C	D	E	Weight [g]
W095X322050	**32**	53	46	1.1	10	9.6	35
W095X402050	**40**	60	53	1.1	12	11.5	55
W095X502050	**50**	68	61	1.1	12	11.5	65
W095X632050	**63**	78	71	1.1	16	15.2	125
W095X802050	**80**	98	91	1.1	16	15.2	160
W095XA12050	**100**	118	111	1.3	20	19	295
W095XA22050	**125**	139	132	1.3	25	23.9	540

Note: Supplied with 2 snap-rings

METAL WORK PNEUMATIC

STAINLESS STEEL MALE HINGE - MODEL BA

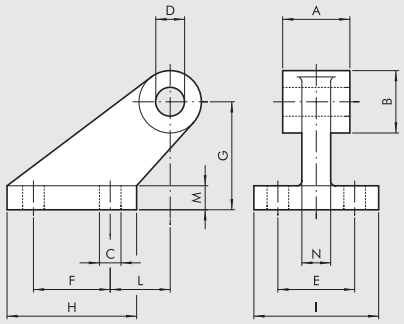
+ = ADD THE STROKE



Code	Ø	D	E	F	Ø G	H	H_3	Weight [g]
W095X322004	32	26	22	10	10	9	143	195
W095X402004	40	28	25	12	12	9	160	265
W095X502004	50	32	27	12	12	11	170	445
W095X632004	63	40	32	16	16	11	190	715
W095X802004	80	50	36	16	16	14	210	1375
W095XA12004	100	60	41	20	20	14	230	2165
W095XA22004	125	70	50	25	25	20	275	3800

Note: Supplied with 4 screws, 4 washers

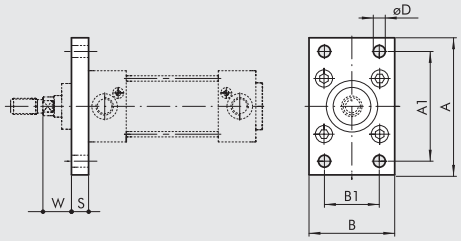
STAINLESS STEEL ISO COUNTER-HINGE FOR MODEL B - MODEL GL



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W095X322008	32	26	20	6.6	10	38	18	32	31	51	3	8	10	165
W095X402008	40	28	22	6.6	12	41	22	36	35	54	2	10	15	235
W095X502008	50	32	26	9	12	50	30	45	45	65	3	12	16	460
W095X632008	63	40	30	9	16	52	35	50	50	67	2	14	16	590
W095X802008	80	50	30	11	16	66	40	63	60	86	7	14	20	1000
W095XA12008	100	60	38	11	20	76	50	71	70	96	5	17	20	1515
W095XA22008	125	70	45	14	25	94	60	90	90	124	10	20	30	3170

Note: Individually packed

STAINLESS STEEL FRONT FLANGE - MODEL C

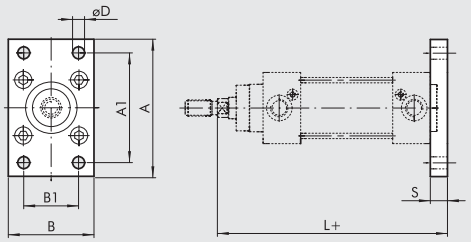


Code	Ø	A	A_1	B	B_1	S	ØD	W	Weight [g]
W095X322002	32	80	64	45	32	10	7	16	220
W095X402002	40	90	72	52	36	10	9	20	280
W095X502002	50	110	90	65	45	12	9	25	540
W095X632002	63	120	100	75	50	12	9	25	680
W095X802002	80	150	126	95	63	16	12	30	1550
W095XA12002	100	170	150	115	75	16	14	35	2100
W095XA22002	125	205	180	140	90	20	16	45	3950

Note: Supplied with 4 screws

STAINLESS STEEL REAR FLANGE - MODEL C

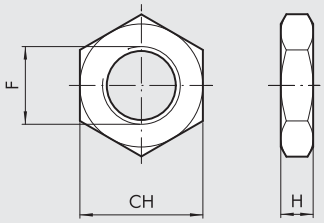
+ = ADD THE STROKE



Code	Ø	A	A_1	B	B_1	S	ØD	L	Weight [g]
W095X322002	32	80	64	45	32	10	7	130	220
W095X402002	40	90	72	52	36	10	9	145	280
W095X502002	50	110	90	65	45	12	9	153	540
W095X632002	63	120	100	75	50	12	9	168	680
W095X802002	80	150	126	95	63	16	12	184	1550
W095XA12002	100	170	150	115	75	16	14	199	2100
W095XA22002	125	205	180	140	90	20	16	235	3950

Note: Supplied with 4 screws

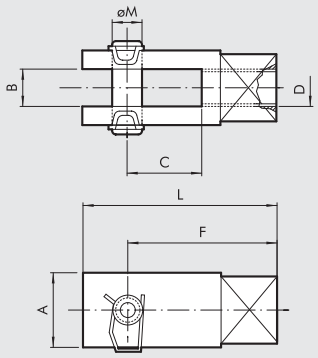
STAINLESS STEEL NUT FOR PISTON RODS



Code	Ø	F	H	CH	Weight [g]
W095X322011	**32**	M10x1.25	6	17	8
W095X402011	**40**	M12x1.25	7	19	11
W095X502011	**50**	M16x1.5	8	24	18
W095X502011	**63**	M16x1.5	8	24	18
W095X802011	**80**	M20x1.5	9	30	31
W095X802011	**100**	M20x1.5	9	30	31
W095XA22011	**125**	M27x2	12	41	81

Note: Individually packed

STAINLESS STEEL FORK-MODEL GK-M



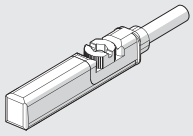
Code	Ø	A	B	C	D	F	L	Ø M	Weight [g]
W095X322020	**32**	20	10	20	M10x1.25	40	52	10	90
W095X402020	**40**	24	12	24	M12x1.25	48	62	12	145
W095X502020	**50**	32	16	32	M16x1.5	64	83	16	325
W095X502020	**63**	32	16	32	M16x1.5	64	83	16	325
W095X802020	**80**	40	20	40	M20x1.5	80	105	20	680
W095X802020	**100**	40	20	40	M20x1.5	80	105	20	680

Note: Individually packed

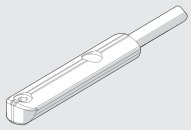
ACCESSORIES: MAGNETIC SENSORS

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

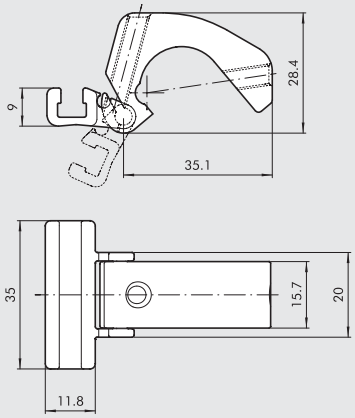


SENSOR, OVAL TYPE
Traditional



For codes and technical data, see **chapter A6**.

SENSOR BRACKET



Code	Bore	Description
W0950001100	32 to 125	Sensor bracket

Note: Individually packed

MATERIAL
Bracket: aluminium
Sensor holder: aluminium
Fixing screw: stainless steel

METAL WORK PNEUMATIC

NOTES

GRIPPERS, ROTARY ACTUATORS, SLIDES SUMMARY

GRIPPERS

- GENERAL TECHNICAL DATA GRIPPERS — A2.4

- GRIPPER WITH TWO PARALLEL JAWS, SERIES P1 — A2.8
- GRIPPER WITH TWO PARALLEL JAWS, SERIES P1K — A3.156

- GRIPPER WITH TWO PARALLEL JAWS, SERIES P2 — A2.10
- GRIPPER WITH TWO PARALLEL JAWS, SERIES P2K — A3.161

- GRIPPER WITH TWO PARALLEL JAWS, SERIES P3 — A2.12
- GRIPPER WITH TWO PARALLEL JAWS, SERIES P3K — A3.165

- GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES P4 — A2.19
- GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES P4K — A3.171

- GRIPPER WITH TWO HINGED JAWS, SERIES P7 — A2.22
- GRIPPER WITH TWO HINGED JAWS, SERIES P7K — A3.180

- TECHNOPOLYMER HINGED GRIPPER, SERIES P8 — A2.24

- GRIPPER 180° WITH TWO HINGED JAWS SERIES P9 — A2.26
- GRIPPER 180° WITH TWO HINGED JAWS SERIES P9K — A3.185

- GRIPPER WITH THREE PARALLEL JAWS, SERIES P12 — A2.28
- GRIPPER WITH THREE PARALLEL JAWS, SERIES P12K — A3.190

- GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES GPLK — A3.175

ROTARY ACTUATORS

- GENERAL TECHNICAL DATA ROTARY ACTUATORS — A2.34

- ROTARY ACTUATOR SERIES R1 — A2.35

- ROTARY ACTUATOR SERIES R2 — A2.38

- ROTARY ACTUATOR SERIES R3 — A2.41
- ROTARY ACTUATOR SERIES R3K — A3.124

- ROTARY ACTUATOR SERIES R3 WITH EXTERNAL SHOCK ABSORBERS — A2.46
- ROTARY ACTUATOR SERIES R3K WITH EXTERNAL SHOCK ABSORBERS — A3.130

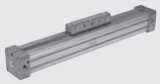
- ROTARY ACTUATOR SERIES DAPK — A3.136

METAL WORK PNEUMATIC

SLIDES

	GENERAL TECHNICAL DATA SLIDES	A2.52
	TWIN CYLINDER SERIES S10	A2.53
	TWIN CYLNDER SLIDE WITH FIXED BODY SERIES S11	A2.57
	TWIN CYLNDER SLIDE WITH FIXED PLATES SERIES S12	A2.63
	PRECISION SLIDE SERIES S13	A2.69
	COMPACT PRECISION SLIDE - SERIES S14K	A3.47

OTHER GUIDE UNITS AND SLIDE

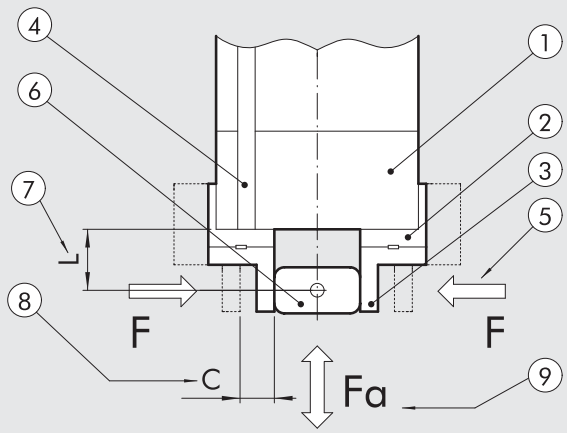
	GDS, GDH AND GDM GUIDE UNITS FOR ISO 6432 GDHK, GDMK GUIDE UNITS FOR ISO 6432	A1.21 A3.79
	GDS, GDH AND GDM GUIDE UNITS FOR ISO 15552 GDHK, GDMK GUIDE UNITS FOR ISO 15552	A1.44 A3.79
	SHORT-STROKE ANTI-ROTATION CYLINDER	A1.119
	COMPACT ANTI-ROTATION CYLINDER SERIES CMPC	A1.89
	ISO 21287 ANTI-ROTATION CYLINDER SERIES LINER	A1.78
	TWIN-ROD CYLINDER SERIES TWNC	A1.57
	COMPACT GUIDES CYLINDER SERIES CMPG	A1.126
	RODLESS CYLINDER STD RODLESS CYLINDER WITH BALL RECIRCULATING GUIDE SERIES V-Lock	A1.132 A3.37

GENERAL TECHNICAL DATA GRIPPERS

NOMENCLATURE

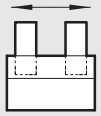
① Pneumatic gripper
② Jaws
③ Clamping finger
④ Sensor slot
⑤ F = clamping force of one jaw only
If a gripper has three jaws, with
F = 25 N, so the total clamping force is 25 x 3 = 75 N
⑥ Load
⑦ L = distance between the barycentre of the load and the reference surface
⑧ C = stroke of a single jaw
⑨ Fa = maximum axial force applied to the grippers

FIG. 1.1



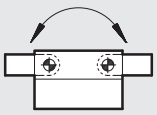
TYPES

Parallel gripper: the jaws move in a straight line. There may be two, three or even four jaws.

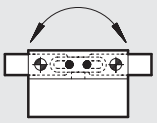


Hinged gripper: the jaws are hinged and move along the arc of a circle. It is generally cheaper than a parallel gripper but there are some limitations (see fig. 1.5):
- If the part has varying dimensions, the contact area changes (see fig. 1.6)
- If the part is cylindrical with varying dimensions, the position of the axis of the clamped part varies (see fig. 1.7)

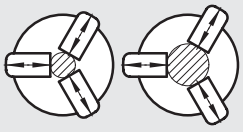
Gripper with retracting jaws: the jaws have an opening angle of about 90°. The clamping fingers can retract fully from the work top, and so, in certain cases, it is possible to avoid one linear retraction motion (see fig. 1.5).



Toggle gripper: a hinged gripper with a toggle-action mechanism to achieve high clamping forces. Clamping is irreversible even when there is no pressure, so the part cannot be released accidentally. The opening angle is 90° so it acts as retracting gripper. The clamping force is high within a limited angle only.



Number of jaws: two-jaw grippers are used for prism-shaped parts or cylindrical ones with a single diameter. Three-jaw grippers can be used for cylindrical parts with different diameters.



METAL WORK PNEUMATIC

CLAMPING FINGERS

The clamping fingers must be as light and short as possible to keep inertia to a minimum.
The longer the clamping fingers, the less force is available (see fig. 1.2).
Wider fingers are only heavier, they do not increase friction (see fig. 1.3).

FIG. 1.2

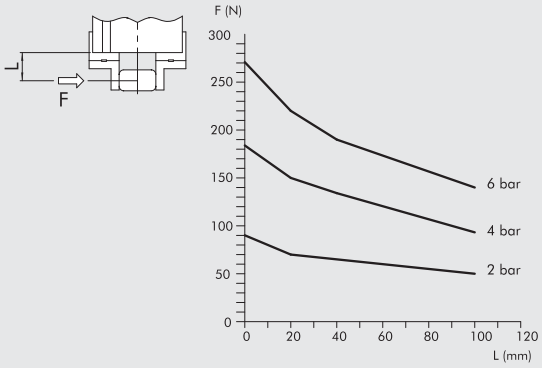
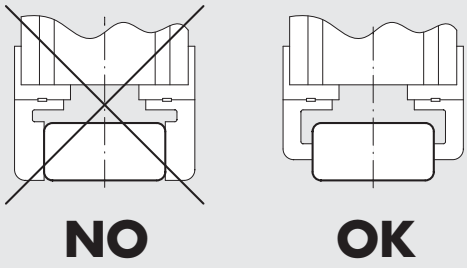
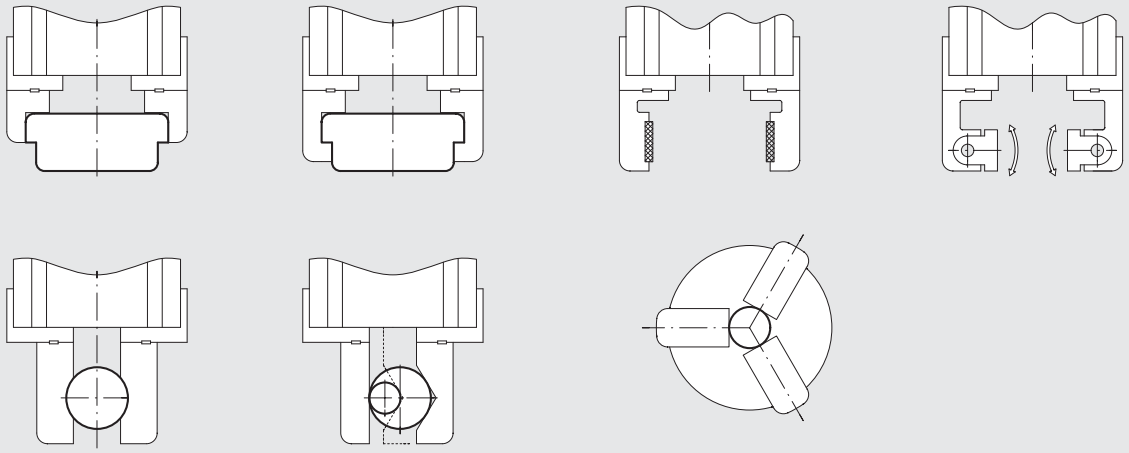


FIG. 1.3



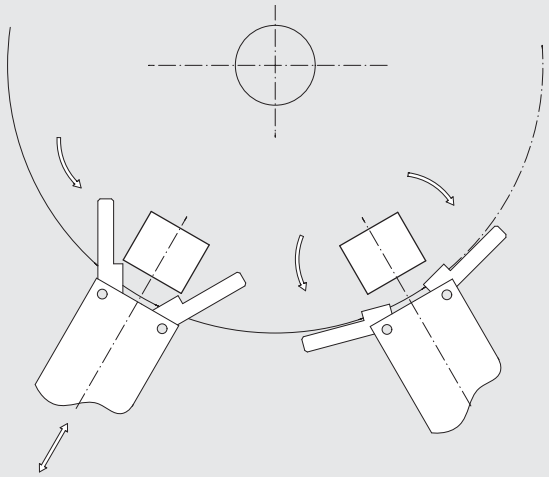
EXAMPLE OF CLAMPING FINGERS

FIG. 1.4



EXAMPLE OF RETRACTING HINGED GRIPPERS

FIG. 1.5



EXAMPLE OF USE LIMITATIONS OF HINGED GRIPPERS

FIG. 1.6

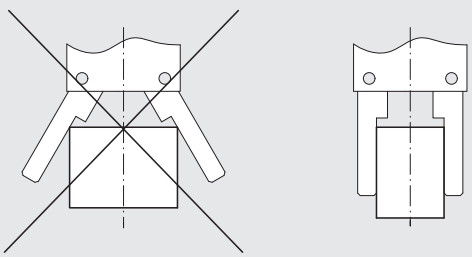
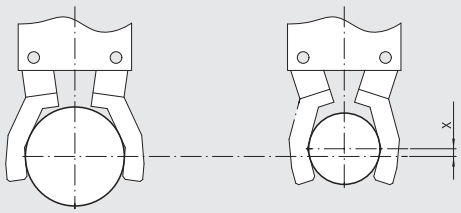


FIG. 1.7

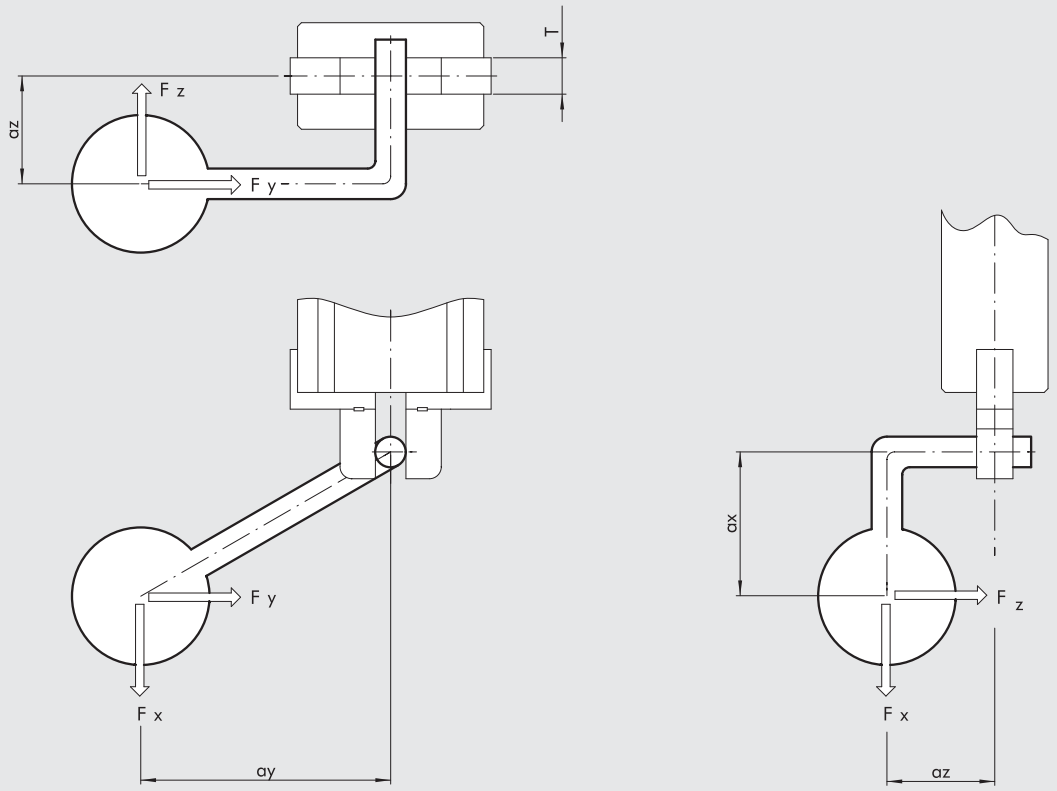


CALCULATIONS

First of all, determine the necessary clamping force.
Then decide which type of gripper can ensure this force with required pressure and clamping distance.
To help designers calculate the clamping force, we propose two levels of calculation.

DRAWING TO CALCULATE GRIPPER CLAMPING FORCE

FIG. 1.8



APPROXIMATION METHOD

Clamping force of each jaw [N] ≥ 200 x weight of part [kg] / number of jaws.

	Data	Unit of measurement	Formula	Example
M	Mass of part	kg		1.2
n	Number of jaws	–		3
F	Clamping force of each jaw	N	≥ 200 x M/n	≥ 200 x 1.2/3 = 80

METAL WORK PNEUMATIC

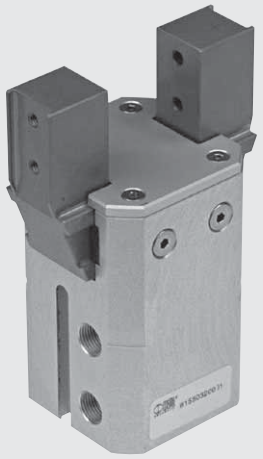
PRECISION COMPUTING METHOD

	Data	Unit of measur.	Formula	Example
M	Mass of part	kg		1.2
a	Acceleration	m/s^2		5 in direction Y
Ω	Angle speed	rad/s		0
T	Width of clamping finger	mm		8
d	Clamping diameter of part	mm		16
ax	Distance along X of the barycentre from clamping centre	mm		0
ay	Distance along Y of the barycentre from clamping centre	mm		0
az	Distance along Z of the barycentre from clamping centre	mm		25
μ	Finger/part friction coefficient			0.2
	Some examples:			
	Smooth steel on smooth metal		μ = 0.1	
	Rough steel on smooth metal		μ = 0.2 - 0.3	
	Soft material, e.g. Vulkolan		μ = 0.4	
	Coupled shape (vedi fig. 1.4)		μ = 1	
	Forces applied to barycentre of part. When determining the forces, assess for each direction:			
	Force x weight	N	M x 9.81	
	Force of inertia x linear acceleration	N	M x a	
	Force of inertia x angular velocity	N	$M \times \Omega^2 \times r$	
Fx	Force along gripper axis	N		Fx = weight 1.2 x 9.81 = 11.8 N
Fy	Force perpendicular to jaw	N		Fy = F. of inertia = 1.2 x 5 = 6 N
Fz	Force tangent to jaw	N		Fz = O
	Force equivalent to clamping centre:			
Ft eq	Equivalent tangential force	N	$\sqrt{\left[Fx \cdot \left(\frac{az+\frac{T}{2}}{T}+\frac{ay+\frac{d}{2}}{d}\right)+Fz \cdot \frac{ax}{T}+Fy \cdot \frac{ax}{d}\right]^2+Fz^2}$	$\sqrt{\left[11.8 \cdot \left(\frac{25+\frac{8}{2}}{8}+\frac{1}{2}\right)+O\right]^2} = 48.6\,N$
Fy eq	Equivalent perpendicular force	N	$Fy \cdot \frac{az+\frac{T}{2}}{T}+Fz \cdot \frac{ay}{T}$	$= 6 \cdot \frac{\left(25+\frac{8}{2}\right)}{8} = 75\,N$
Fs teo	Theoretical clamping force	N	Greater of (Fteq/2μ) and (Fyeq)	Greater of (42.8/2.02) and 75 = 107
F	Clamping force	N	FsTeo · 1.5 (safety coefficient)	= 107 · 1.5 = 160 N

NOTES

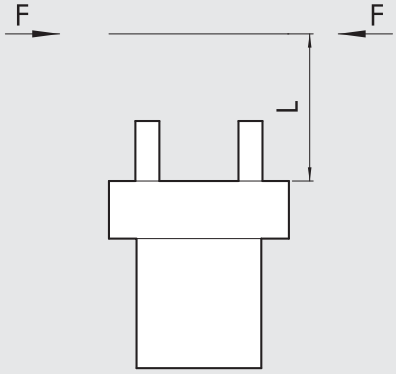
GRIPPER WITH TWO PARALLEL JAWS SERIES P1

- Dual-acting parallel gripper for internal and external clamping.
- Anodized aluminium alloy body and tempered steel jaws.
- Bottom or side fixing.
- All sizes come with magnets and sensor slots.



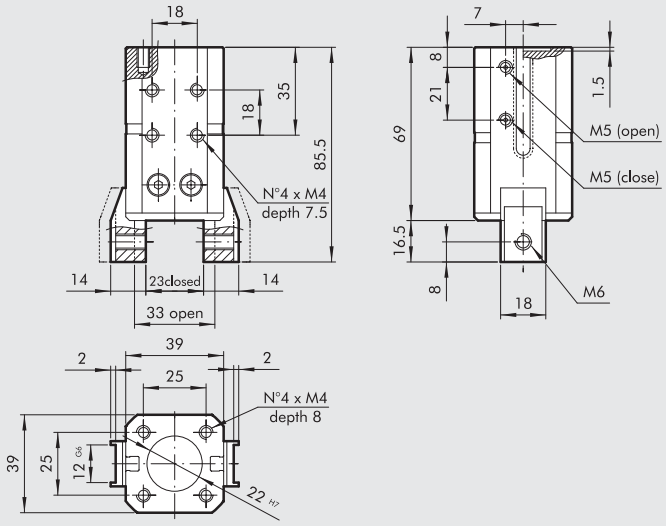
TECHNICAL DATA		P1-20	P1-32
Operating pressure	bar	2 to 8	
	MPa	0.2 to 0.8	
	psi	29 to 116	
Temperature range	°C	5 to 70	
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous	
Bores	mm	20	32
Clamping force at 6.3 bar 20 mm from the top surface during opening and closing	N	70	170
Single jaw stroke	mm	5	5
Weight	kg	0.50	0.70

TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION

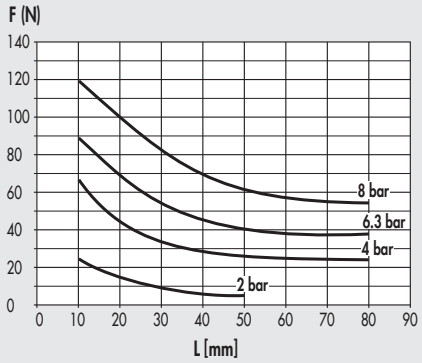


METAL WORK PNEUMATIC

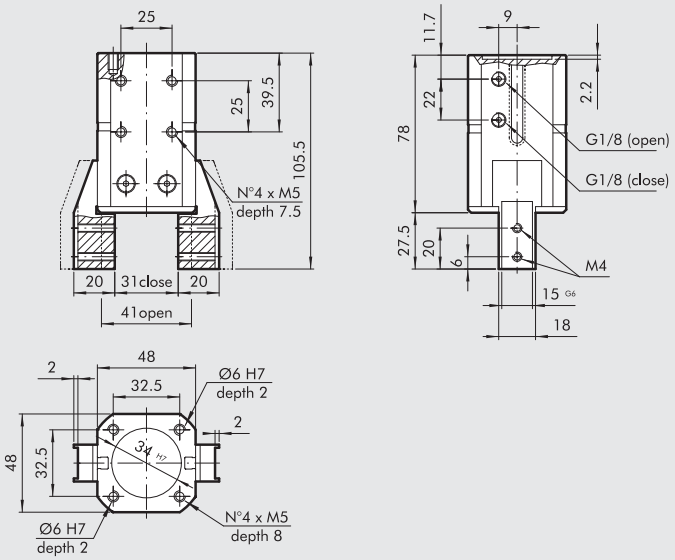
DIMENSIONS OF GRIPPER P1-20



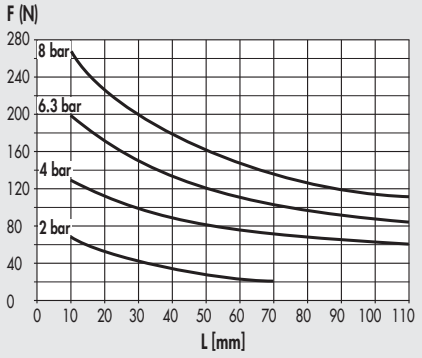
Code	Description
W1550200001	Gripper with 2 parallel jaws P1-20



DIMENSIONS OF GRIPPER P1-32



Code	Description
W1550320001	Gripper with 2 parallel jaws P1-32

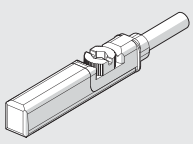


ACCESSORIES

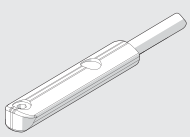
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

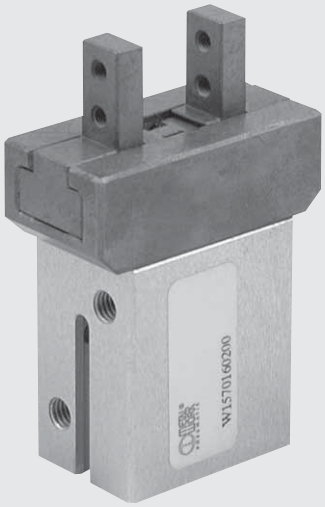


SENSOR, OVAL TYPE
Traditional



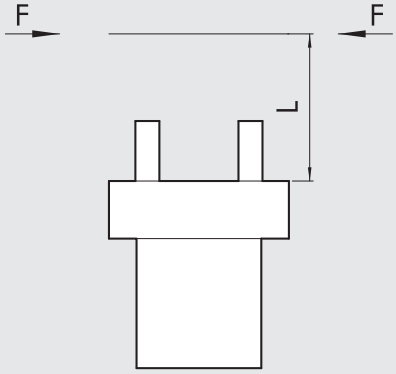
GRIPPER WITH TWO PARALLEL JAWS SERIES P2

Double-acting system with clamping in both directions.
All the grippers come with magnet and sensor slots.

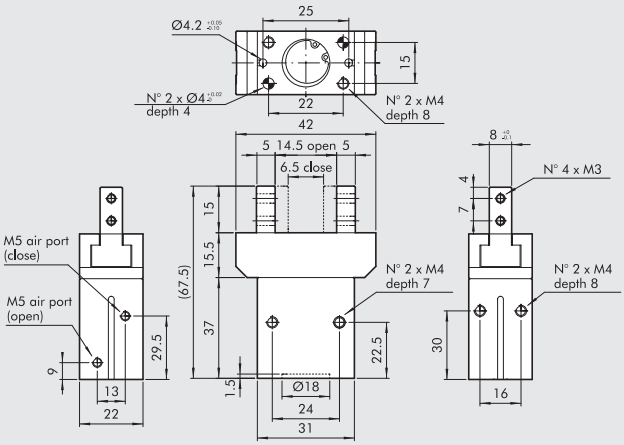


TECHNICAL DATA		P2 -16	P2-20	P2- 25
Operating pressure	bar	2 to 8		
	MPa	0.2 to 0.8		
	psi	29 to 116		
Operating temperature	°C	-10 to +80		
Maximum operating frequency	cycles/s	2		
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous		
Size		16	20	25
Bore	mm	16	20	25
Single jaw stroke	mm	4	5	7
Clamping force at 6.3 bar 20 mm from the top surface	N	45	100	135
during opening and closing				
Weight	kg	0.2	0.4	0.75

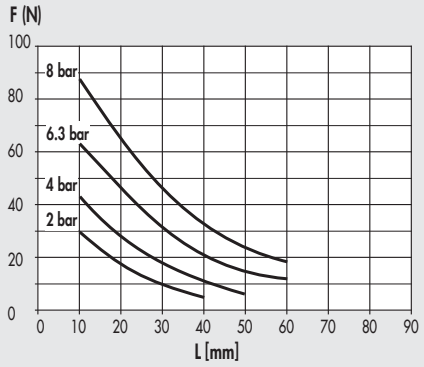
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



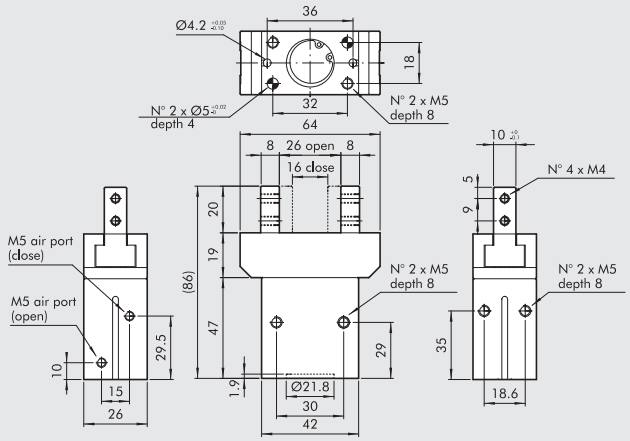
DIMENSIONS OF GRIPPER P2-16



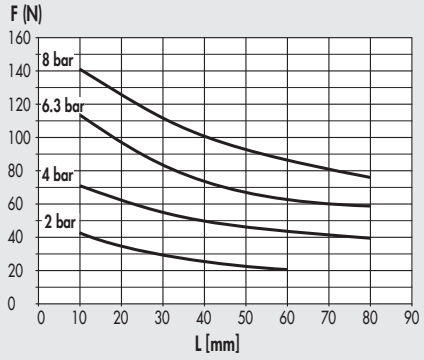
Code	Description
W1570160200	Gripper with 2 parallel jaws P2-16



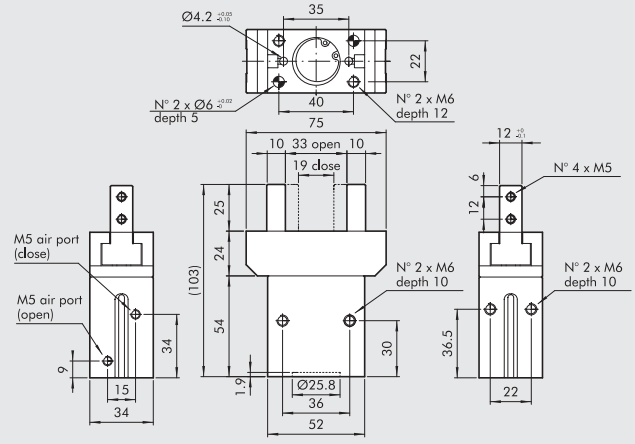
DIMENSIONS OF GRIPPER P2-20



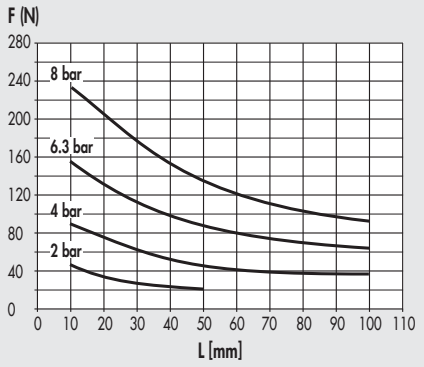
Code	Description
W1570200200	Gripper with 2 parallel jaws P2-20



DIMENSIONS OF GRIPPER P2-25

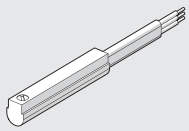


Code	Description
W1570250200	Gripper with 2 parallel jaws P2-25



ACCESSORIES

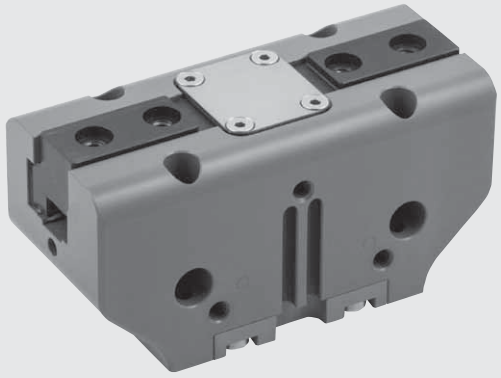
SENSOR Ø 4



For codes and technical data, see **chapter A6**.

GRIPPER WITH TWO PARALLEL JAWS, SERIES P3

Parallel double-acting two-jaw gripper, with either internal or external clamping.
Aluminum alloy body coated with surface hardening treatment; jaws made of wear-resistant coated steel.
The jaw-guiding system and precision in coupling with the body make the gripper extremely stable.
The ceramic-coated body reduces friction and wear, and enhances the movement of the jaws on the body.
All sizes are available in the version with standard stroke and clamping force, while only some in the version with reduced stroke but with higher clamping torque.
The gripper is equipped with a magnet and grooves for sensors.
A version designed to house inductive sensors is also available (**the inductive sensors are not supplied by Metal Work**).
Pneumatic supply is available on both sides.



TECHNICAL DATA		P3-40	P3-64	P3-80		P3-100	
				Standard	Increased force	Standard	Increased force
Operating pressure	bar	2 to 8					
	MPa	0.2 to 0.8					
	psi	29 to 116					
Temperature range	°C	-10 to 80					
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous					
Clamping force of a single jaw at 6.3 bar, 20 mm from the upper surface, on opening and closing	N	75	125	265	445	360	790
Maximum movable weight	kg	0.65	1.3	2.5	5	3.5	7
Stroke of each jaw	mm	2.5	6	8	4	10	5
Minimum opening/closing time	s	0.05					
Repeatability	mm	0.01					
Moment of inertia as regards the piston axis	kg cm²	1.8	4	4.5		12	
Max. admissible static loads:							
- Fa	N	250	1100	1500		2000	
- Mx	Nm	10	40	90		80	
- My	Nm	5	60	55		115	
- Mz	Nm	12	40	55		70	
Weight	kg	0.12	0.35	0.5		0.9	

COMPONENTS

① BODY: hard-anodised aluminium
② JAWS: nitrided steel
③ PISTON ROD + GUIDE: nitrided steel
④ PISTON: hard-anodised aluminium
⑤ PISTON GASKET: NBR
⑥ PISTON ROD GASKET: NBR / polyurethane
⑦ BASE GASKET: reinforced SBR / NBR
⑧ MAGNET: neodymium

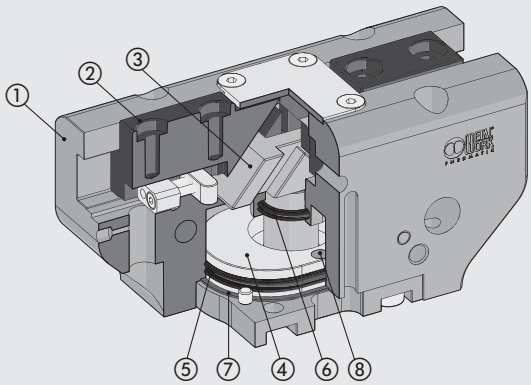
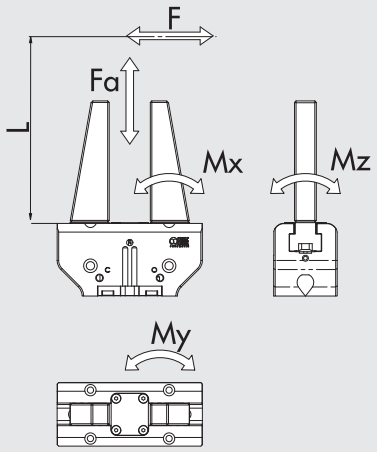


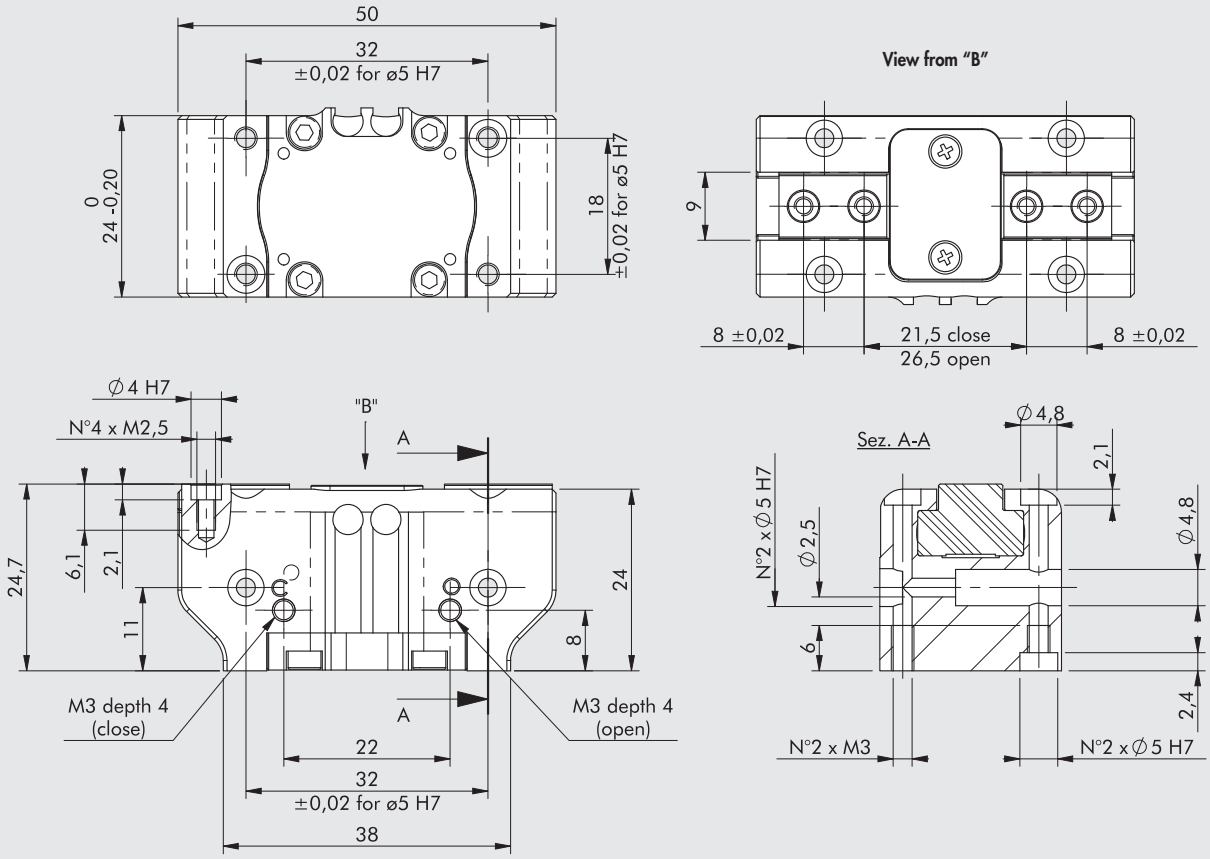
DIAGRAM OF FORCES AND MOMENTS

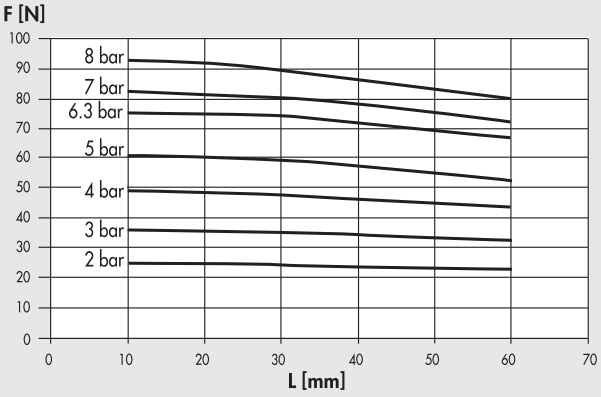


F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

METAL WORK PNEUMATIC

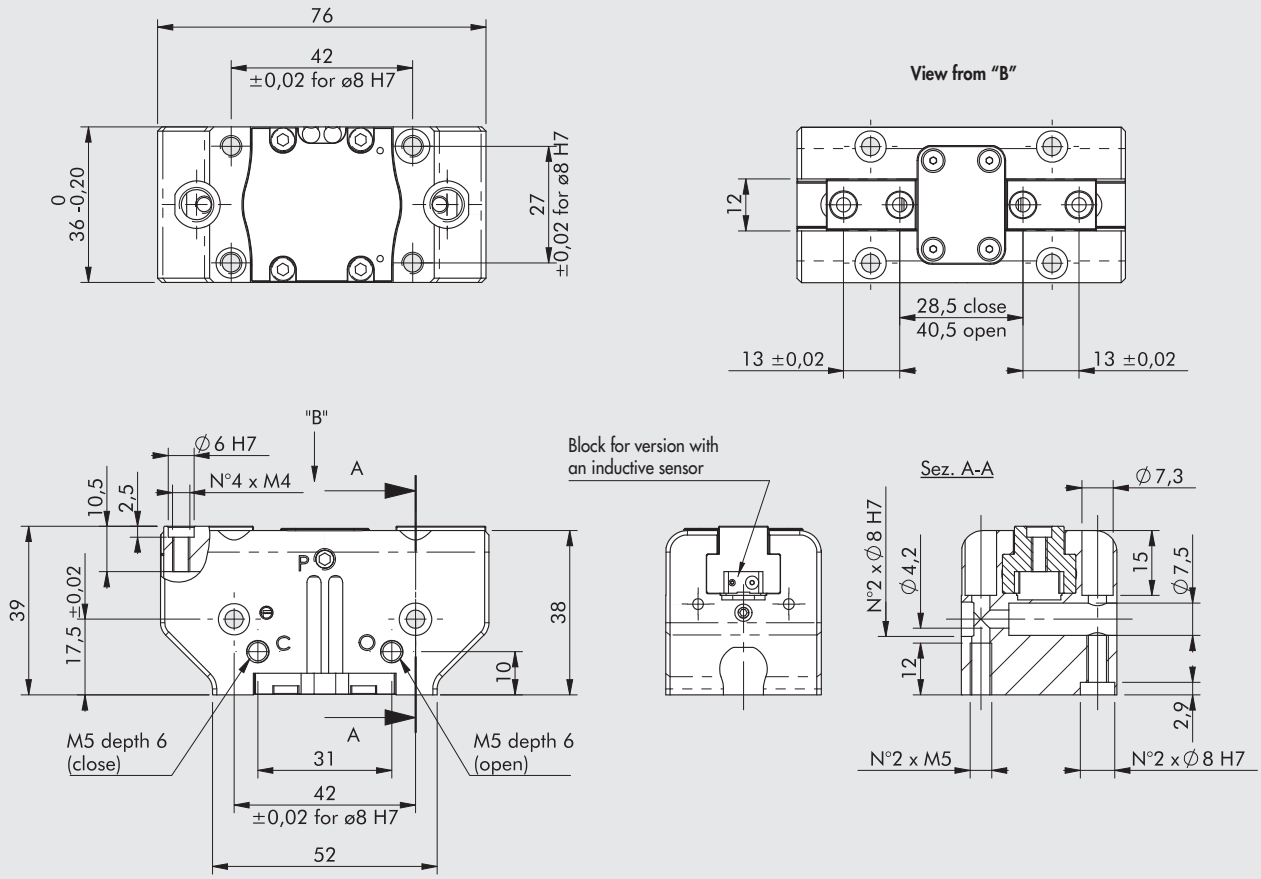
DIMENSIONS OF GRIPPER P3-40

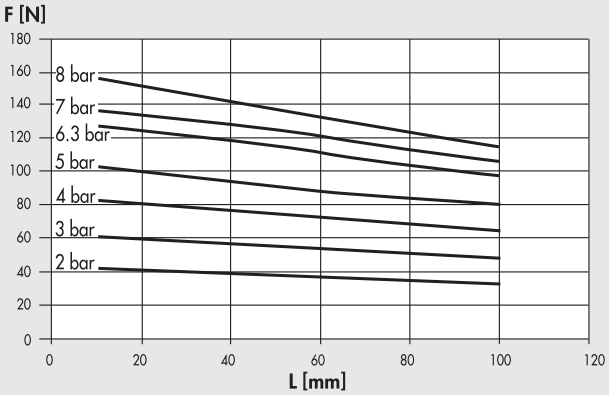




Code	Description
W1560400200	Gripper with 2 parallel jaws P3-40

DIMENSIONS OF GRIPPER P3-64

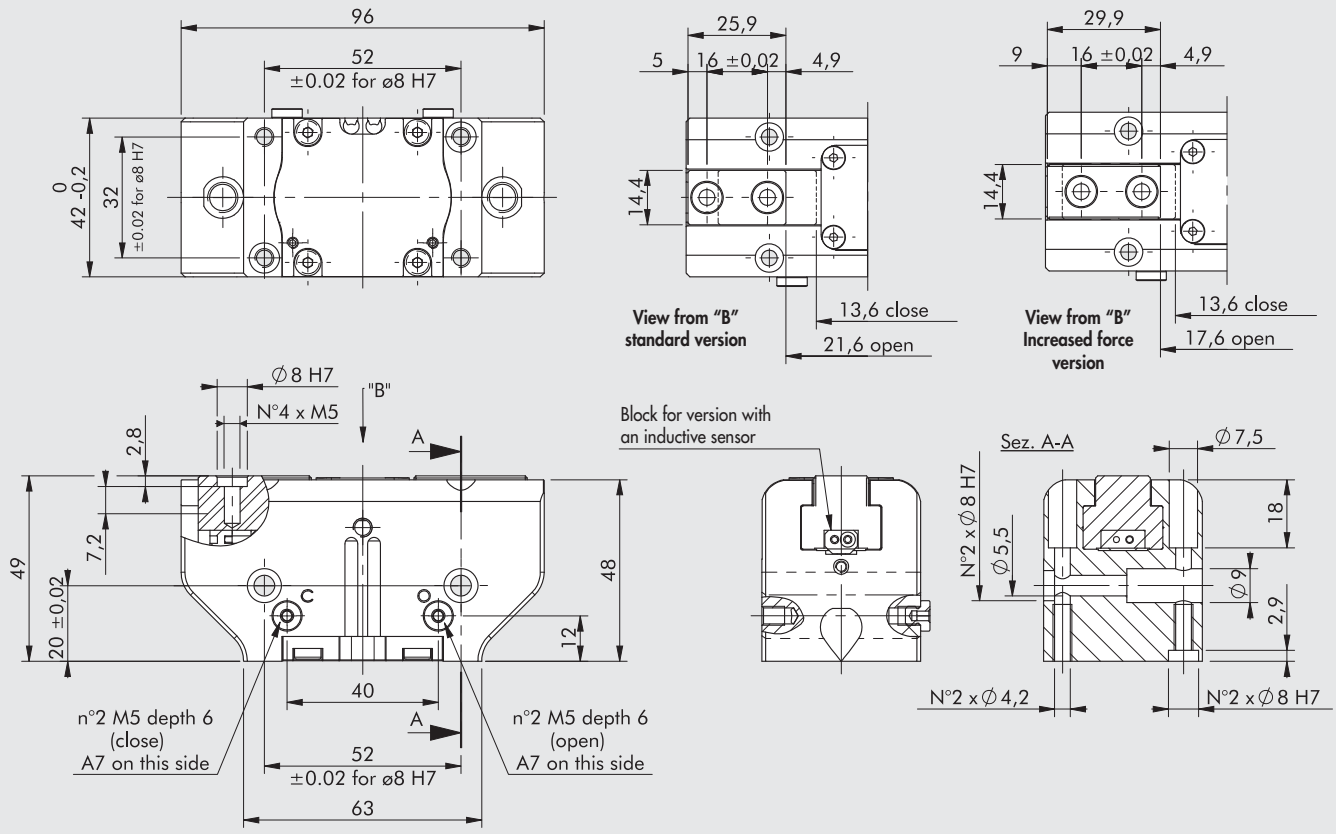




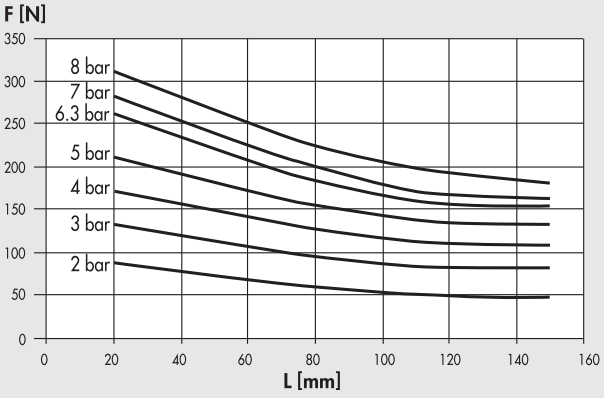
Code	Description
W1560640200	Gripper with 2 parallel jaws P3-64
W1560640201	Gripper with 2 parallel jaws P3-64 for inductive sensors

METAL WORK PNEUMATIC

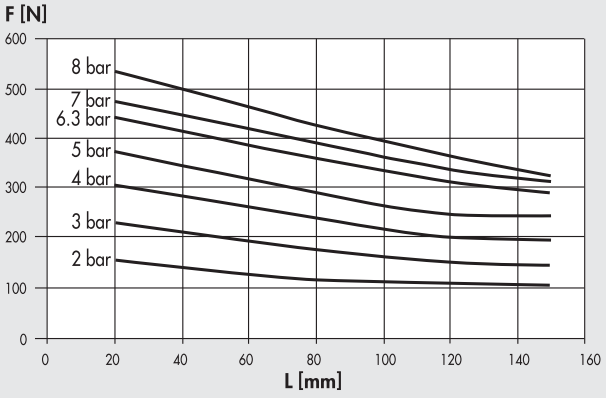
DIMENSIONS OF GRIPPER P3-80



Standard version

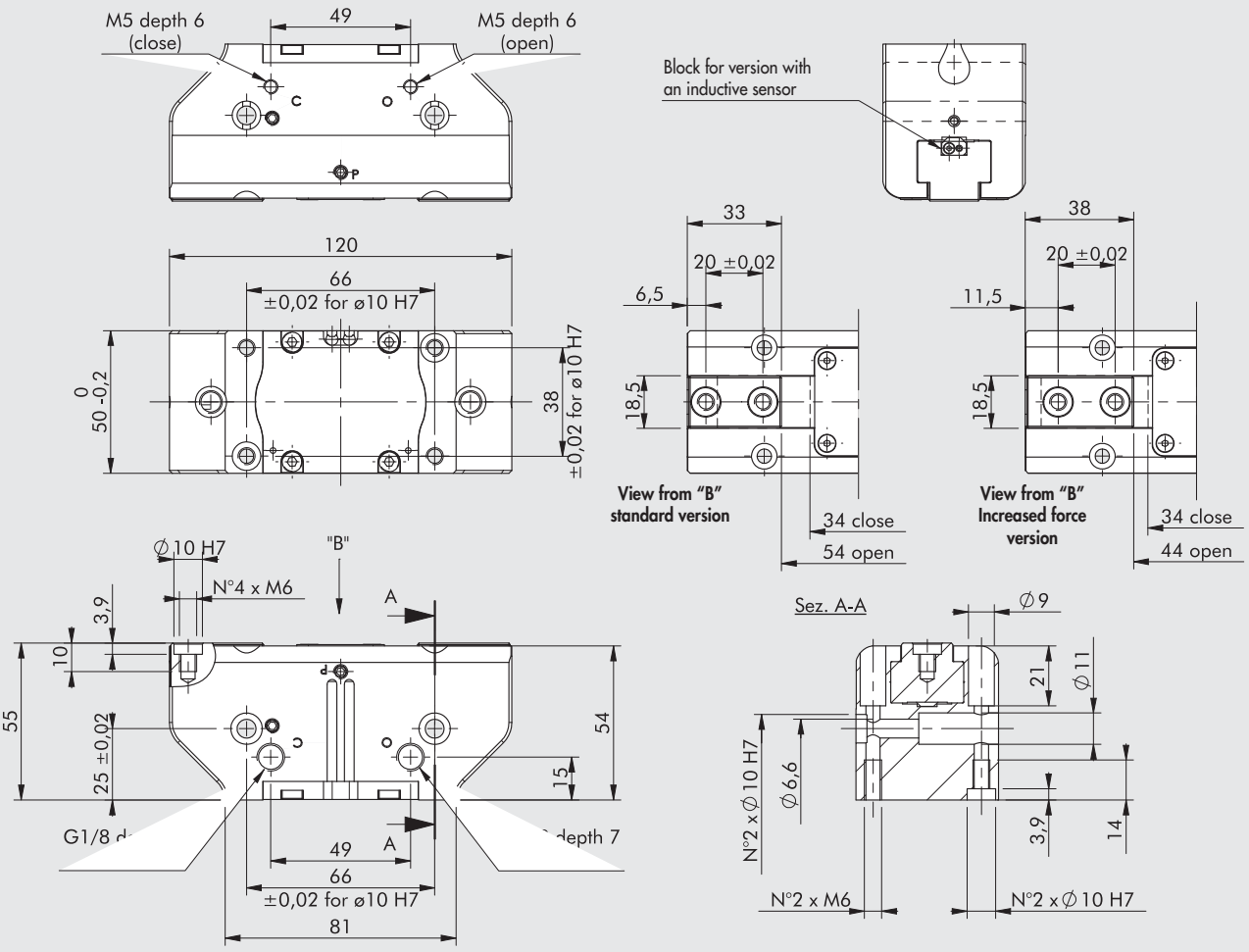


Increased force version

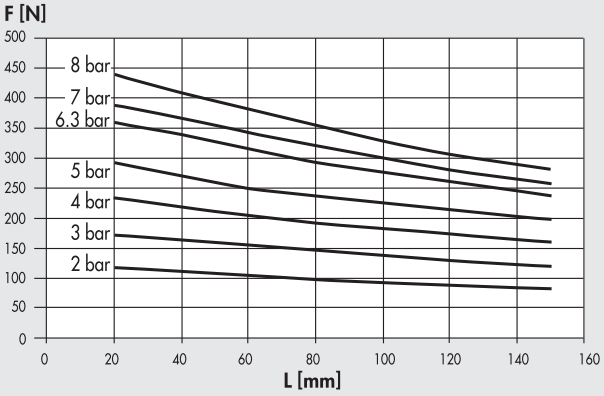


Code	Description
W1560800200	Gripper with 2 parallel jaws P3-80
W1560800201	Gripper with 2 parallel jaws P3-80 for inductive sensors
W1560800220	Gripper with 2 parallel jaws P3-80 increased force
W1560800221	Gripper with 2 parallel jaws P3-80 increased force for inductive sensors

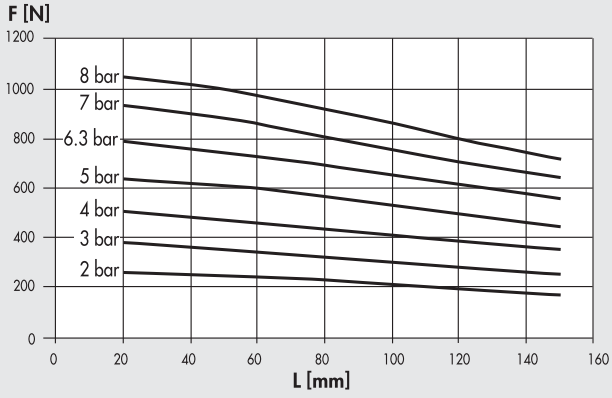
DIMENSIONS OF GRIPPER P3-100



Standard version



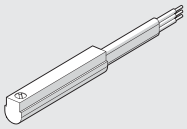
Increased force version



Code	Description
W1561000200	Gripper with 2 parallel jaws P3-100
W1561000201	Gripper with 2 parallel jaws P3-100 for inductive sensors
W1561000220	Gripper with 2 parallel jaws P3-100 increased force
W1561000221	Gripper with 2 parallel jaws P3-100 increased force for inductive sensors

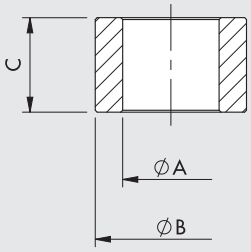
ACCESSORIES

SENSOR Ø 4



For codes and technical data, see **chapter A6**.

CENTRING RING



Code	Size	ØA	ØB f7	C
W1560409201	40	$3^{0}_{-0.1}$	4	$4^{0}_{-0.1}$
W1560649201	64	$4.5^{0}_{-0.1}$	6	$5^{0}_{-0.1}$
W1560809201	80	$5.1^{0}_{-0.1}$	8	$5^{0}_{-0.05}$
W1561009201	100	$6.2^{\pm 0.1}$	10	$6.9^{0}_{-0.1}$

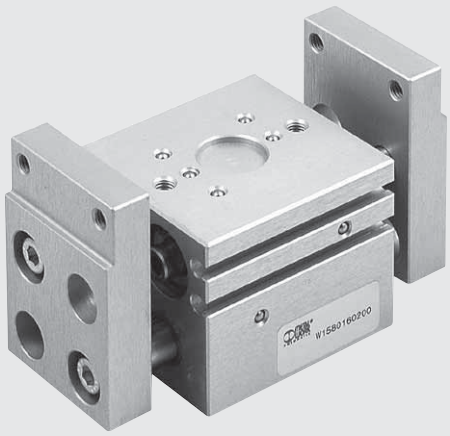
Note: 2-pieces pack

NOTES

NOTES

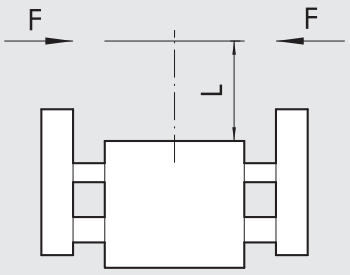
GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES P4

These are grippers with 2 parallel long-stroke jaws. The mechanical design makes them suitable for clamping bulky parts. All grippers, except for the smallest ones, can mount a retracting magnetic proximity sensor.

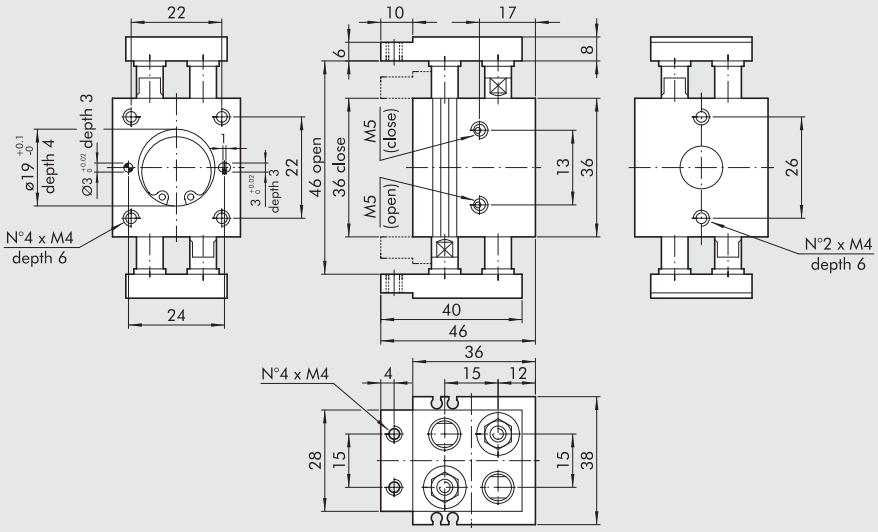


TECHNICAL DATA		P4-10	P4-12	P4-16	P4-25	P4-30
Operating pressure	bar	3 to 7				
	MPa	0.3 to 0.7				
	psi	43 to 101				
Operating temperature	°C	-10 to +80				
Maximum operating frequency	cycles/s	1				
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous				
Bore	mm	2 x 10	2 x 12	2 x 16	2 x 30	2 x 30
Single jaw stroke	mm	5	10	15	30	60
Clamping force at 6.3 bar 20 mm from the top surface during opening and closing	N	30	45	75	280	280
Weight	kg	0.18	0.3	0.5	2.95	3.7

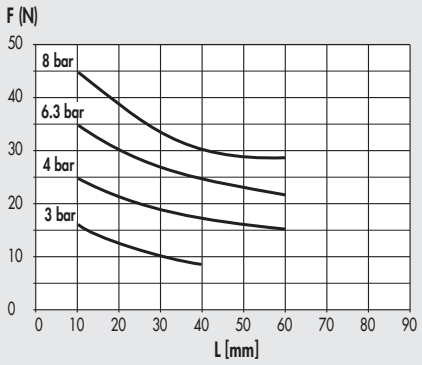
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



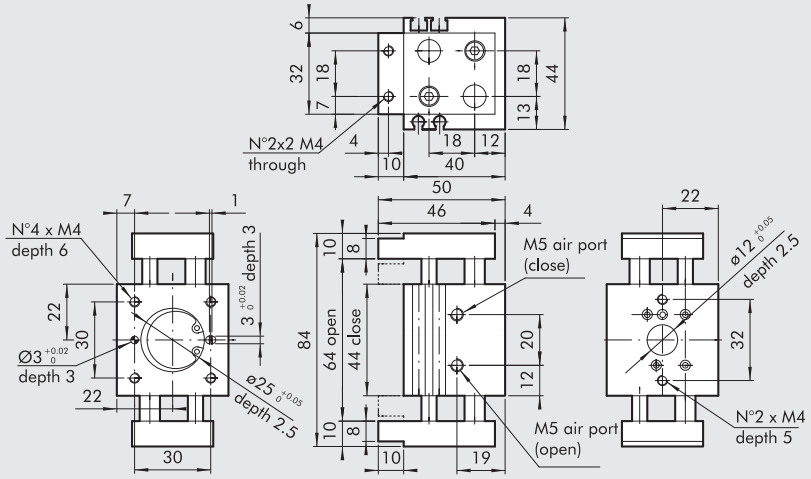
DIMENSIONS OF GRIPPER P4-10



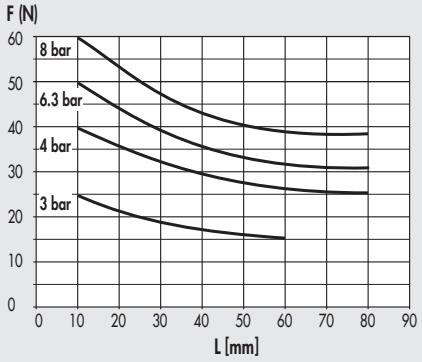
Code	Description
W1580100200	Gripper with 2 parallel long-stroke jaws P4-10



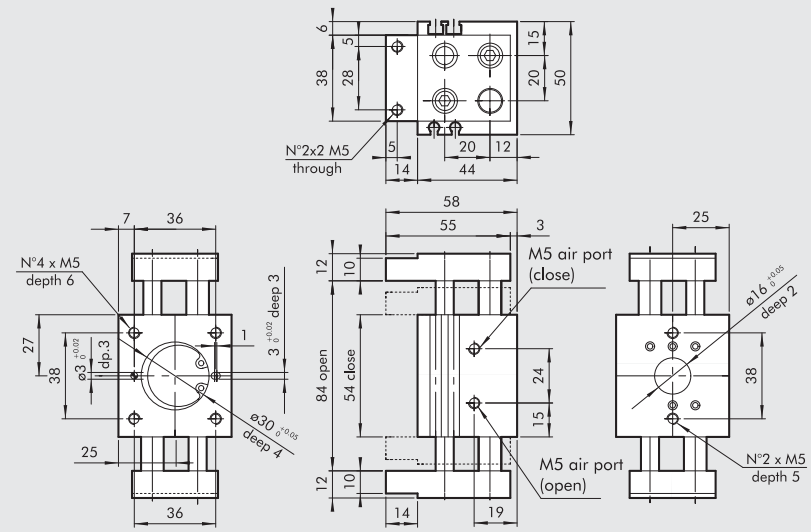
DIMENSIONS OF GRIPPER P4-12



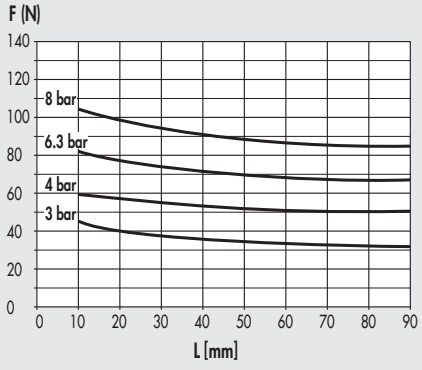
Code	Description
W1580120200	Gripper with 2 parallel long-stroke jaws P4-12



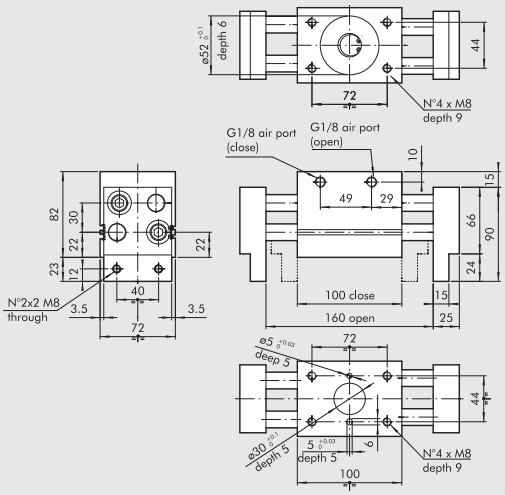
DIMENSIONS OF GRIPPER P4-16



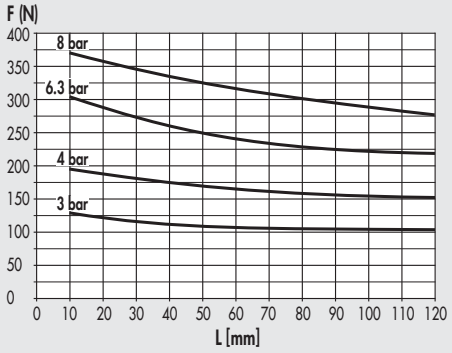
Code	Description
W1580160200	Gripper with 2 parallel long-stroke jaws P4-16



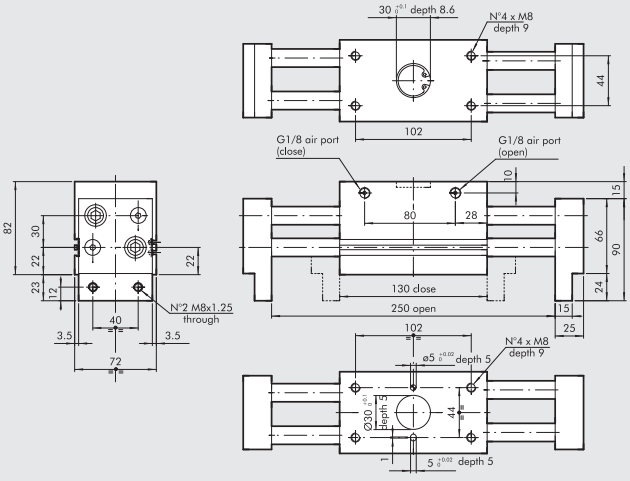
DIMENSIONS OF GRIPPER P4-25



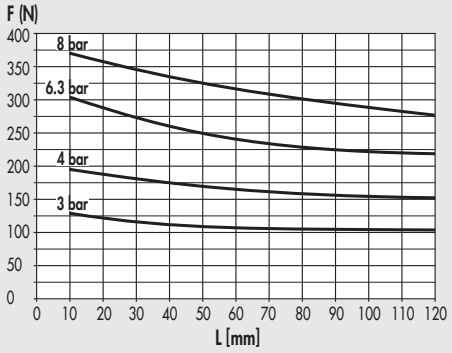
Code	Description
W1580250200	Gripper with 2 parallel long-stroke jaws P4-25



DIMENSIONS OF GRIPPER P4-30

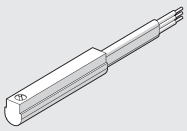


Code	Description
W1580300200	Gripper with 2 parallel long-stroke jaws P4-30



ACCESSORIES

SENSOR Ø 4 FOR P4 10-30

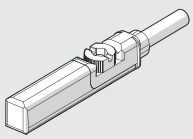


For codes and technical data, see **chapter A6**.

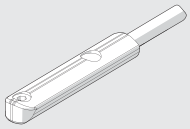
RETRACTABLE SENSOR FOR P4-12-30

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation, secure fixing

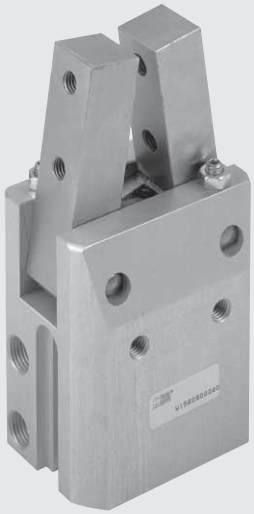


SENSOR, OVAL TYPE
Traditional



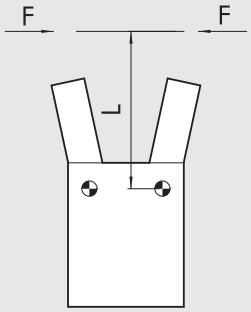
GRIPPER WITH TWO HINGED JAWS – SERIES P7

Bores 16, 20, 32 and 50 mm.
All grippers are magnetic with slots in the body with retracting sensors.

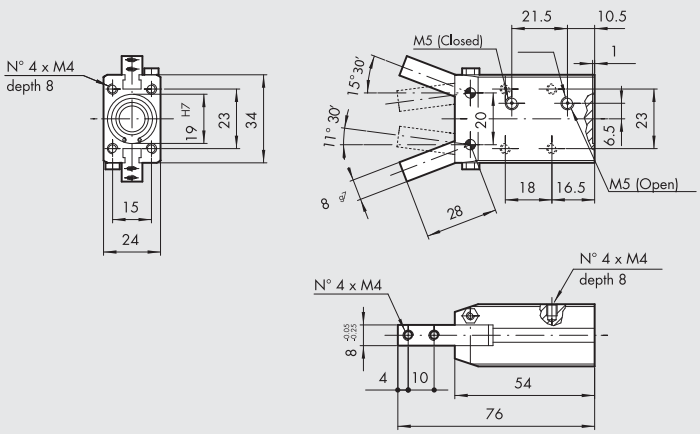


TECHNICAL DATA		P7-16	P7-20	P7-32	P7-50
Operating pressure	bar	2 to 10	2 to 10	2 to 10	2 to 10
	MPa	0.2 to 1	0.2 to 1	0.2 to 1	0.2 to 1
	psi	29 to 145	29 to 145	29 to 145	29 to 145
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous			
Temperature range	°C	-10 to +80			
Maximum opening angle of single jaw		15° 30′	16° 30′	16°	8° 30′
Clamping force at 6.3 bar 20 mm from the centre of rotation of the jaws, during opening and closing	N	27	50	120	380
Weight	kg	0.12	0.19	0.5	1.6

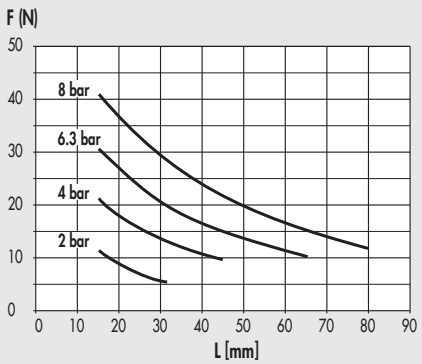
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



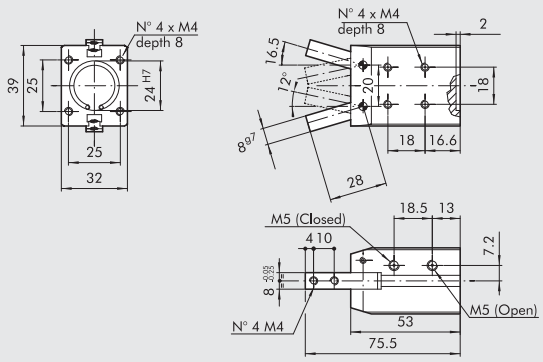
DIMENSIONS OF GRIPPER P7-16



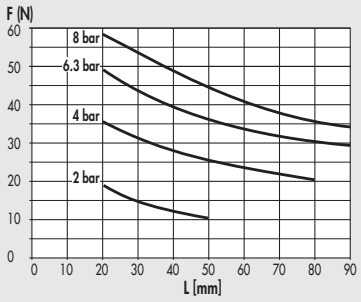
Code	Description
W1590160200	Gripper with 2 hinged jaws P7-16



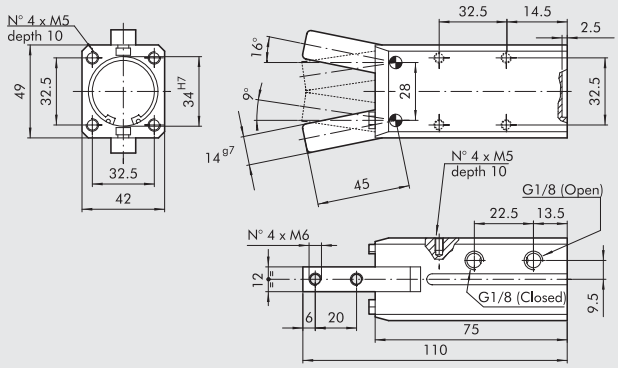
DIMENSIONS OF GRIPPER P7-20



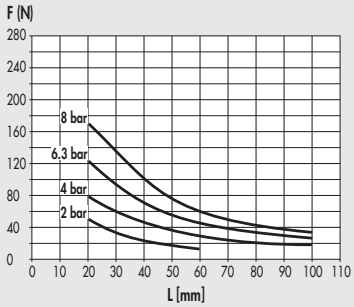
Code	Description
W1590200200	Gripper with 2 hinged jaws P7-20



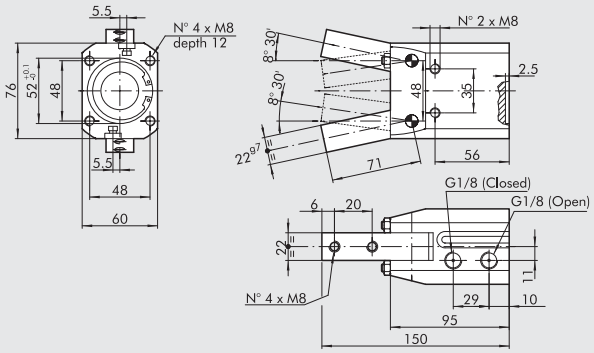
DIMENSIONS OF GRIPPER P7-32



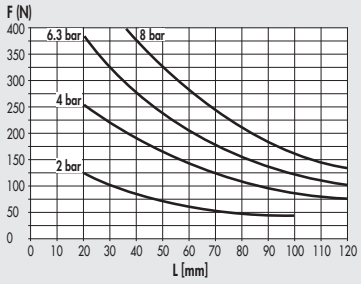
Code	Description
W1590320200	Gripper with 2 hinged jaws P7-32



DIMENSIONS OF GRIPPER P7-50



Code	Description
W1590500200	Gripper with 2 hinged jaws P7-50

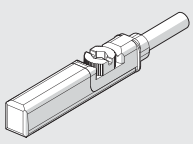


ACCESSORIES

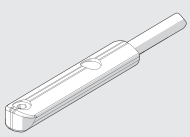
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

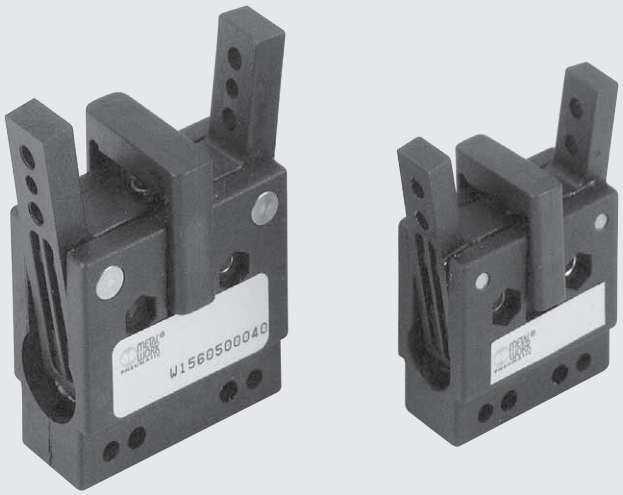


SENSOR, OVAL TYPE
Traditional



TECHNOPOLYMER HINGED GRIPPER SERIES P8

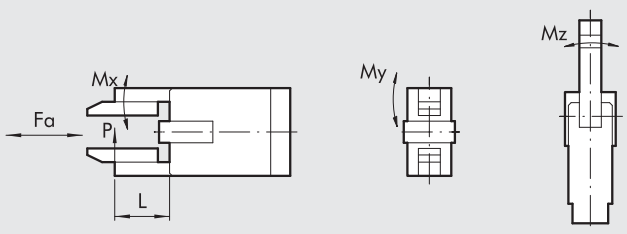
Single-acting hinged grippers, normally open, made entirely of technopolymer. Three sizes with clamping force 25-80 N at 6 bar. This solution makes the entire system lighter.
This gripper is corrosion-resistant and antimagnetic. It comes complete with spring-loaded bracket for pre-loading the piece (force 1.5-6 N) and sensor holders.



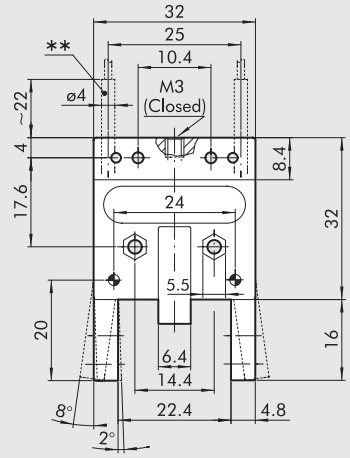
TECHNICAL DATA		P8-32	P8-40	P8-50
Operating pressure	bar	4 to 7		
	MPa	0.4 to 0.7		
	bar	58 to 101		
Operating temperature	°C	-10 to +60		
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous		
Life		Over 2 million cycles		
Jaw opening angle		8°		
Clamping force per jaw at 6 bar	N	22.5	48	80
Applicable weight (recommended)	kg	0.2	0.4	0.8
Air consumption per cycle	cm^3	0.5	1	1.8
Opening time	sec	0.04	0.05	0.05
Closing time	sec	0.06	0.08	0.08
Weight of grippers	g	36	45	60
Moment of inertia	kg cm^2	0.04	0.12	0.15
Repeatability	mm	0.1	0.1	0.1

TABLE OF MOMENTS

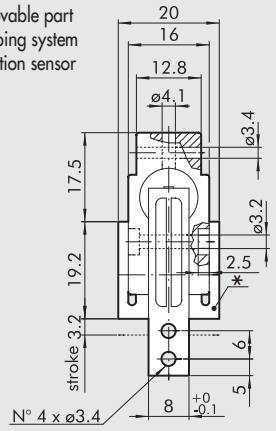
Gripper	FA (N)	Mx (Ncm)	My (Ncm)	Mz (Ncm)	P (N)
P8 - 32	3	9	10	10	22.5
P8 - 40	5	23	20	20	47.5
P8 - 50	8	49	30	40	80



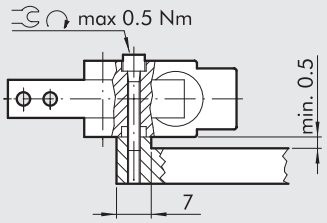
DIMENSIONS OF GRIPPER P8-32



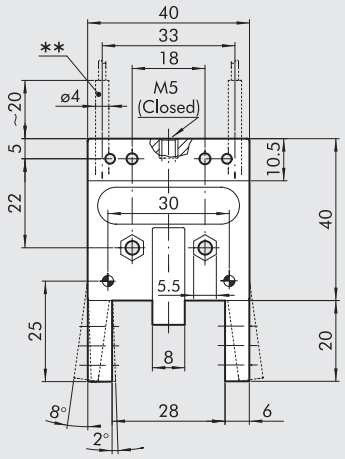
* Removable part clamping system
** Induction sensor



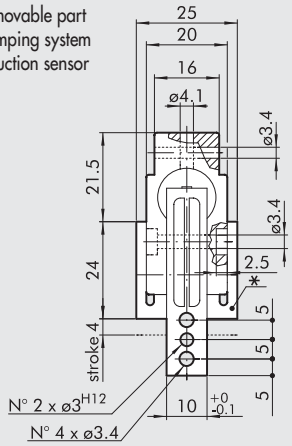
Code	Description
W0710010002	Tecnopolimer hinged grippers P8-32



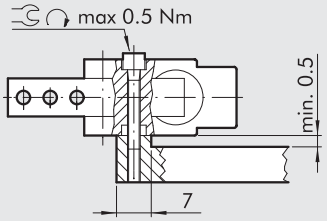
DIMENSIONS OF GRIPPER P8-40



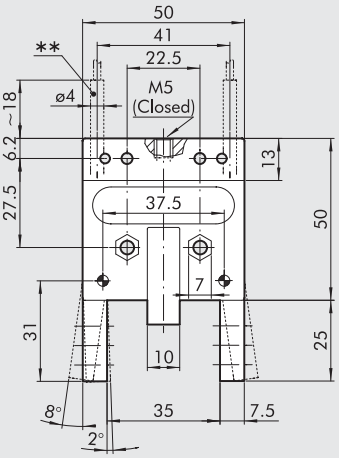
* Removable part clamping system
** Induction sensor



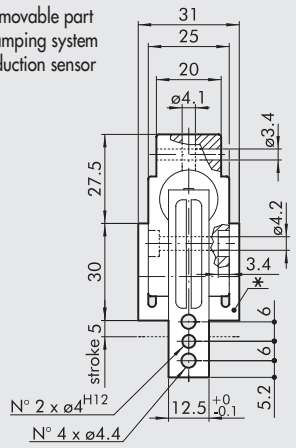
Code	Description
W0710010003	Tecnopolimer hinged grippers P8-40



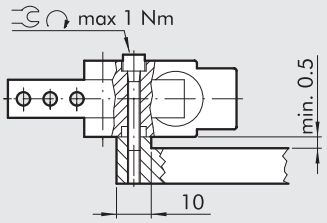
DIMENSIONS OF GRIPPER P8-50



* Removable part clamping system
** Induction sensor

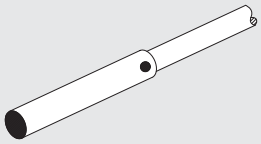


Code	Description
W0710010004	Tecnopolimer hinged grippers P8-50



ACCESSORIES

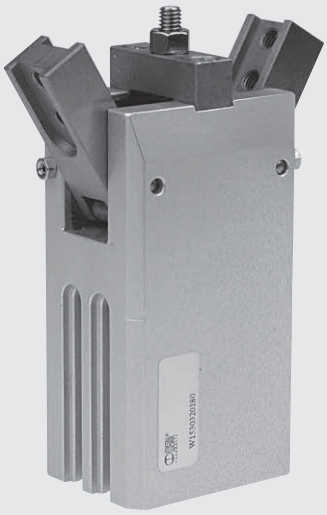
INDUCTION SENSOR



Code	Description
W0950037391	Induction sensor Ø 4 mm PNP-NO-2 m

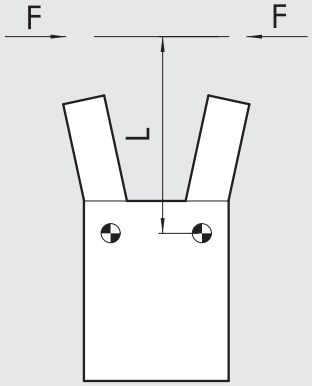
GRIPPER 180° WITH TWO HINGED JAWS - SERIES P9

- Toggle-type pivoted grippers, with adjustable opening angle.
- High clamping forces.
- Body made of hard anodized aluminium, jaws and moving parts made of tempered steel.
- Bottom or side fixing.
- All sizes come with magnets and sensor slots.



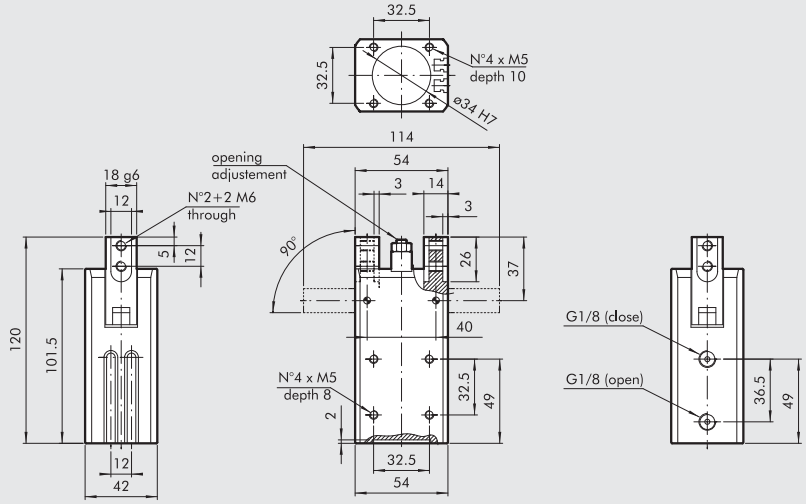
TECHNICAL DATA		P9-32	P9-40
Operating pressure	bar	2 to 8	
	MPa	0.2 to 0.8	
	psi	29 to 116	
Temperature range	°C	-10 to +80	
Fluid		Filtered, lubricated or unlubricated air; lubrification if used, it must be continuous	
Bores	mm	32	40
Jaw opening angle		Adjustable 180°	
Clamping force at 6.3 bar 40 mm from the jaw pivot during opening and closing	N	160	260
Weight	kg	0.85	1.5

TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION

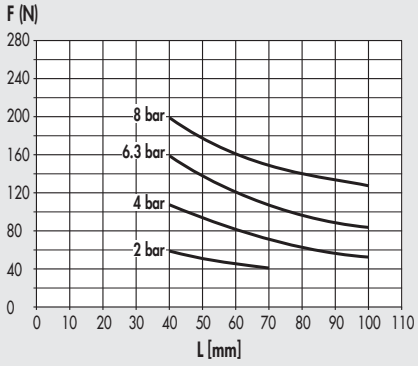


METAL WORK PNEUMATIC

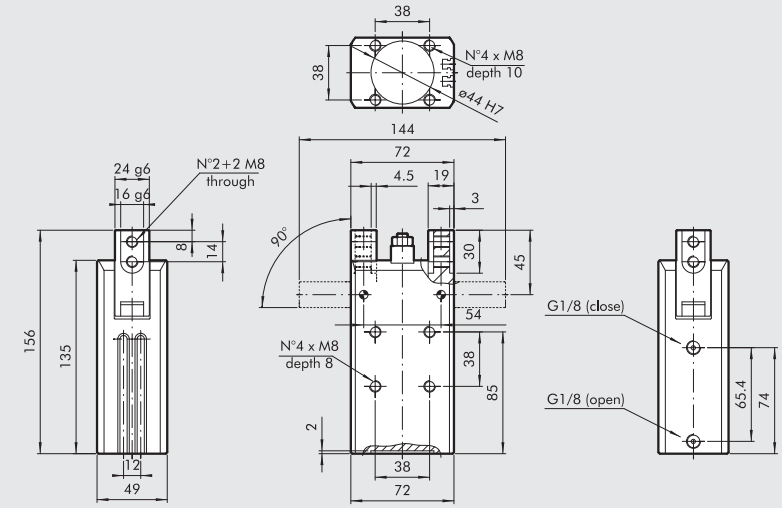
DIMENSIONS OF GRIPPER P9-32



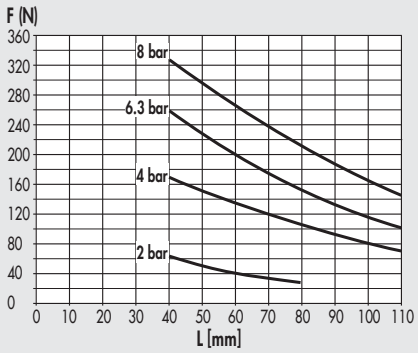
Code	Description
W1530320180	Hinged gripper P9-32



DIMENSIONS OF GRIPPER P9-40



Code	Description
W1530400180	Hinged gripper P9-40

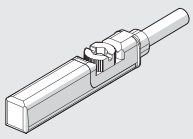


ACCESSORIES

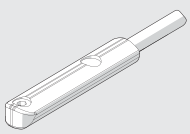
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

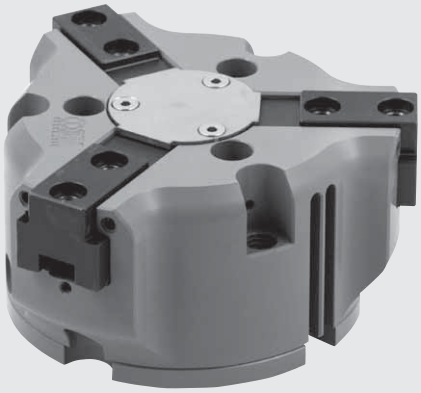


SENSOR, OVAL TYPE
Traditional



GRIPPER WITH THREE PARALLEL JAWS, SERIES P12

Parallel double-acting three-jaw gripper, with either internal or external clamping.
Aluminum alloy body coated with surface hardening treatment; jaws made of wear-resistant coated steel.
The jaw-guiding system and precision in coupling with the body make the gripper extremely stable.
The ceramic-coated body reduces friction and wear, and enhances the movement of the jaws on the body.
All sizes are available in the version with standard stroke and clamping force, while only some in the version with reduced stroke but with higher clamping torque.
The gripper is equipped with a magnet and grooves for sensors.
A version designed to house inductive sensors is also available (**the inductive sensors are not supplied by Metal Work**).



TECHNICAL DATA		P12-40	P12-64	P12-80		P12-100	
				Standard	Increased force	Standard	Increased force
Operating pressure	bar	2 to 8					
	MPa	0.2 to 0.8					
	psi	29 to 116					
Temperature range	°C	-10 to 80					
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous					
Clamping force of a single jaw at 6.3 bar, 20 mm from the upper surface, on opening and closing	N	130	310	435	860	840	1450
Maximum movable weight	kg	1.3	2.9	4.5	9	9	20
Stroke of each jaw	mm	2.5	6	8	4	10	5
Minimum opening/closing time	s	0.05					
Repeatability	mm	0.01					
Moment of inertia as regards the piston axis	kg cm²	2.1	6	6.5		19	
Max. admissible static loads:							
- Fa	N	250	1100	1500		2000	
- Mx	Nm	10	40	90		80	
- My	Nm	5	60	55		115	
- Mz	Nm	12	40	55		70	
Weight	kg	0.2	0.7	0.75		1.4	

COMPONENTS

① BODY: hard-anodised aluminium
② JAWS: nitrided steel
③ PISTON ROD + GUIDE: nitrided steel
④ PISTON: hard-anodised aluminium
⑤ PISTON GASKET: NBR
⑥ PISTON ROD GASKET: NBR / polyurethane
⑦ BASE GASKET: reinforced SBR / NBR
⑧ MAGNET: neodymium

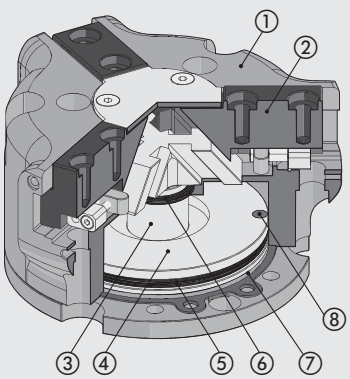
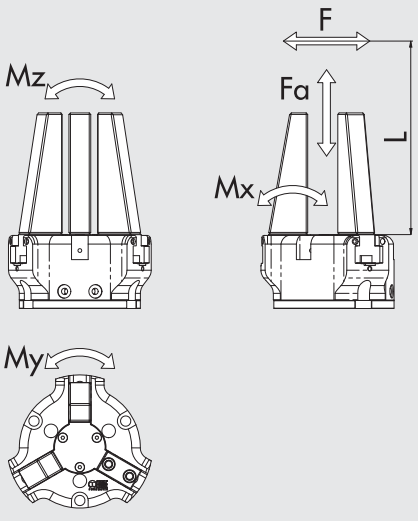


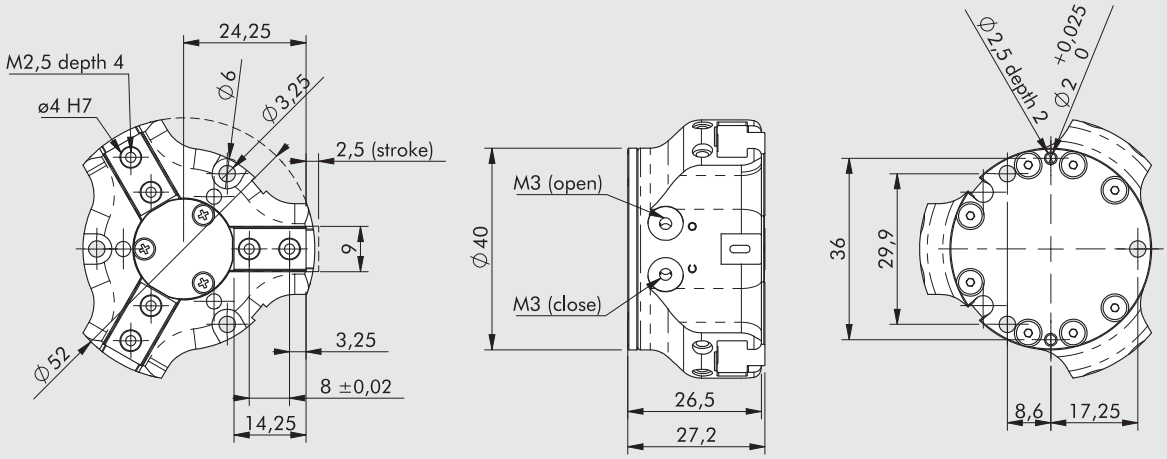
DIAGRAM OF FORCES AND MOMENTS



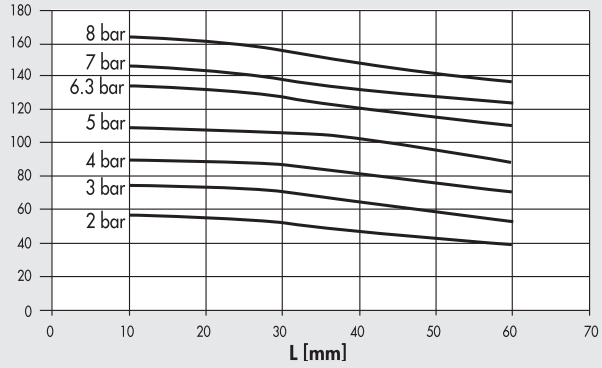
F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

METAL WORK PNEUMATIC

DIMENSIONS OF GRIPPER P12-40

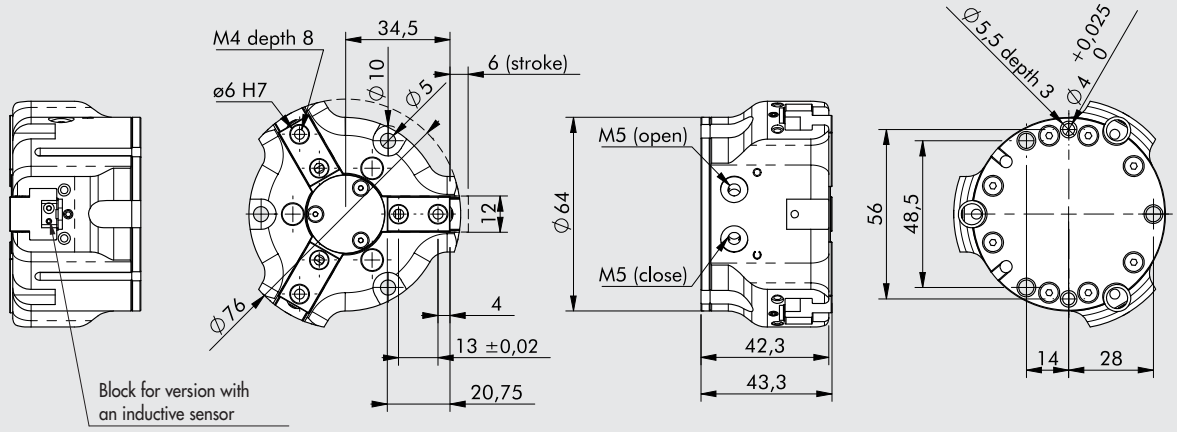


F [N]

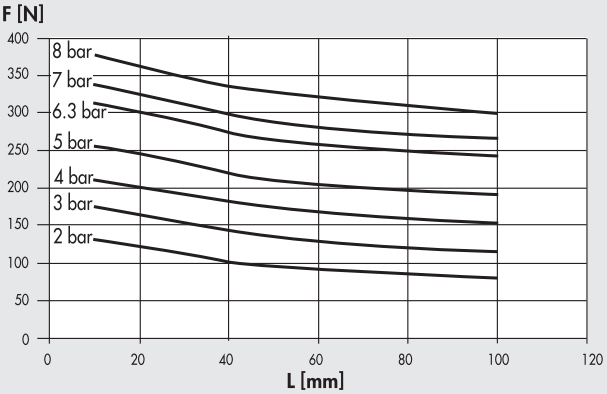


Code	Description
W1560400300	Gripper with 3 parallel jaws P12-40

DIMENSIONS OF GRIPPER P12-64

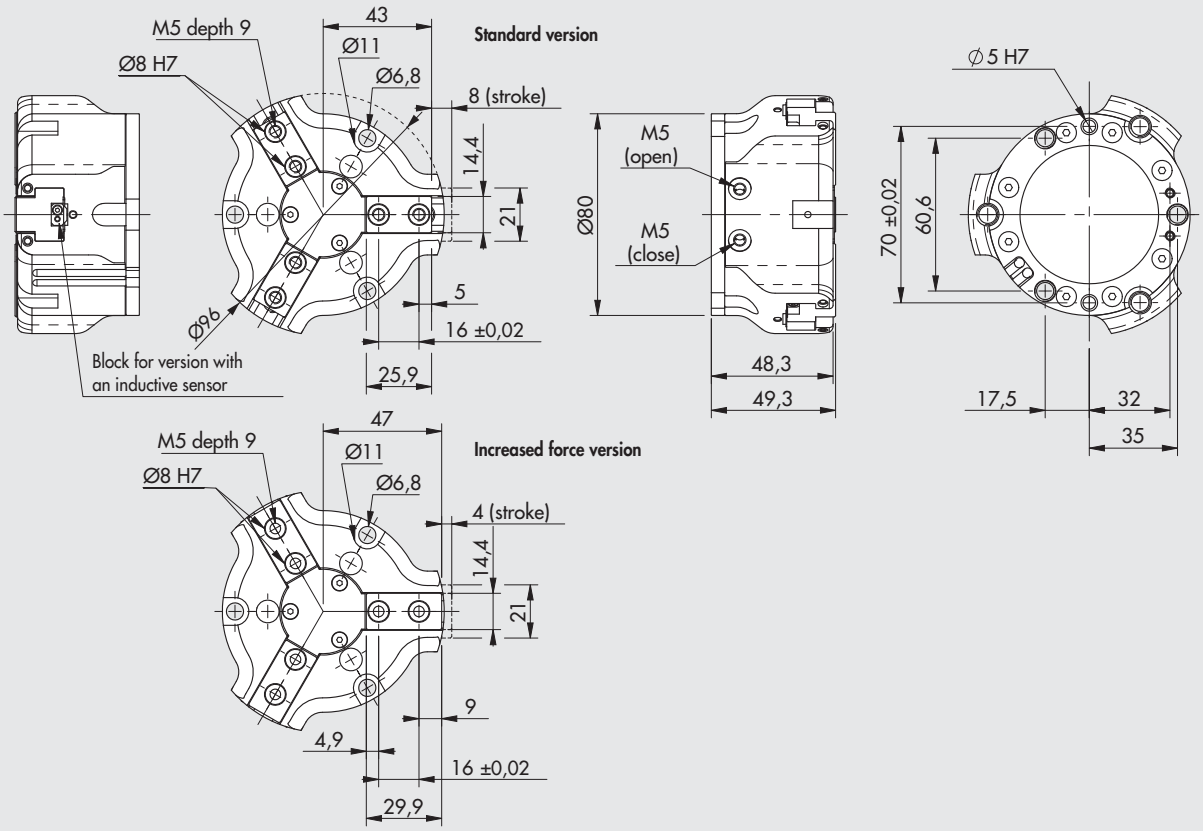


F [N]

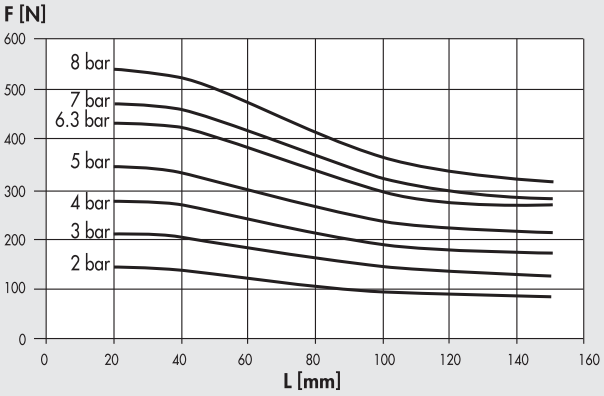


Code	Description
W1560640300	Gripper with 3 parallel jaws P12-64
W1560640301	Gripper with 3 parallel jaws P12-64 for inductive sensors

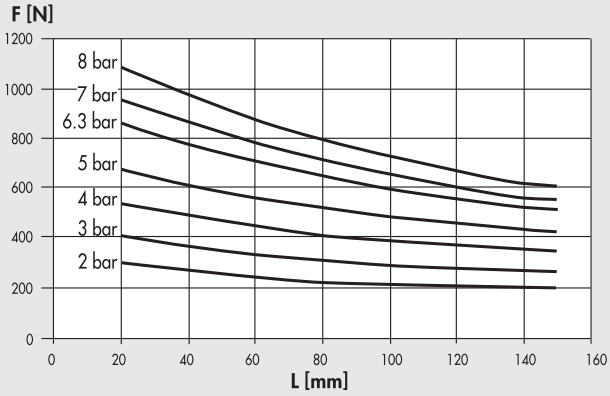
DIMENSIONS OF GRIPPER P12-80



Standard version



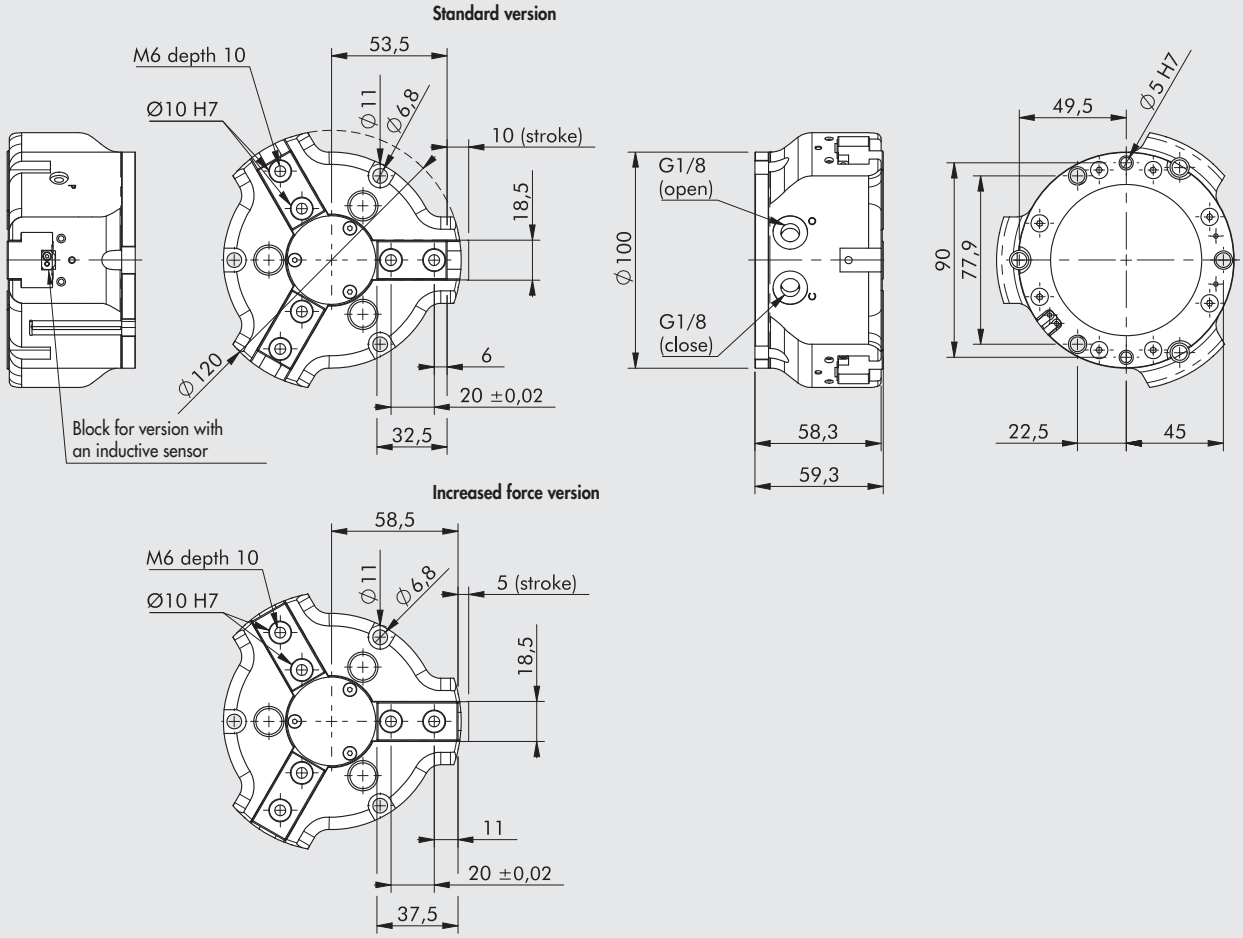
Increased force version



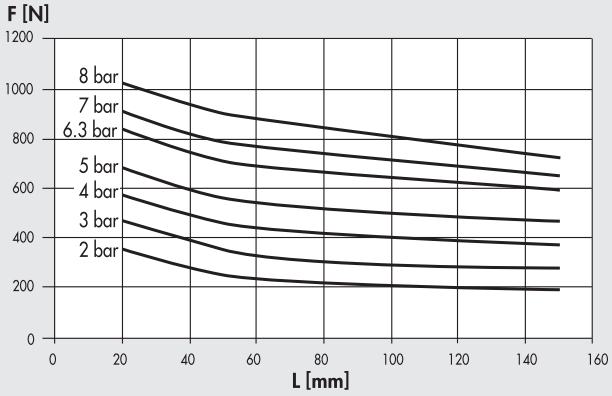
Code	Description
W1560800300	Gripper with 3 parallel jaws P12-80
W1560800301	Gripper with 3 parallel jaws P12-80 for inductive sensors
W1560800320	Gripper with 3 parallel jaws P12-80 increased force
W1560800321	Gripper with 3 parallel jaws P12-80 increased force for inductive sensors

METAL WORK PNEUMATIC

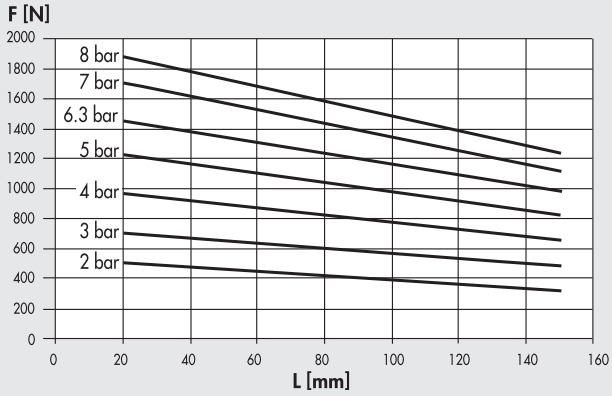
DIMENSIONS OF GRIPPER P12-100



Standard version



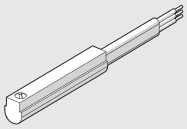
Increased force version



Code	Description
W1561000300	Gripper with 3 parallel jaws P12-100
W1561000301	Gripper with 3 parallel jaws P12-100 for inductive sensors
W1561000320	Gripper with 3 parallel jaws P12-100 increased force
W1561000321	Gripper with 3 parallel jaws P12-100 increased force for inductive sensors

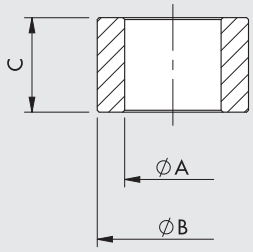
ACCESSORIES

SENSOR Ø 4



For codes and technical data, see **chapter A6**.

CENTRING RING



Code	Size	ØA	ØB f7	C
W1560409201	40	$3^{0}_{-0.1}$	4	$4^{0}_{-0.1}$
W1560649201	64	$4.5^{0}_{-0.1}$	6	$5^{0}_{-0.1}$
W1560809201	80	$5.1^{0}_{-0.1}$	8	$5^{0}_{-0.05}$
W1561009201	100	$6.2^{\pm 0.1}$	10	$6.9^{0}_{-0.1}$

Note: 2-pieces pack

NOTES

METAL WORK PNEUMATIC

NOTES

GENERAL TECHNICAL DATA ROTARY ACTUATORS

DEVICES

The use of hydraulic decelerators means it is possible to increase absorbed power. Some models in the catalogue have built-in decelerators. For those without, the user can mount decelerators outside the actuator.
With horizontal axis rotation, if the masses are distributed asymmetrically it may be difficult to keep a constant rotation speed using flow regulators only. In this case it is advisable to use a decelerator.

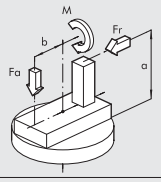
CALCULATIONS

The following needs to be calculated:
- Absorbed kinetic energy
- Axial forces on the shaft or rotating flange
- Radial force on the shaft or rotating flange
- Overturning moment

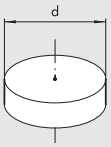
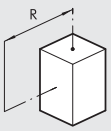
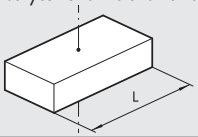
Then compare each of the 4 sizes with the admissible ones shown in the catalogue for each rotary actuator. Remember that the application of optional hydraulic decelerator, where envisaged, doubles the kinetic energy that can be absorbed by the actuator.

SIZING

HOW TO CALCULATE KINETIC ENERGY

	Denomination	Unit of measurement	Formula	Example
				
α	Angle of rotation	rad	$= \text{degrees} \cdot \frac{\pi}{180}$	$= 90° = \frac{\pi}{2}$ rad.
t	Rotation time	s		2
Jta	Moment of inertia of rotating masses N.B.: added those of the individual masses	kg m^2	$= \Sigma$ Ji	= 0.078 + 0.02 + 0.133 = 0.232
E	Kinetic energy	Nm	$= 1/2\ Jw^2 = 2J \cdot \left(\frac{\alpha}{t}\right)^2$	$= 2 \cdot 0.232 \cdot \left(\frac{\frac{\pi}{2}}{2}\right)^2 = 0.57$
Fr	Radial force (Remember to take into account centrifugal forces)	N	($Fc = M \cdot w^2 \cdot R$)	50
Fa	Axial force	N		10
M	Overturning moment	Nm	$= M + Fr \cdot a + Fa \cdot b$	= 50 x 0.1 + 10 x 0 = 5

MOMENTS OF INERTIA FOR THE MOST COMMON SHAPES

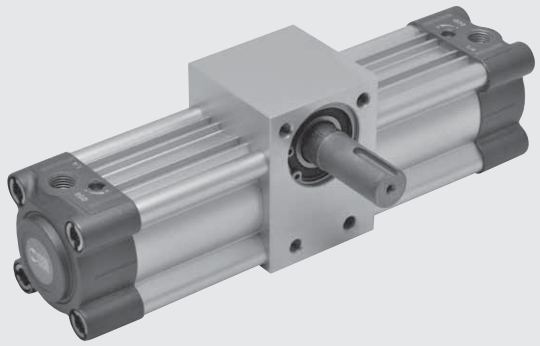
	Denomination	Unit of measurement	Formula	Example
			Disco 	
M	Disk mass	kg		7
d	Disk diameter	m		0.3
J	Moment of inertia of the disk	kg m^2	$= \frac{Md^2}{8}$	$= \frac{7 \cdot 0.3^2}{8} = 0.0787$
			Mass distant from rotation axis 	
M	Mass	kg		0.5
R	Distance between barycenter and rotation axis	m		0.2
J	Moment of inertia of the mass	kg m^2	$= MR^2$	= 0.5 x 0.2^2 = 0.02
			Parallelepiped with barycenter on rotation axis 	
M	Mass	kg		10
L	Side of the parallelepiped	m		0.4
J	Moment of inertia of the mass	kg m^2	$= M \frac{L^2}{12}$	$= \frac{10 \cdot 0.4^2}{12} = 0.13$

ROTARY ACTUATOR SERIES R1

Rack-type rotary actuators in various configurations:
- Configuration with standard magnet
- Version with male pinion or female hole
- Mechanical stroke adjustment
- Special configurations on request

The central body has ISO bore holes for wall fixing using ISO pin and/or flange fittings.

N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.



TECHNICAL DATA		Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
Gaskets		NBR					
Operating pressure	bar	10					
	MPa	1					
	psi	145					
Temperature range	°C	– 10 to + 80					
Fluid		Filtered lubricated or unlubricated air. Lubrication, if used, must be continuous					
Rotation angle		90°; 180°; 270°; 360°					
Type of construction		Extruded profile					
Configuration		Magnetic standard cushioned					
Axial load	N	2500	2800	4500	5600	8500	12200
Max. moment (6 bar - 0.6 MPa)	Nm	4.5	12.5	16	32	70	120

N.B.: The product is supplied with negative end-of-stroke piston (in the proximity of head A).
The first cycle involves movement of the piston (towards head B) with consequent anti-clockwise rotation of the pinion.

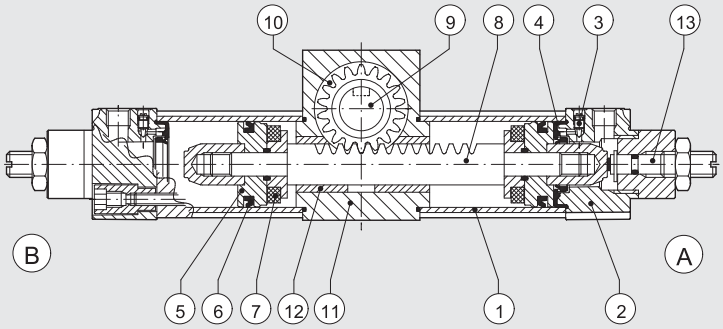
ACTUAL ROTATION ANGLE
Actuators without regulation of the rotation angle: the manufactural tolerance is + 4°/0° compared to the nominal value
Actuators with regulation of the rotation angle: the possible regulation ranges from + 2°/- 20°.

WEIGHTS [kg]

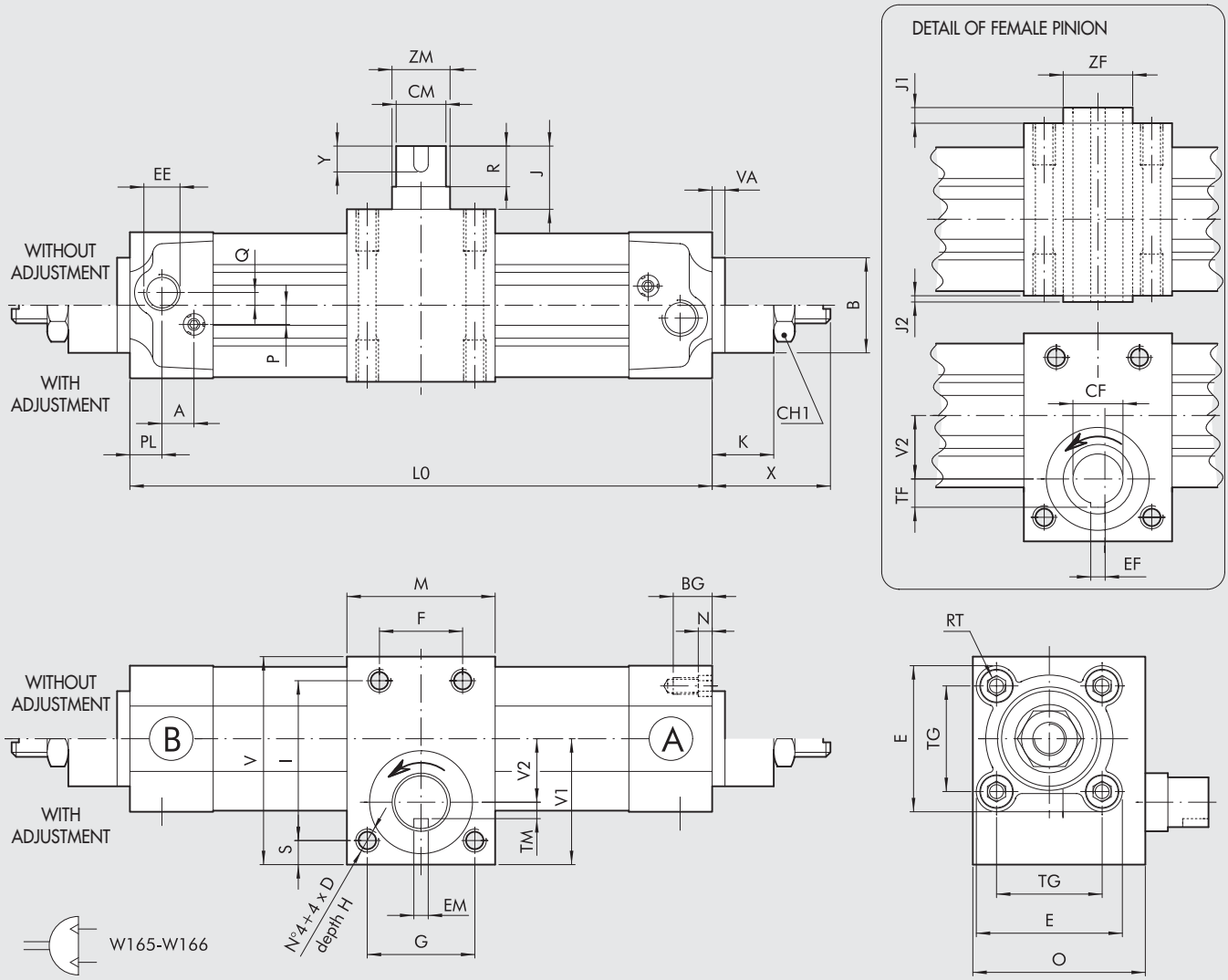
	VERSION W165_ _ _1 _ _ _				VERSION W165_ _ _2 _ _ _				VERSION W166_ _ _1 _ _ _				VERSION W166_ _ _2 _ _ _			
	Rotation angle				Rotation angle				Rotation angle				Rotation angle			
Ø	90°	180°	270°	360°	90°	180°	270°	360°	90°	180°	270°	360°	90°	180°	270°	360°
32	1.25	1.36	1.47	1.58	1.50	1.62	1.73	1.84	1.18	1.30	1.40	1.51	1.44	1.55	1.61	1.77
40	1.85	1.90	2.15	2.30	2.26	2.41	2.43	2.56	1.74	1.79	2.04	2.19	2.15	2.30	2.32	2.45
50	2.80	3.02	3.24	3.46	3.48	3.70	3.91	4.13	2.63	2.85	3.07	3.29	3.30	3.52	3.74	3.96
63	4.02	4.30	4.58	4.85	4.85	5.13	5.40	5.67	3.75	4.02	4.30	4.57	4.57	4.85	5.12	5.39
80	7.90	8.53	9.13	9.73	9.77	10.41	11.00	11.60	7.26	7.90	8.49	9.09	9.13	9.77	10.37	10.97
100	12.30	13.20	14.10	15.01	14.17	15.07	16.00	16.90	11.13	12.03	12.94	13.85	13.00	13.90	14.81	15.73

COMPONENTS

① BARREL: profiled anodised aluminium alloy
② HEAD: die cast aluminium
③ CUSHIONING NEEDLE: OT 58 with needle out movement safety system even when fully open
④ BUFFER + Static O-rings: NBR or FKM/FPM
⑤ PISTON: aluminium
⑥ PISTON GASKET: NBR
⑦ MAGNET: plastoferrite
⑧ RACK: AISI 304
⑨ PIGNON MALE/FEMALE: nitrided alloy steel
⑩ BALL BEARING
⑪ CENTRAL BODY: anodised aluminium
⑫ RACK GUIDE BUSH: self-lubricating sintered bronze
⑬ REGULATION SCREW: AISI 303



DIMENSIONS OF ROTARY ACTUATOR Ø 32 to 100



Note: with the key slot in the position specified, the piston is in contact with head Ⓐ

Ø	L0 ±1 fot ROTATION ANGLE 90°	180°	270°	360°	Δ	A	B	BG	CM g7	CF g7	CH1	D	E	EE	EF D10	EM H9	F	G	H	I	J
32	218.7	261.1	303.5	345.9	0.236	10	30	15.5	14	10	22	M6	46	G1/8	3	5	30	30	14	50	34.5
40	241.4	288.6	335.6	382.8	0.262	10	35	15.5	16	12	22	M6	54	G1/4	4	5	30	30	14	60	39.5
50	265.9	322.4	379.0	435.5	0.314	10	40	18.5	19	14	27	M8	64.5	G1/4	5	6	32	45	16	65	46.5
63	295.1	358.0	420.8	483.6	0.349	10	45	18.5	24	16	27	M10	75.5	G3/8	5	8	38	52	17	73	47.5
80	358.3	443.1	528.0	612.8	0.471	12	45	21.5	28	25	36	M12	94	G3/8	8	8	48	70	20	100	58.5
100	399.8	500.4	600.9	701.4	0.559	12	55	21.5	38	30	36	M14	111	G1/2	8	10	60	80	25	120	67

Ø	J1	J2	K	M	N	O	P	PL	Q	R	RT	S	TG	TF	TM	V	V1	V2	VA	X	Y	ZM	ZF
32	4.5	-	16	47	4.5	47	6	10	4	30	M6	9	32.5	6.4	4	68	44.5	19	4	32 - 35.5	20	15	15
40	5	2	20	52.5	4.5	54.5	6	12	4	35	M6	7	38	7.8	5	74	45	22	4	45.5 - 50	25	17	17
50	7	-	25	63	5.5	64	6	14	6	40	M8	10	46.5	9.3	6	85	51	25	4	48.5 - 53	25	20	20
63	2,5	-	25	75	5.5	75	6	16	6	45	M8	11	56.5	10.3	8	95	56	27.5	4	46.5 - 51	30	25	25
80	8.5	-	33	95	5.5	95	10	18	7	50	M10	12.5	72	15.8	10	125	76	39	4	61 - 67	35	35	35
100	7	-	38	108	5.5	110	10	20	7	60	M10	15	89	18.3	14	150	90.5	45.5	4	66.5 - 74.5	45	45	45

Δ = Linear displacement (mm) for each degree of rotation

KEY TO CODES

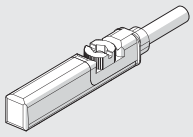
W165	050	1	090
TYPE	**BORES**	**VERSION**	**ANGLE OF ROTATION •**
W165 Rotary actuator with male pinion	032	**1** Without adjustment of rotation angle	090
W166 Rotary actuator with female pinion	040	**2** With adjustment of rotation angle	180
	050		270
	063		360
	080		
	100		

• expressed in sexagesimal degrees.

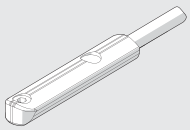
ACCESSORIES: MAGNETIC SENSORS

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation, secure fixing

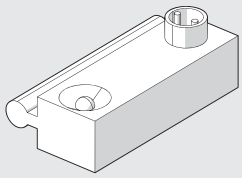


SENSOR, OVAL TYPE
Traditional



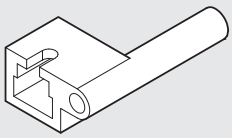
For codes and technical data, see **chapter A6**.

SENSOR SERIES DSM



For codes and technical data, see **chapter A6**.

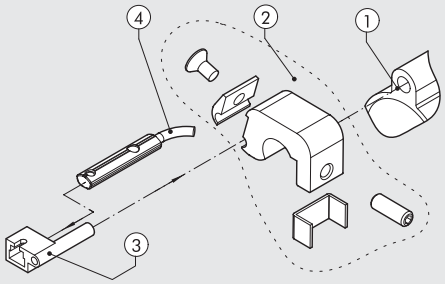
ADAPTER FOR OVAL TYPE RETRACTABLE SENSORS



Code	Description
W0950001001	Adaptor DSS005 for DST/ST brackets

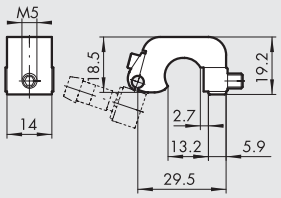
ASSEMBLY DIAGRAM

① Rotary actuator Serie R1
② Sensor bracket mod. DST (Ø 32 to 100)
③ Adaptor
④ Retractable sensor "oval type"



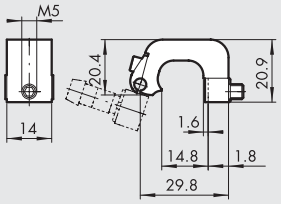
SENSOR SUPPORT BRACKETS FOR SENSORS DSM

Ø 32 to 40



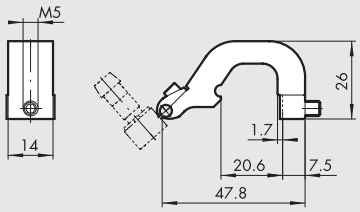
Code	Description
W0950000711	Bracket D.32-40 DST 80

Ø 50 to 63



Code	Description
W0950000712	Bracket D.50-63 DST 81

Ø 80 to 100

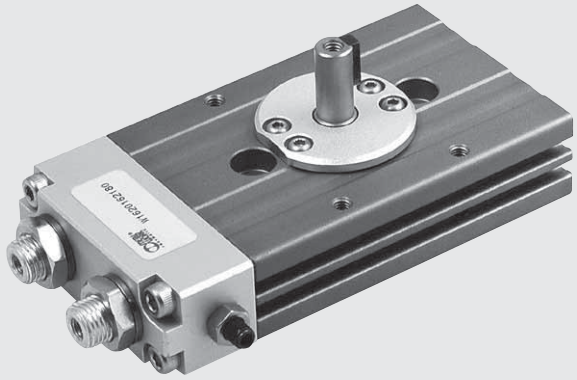


Code	Description
W0950000713	Bracket D.80-100-125 DST 82

ROTARY ACTUATOR SERIES R2

Actuator with double rack and play take-up.
Four sizes – 12, 16, 20 and 25. Two angles of rotation – 90° and 180°.
Stroke adjustment system for all sizes. Pneumatic cushioning for all sizes except the smallest. There are slots in the body to house a magnetic proximity sensor. Air supply, stroke adjustment and cushioning adjustment are all on the same side.

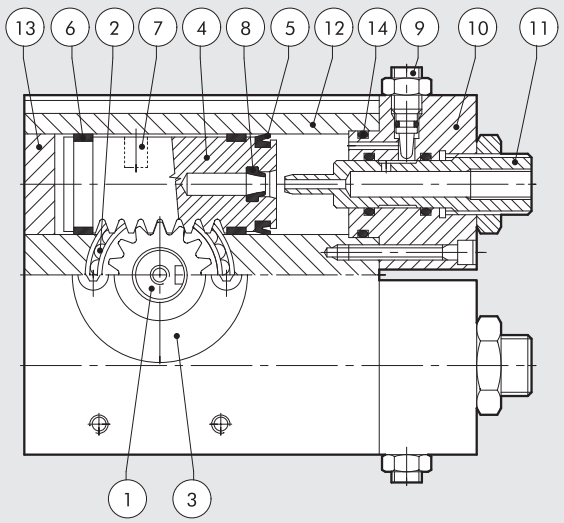
N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.



TECHNICAL DATA		R2-12	R2-16	R2-20	R2-25
Operating pressure	bar	1.5 to 7			
	MPa	0.15 to 0.7			
	psi	22 to 101			
Temperature range	°C	-10 to +80			
Angle adjustment	degrees	35° (about +10° -25°)			
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous			
Versions		90°/180° rotation			
Ports		Both at the front			
Sizes	mm	12	16	20	25
Theoretical torque (ΔP= pressure in bar)	Nm	0.065 x P	0.11 x P	0.21 x P	0.48 x P
Max. axial load	N	8	14	40	80
Max. radial load	N	8	14	40	80
Weight with 90° rotation	kg	0.18	0.26	0.63	0.8
Weight with 180° rotation	kg	0.21	0.31	0.72	1
Rotation time without load:					
• 90° angle	s	0.2	0.2	0.2	0.2
• 180° angle	s	0.3	0.3	0.3	0.3

COMPONENTS

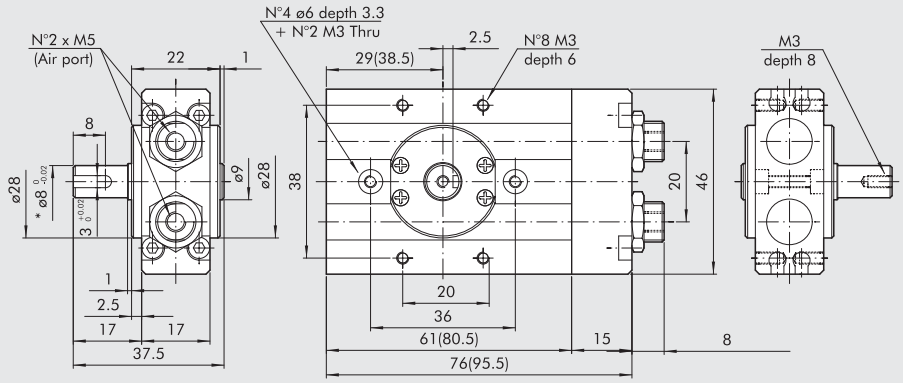
① ROTARY SHAFT / PINION: hardened and tempered steel
② BALL BEARING
③ FLANGE: anodised aluminium
④ PISTON / RACK: hardened and tempered steel
⑤ PISTON GASKET: NBR
⑥ GUIDE PAD: PTFE
⑦ MAGNET: neodymium
⑧ CUSHIONING GASKET: NBR
⑨ CUSHIONING PIN: zinc-plated steel
⑩ HEAD: anodised aluminium
⑪ PNEUMATIC CONNECTION / STROKE ADJUSTMENT: steel
⑫ BARREL: anodised aluminium
⑬ BASE: anodised aluminium
⑭ SEAL: NBR



METAL WORK PNEUMATIC

ROTARY ACTUATOR R2-12 90°/180°

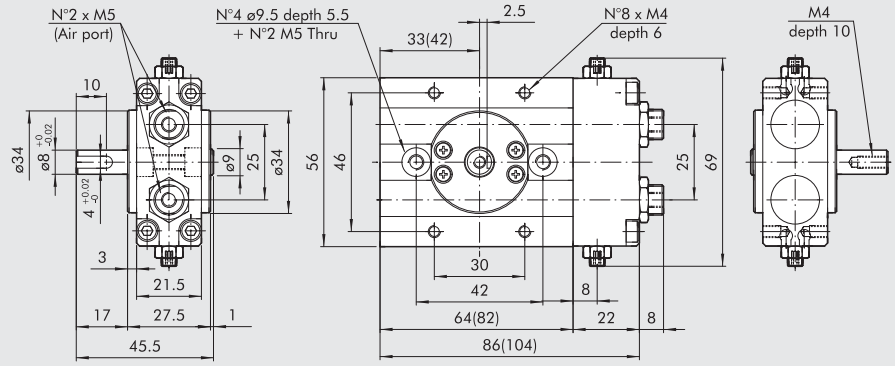
Code	Description
W1620122090	Rotary actuator R2-12-90°
W1620122180	Rotary actuator R2-12-180°



* For the version R2-12-90° it was Ø6 mm; spare actuators code W1620122091 can be still supplied
Dimensions for 180° rotation are given in brackets

ROTARY ACTUATOR R2-16 90°/180°

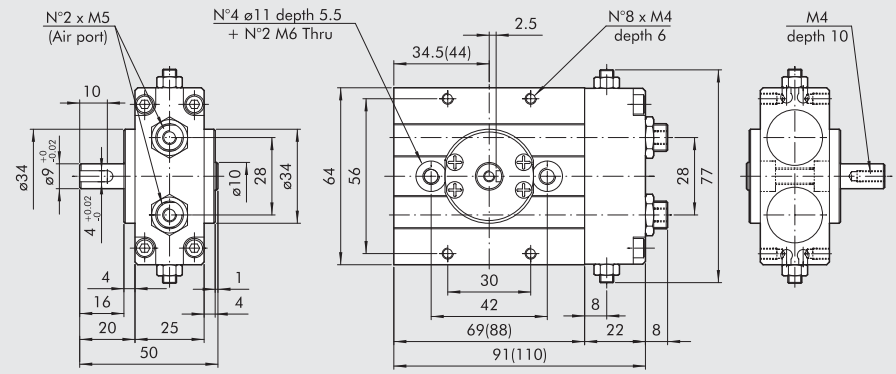
Code	Description
W1620162090	Rotary actuator R2-16-90°
W1620162180	Rotary actuator R2-16-180°



Dimensions for 180° rotation are given in brackets

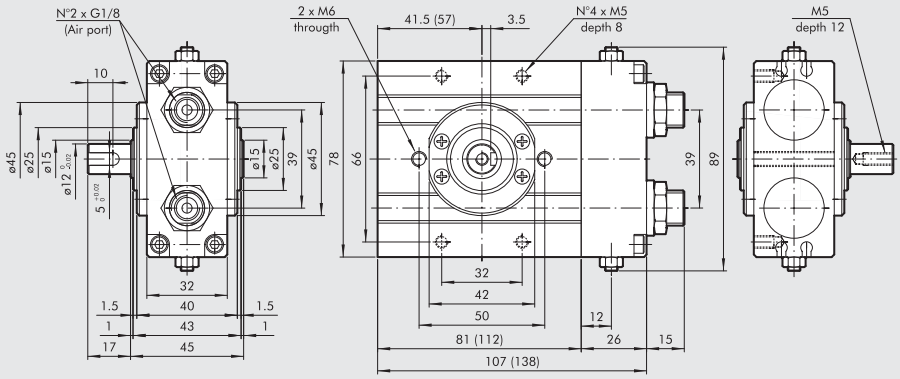
ROTARY ACTUATOR R2-20 90°/180°

Code	Description
W1620202090	Rotary actuator R2-20-90°
W1620202180	Rotary actuator R2-20-180°



Dimensions for 180° rotation are given in brackets

ROTARY ACTUATOR R2-25 90°/180°

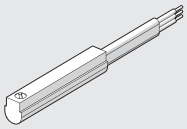


Code	Description
W1620252090	Rotary actuator R2-25-90°
W1620252180	Rotary actuator R2-25-180°

Dimensions for 180° rotation are given in brackets

ACCESSORIES

SENSOR Ø 4



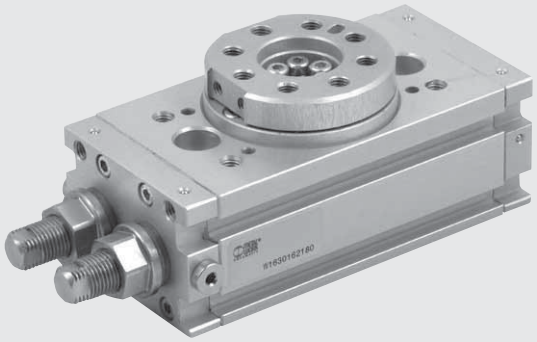
For codes and technical data, see **chapter A6**.

NOTES

ROTARY ACTUATOR SERIES R3

Actuator with double rack and play take-up. Angle of rotation adjustable from 0 to 180°. The R3 rotary actuator can come with a mechanical stop or hydraulic end-of-stroke cushioning.
There is a version with flange and one with shaft (for ø16-20-25-30).
There are slots in the body for retracting magnetic proximity sensors, two on each side. There is hole in the flange for air pipes or wires.

N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.

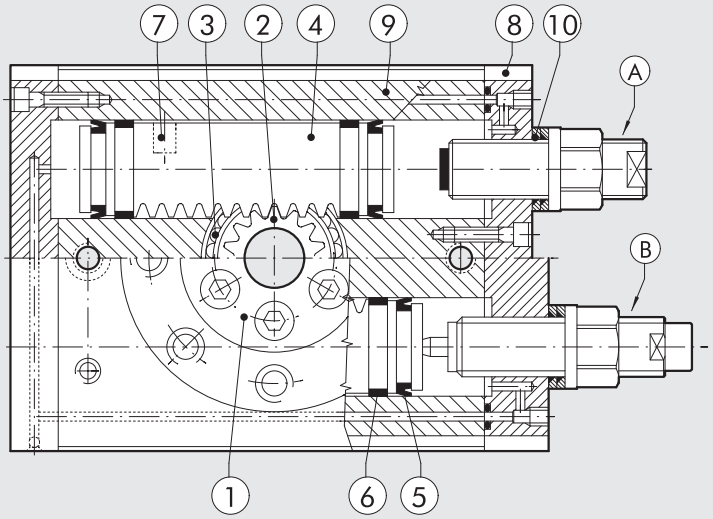


TECHNICAL DATA		R3-16	R3-20	R3-22	R3-25	R3-30	R3-40
Operating pressure	bar	3 to 7					
	MPa	0.3 to 0.7					
	psi	43.5 to 101					
Temperature range	°C	-10 to +80					
Angle adjustment	degrees	0° to 180°					
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous					
Versions		With mechanical stop / hydraulic decelerator					
Sizes		16	20	22	25	30	40
Bores	mm	2 x 16	2 x 20	2 x 22	2 x 25	2 x 30	2 x 40
Theoretical torque at 6 bar	Nm	0.9	1.8	2.7	4.6	9.3	22
Max. axial load	N	74	135	195	300	340	360
Max. radial load	N	78	137	360	450	490	560
Weight	kg	0.53	0.99	1.29	2.08	3.9	6.7
Rotation time without load	s	0.2	0.2	0.2	0.2	0.3	0.3
Admissible kinetic energy	Joule						
WITH MECANICAL STOP		0.007	0.025	0.049	0.082	0.090	0.150
(with flange W1630__2180 and with shaft W1630__5180)							
WITH HYDRAULIC DECELERATOR		-	-	-	0.29	1.10	1.60
(with flange W1630__2180 and with shaft W1630__5180)							

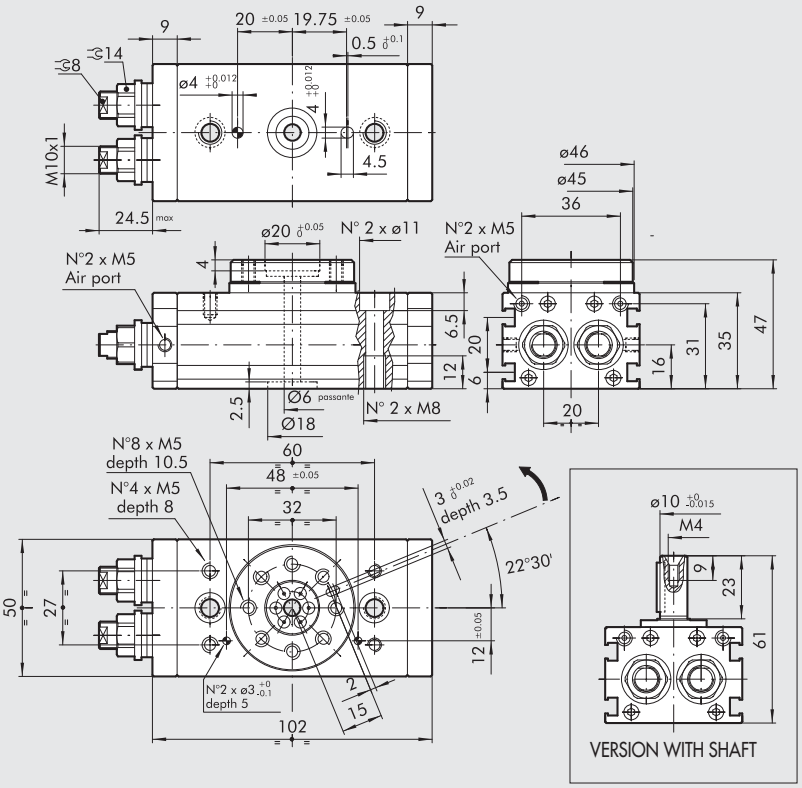
COMPONENTS

① ROTARY FLANGE: anodised aluminium
② PINION: hardened and tempered steel
③ BALL BEARING
④ PISTON / RACK: hardened and tempered steel
⑤ CUSHIONING GASKET: NBR
⑥ GUIDE PAD: PTFE
⑦ MAGNET: neodymium
⑧ HEAD: anodised aluminium
⑨ BARREL: anodised aluminium
⑩ SEAL: NBR

VERSIONS:
Ⓐ Stroke adjustment
Ⓑ Stroke adjustment with inside hydraulic shock absorbers (available from Ø 25)

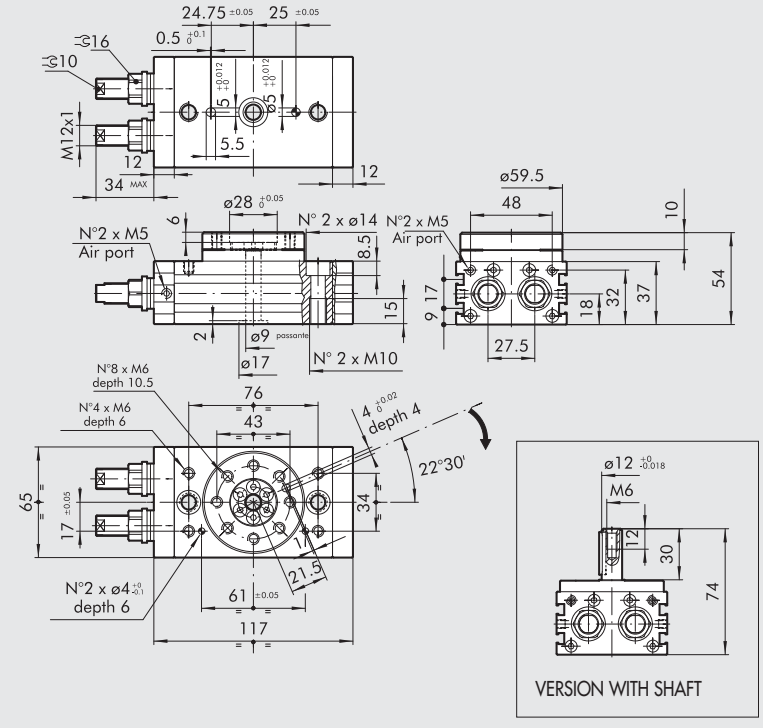


ROTARY ACTUATOR R3-16



Code	Description
W1630162180	Rotary actuator with flange R3-16
W1630165180	Rotary actuator with shaft R3-16

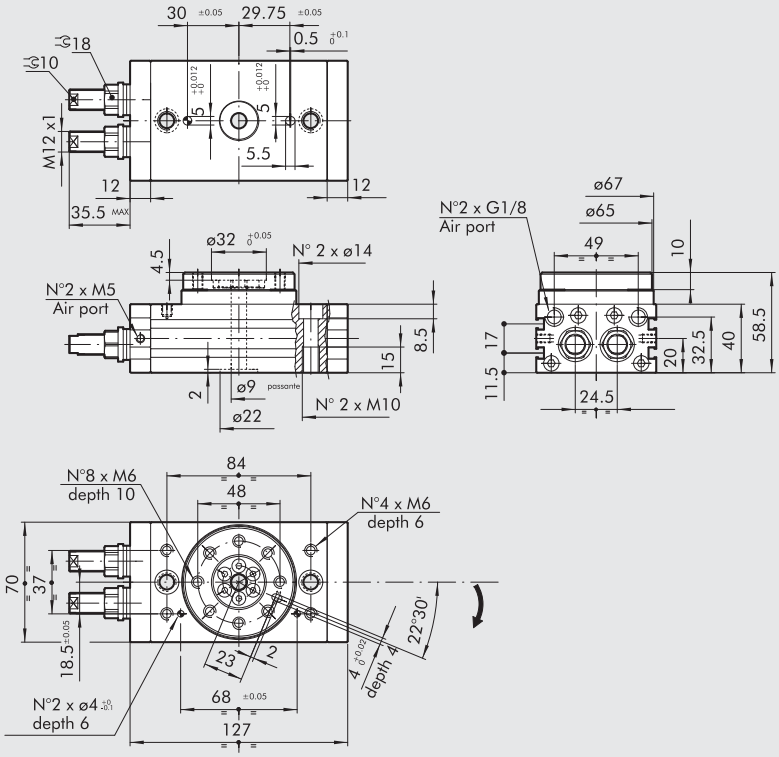
ROTARY ACTUATOR R3-20



Code	Description
W1630202180	Rotary actuator with flange R3-20
W1630205180	Rotary actuator with shaft R3-20

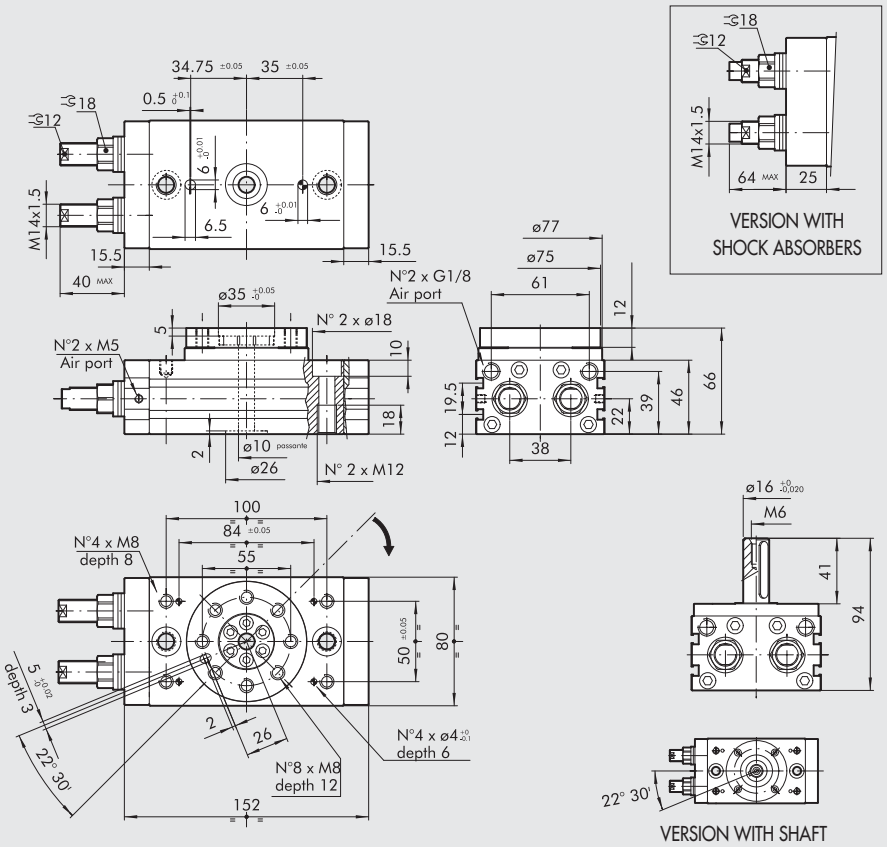
METAL WORK PNEUMATIC

ROTARY ACTUATOR R3-22



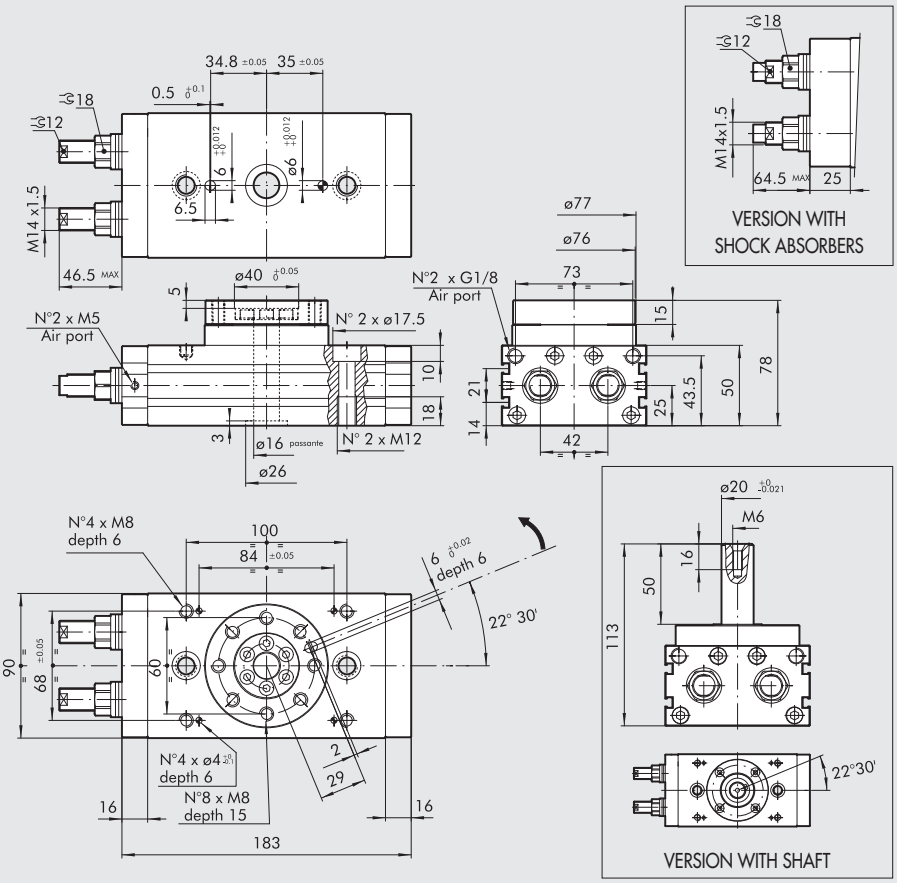
Code	Description
W1630222180	Rotary actuator with flange R3-22

ROTARY ACTUATOR R3-25



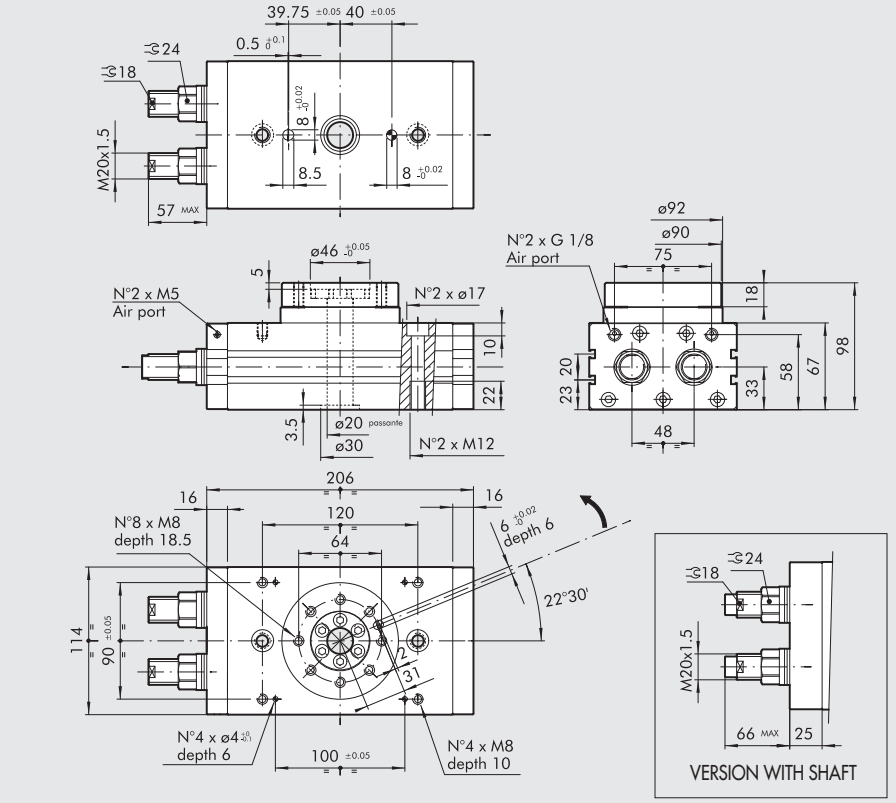
Code	Description
W1630252180	Rotary actuator with flange R3-25
W1630253180	Rotary actuator with flange + shock absorbers R3-25
W1630255180	Rotary actuator with shaft R3-25
W1630256180	Rotary actuator with shaft + shock absorbers R3-25

ROTARY ACTUATOR SERIES R3-30



Code	Description
W1630302180	Rotary actuator with flange R3-30
W1630303180	Rotary actuator with flange + shock absorbers R3-30
W1630305180	Rotary actuator with shaft R3-30
W1630306180	Rotary actuator with shaft + shock absorbers R3-30

ROTARY ACTUATOR SERIES R3-40



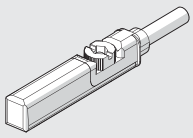
Code	Description
W1630402180	Rotary actuator with flange R3-40
W1630403180	Rotary actuator with flange + shock absorbers R3-40

ACCESSORIES

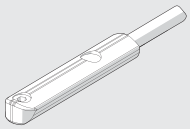
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

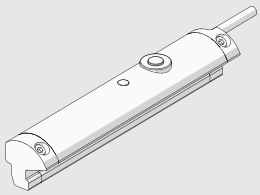


SENSOR, OVAL TYPE
Traditional



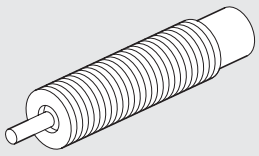
LTS POSITION SENSORS

For technical data and usage strokes see **chapter A6**.



SPARE PARTS

SHOCK ABSORBERS



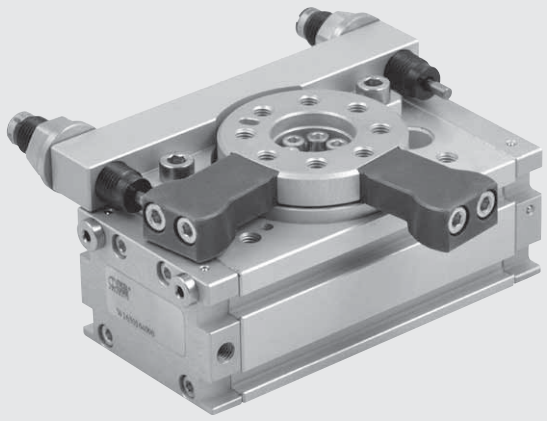
Code	Ø	Description
0950004015	Ø 25	Shock absorbers ECO S 25 MC2 short M14x1.5
0950004008	Ø 30	Shock absorbers ECO 25 MC4 M14x1.5
0950004005	Ø 40	Shock absorbers ECO 50 MC2 + nut M20x1.5

NOTES

ROTARY ACTUATOR SERIES R3 WITH EXTERNAL SHOCK ABSORBERS

Dual-rack actuator with automatic adjustment for wear.
Hydraulic shock absorbers are arranged externally and operate at a distance from the axis of rotation which is considerably higher than for internal ones. This means that the absorbable kinetic energy is 4 to 8 times higher.
It is reduced in length as there are no adjusting screws.
A 90° and a 180° versions are available.
Grooves are provided in the body to fix retractable magnetic proximity sensors, two on each side.
A hole has been drilled in the flange for the passage of air pipes or power cables.

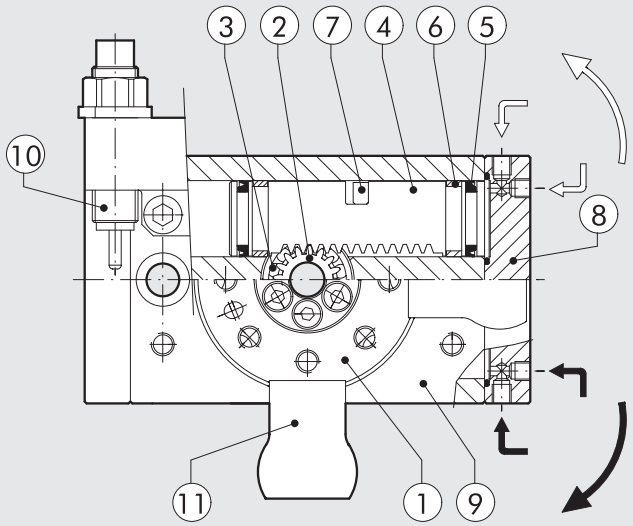
N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.



TECHNICAL DATA		R3-16	R3-20	R3-22	R3-25	R3-30	R3-40
Operating pressure	bar	3 to 7					
	MPa	0.3 to 0.7					
	psi	43.5 to 101					
Temperature range	°C	-10 to +80					
Angle adjustment	degrees	90° o 180° ± 3°					
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous					
Sizes	mm	16	20	22	25	30	40
Bore	mm	2 x 16	2 x 20	2 x 22	2 x 25	2 x 30	2 x 40
Theoretical torque at 6 bar	Nm	0.9	1.8	2.7	4.6	9.3	22
Max. axial load	N	74	135	195	300	340	360
Max. radial load	N	78	137	360	450	490	560
Max overturning moment	Nm	2.4	4	5.3	9.7	12	18
Admissible kinetic energy	J	0.16	0.55	0.85	1.40	1.85	3.35
Rotation time without load	s	0.2	0.2	0.2	0.2	0.3	0.3

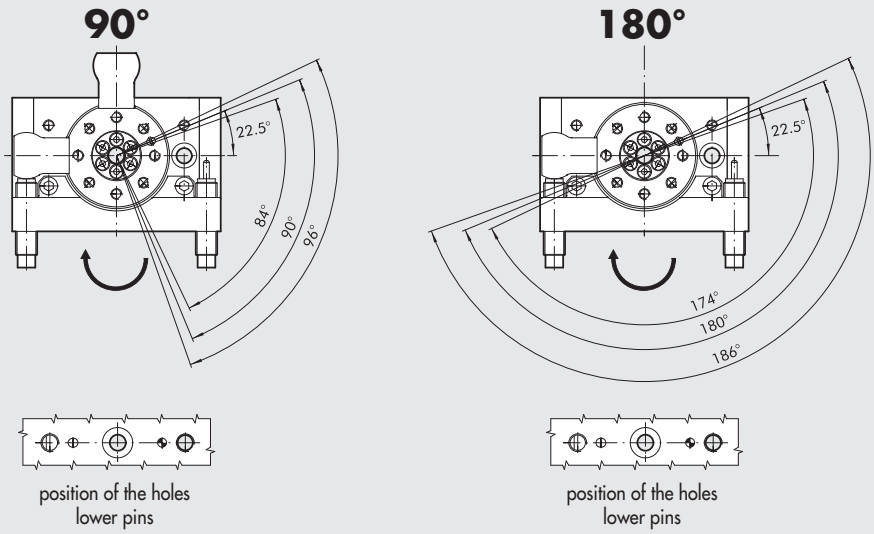
COMPONENTS

① ROTARY FLANGE: anodised aluminium
② PINION: hardened and tempered steel
③ BALL BEARING
④ PISTON / RACK: hardened and tempered steel
⑤ CUSHIONING GASKET: NBR
⑥ GUIDE PAD: PTFE
⑦ MAGNET: neodymium
⑧ HEAD: anodised aluminium
⑨ BARREL: anodised aluminium
⑩ STROKE REGULATOR WITH HYDRAULIC SHOCK ABSORBERS
⑪ Block for 90° version



METAL WORK PNEUMATIC

ROTATION ANGLE

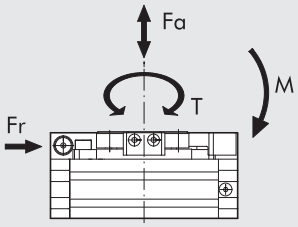


ADMISSIBLE KINETIC ENERGY Joule [J]

Bore Ø	With flange, 90° rotation°: W1630__4090 With flange, 180° rotation°: W1630__4180
16	0.16
20	0.55
22	0.85
25	1.40
30	1.85
40	3.35

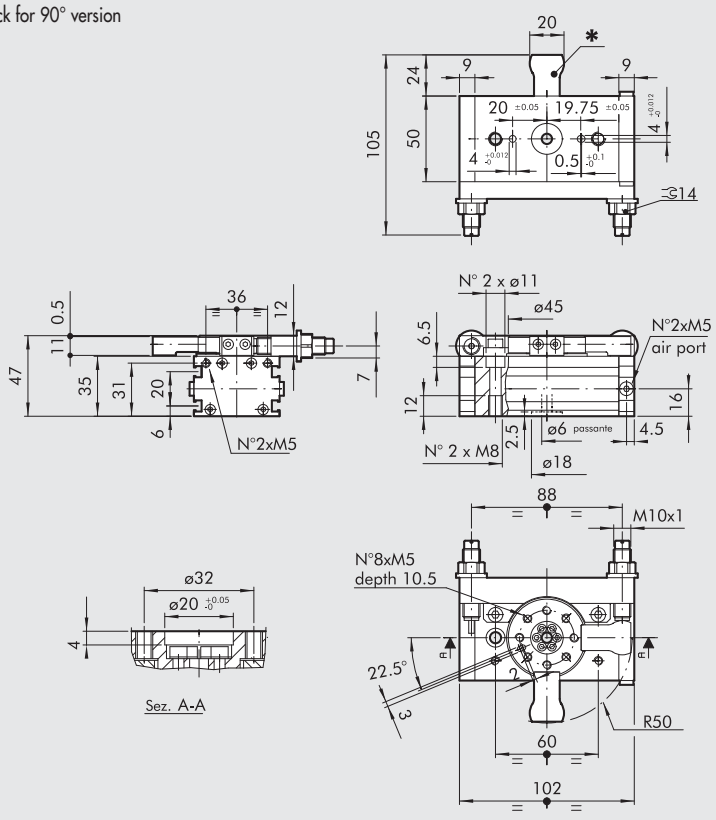
DIMENSIONES - FORCES AND MOMENTS

Bore Ø	T Theoretical torque at 6 bar [Nm]	FA Max. axial load [N]	FR Max. radial load [N]	M Averturing momnet [Nm]
16	0.9	74	78	2.4
20	1.8	135	137	4
22	2.7	195	360	5.3
25	4.6	300	450	9.7
30	9.3	340	490	12
40	22	360	560	18



ROTARY ACTUATOR SERIES R3-16 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

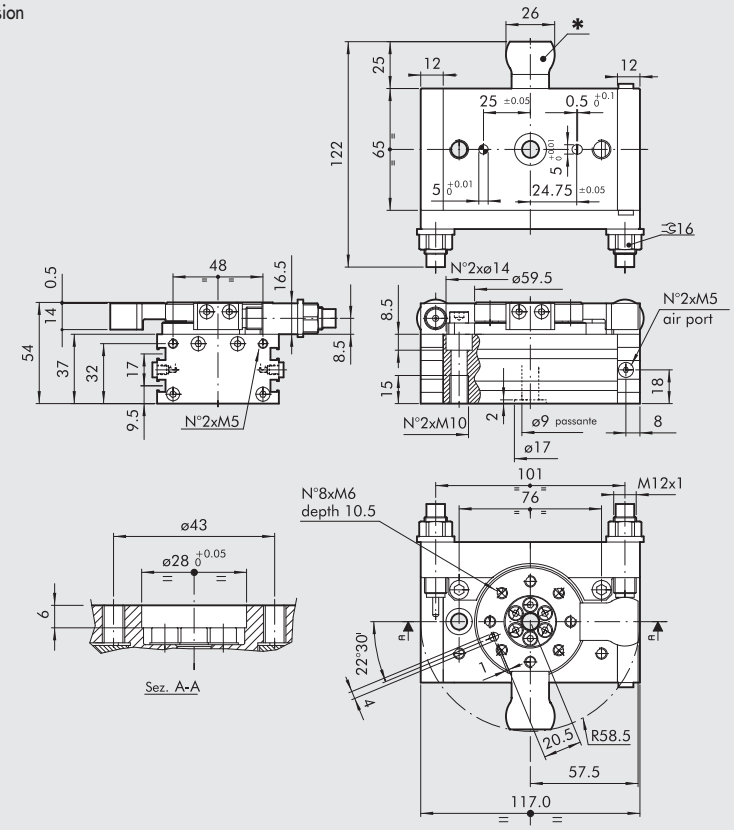
✱ Block for 90° version



Code	Description
W1630164090	Rotary actuator with flange + shock absorbers R3-16-90
W1630164180	Rotary actuator with flange + shock absorbers R3-16-180

ROTARY ACTUATOR SERIES R3-20 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

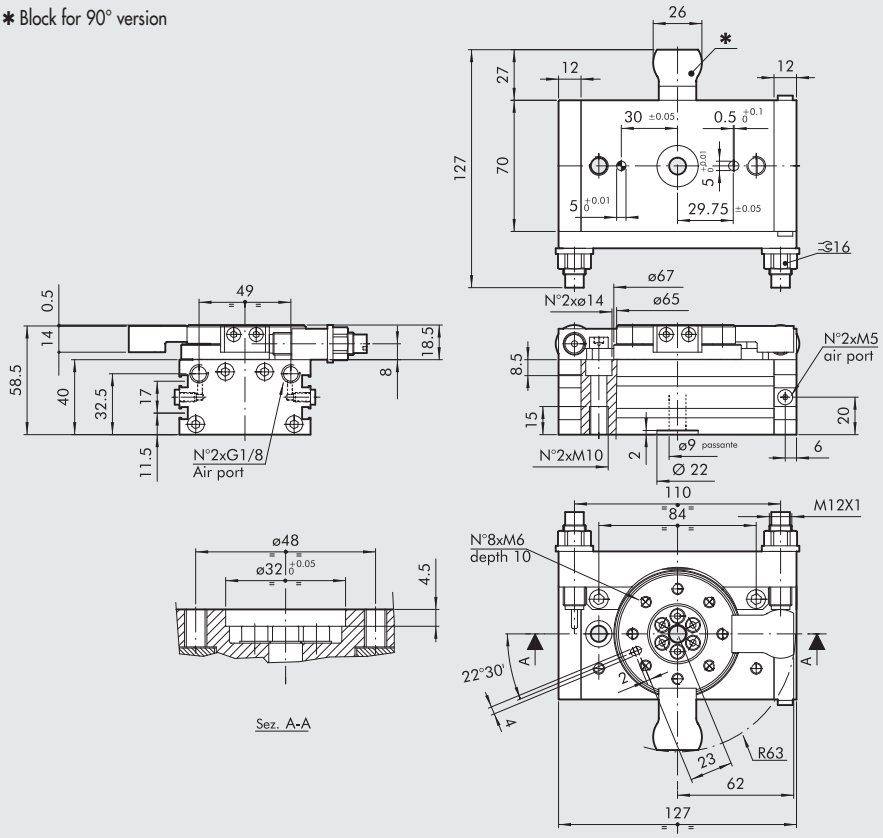
✱ Block for 90° version



Code	Description
W1630204090	Rotary actuator with flange + shock absorbers R3-20-90
W1630204180	Rotary actuator with flange + shock absorbers R3-20-180

ROTARY ACTUATOR SERIES R3-22 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

✱ Block for 90° version

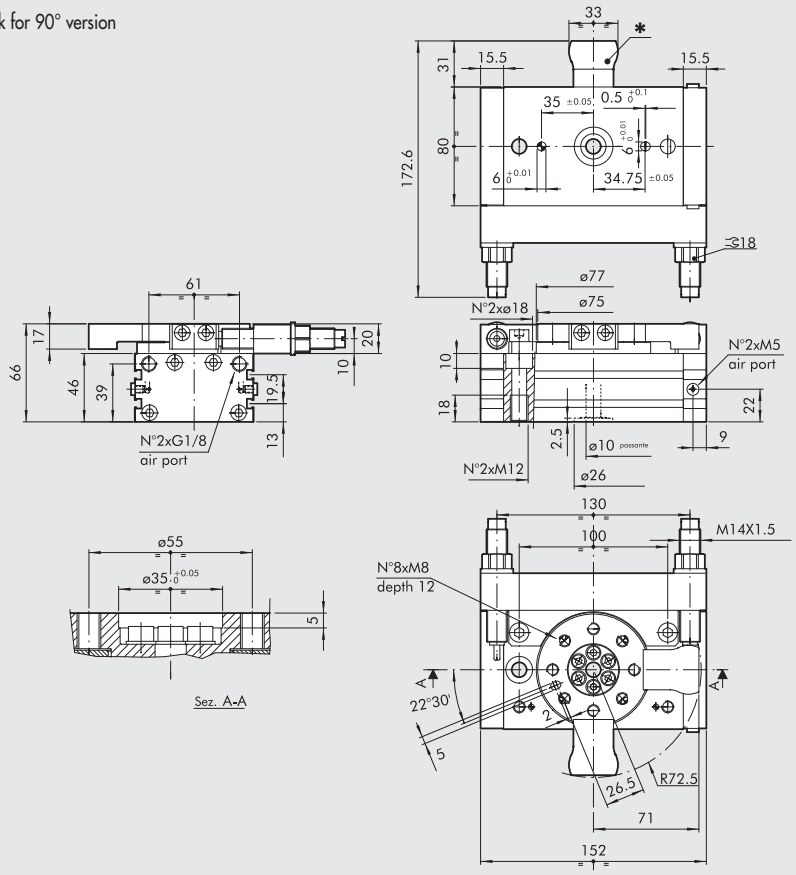


Code	Description
W1630224090	Rotary actuator with flange + shock absorbers R3-22-90
W1630224180	Rotary actuator with flange + shock absorbers R3-22-180

METAL WORK PNEUMATIC

ROTARY ACTUATOR SERIES R3-25 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

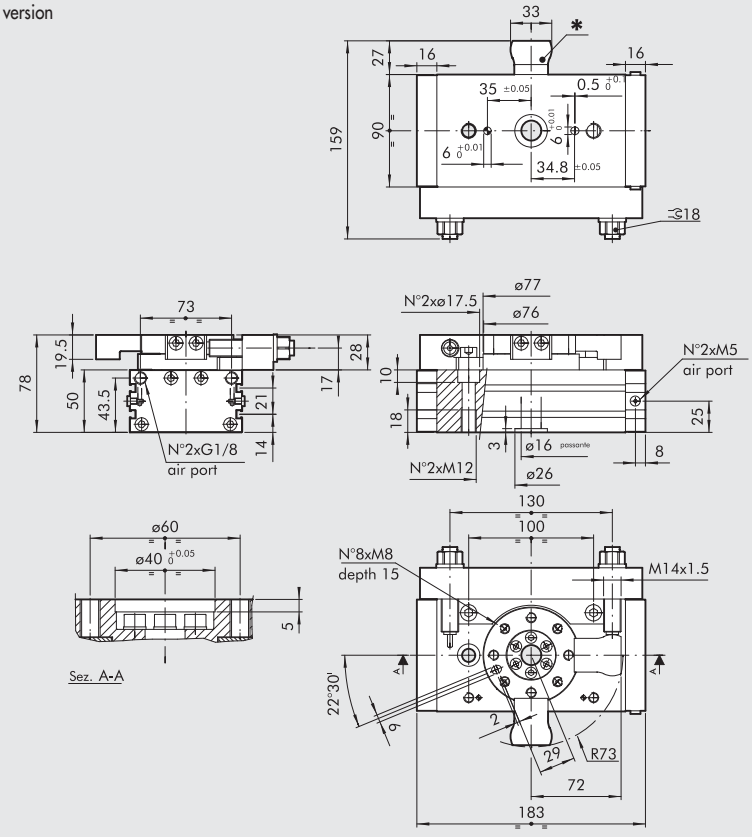
✱ Block for 90° version



Code	Description
W1630254090	Rotary actuator with flange + shock absorbers R3-25-90
W1630254180	Rotary actuator with flange + shock absorbers R3-25-180

ROTARY ACTUATOR SERIES R3-30 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

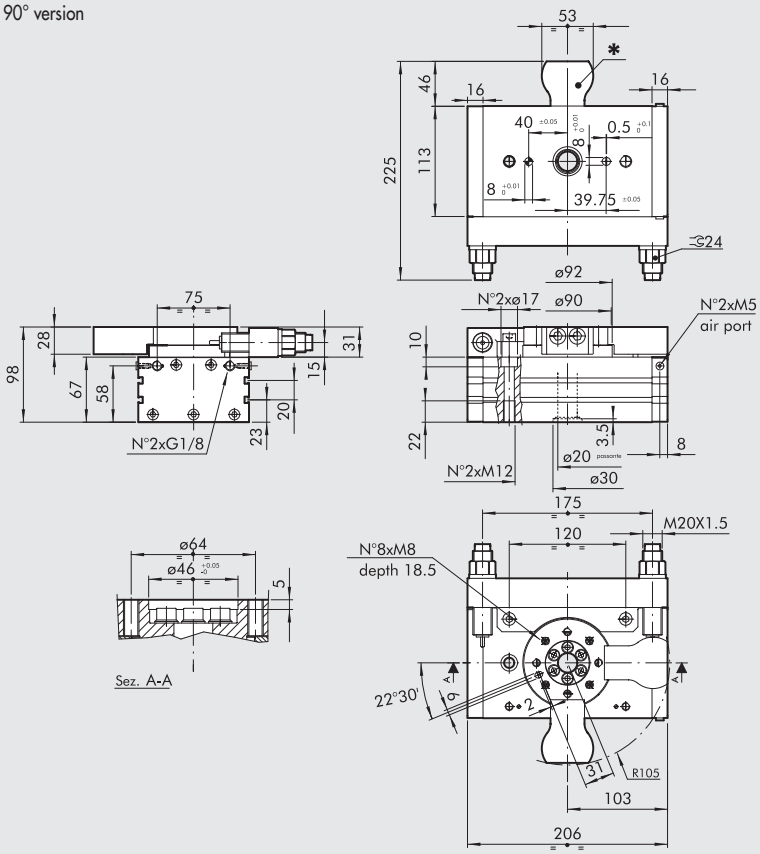
✱ Block for 90° version



Code	Description
W1630304090	Rotary actuator with flange + shock absorbers R3-30-90
W1630304180	Rotary actuator with flange + shock absorbers R3-30-180

ROTARY ACTUATOR SERIES R3-40 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

✱ Block for 90° version



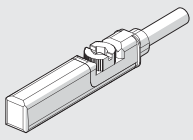
Code	Description
W1630404090	Rotary actuator with flange + shock absorbers R3-40-90
W1630404180	Rotary actuator with flange + shock absorbers R3-40-180

ACCESSORIES

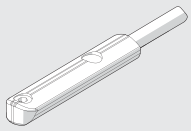
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation, secure fixing

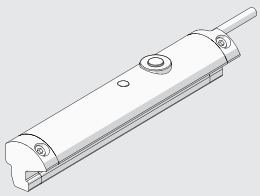


SENSOR, OVAL TYPE
Traditional



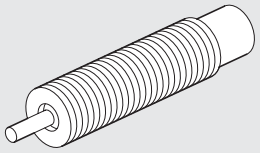
LTS POSITION SENSORS

For technical data and usage strokes see **chapter A6**.



SPARE PARTS

SHOCK ABSORBERS



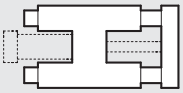
Code	Ø	Description
0950004009	Ø 16	Shock absorbers ECO 10 MF3 M10x1
0950004010	Ø 22	Shock absorbers ECO 15 MF4 M12x1
0950004015	Ø 25 - 30	Shock absorbers ECO S 25 MC2 M14x1.5
0950004005	Ø 40	Shock absorbers ECO MC2 + nut M20x1.5

NOTES

GENERAL TECHNICAL DATA SLIDES

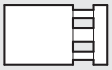
TYPES

The range of guide units and slides is very extensive.
Guides are grouped into families.

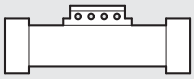


Guide units to couple with standard cylinders.
These are separate units to which an ISO 6432 or ISO 15552 cylinder is attached.

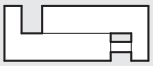
Twin pneumatic cylinder.
The barrel has two calibrated holes for housing two pistons and rods side by side. There are versions with a single piston rod, through piston rod and different power supplies depending on whether you wish to fix the barrel or the flanges to the ends of the piston rod.



Pneumatic single piston cylinders with supports at the end of the piston rod.
The common factor in all the various configurations is that, as well the calibrated hole for the piston in the cylinder body or front head, there are other slots housing bushes or guide bearings for additional piston rods.



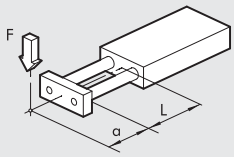
Rodless cylinders.
In these cylinders the piston rod is integral with a carriage on the outside of the barrel, so there is no piston rod.
We offer versions in which the barrel is open, with a C-shaped section, and piston and carriage linked mechanically.

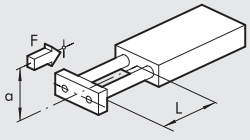


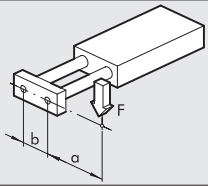
Guides with pneumatic actuator.
The main part of this actuators is the guiding section which determines the shape, applications, loads, maximum strokes and cost. The pneumatic part is housed in one of the bodies of the unit or it comes as a complete cylinder housed inside the guide.

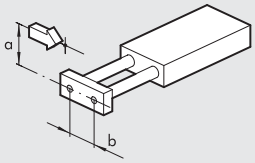
LOAD CONDITIONS

Admitted loads for each guide unit are shown in the catalogue.
If the load is not aligned with the moving plate, it is possible to determine the equivalent load or stroke with a good approximation.

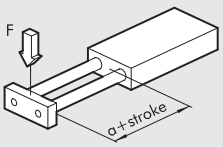




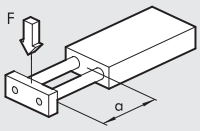




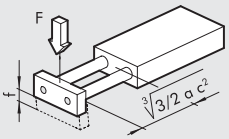
LOAD OR STROKE EQUIVALENCE

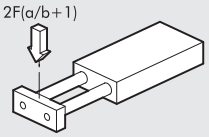


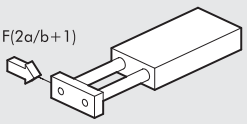
To check the admissible load



To check the arrow



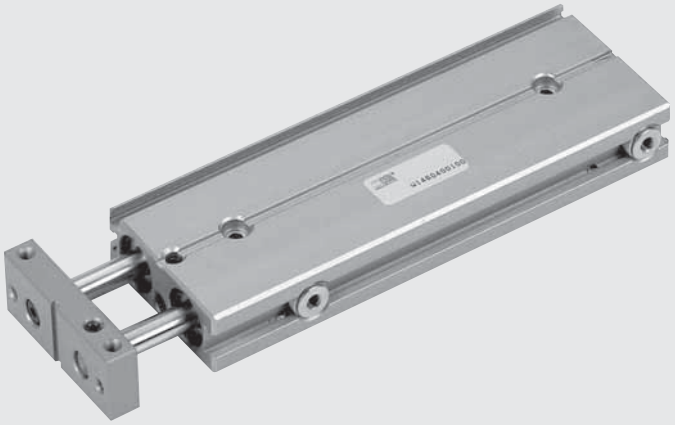




TWIN CYLINDER SERIES S10

METAL WORK PNEUMATIC

There are two sliding systems available:
• on bushes
• on ball recirculating bearings
The frame is made up of two paired cylinders with a common anodized aluminium body containing slots for retracting sensors.
There are 5 bores available:
2 x Ø 12, 2 x Ø 16, 2 x Ø 20, 2 x Ø 25 and 2 x Ø 30.

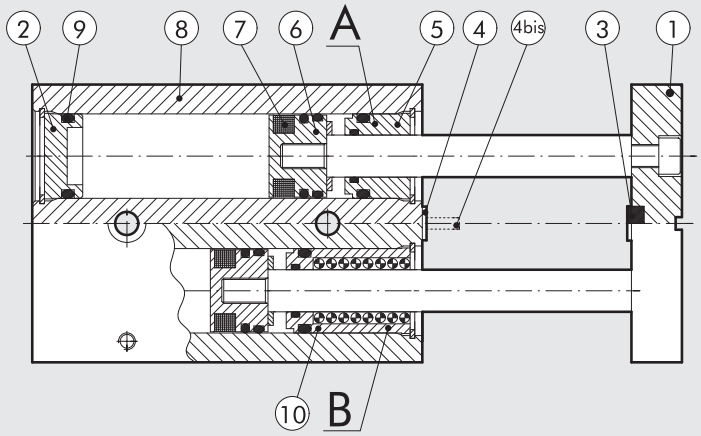


TECHNICAL DATA		S10-12	S10-16	S10-20	S10-25	S10-30
Pressure range	bar	3 to 7				
	MPa	0.3 to 0.7				
	psi	43.5 to 101				
Temperature range	°C	-10 to +80				
Fluid		20 µm dried or lubricated filtered air. Lubrication, if used, must be continuous.				
Piston speed	mm/s	30 to 100				
Versions		System with sliding bushes/System with ball bushes available with stop screw or hydraulic decelerator				
Sizes		12	16	20	25	30
Bores	mm	2 x 12	2 x 16	2 x 20	2 x 25	2 x 30
Piston rod diameter	mm	6	8	10	12	16
Strokes	mm	15	15	25	25	25
	mm	25	25	50	50	50
	mm	50	50	75	75	75
	mm	–	75	100	100	100
		–	–	–	125	125
Weight (C = stroke mm)						
• Bushes version	kg	0.12 + (0.002 x C)	0.24 + (0.0025 x C)	0.51 + (0.005 x C)	0.76 + (0.006 x C)	1.3 + (0.009 x C)
• Ball bearing version	kg	0.21 + (0.002 x C)	0.48 + (0.0025 x C)	0.77 + (0.005 x C)	0.18 + (0.006 x C)	1.92 + (0.009 x C)
Theoretical thrust (P = relative pressure in bar)		(Multiply the value shown by the pressure in bar)				
• Thrust force	da N	2.26 x P	4 x P	6.28 x P	9.8 x P	14.1 x P
• Pull force	da N	1.69 x P	3 x P	4.11 x P	7.5 x P	10.1 x P
Max. loads		(The values shown refer to the min. and max. strokes)				
• Bushes version	N	6 to 4	11 to 6	20 to 7	26 to 8	36 to 11
• Ball bearing version	N	3 to 1.5	6 to 3	10 to 3.5	12 to 5.6	20 to 7

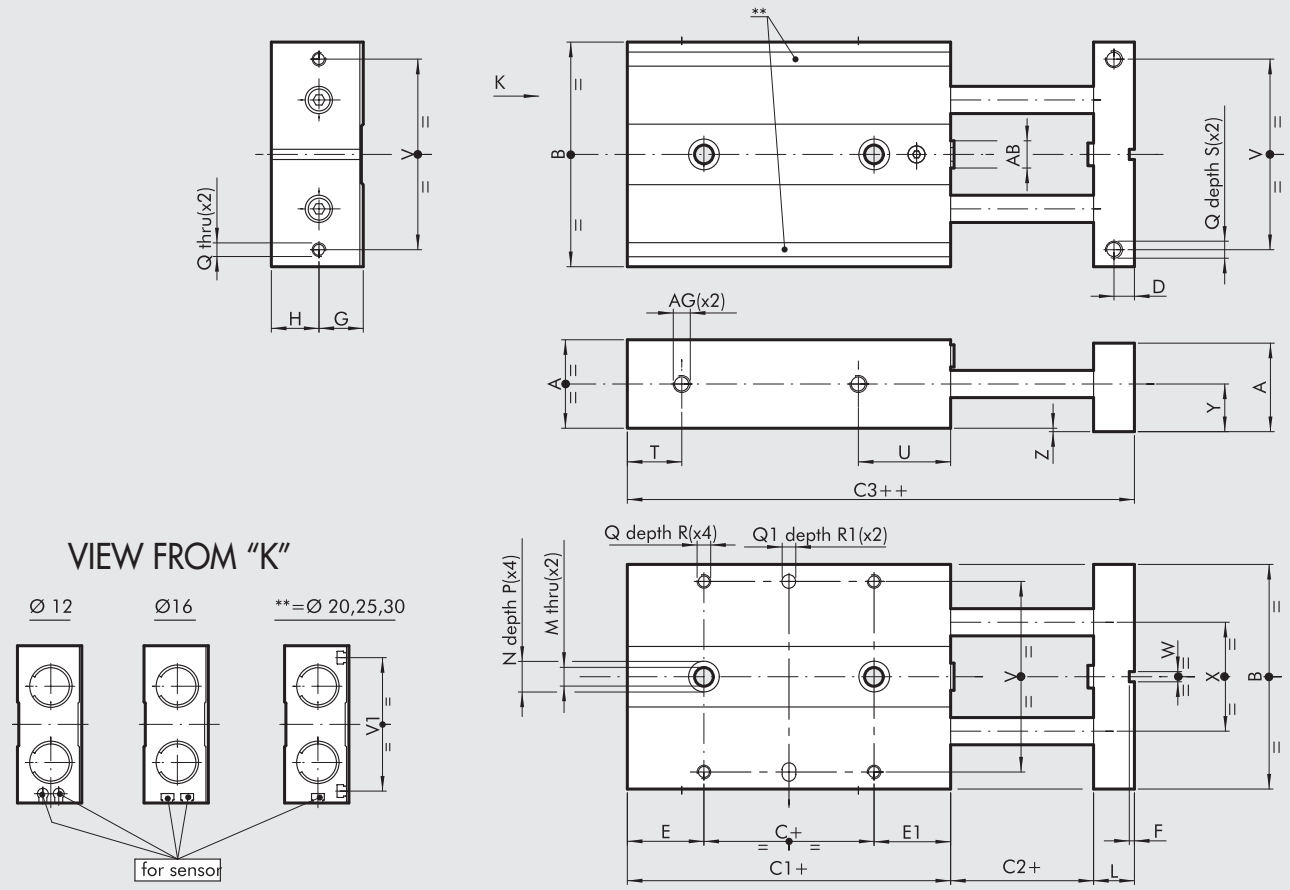
COMPONENTS

① FLANGE: anodized aluminium
② REAR BASE: anodized aluminium
③ BUFFER: rubber
④ ADJUSTABLE STRIKER PLATE. Zinc-plated steel
(4bis) HYDRAULIC DECELERATOR
⑤ FRONT BASE: brass
⑥ PISTON: brass
⑦ MAGNET: Plastoferrite
⑧ CYLINDER BODY: anodized aluminium
⑨ STATIC O-RING: NBR
⑩ BALL RE-CIRCULATION BUSH

VERSIONS:
Ⓐ With sliding bushes
Ⓑ With ball bushes



DIMENSIONS OF TWIN CYLINDER SERIES S10, ON BUSHES Ø 12 to 30 mm



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	D	E	E1	F	G	H	L	M	N	P	Q	Q1^{H7}	R	R1	S	T
W1440122...	**12**	18	46	10	50	2	60	4	20	20	1.5	9	10	8	4.3	8	4	M3	4	5	3	8	9
W1440162...	**16**	22	56	16	62	2	74	5	26	20	1.5	11	12	10	4.3	8	4	M4	4	6	3	8	10
W1440202...	**20**	26	66	10	68	2	82	6	29	29	1.5	13	14	12	5.5	9	5	M4	4	7	3	10	11
W1440252...	**25**	32	78	10	74	2	90	7	32.5	31.5	2.5	16	17	14	6.5	10.5	6	M5	4	7	3	12	11
W1440302...	**30**	36	98	10	87	2	105	8	37.5	39.5	2.5	18	19	16	8.5	14	8	M6	6	8	5	12	13

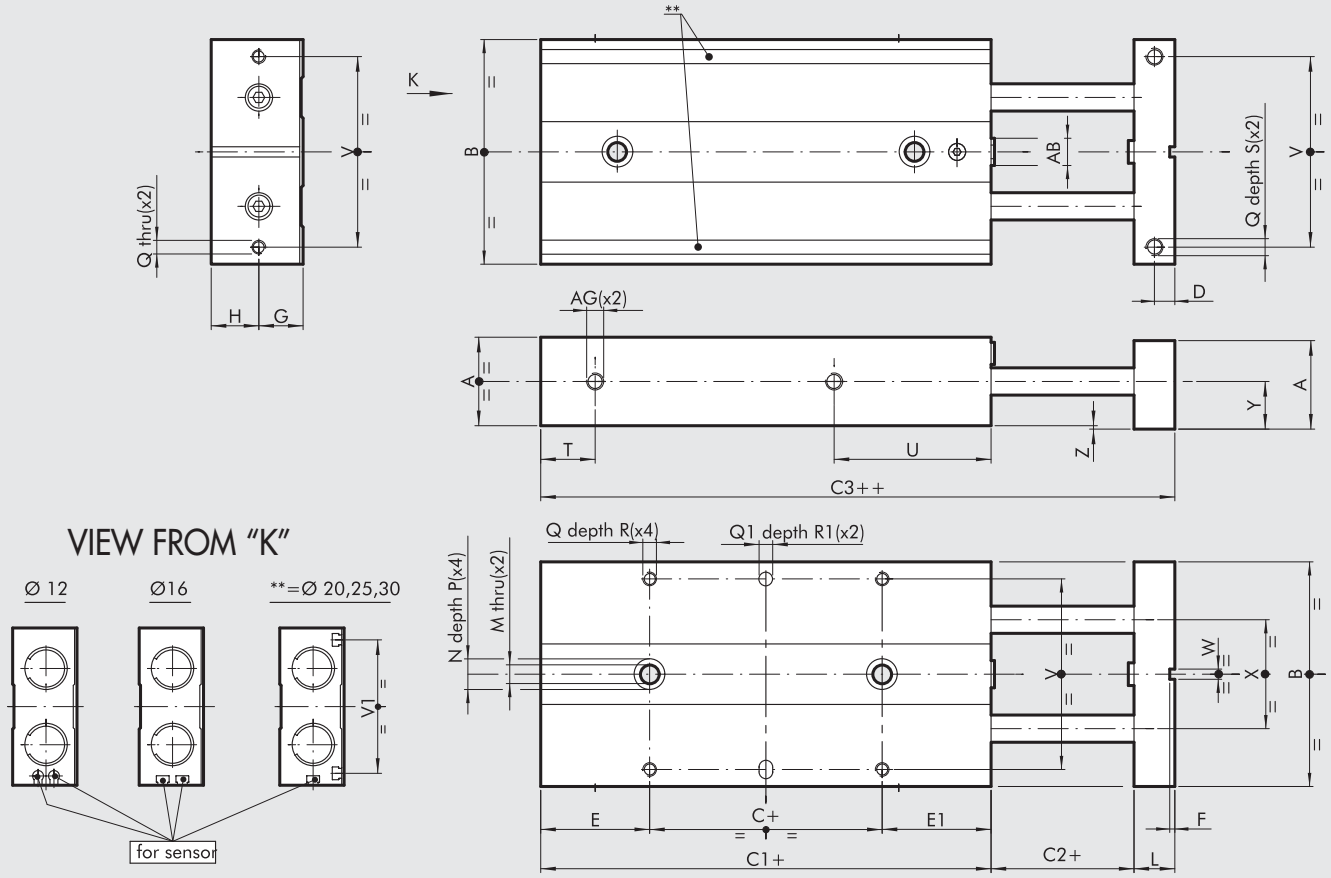
Ø	U	V	V1	W	X	Y	Z	AB	AG
12	28	38	–	3	20	10	1	M5	M5
16	33	46	–	3	26	12	1	M6	M5
20	40	56	54	3	30	14	1	M8	M5
25	42	66	64	5	39	17	1	M10	M5
30	51	86	82	5	52	19	1	M12	G 1/8"

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1440122050)

Strokes for bore 12 mm	15; 25; 50;
Strokes for bore 16 mm	15; 25; 50; 75;
Strokes for bore 20 mm	25; 50; 75; 100;
Strokes for bore 25 mm	25; 50; 75; 100; 125;
Strokes for bore 30 mm	25; 50; 75; 100; 125;

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN CYLINDER SERIES S10, ON BALL BEARINGS Ø 12 to 30 mm



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	D	E	E1	F	G	H	L	M	N	P	Q	Q1^{H7}	R	R1	S	T
W1440123...	**12**	18	46	10	69	2	79	4	29.5	29.5	1.5	9	10	8	4.3	8	4	M3	4	5	3	8	9
W1440163...	**16**	22	56	10	90	2	98	5	42	38	1.5	11	12	10	4.3	8	4	M4	4	6	3	8	10
W1440203...	**20**	26	66	10	100	2	111	6	46.5	43.5	1.5	13	14	12	5.5	9	5	M4	4	7	3	10	11
W1440253...	**25**	32	78	10	108	2	120	7	51.5	46.5	2.5	16	17	14	6.5	10.5	6	M5	4	7	3	12	11
W1440303...	**30**	36	98	10	124	2	142	8	56	58	2.5	18	19	16	8.5	14	8	M6	6	8	5	12	13

Ø	U	V	V1	W	X	Y	Z	AB	AG
12	47	38	–	3	20	10	1	M5	M5
16	57	46	–	3	26	12	1	M6	M5
20	69	56	54	3	30	14	1	M8	M5
25	72	66	64	5	39	17	1	M10	M5
30	88	86	82	5	52	19	1	M12	G 1/8"

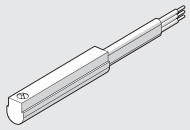
...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1440123050)

Strokes for bore 12 mm	15; 25; 50;
Strokes for bore 16 mm	15; 25; 50; 75;
Strokes for bore 20 mm	25; 50; 75; 100;
Strokes for bore 25 mm	25; 50; 75; 100; 125;
Strokes for bore 30 mm	25; 50; 75; 100; 125;

ACCESSORIES

SENSOR Ø 4, FOR SLIDE S10 Ø 12

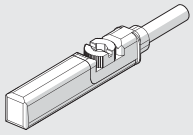
For codes and technical data, see **chapter A6**.



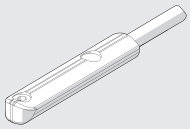
RETRACTABLE SENSOR, FOR SLIDE S10 Ø16 to 30

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional

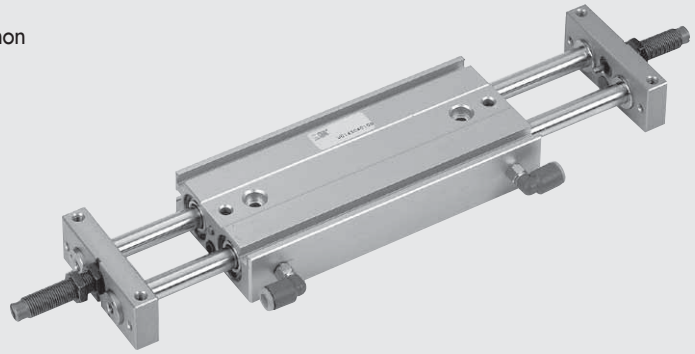


NOTES

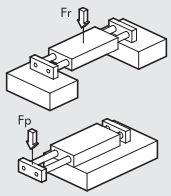
TWIN CYLINDER SLIDE WITH FIXED BODY SERIES S11

METAL WORK PNEUMATIC

There are two sliding systems available:
• on bushes
• on ball bearings
The frame is made up of two paired through-rod cylinders with a common anodized aluminium body containing slots for retracting sensors.
There are 5 bores available:
2 x Ø 12; 2 x Ø 16; 2 x Ø 20; 2 x Ø 25 and 2 x Ø 30.
The piston rods are united by means of a plate on which mechanical stops or hydraulic shock absorbers can be mounted.



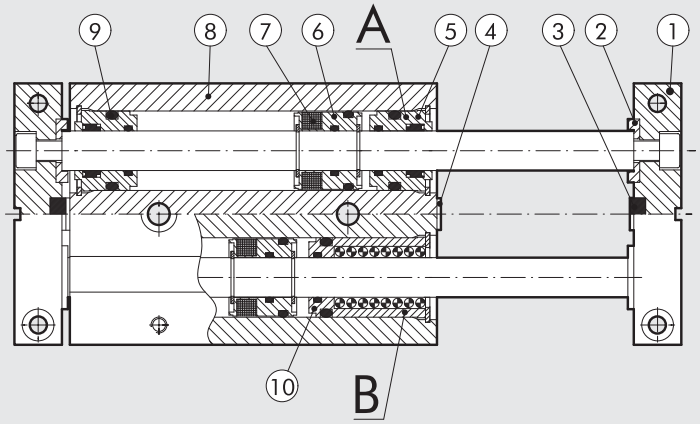
TECHNICAL DATA		S11-12	S11-16	S11-20	S11-25	S11-30
Fluid		20 µm filtered air				
Pressure range	bar	1.5 to 7				
	MPa	0.15 to 0.7				
	psi	43.5 to 101				
Temperature range	°C	-10 to +80				
Piston speed	mm/s	30 to 200				
Versions		With sliding bushes / With ball bearing bushes / With stop screw / With hydraulic shock absorbers				
Bores	mm	12	16	20	25	30
Piston rod diameter	mm	6	8	10	12	16
Strokes	mm	25	25	25	25	25
		50	50	50	50	50
		75	75	75	75	75
		–	100	100	100	100
		–	–	125	125	125
		–	–	–	150	150
Weight = X + (Y · C) where C = stroke	kg					
• Bushes version		X = 0.14	X = 0.25	X = 0.5	X = 0.7	X = 1.24
		Y = 0.002	Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
• Ball bearing version		X = 0.25	X = 0.37	X = 0.78	X = 1.04	X = 1.98
		Y = 0.002	Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
Theoretical thrust (P = relative pressure in bar)	N	16.9 x P	30 x P	47 x P	75 x P	101 x P
Max. loads		(The values shown refer to the min. and max. strokes)				
• Bushes version	N	Fr: 13 to 5	Fr: 35 to 6.5	Fr: 58 to 7	Fr: 80 to 8	Fr: 130 to 18
		Fp: 6 to 3	Fp: 11 to 3	Fp: 18 to 5	Fp: 23 to 6	Fp: 50 to 8
• Ball bearing version	N	Fr: 7 to 3	Fr: 20 to 4	Fr: 35 to 4.5	Fr: 50 to 5.4	Fr: 80 to 12
		Fp: 4 to 1.5	Fp: 4 to 1.5	Fp: 12 to 3	Fp: 15 to 3.5	Fp: 20 to 4.5



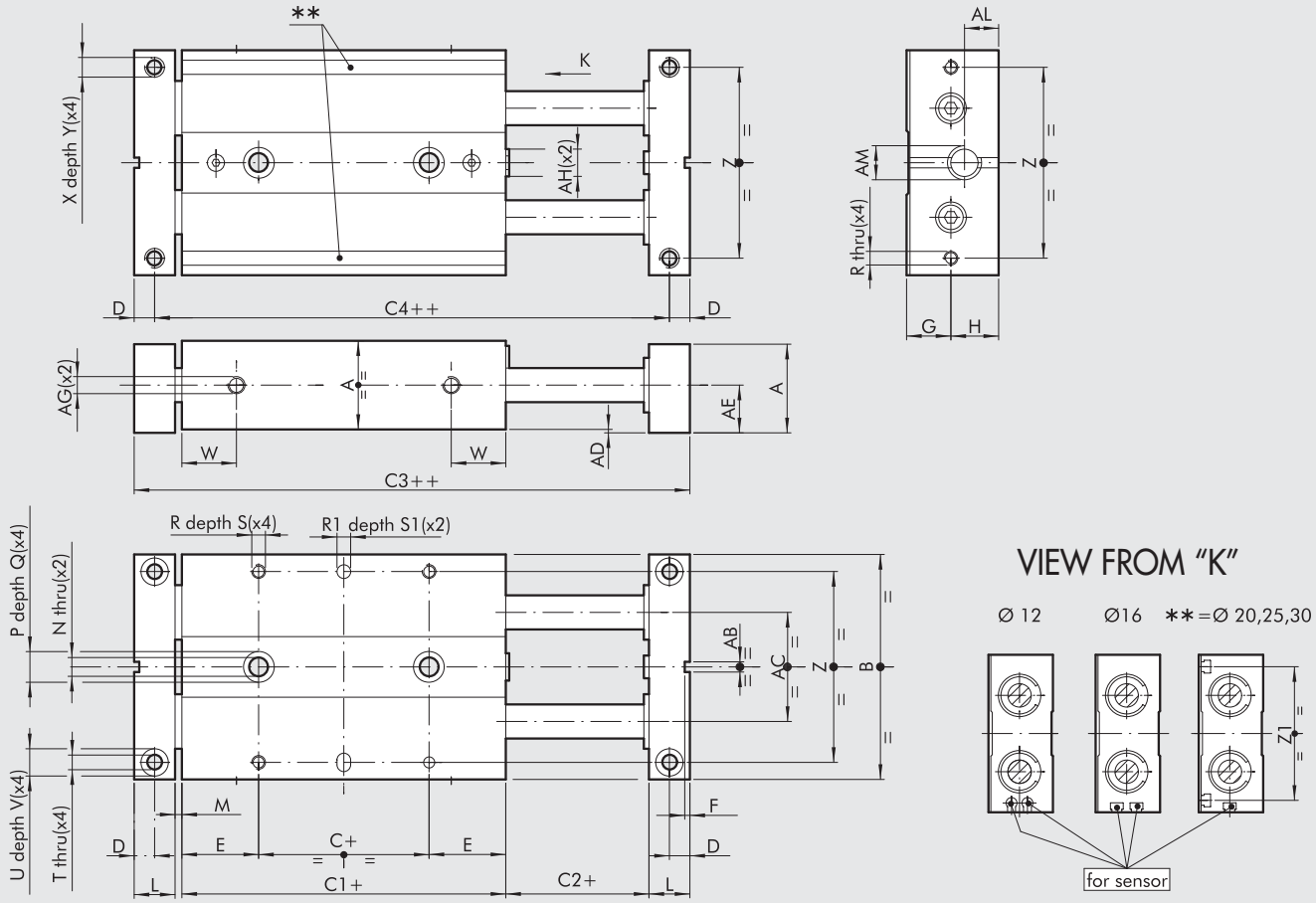
COMPONENTS

① FLANGE: anodized aluminium
② WASHER: steel
③ BUFFER: rubber
④ ADJUSTABEL STRIKER PLATE: Zinc-plated steel
⑤ BASE: brass
⑥ PISTON: brass
⑦ MAGNET: plastoferrite
⑧ CYLINDER BODY: anodized aluminium
⑨ STATIC O-RINGS: NBR
⑩ BUSH: ball bearing

VERSIONS:
Ⓐ With sliding bushes
Ⓑ With ball bearing bushes



DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS SERIES S11, ON BUSHES Ø 12 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1450122...	**12**	18	46	5	45	2	65	57	4	20	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450162...	**16**	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450202...	**20**	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450252...	**25**	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450302...	**30**	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

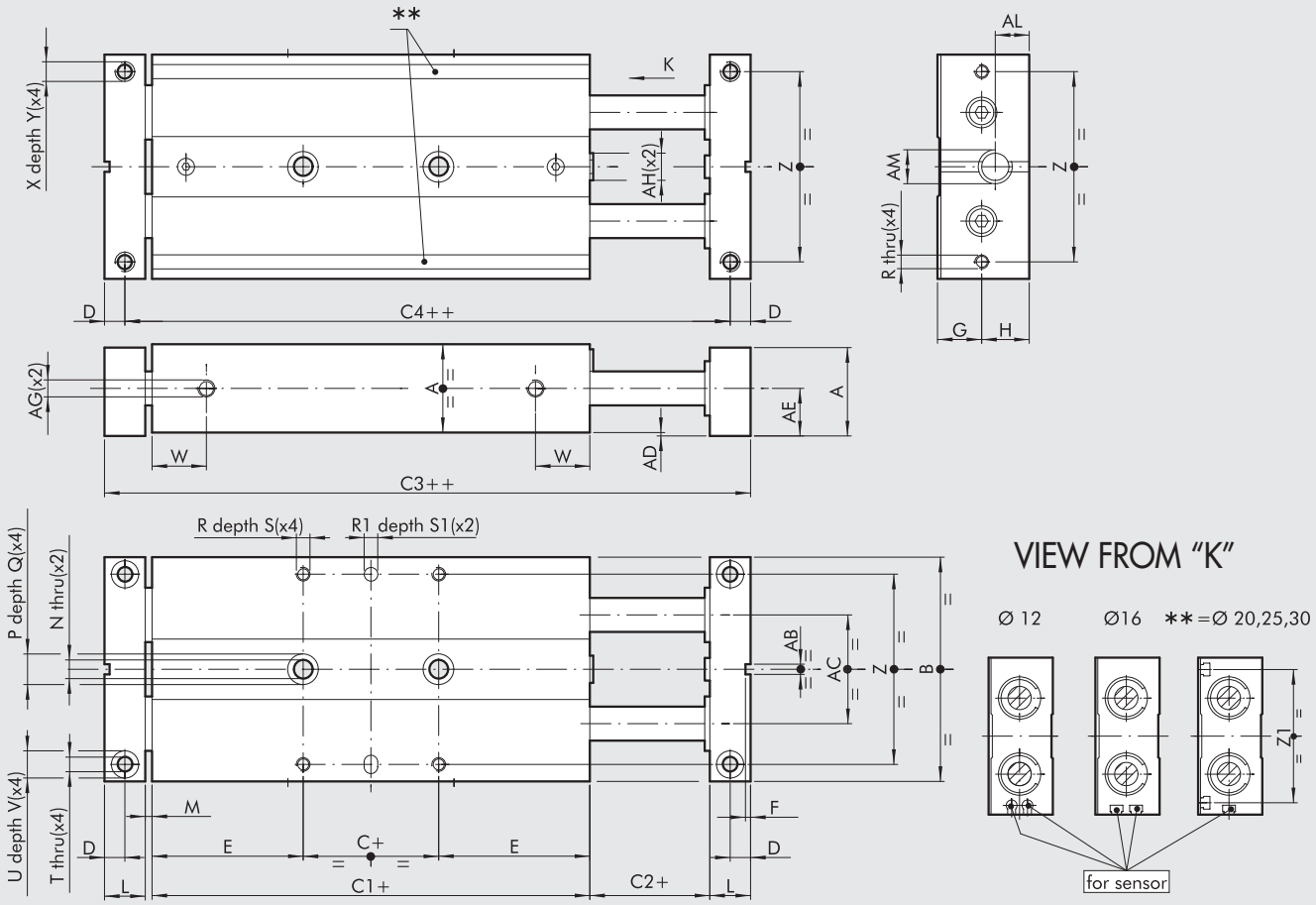
Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AM	AL
12	6	3	14	M4	6	38	–	3	20	1	10	4	M5	M8x1	7
16	8	4	15	M5	8	46	–	3	26	1	12	5	M5	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	M10x1	9
25	9	5	19	M6	12	66	64	5	39	1	17	6	M5	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450122050)

Strokes for bore 12 mm	25; 50; 75
Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS SERIES S11, ON BALL BEARINGS Ø 12 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

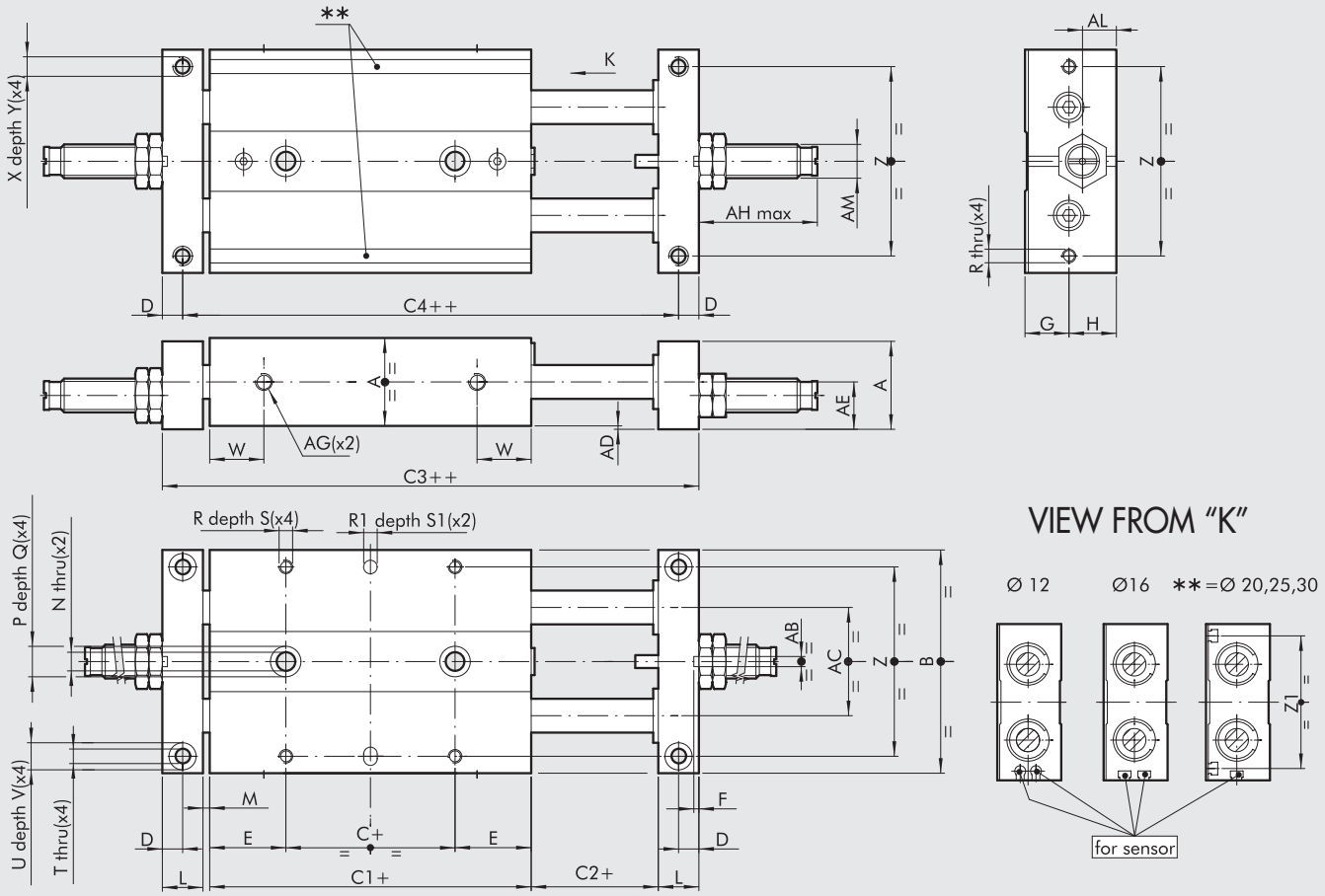
Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1450123...	**12**	18	46	5	71	2	91	83	4	33	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450163...	**16**	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450203...	**20**	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450253...	**25**	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450303...	**30**	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
12	6	3	28	M4	6	38	–	3	20	1	10	4	M5	M5	M8x1	7
16	8	4	33	M5	8	46	–	3	26	1	12	5	M5	M6	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	M8	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	M10	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	M12	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450123050)

Strokes for bore 12 mm	25; 50; 75
Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS WITH SHOCK ABSORBERS SERIES S11, ON BUSHES Ø 12 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1450124...	**12**	18	46	5	45	2	65	57	4	20	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450164...	**16**	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450204...	**20**	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450254...	**25**	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450304...	**30**	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

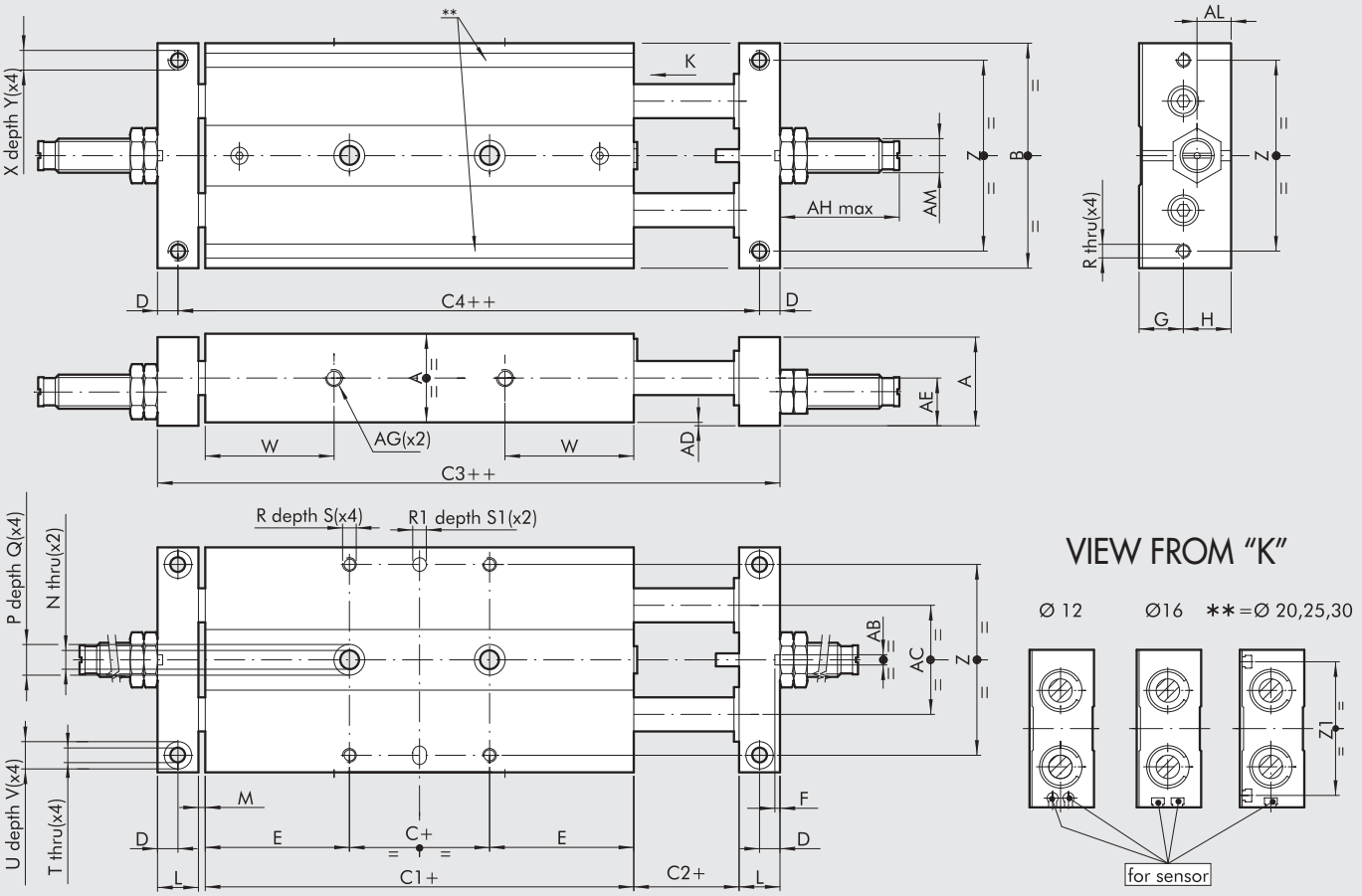
Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
12	6	3	14	M4	6	38	–	3	20	1	10	4	M5	30	M8x1	7
16	8	4	15	M5	8	46	–	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	19	M6	12	66	69	5	39	1	17	6	M5	36	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450124050)

Strokes for bore 12 mm	25; 50; 75
Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS WITH SHOCK ABSORBERS SERIES S11, ON BALL BEARING Ø 12 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1450125...	**12**	18	46	5	71	2	91	83	4	33	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450165...	**16**	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450205...	**20**	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450255...	**25**	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450305...	**30**	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
12	6	3	28	M4	6	38	–	3	20	1	10	4	M5	30	M8x1	7
16	8	4	33	M5	8	46	–	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	36	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1.5	12

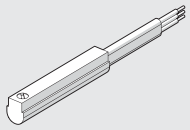
...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450125050)

Strokes for bore 12 mm	25; 50; 75
Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

ACCESSORIES

SENSOR Ø 4, FOR SLIDE S11 Ø 12

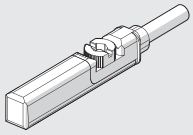
For codes and technical data, see **chapter A6**.



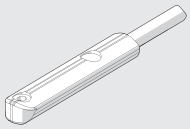
RETRACTABLE SENSOR, FOR SLIDE S11 Ø16 to 30

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

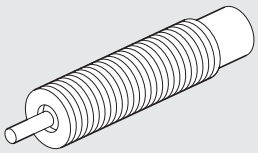


SENSOR, OVAL TYPE
Traditional



SPARE PARTS

SHOCK ABSORBERS

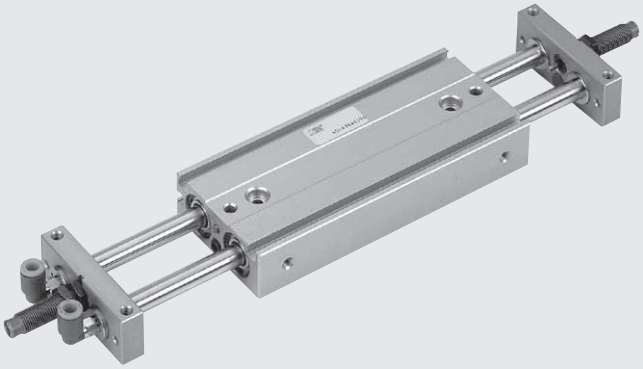


Code	Ø	Description
0950004001	12	Shock absorbers ECO 8 MC2 + nut M8x1
0950004002	16 - 20	Shock absorbers ECO 10 MF2 + nut M10x1
0950004003	25	Shock absorbers ECO 15 MF1 + nut M12x1
0950004004	30	Shock absorbers ECO 25 MC2 + nut M14x1.5

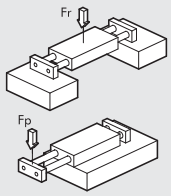
NOTES

TWIN CYLINDER SLIDE WITH FIXED PLATES SERIES S12

Two sliding systems are available:
• on bushes
• on ball bearings
The structure is made up of two paired through-rod cylinders with a common anodized aluminium body with grooves for mounting the retractable sensor.
Five bores available: 2 x Ø 16; 2 x Ø 20; 2 x Ø 25; 2 x Ø 30.
The rods are joined together by means of a plate on which the mechanical limit switches or hydraulic shock absorbers can be mounted.
The compressed air ports are at the end of the piston rods.



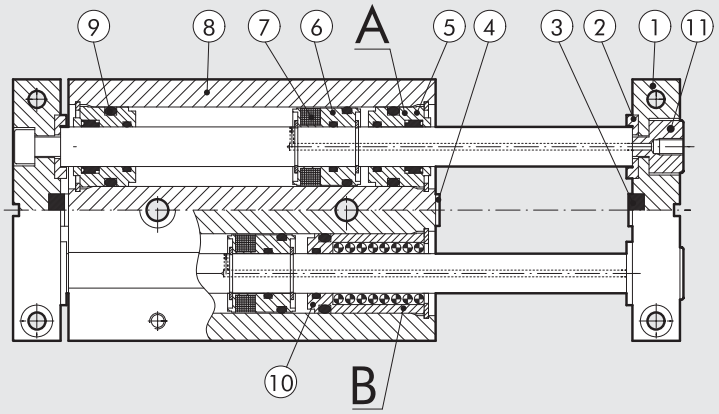
TECHNICAL DATA		S12-16	S12-20	S12-25	S12-30
Fluid		20 µm filtered air			
Pressure range	bar	1.5 to 7			
	MPa	0.15 to 0.7			
	psi	21.5 to 101			
Temperature range	°C	-10 to +80			
Piston speed	mm/s	30 to 200			
Versions		With sliding bushes / With ball bearing bushes / With stop screw / With hydraulic shock absorbers			
Bores	mm	16	20	25	30
Piston rod diameter	mm	8	10	12	16
Strokes	mm	25	25	25	25
		50	50	50	50
		75	75	75	75
		100	100	100	100
		–	125	125	125
		–	–	150	150
Weight = X + (Y · C) where C = stroke	kg				
• Bushes version		X = 0.25	X = 0.5	X = 0.7	X = 1.24
		Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
• Ball bearing version		X = 0.37	X = 0.78	X = 1.04	X = 1.98
		Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
Theoretical thrust (P = relative pressure in bar)	N	30 x P	47 x P	75 x P	101 x P
Max. loads		(The values shown refer to the min. and max. strokes)			
• Bushes version	N	Fr: 35 to 6.5	Fr: 58 to 7	Fr: 80 to 8	Fr: 130 to 18
		Fp: 11 to 3	Fp: 18 to 5	Fp: 23 to 6	Fp: 50 to 8
• Ball bearing version	N	Fr: 20 to 4	Fr: 35 to 4.5	Fr: 50 to 5.4	Fr: 80 to 12
		Fp: 4 to 1.5	Fp: 12 to 3	Fp: 15 to 3.5	Fp: 20 to 4.5



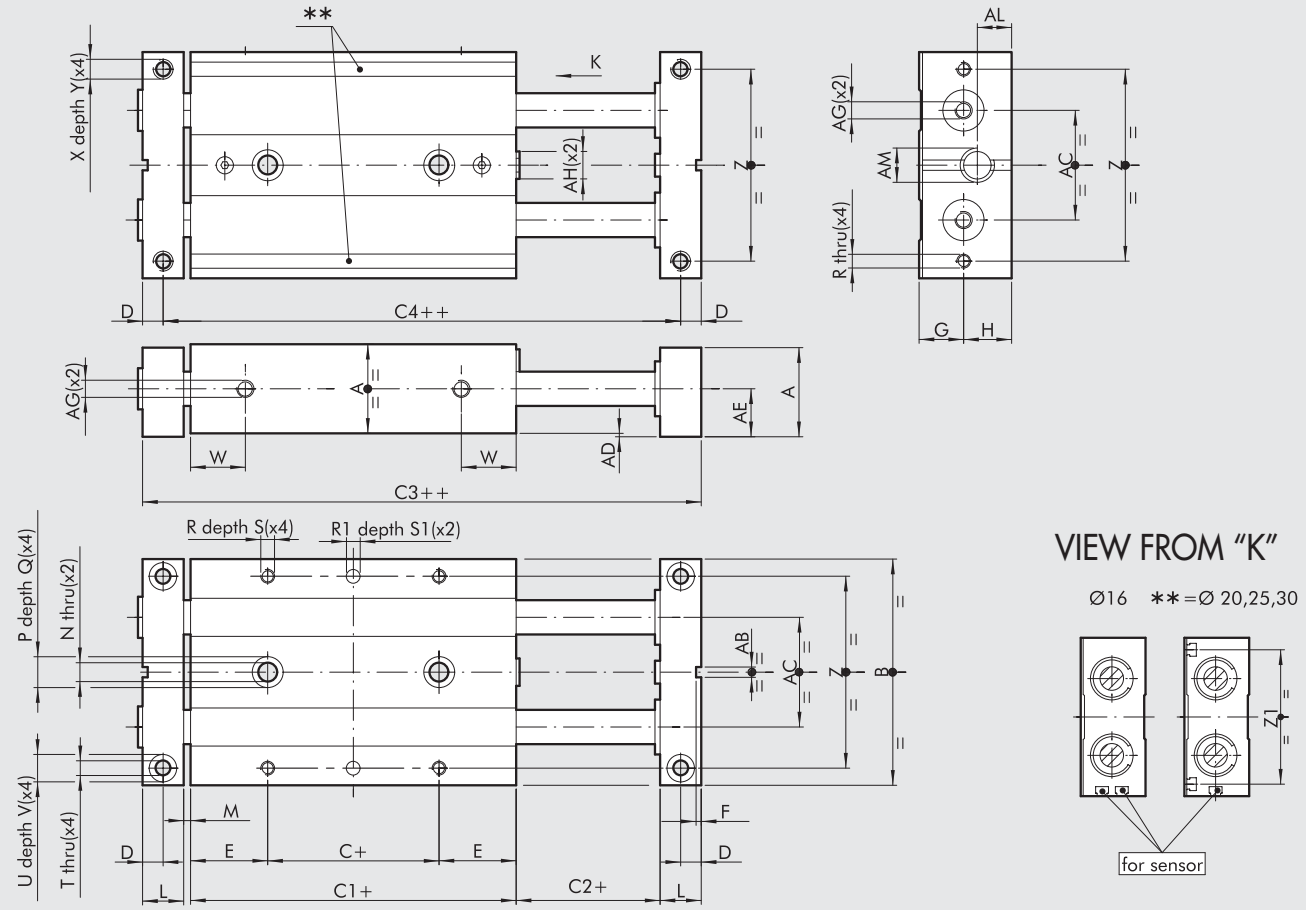
COMPONENTS

① FLANGE: anodized aluminium
② WASHER: steel
③ BUFFER: rubber
④ ADJUSTABLE STRIKER PLATE: Zinc-plated steel
⑤ BASE: brass
⑥ PISTON: brass
⑦ MAGNET: Plastoferrite
⑧ CYLINDER BODY: anodized aluminium
⑨ STATIC O-RINGS: NBR
⑩ BUSH: ball bearing
⑪ SCREW: pneumatically powered

VERSIONS:
Ⓐ With sliding bush
Ⓑ With ball bearing bush



DIMENSIONS OF TWIN-CYLINDER SLIDE SERIES S12, ON BUSHES Ø 16 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1H7	S	S1	T
W1460162...	**16**	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460202...	**20**	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460252...	**25**	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460302...	**30**	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

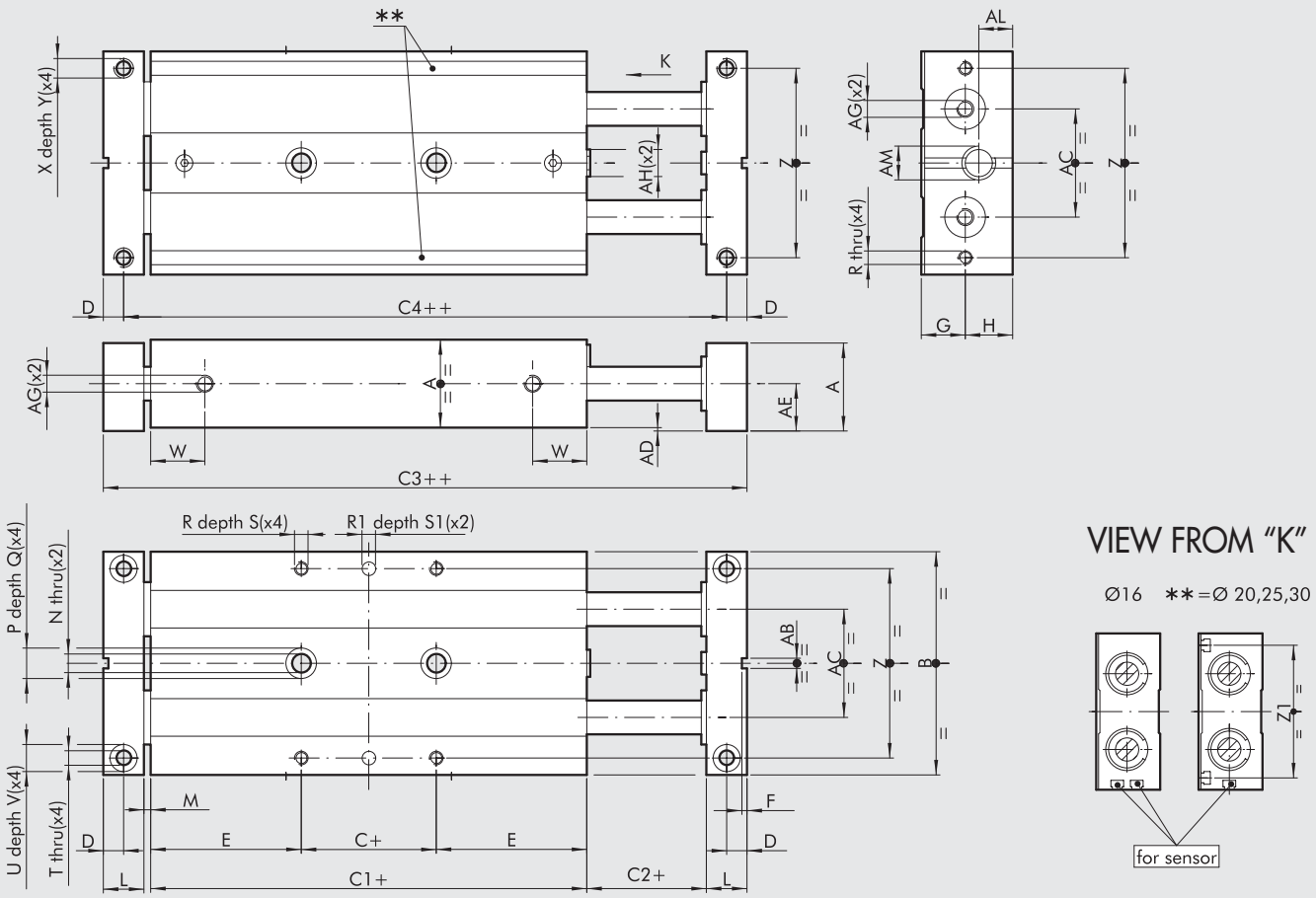
Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	15	M5	8	46	–	3	26	1	12	5	M5	M6	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	M8	M10x1	9
25	9	5	19	M6	12	66	64	5	39	1	17	6	M5	M10	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	M12	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450162050)

Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN-CYLINDER SLIDE SERIES S12, ON BALL BEARINGS Ø 16 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

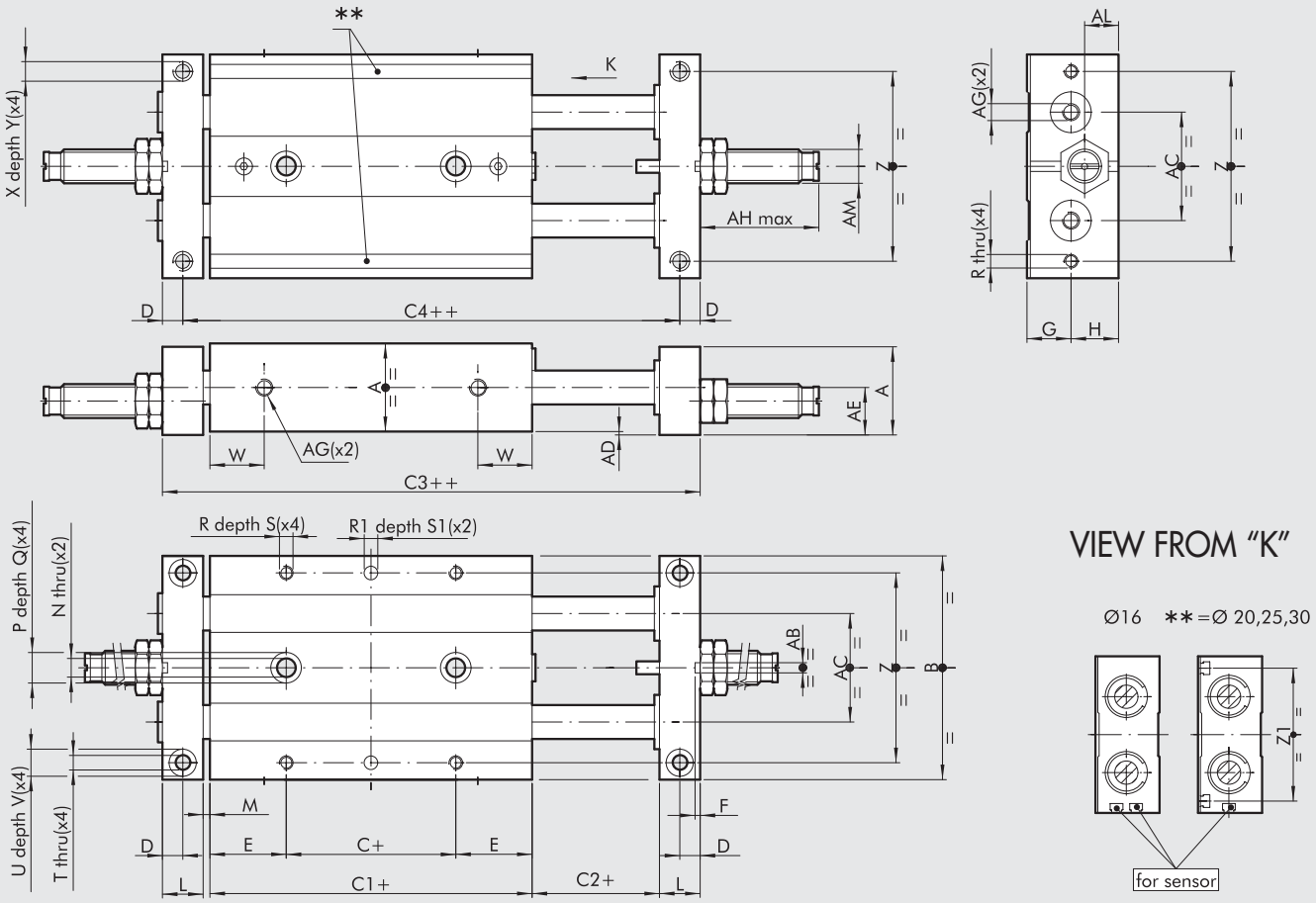
Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1460163...	**16**	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460203...	**20**	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460253...	**25**	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460303...	**30**	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	33	M5	8	46	–	3	26	1	12	5	M5	M6	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	M8	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	M10	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	M12	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450163050)

Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER SLIDE WITH SHOCK ABSORBERS SERIES S12, ON BUSHES Ø 16 to 30



VIEW FROM "K"

Ø16 **=Ø 20,25,30

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1460164...	**16**	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460204...	**20**	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460254...	**25**	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460304...	**30**	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

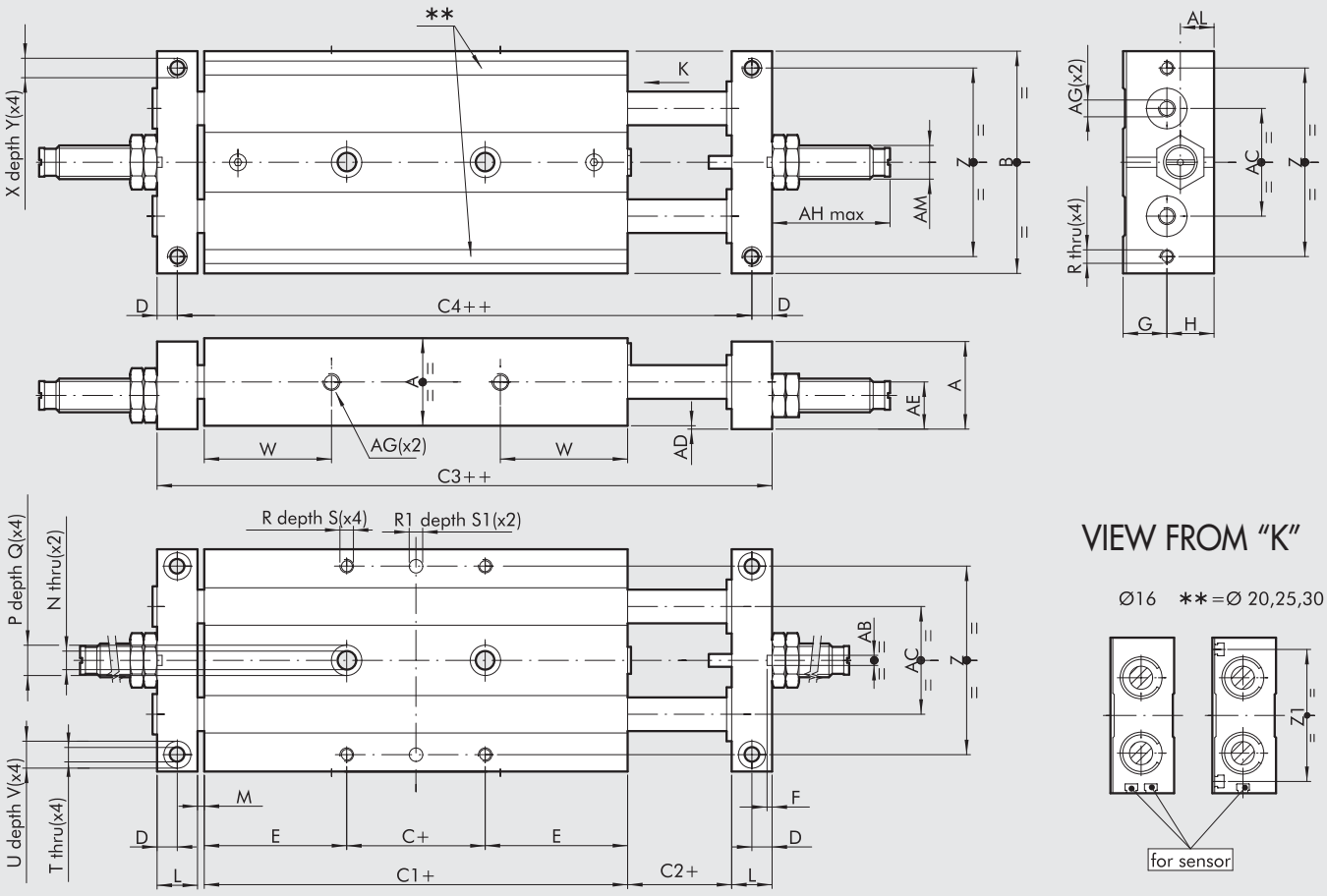
Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	15	M5	8	46	–	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	19	M6	12	66	64	5	39	1	17	6	M5	36	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450164050)

Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN-CYLINDER SLIDE WITH SHOCK ABSORBERS SERIES S12, ON BALL BEARING Ø 16 to 30



VIEW FROM "K"

Ø16 ** = Ø 20,25,30

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1460165...	16	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460205...	20	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460255...	25	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460305...	30	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	33	M5	8	46	–	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	36	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1	12

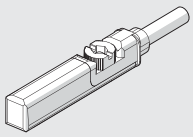
...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450165050)

Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

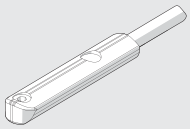
ACCESSORIES

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



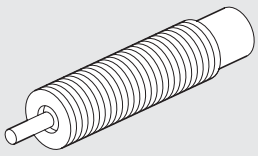
SENSOR, OVAL TYPE
Traditional



For codes and technical data, see **chapter A6**.

SPARES

SHOCK ABSORBERS



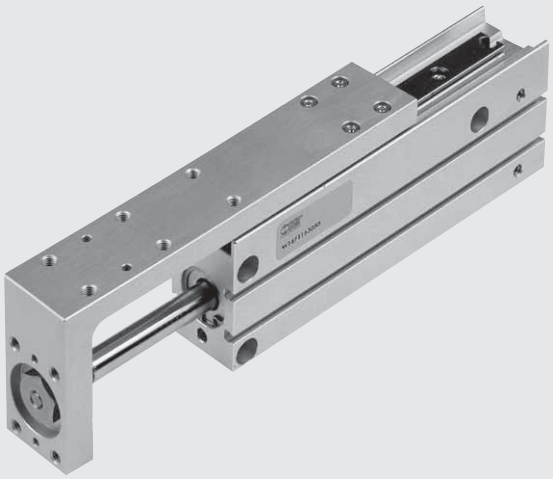
Code	Ø	Description
0950004002	ø 16 - 20	Shock absorbers ECO 10 MF2 + nut M10x1
0950004003	ø 25	Shock absorbers ECO 15 MF1 + nut M12x1
0950004004	ø 30	Shock absorbers ECO 25 MC2 + nut M14x1.5

NOTES

PRECISION SLIDE SERIES S13

METAL WORK PNEUMATIC

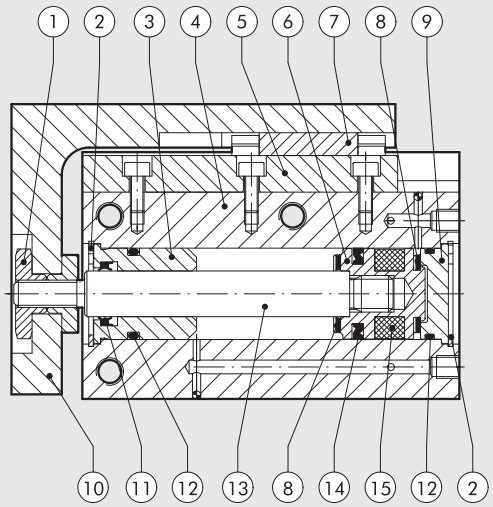
Series S13 precision slides feature a dual-acting pneumatic cylinder that has the sole purpose of pushing and pulling the load, a ground steel guide that is integral with the body, and a ball recirculation pad that is fixed onto the moving table and is designed to withstand all the loads and movements applied. This ensures accurate movement with virtually no play, and the piston rods do not suffer wear as there are no lateral loads.
All the slides are equipped with sensor magnets.
The body can be secured on many sides. The load side can be fixed onto the table from the top or the front. The compressed air supply can be connected on three sides. The retractable sensors can be fitted on the right or on the left. All these possibilities make the application extremely flexible. The width is extremely reduced to allow installation in small spaces and the combination of several reduced-pitch slides.



TECHNICAL DATA		Ø 6	Ø 10	Ø 16	Ø 20
Operating pressure	bar	2 to 8			
	MPa	0.2 to 0.8			
	psi	29 to 116			
Operating temperature	°C	-10 to +80			
Fluid		Lubricated and unlubricated compressed air at 20 µm, must be uninterrupted when lubricated			
Minimum and maximum speed	mm/s	30 to 500			
Pneumatic fittings		M5			
Type of guide		Ball recirculation			
Versions		Magnetic dual-acting with rubber buffer			
Strokes	mm	10	10	10	10
		25	25	25	25
		---	---	50	50
Theoretical thrust force, at 6 bar	N	17	47	120	188
Theoretical pull force, at 6 bar	N	13	40	104	158
Admitted loads		See **next page**			
Admitted kinetic energy	Joule	0.012	0.025	0.050	0.100
Stroke tolerance	mm	0 / +1.0			
Assembly position		Any (horizontal and vertical)			
Weight	kg	See **next page**			

COMPONENTS

① NUT: stainless steel
② SNAP RING: galvanised steel
③ FRONT BASE: bronze
④ BODY: anodized aluminium
⑤ GUIDE: tempered stainless steel
⑥ PISTON: aluminium
⑦ BALL RECIRCULATION PAD: stainless steel
⑧ BUFFER: NBR
⑨ REAR BASE: anodized aluminium
⑩ PLATE: anodized aluminium
⑪ PISTON ROD GASKET: type EM, NBR
⑫ O-RING: NBR
⑬ PISTON ROD: stainless steel
⑭ PISTON GASKET: type PZ, NBR
⑮ MAGNET: neodymium (Ø 6 and Ø 10)
plastoferrite (Ø 16 and Ø 20)



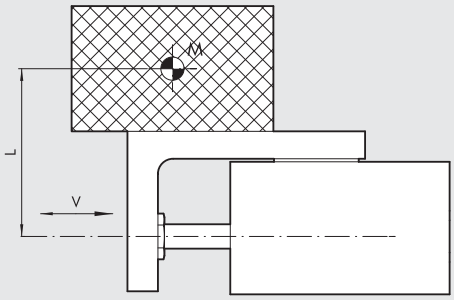
WEIGHTS

WEIGHT [gr]				
Stroke			**Bore**	
	6	8	16	20
10	68	125	230	455
25	90	160	280	550
50	---	---	350	660

WEIGHT OF MOVING PART [gr]				
Stroke			**Bore**	
	6	8	16	20
10	30	50	100	180
25	40	68	125	220
50	---	---	167	290

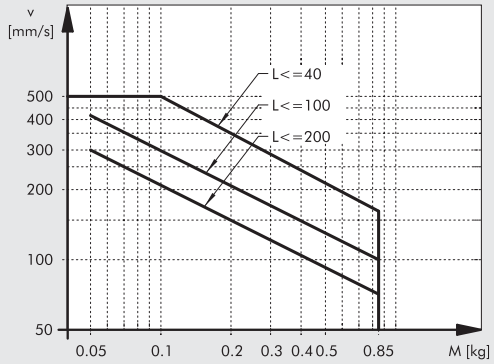
MASS/VELOCITY DIAGRAM

M (kg) = Mass applied
L (mm) = Distance between the axis of the piston rod and the barycentre of the mass
v (mm/s) = Velocity of the slide
vert = Limit with vertical movement

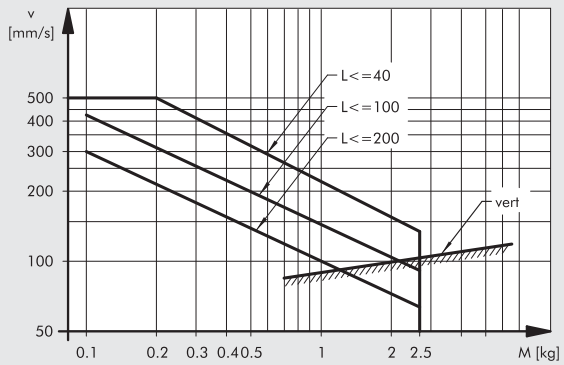


ADMITTED LOADS DIAGRAM

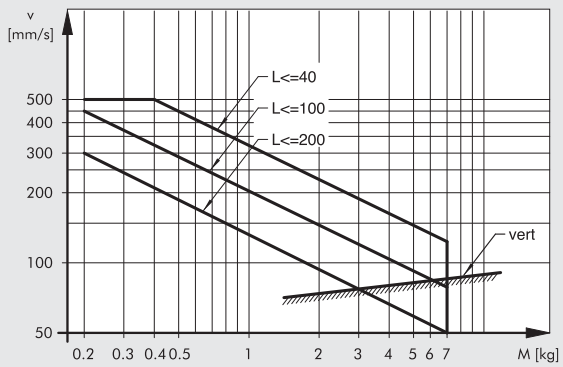
S13-6



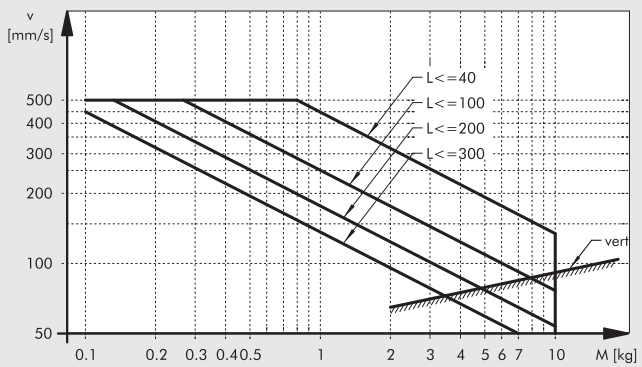
S13-10



S13-16



S13-20



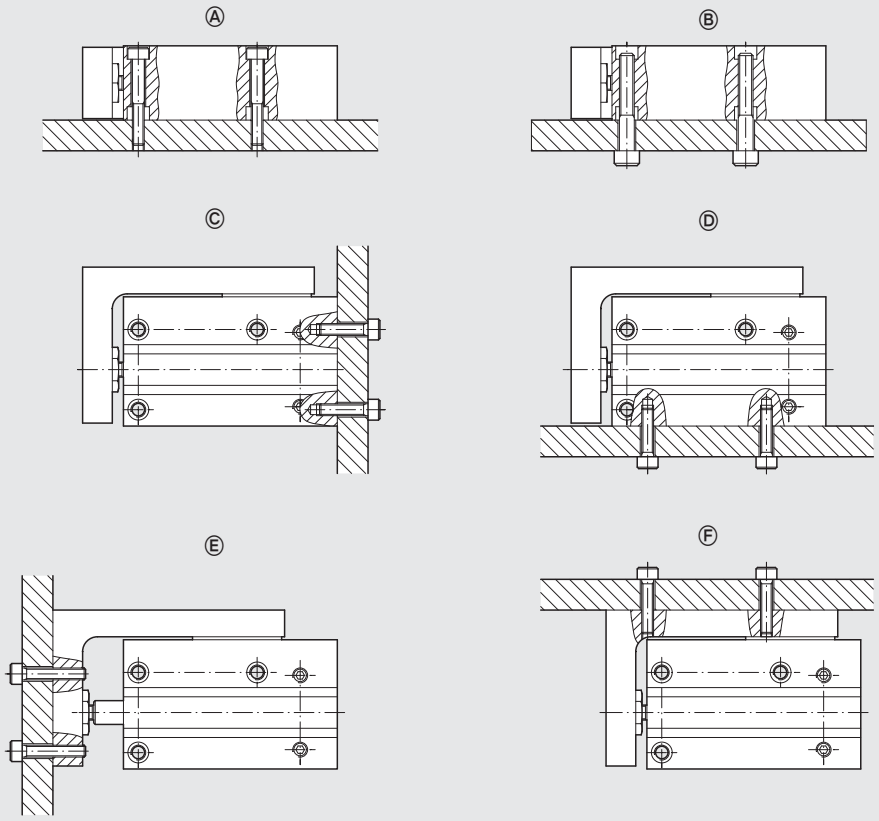
METAL WORK PNEUMATIC

FIXING OPTIONS

FIXING THE BODY
Ⓐ Lateral, via the through holes
Ⓑ Lateral, on the hole threads
Ⓒ Rear, on the threaded holes
Ⓓ Vertical, on the threaded holes

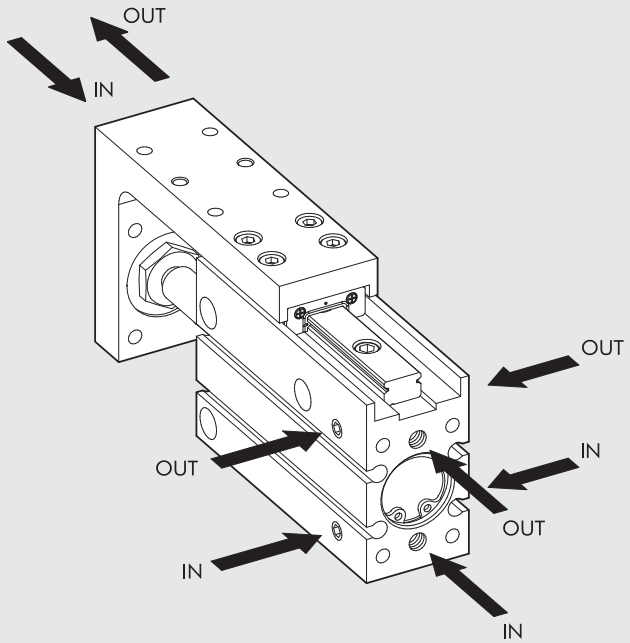
FIXING THE MOVING TABLE
Ⓔ Front, on the threaded holes
Ⓕ Top, on the threaded holes

N.B. Since the table is supported by a ball guide/pad, avoid applying excessive torques or forces. When securing the screws, hold the table, not the body, so that the torque discharges through the ball pad.

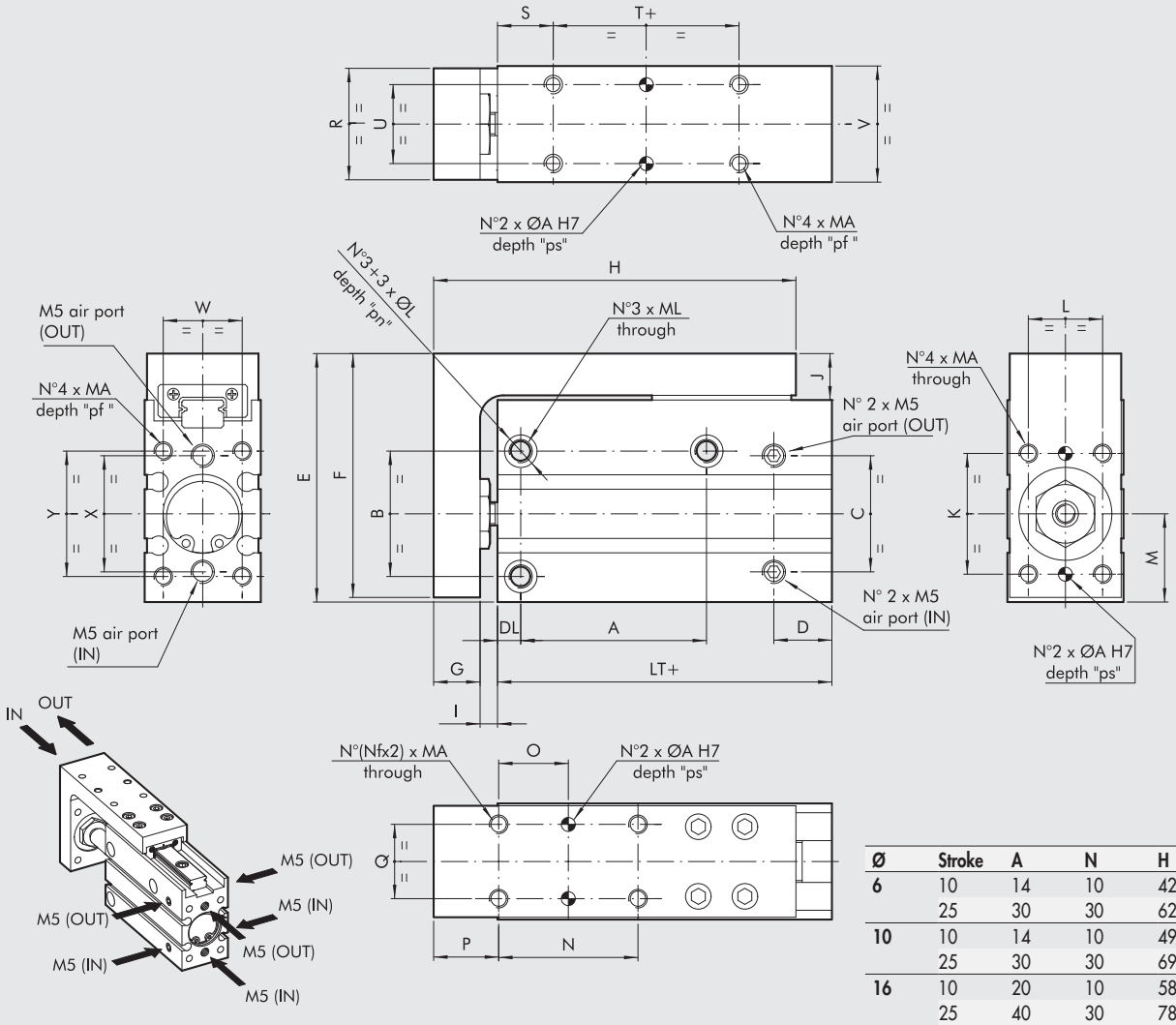


COMPRESSED-AIR SUPPLY

The compressed air supply can be from the back, from the left or from the right.
The slide comes with holes on the left and right that are plugged with screws and O-ring seals.
If you wish to use the holes, remove the screws and O-rings and fix them in the holes in the back, applying a drop of adhesive to the screw thread.



DIMENSIONS



Ø	Stroke	A	N	H	NF
6	10	14	10	42	2
	25	30	30	62	2
10	10	14	10	49	2
	25	30	30	69	2
16	10	20	10	58	2
	25	40	30	78	2
	50	60	25	98	3
20	10	20	10	64	2
	25	40	30	84	2
	50	70	25	104	3

\+ = ADD THE STROKE

Code	Ø	LT	B	C	D	E	F	G	I	J	K	MA	pf	ØA	ps	L	M	O	P	Q	R	S
W1471063...*	**6**	31	19	18	10	39	38	5.5	2.9	7.5	15	M3	5	2	4.5	9	14.5	N/2	8	9	15	10
W1471103...*	**10**	35	23	20	12.5	47	46	7.5	4	9	18	M4	6	2	4.5	11	15.5	N/2	11	11	19	12
W1471163...*	**16**	42	27	25	12.5	53.5	52.5	10	3.75	10	26	M4	7	3	7.5	16	19	N/2	14	16	24	12
W1471203...*	**20**	52.5	34	32	15	64.5	63.5	11	4.5	10.5	34	M5	9	3	7.5	20	23	N/2	14	20	31	15

Ø	T	U	V	W	X	Y	ØL	pn	ML	DL
6	5	9	16	10.5	18	19	6	3.5	M4	4
10	5	13	20	13	20	23	7.5	4.5	M5	5
16	10	17	25	17	25	27	7.5	4.5	M5	5
20	10	20	32	20	32	34	9.5	7.5	M6	6

* Enter the stroke in mm (e.g. Ø 6 stroke 10=W1471063010)

Standard strokes:

Bore Ø 6 -> 10; 25 mm

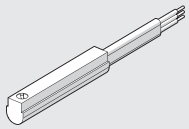
Bore Ø 10 -> 10; 25 mm

Bore Ø 16 -> 10; 25; 50 mm

Bore Ø 20 -> 10; 25; 50 mm

ACCESSORIES

SENSOR Ø 4



For codes and technical data, see **chapter A6**.

NOTES

SUMMARY V-Lock

V-Lock SYSTEM

- V-Lock GENERAL INTRODUCTION A3.4

BASIC ELEMENTS

- V-Lock FIXING ELEMENTS A3.12

- V-Lock ADAPTORS A3.19

- PROFILES A3.32

- V-Lock ACCESSORIES AND SPARE PARTS A3.36

LINEAR ACTUATORS

- RODLESS CYLINDER WITH BALL RECIRCULATING GUIDE SERIES V-Lock A3.37

- COMPACT PRECISION SLIDE SERIES S14K A3.47

- COMPACT GUIDED CYLINDER SERIES CMPGK A3.63

- GUIDE UNITS SERIES GDHK AND GDMK A3.79

- LINEAR UNITS SERIES LEPK A3.95

ROTARY ACTUATORS

- ROTARY ACTUATOR SERIES R3K A3.124

- ROTARY ACTUATOR SERIES R3K WITH EXTERNAL SHOCK ABSORBERS A3.130

- ROTARY ACTUATOR SERIES DAPK A3.136

GRIPPERS

- GRIPPER WITH TWO PARALLEL JAWS SERIES P1K A3.156

- GRIPPER WITH TWO PARALLEL JAWS SERIES P2K A3.161

- GRIPPER WITH TWO PARALLEL JAWS SERIES P3K A3.165

METAL WORK PNEUMATIC

- GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES P4K — A3.171

- GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES GPLK — A3.175

- GRIPPER WITH TWO HINGED JAWS SERIES P7K — A3.180

- GRIPPER 180° WITH TWO HINGED JAWS SERIES P9K — A3.185

- GRIPPER WITH THREE PARALLEL JAWS SERIES P12K — A3.190

- V-Lock GRIPPER ACCESSORIES — A3.196

ELECTRIC AXIS

- ELECTRIC AXIS ELEKTRO SHAK SERIES — A5.46

- ELECTRIC AXIS SERIES ELEKTRO SHAK GANTRY — A5.60

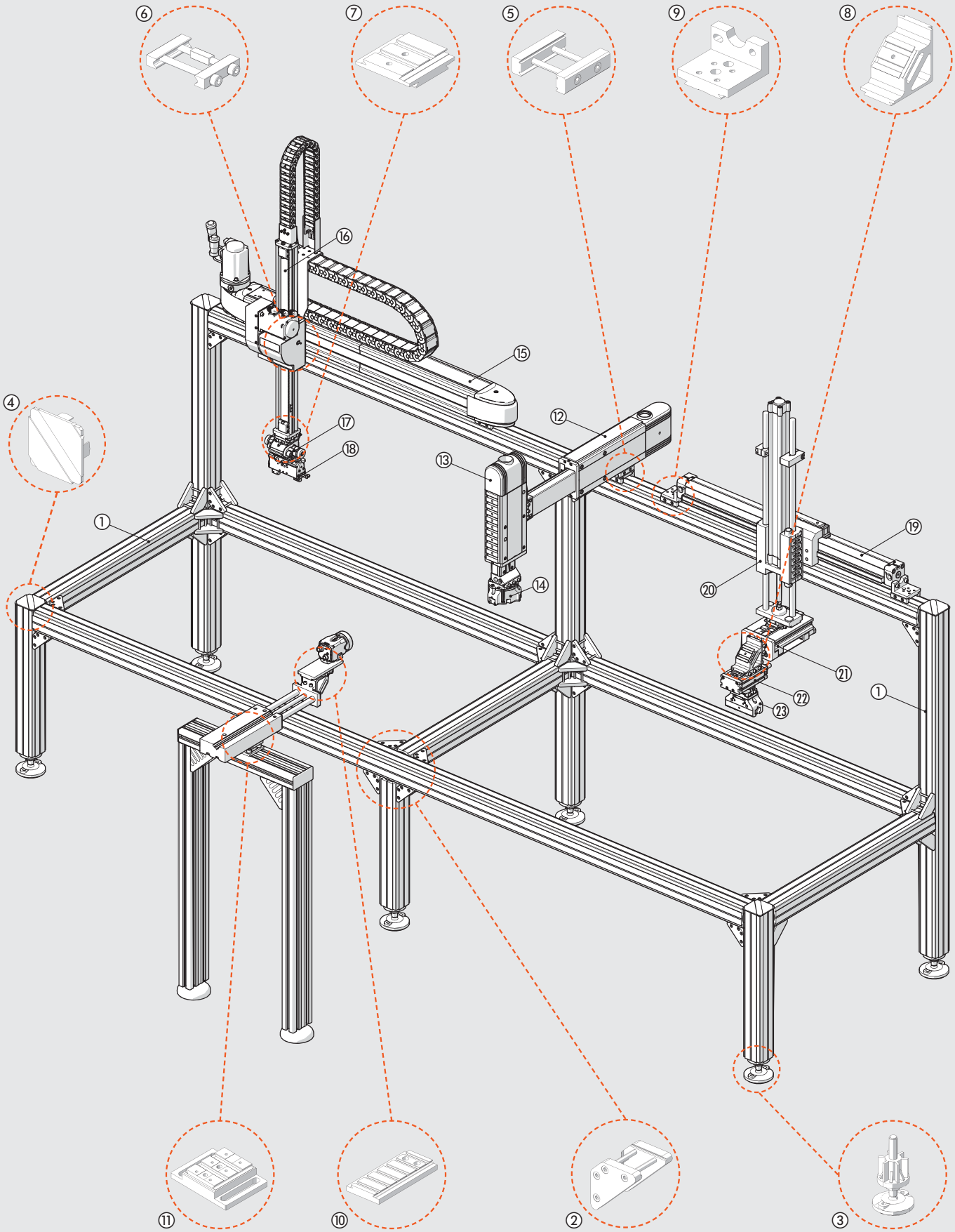
- ELECTRIC AXIS ELEKTRO SVAK SERIES — A5.70

- ELECTRIC AXIS - RODLESS ELEKTRO SK SERIES — A5.77

- ELECTRIC AXIS BELT-DRIVEN RODLESS, SERIES ELEKTRO BK — A5.90

V-Lock GENERAL INTRODUCTION

THE V-Lock WORLD



METAL WORK PNEUMATIC

The V-Lock system can be used to create pneumatic and/or electrical automation systems for a wide range of applications, from simple to more complex ones.

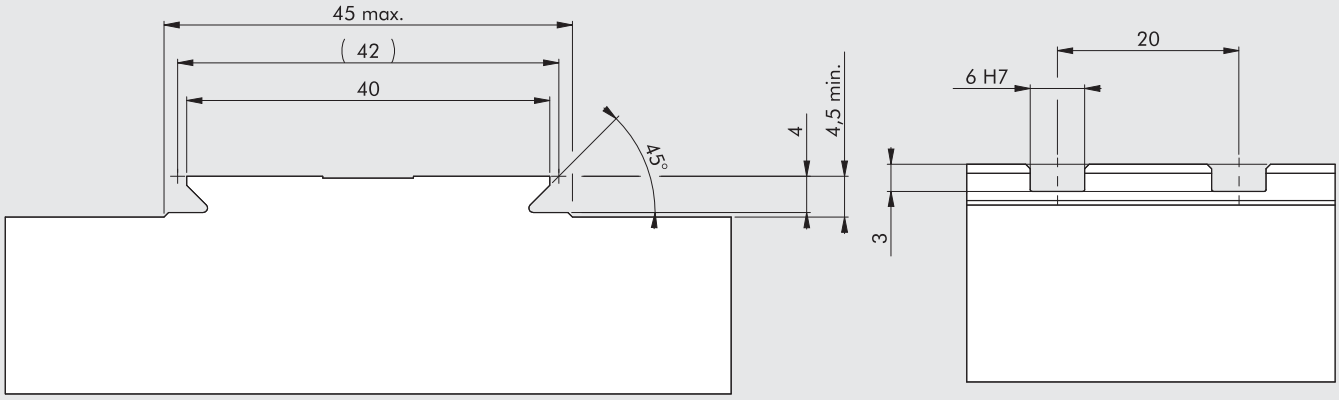
① Quick-Set dovetail fixing PROFILES, which can be cut up using a standard die-cutter and do no required any particular machining; no threaded holes or pinholes are required. Dovetail fixing elements can withstand greater loads than those with T-grooves.
② BRACKETS for fixing Quick-set profiles.
③ Articulated FOOTS with 90mm adjustment length.
④ Plastic CAP for profiles.
⑤ QS FIXING ELEMENTS for the coupling of V-Lock profiles and/or components (no need for V-Lock transverse grooves).
⑥ K FIXING ELEMENTS for V-Lock couplings, using the transverse grooves of V-Lock components. They feature high precision, repeatability and space saving.
⑦ Parallel or crosswise ADAPTORS for the coupling of V-Lock components, e.g. rotated by 90 degrees.
⑧ BRACKETS for fixing at a 45° or 90° angle, longitudinal, transversal, cross.
⑨ Various V-Lock fixing ACCESSORIES: foots, flanges, etc.
⑩ V-Lock TRANSFORMERS fixed to any component (a video camera in the photo) converts it into a V-Lock component.
⑪ PROFILE ADAPTORS to secure any types of profile (Bosch®, Item® ecc.) available from the trade into V-Lock components.
⑫ Pneumatically-controlled LINEAR UNITS SERIES LEPK, featuring high precision and rigidity, long life, adjustable strokes, cushioned end stop, 2 or 3 positions.
⑬ LINEAR UNITS SERIES LEPK FOR VERTICAL MOUNTING, featuring weight balance of the slide and the applied mass.
⑭ 3-JAW GRIPPERS.
⑮ ELECTRIC AXES SERIES ELEKTRO with a toothed belt, a ball circulation screw, various guide and drive systems. The figure shows an electric axis in the Elektro SHAK 340 series.
⑯ ELECTRIC AXIS FOR VERTICAL APPLICATIONS. The figure shows an electric axis in the Elektro SVAK series.
⑰ Pneumatically-controlled PRECISION ROTARY ACTUATORS. The figure shows a DAPK actuator with 2 adjustable angles.
⑱ PRECISION GRIPPERS. The figure shows a parallel long-stroke two-jaw gripper in the GPLK series.
⑲ RODLESS CYLINDERS with a V-Lock ball circulation guide.
⑳ V-Lock GUIDE UNIT for ISO 15552 pneumatic cylinders or Elektro ISO 15552 electric cylinders.
㉑ SLIDES. The figure shows an S14K compact precision slide.
㉒ R3K pneumatic ROTARY ACTUATORS, with an adjustable angle, mechanical stop or hydraulic internal or external shock-absorbers.
㉓ GRIPPERS with two parallel jaws, two hinged jaws, toggle joint and three jaws.

EXAMPLES OF APPLICATION

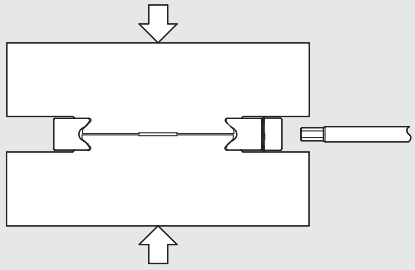
METAL WORK PNEUMATIC

The V-Lock system is a range of components for automation, fixing elements and accessories featuring a standard modular connecting system, easy assembly, rapid configuration, and the option of either precise repeatable connections or an adjustable mounting position.

Unlike the other components used with machinery and equipment, all V-Lock components have a 40 mm-wide dovetail in the coupling surfaces that extends the entire length of the component. There are precision-cut transversal grooves in the component that are 6^{H7} wide and have a 20 mm pitch.

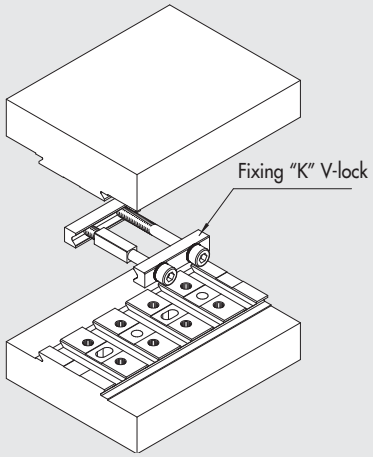


To connect two components, merely bring them into contact and tighten the M5 screws in the fixing elements, transversal to the body of the component. This system makes the assembly, disassembly and reconfiguration of numerous multiple components very quick and easy. Despite this, the parts are connected in a perfectly stable and precise manner.

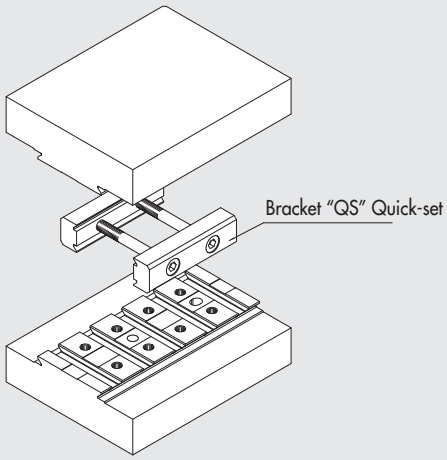


There are two types of fixing element for connecting V-Lock components, type K for highly compact, precise and repeatable fixing, and type QS to give a flexible system that can be regulated at the mounting stage.

When using K elements, insert the hollow square key (6^{f8}) in one of the transversal grooves (6^{H7}) and the M5 screw in the adjacent free-passage slot. This means the components will always be in the original position when the coupling is disassembled or reassembled.

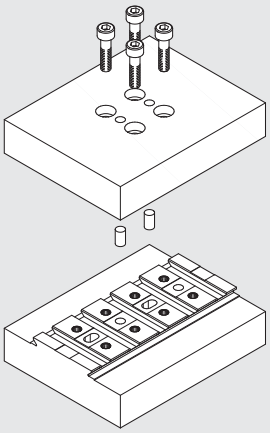


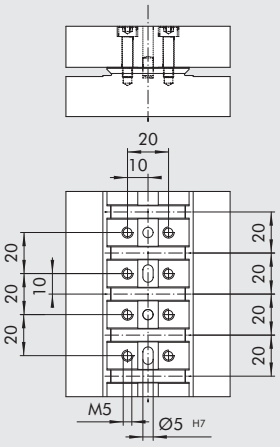
If you require mechanical adjustment of the position at the assembly stage, it is preferable to use QS elements, which form part of the Montech® Quick-set system.
The distance between components allows free passage of the M5 screws, which do not affect the relative position of the components, which remain apart. The assembly position must be regulated whenever the components are disassembled.



The V-Lock system comes with a series of modules and accessories designed to allow free spatial positioning of the components. The range includes cross adaptors, 45° and 90° squares, which are described in detail in the catalogue.
V-Lock components can be connected to Quick-set profiles by Montech® using QS fixing elements because the dovetails in the two systems are the same.
V-Lock components can also be connected to all the main extruded profiles with a slot centre distance of 40 mm or 45 mm. There is also a universal adaptor for the longitudinal assembly of V-Lock components and one for transversal assembly.

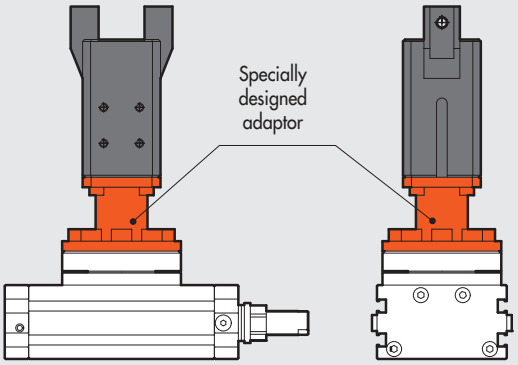
Where physically possible, all the faces of V-Lock components have a series of M5 threaded holes, pitch 20 x 20 mm, and holes for Ø 5 pins to allow standard mounting of external elements on V-Lock components.





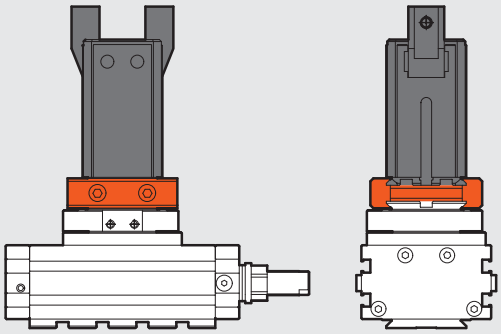
This standard and universal modular system makes the designer's work easier because it is not necessary to design adaptors, flanges, brackets and so on, and he can concentrate on the heart of the problem, namely the design of the machine.
Likewise, the person who assembles the components is provided with a complete kit that is quick and easy to use, so the machine can be assembled, set up and reconfigured in a very short time.
In short, with the V-Lock system you can:
- connect anything to anything: grippers, slides, rotary actuators or guide units, or even aluminium structures of any make
- have any spatial orientation
- make a simple quick-to-lock connection that is accessible from all sides
- avoid adaptor plates between components
- obtain an extremely robust connection that can withstand high loads and vibration
- construct a system with precision to the hundredth of a millimetre and repeatable, so that when a component is removed for maintenance, it can be repositioned accurately.

NON-MODULAR SYSTEM



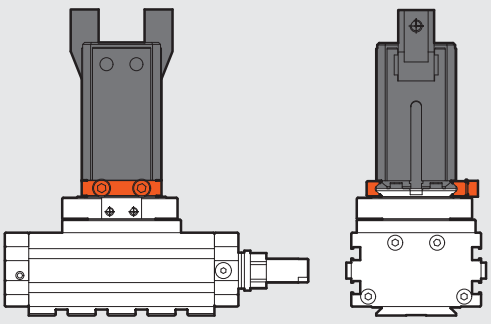
Adaptors have to be designed, produced and assembled.

Quick-set SYSTEM (Montech®)



① ✓ No adaptors required
② ✓ High rigidity
③ ✓ Longitudinally adjustable position
④ /
⑤ /
⑥ /
⑦ ✓ Rapid assembly
⑧ ✓ Easy access to fastening screws

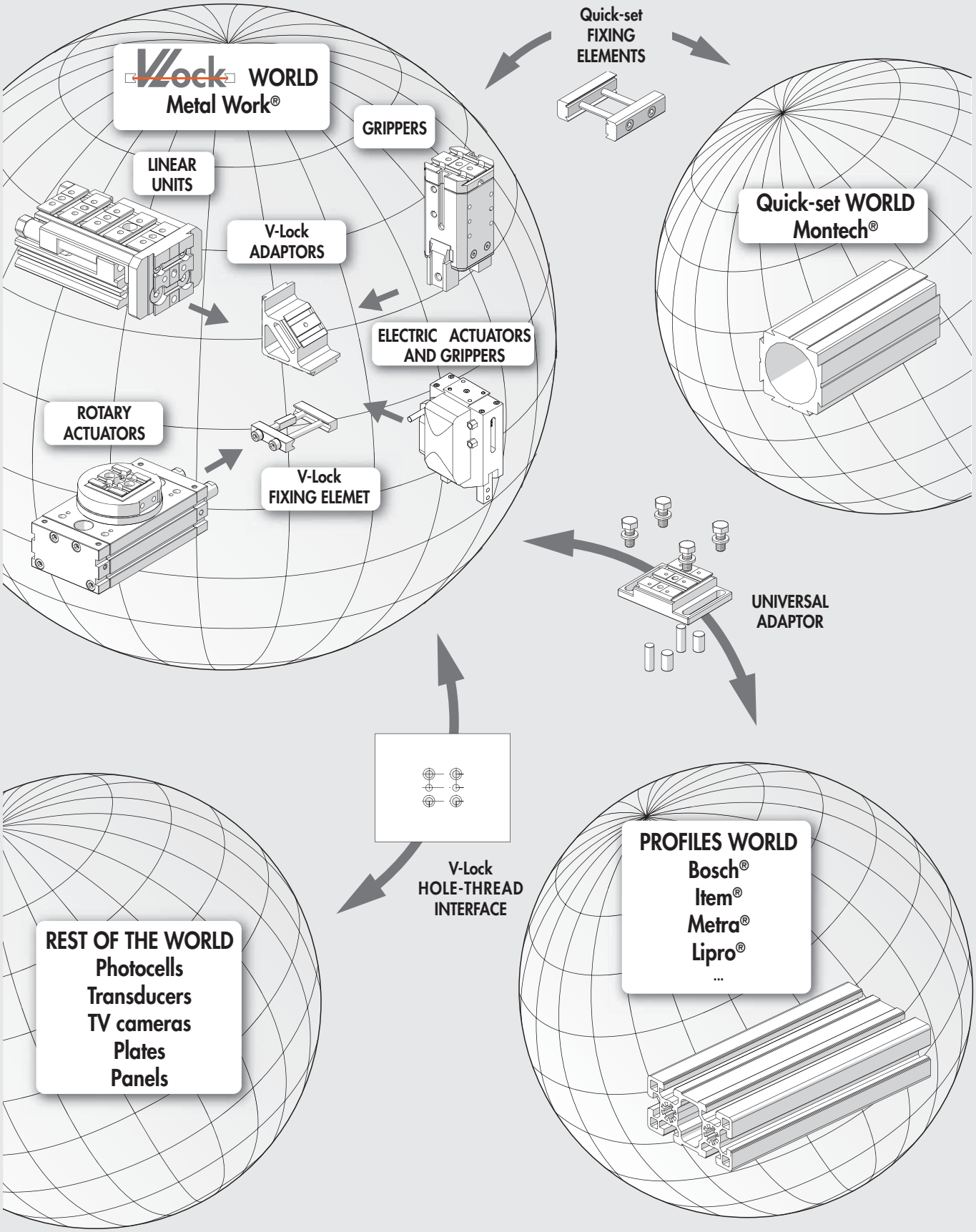
V-Lock System (Metal Work®)



① ✓ No adaptors required
② ✓ Improved rigidity
③ /
④ ✓ Accurate positioning using a key
⑤ ✓ Positioning repeatability after disassembly
⑥ ✓ Reduced overall dimensions
⑦ ✓ Rapid assembly
⑧ ✓ Easy access to fastening screws

METAL WORK PNEUMATIC

THE V-Lock WORLD CAN BE COMBINED WITH OTHER WORLDS OF AUTOMATION



V-Lock FIXING ELEMENTS

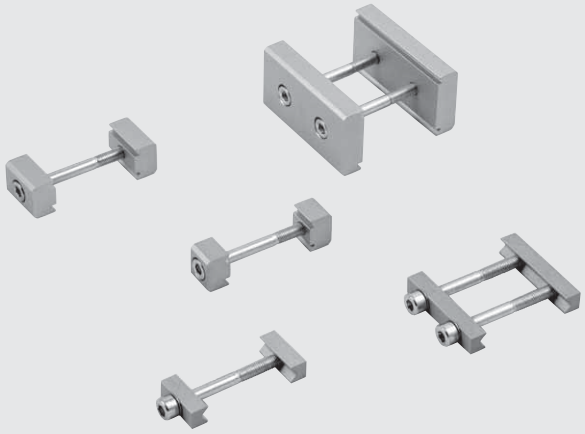
Metal Work products in the V-Lock series can be connected using either type K fixing system or QS fixing system, by Montech® Quick-Set.

Both modular systems are complementary and interchangeable.

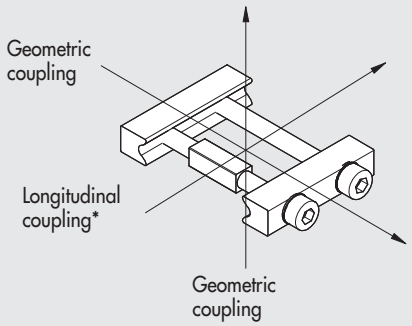
The V-Lock system guarantees accurate and repeatable positioning, even longitudinally. A hollow key can be inserted in the transverse grooves in the dovetails in the components (f8/H7 coupling).
Components connected using K elements are slightly detached from each other (minimum 0.4 mm distance between the adjacent surfaces of two components) to allow self-centring during assembly.

QS fixing elements allow longitudinal adjustment during assembly, without limiting the fitter to a particular position Here, too, the components are detached, but by more compared to the K system - 8 mm or 22 mm, depending on the connecting element chosen.

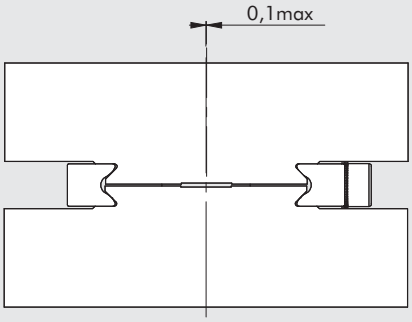
Both systems give rapid and accurate couplings that are very sturdy and vibration-resistant due to the dovetail joint and do not require specially designed adaptors.
The screws all remain accessible, so the components are easy to disassemble.



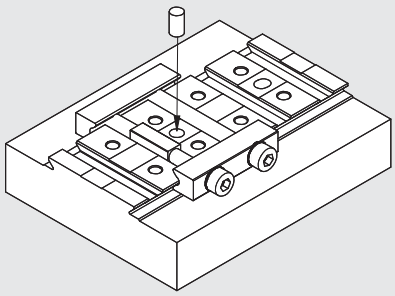
For very high loads there is a 6 mm solid square key with f8 tolerance (see accessories) that can be positioned between the free grooves in adjacent V-Lock elements.



* Resistance to the reciprocal displacement of two components with a 6 Nm screw torque.
Tests conducted with intact and undamaged elements.



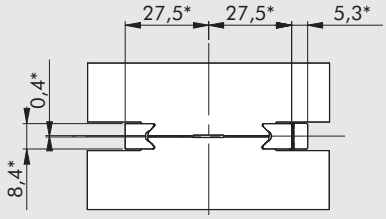
The V-Lock system allows transversal self-centring of the components. If the K blocks are mounted correctly, the alignment error is less than 0.1 mm.



If greater precision is required, one or two Ø 5 pins can be inserted in the slots provided.

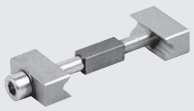
K FIXING ELEMENT

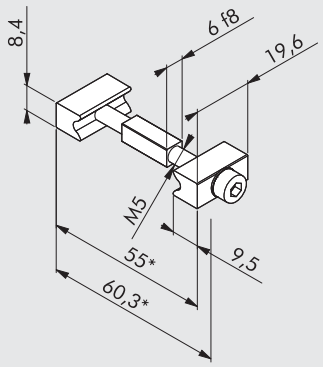
STANDARD TRANSVERSE DIMENSIONS



*dimensions with element fixed

K FIXING ELEMENT WITH ONE SCREW, CODE W0950005051K



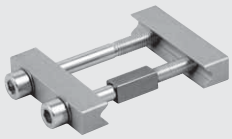


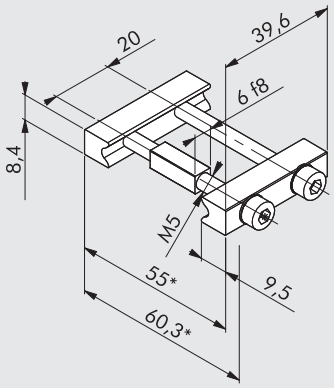
Short fixing element for low stress.

Resistance to longitudinal displacement	750 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.020 kg

*dimensions with element fixed

K FIXING ELEMENT WITH TWO SCREWS, CODE W0950005052K



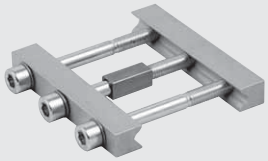


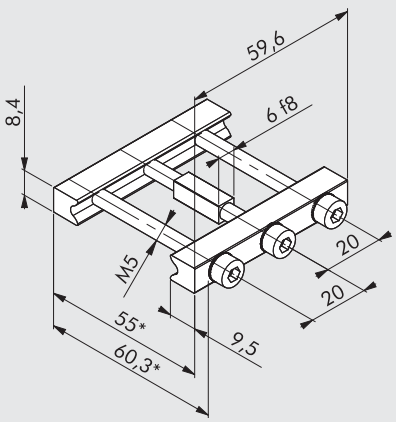
Fixing element for high stress.

Resistance to longitudinal displacement	3000 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.037 kg

*dimensions with element fixed

K FIXING ELEMENT WITH THREE SCREWS, CODE W0950005053K



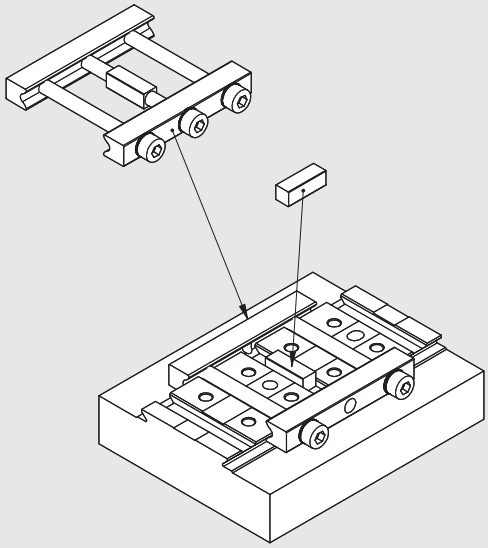


Fixing element for very high stress.

Resistance to longitudinal displacement	5000 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.055 kg

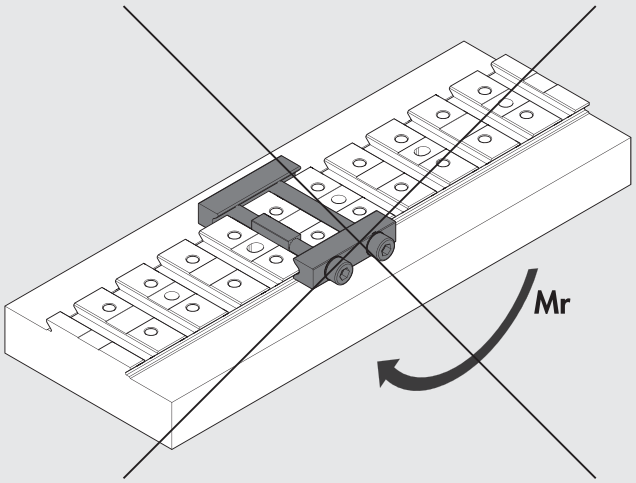
*dimensions with element fixed

For applications with high impacts, accelerations and masses, the resistance of the coupling system can be increased by inserting a solid key (code W0950005151K) instead of a screw and hollow key.

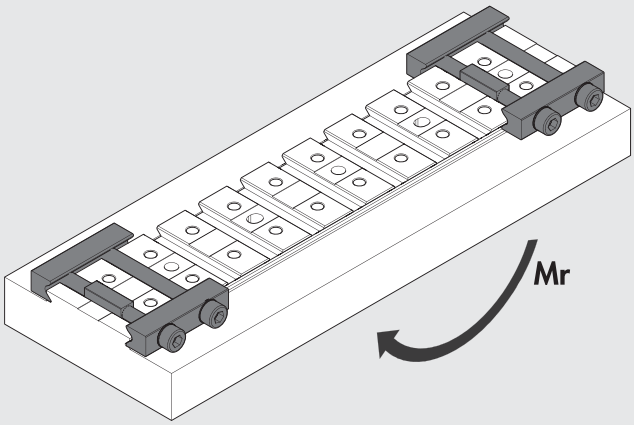


The number and size of fixing elements depend on the specific application. Under operating conditions of high speed, pressure and load, we recommend installing two elements with two screws as spaced as possible from each other.

NO

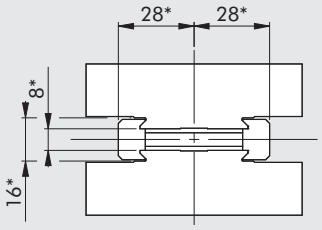


YES



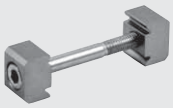
FIXING ELEMENT QS

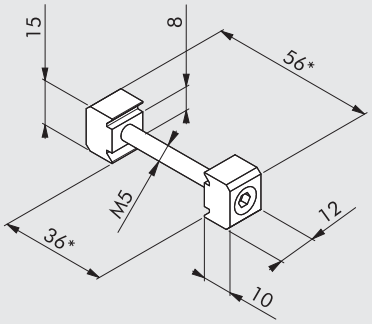
QS HEIGHT 8 mm: STANDARD TRANSVERSE DIMENSIONS



*dimensions with element fixed

QS 12-8 (SLL-12-40) FIXING ELEMENT, CODE W0950005000K



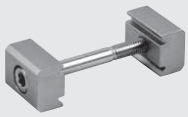


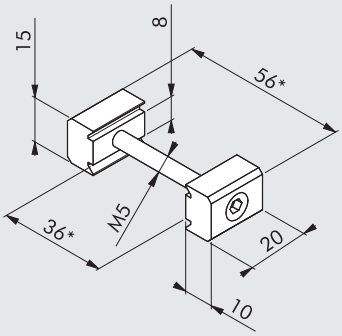
Short fixing element for low stress.

Resistance to longitudinal displacement	750 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.016 kg

*dimensions with element fixed

QS 20-8 (SLL-20-40) FIXING ELEMENT, CODE W0950005001K



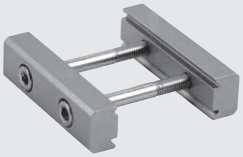


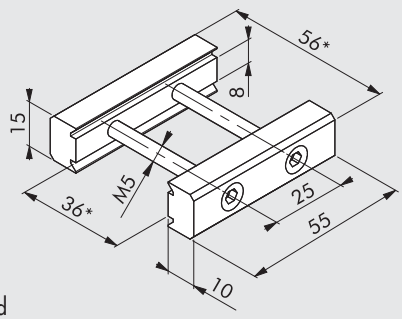
Short fixing element for medium stress.

Resistance to longitudinal displacement	1350 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.020 kg

*dimensions with element fixed

QS 55-8 (SLL-55-40) FIXING ELEMENT, CODE W0950005003K



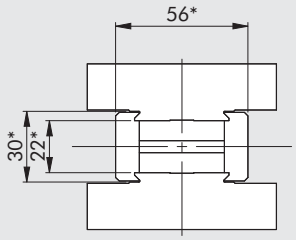


Fixing element for high stress.

Resistance to longitudinal displacement	3000 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.055 kg

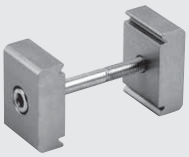
*dimensions with element fixed

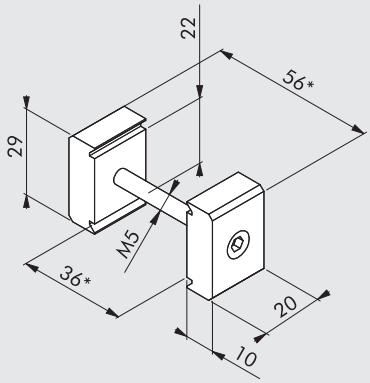
QS HEIGHT 22 mm: STANDARD TRANSVERSE DIMENSIONS



*dimensions with element fixed

QS 20-22 (SLL-20/22-40) FIXING ELEMENT, CODE W0950005002K



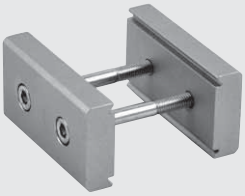


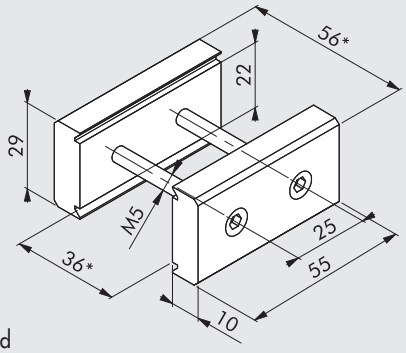
Short fixing element for medium stress and greater distances.

Resistance to longitudinal displacement	1350 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.022 kg

*dimensions with element fixed

QS 55-22 (SLL-55/22-40) FIXING ELEMENT, CODE W0950005004K





Short fixing element for high stress and greater distances.

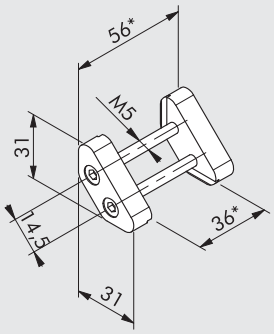
Resistance to longitudinal displacement	3000 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.096 kg

*dimensions with element fixed

NOTES

FIXING BRACKETS FOR PROFILES

EV-2-40 FIXING BRACKET, CODE W0950005811K

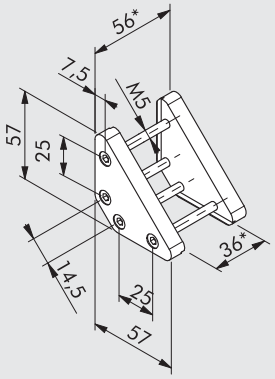


Angled attachment for 90° connections for use in reduced load applications.

Resistance to longitudinal displacement	1800 N
Recommended screw torque	6 Nm
Locking groove orthogonality (referred to a 19 mm length)	±0.02 mm
Material	Anodized aluminium
Weight	0.050 kg

*dimensions with element fixed

EV-3-40 FIXING BRACKET, CODE W0950005812K

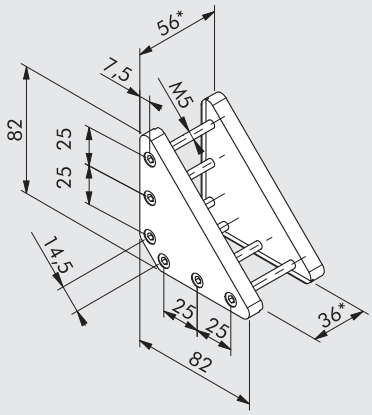


Angled attachment for 90° connections for use in medium load applications.

Resistance to longitudinal displacement	3000 N
Recommended screw torque	6 Nm
Locking groove orthogonality (referred to a 45 mm length)	±0.03 mm
Material	Anodized aluminium
Weight	0.130 kg

*dimensions with element fixed

EV-4-40 FIXING BRACKET, CODE W0950005813K



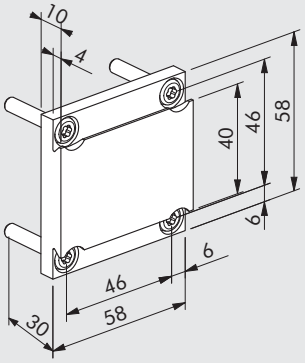
Angled attachment for 90° connections in high load applications.

Resistance to longitudinal displacement	4500 N
Recommended screw torque	6 Nm
Locking groove orthogonality (referred to a 70 mm length)	±0.04 mm
Material	Anodized aluminium
Weight	0.250 kg

*dimensions with element fixed

FRONT ADAPTER FOR LIGHTWEIGHT PROFILE PROFILE

FRONT ADAPTER SA-58-40, CODE W0950005816K



Adapter for front fixing obtained from DIN 17615 profile profiles (precision profiles)

Recommended screw torque	6 Nm
Material	Anodized aluminium heat set
Weight	0.060 kg

Note: Adapter for lightweight profile LP-66-40-3M, code W0950005801K

NOTES

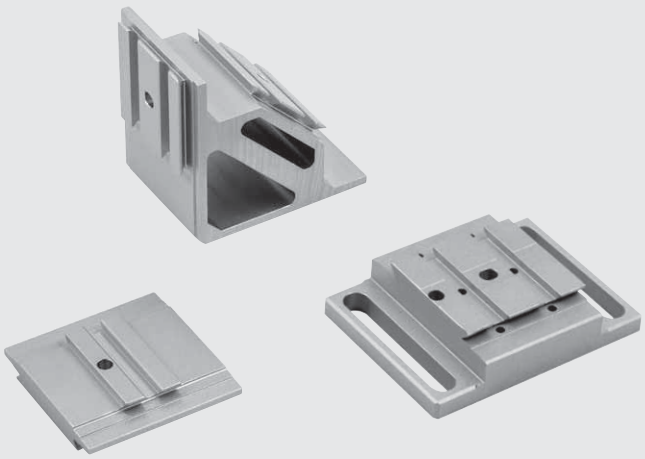
V-Lock ADAPTORS

METAL WORK PNEUMATIC

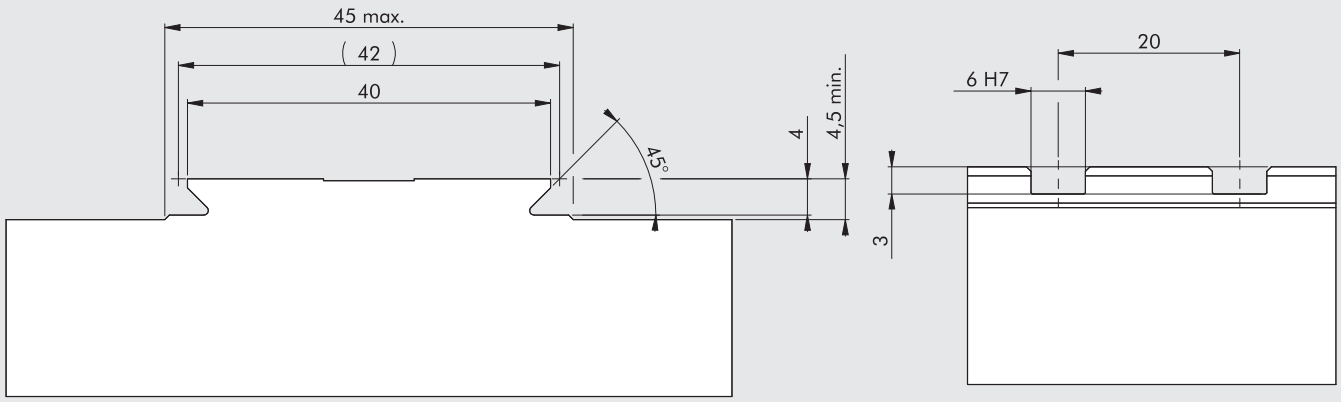
V-Lock adaptors can be used to connect various components quickly and securely when you require a rotated fixing or you need to adapt single-groove elements to multiple-groove elements.

All these adaptors have a 45° dovetail for connection using K and QS fixing elements.

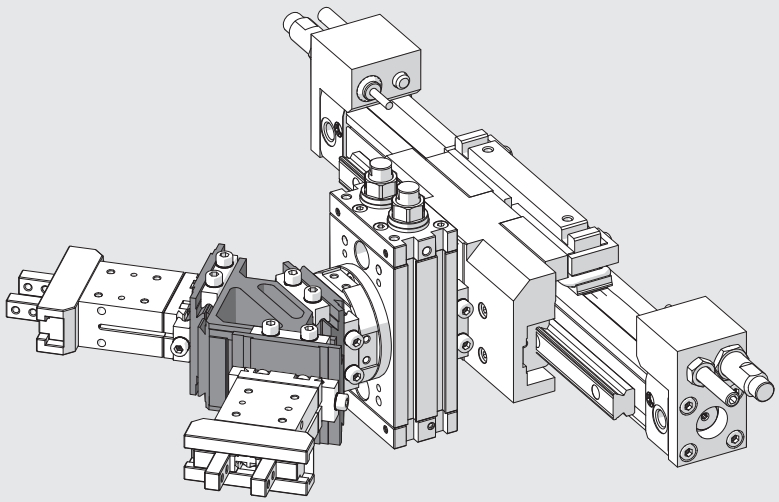
Where possible, pinholes have been drilled in the surfaces for interfacing with other components.



DIMENSIONS OF V-Lock DOVETAIL

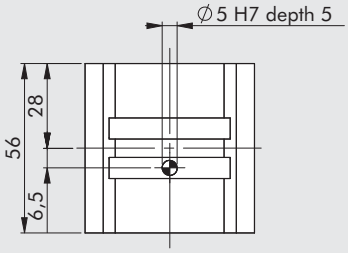


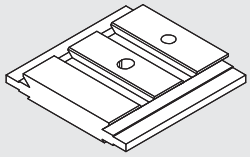
GENERAL APPLICATION OF V-Lock ADAPTORS

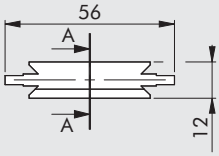


2-1 PARALLEL ADAPTOR, CODE W0950005100K

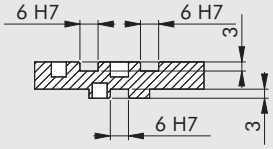
NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.

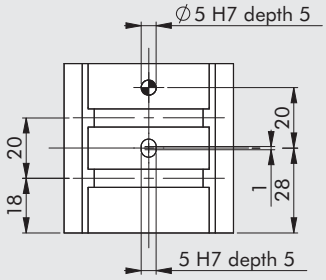






A-A

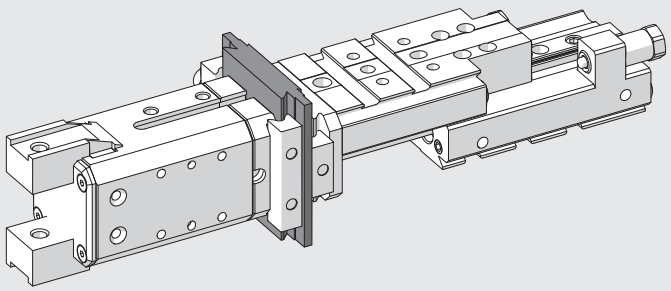




Adaptor suitable for parallel coupling of two V-Lock components, one with at least two grooves and the other with one groove only.

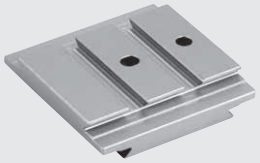
Material	Anodized aluminium
Weight	0.060 kg

EXAMPLE OF APPLICATION

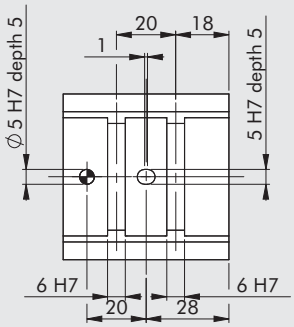


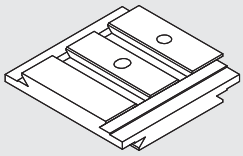
METAL WORK PNEUMATIC

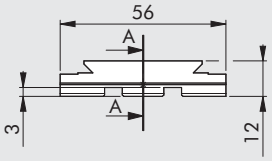
2-2 CROSS ADAPTOR, CODE W0950005110K



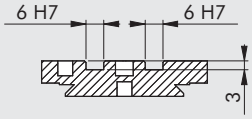
NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.

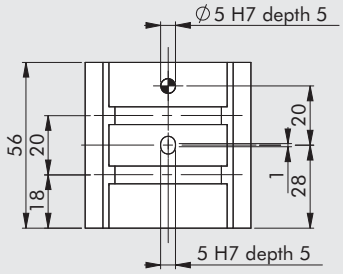






A-A

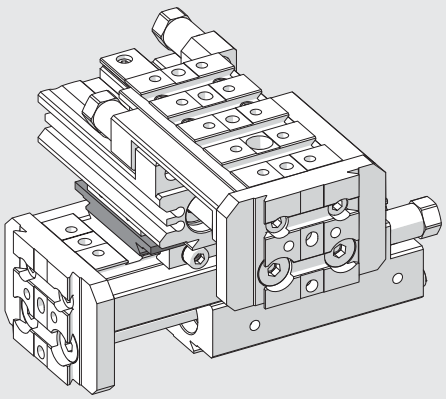




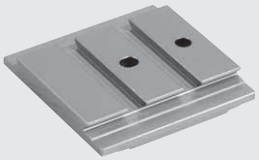
Adaptor suitable for cross-coupling two V-Lock components, both with at least two grooves.

Material	Anodized aluminium
Weight	0.069 kg

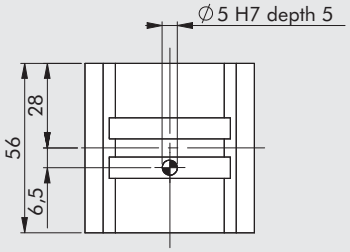
EXAMPLE OF APPLICATION

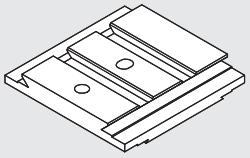


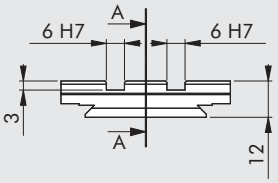
2-1 CROSS ADAPTOR, CODE W0950005120K

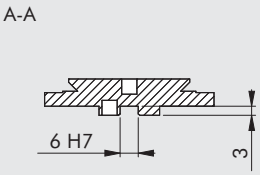


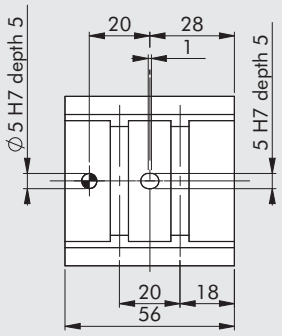
NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.







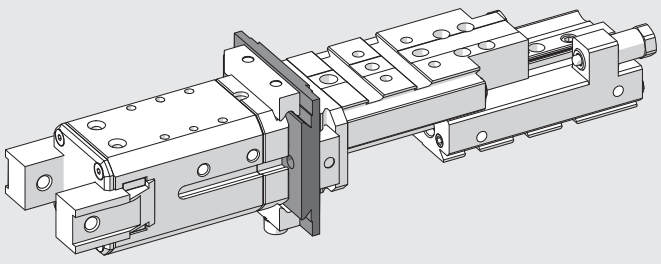




Adaptor suitable for cross-coupling of two V-Lock components, one with at least two grooves and the other with one groove only.

Material	Anodized aluminium
Weight	0.060 kg

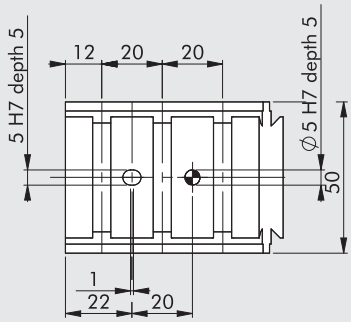
EXAMPLE OF APPLICATION

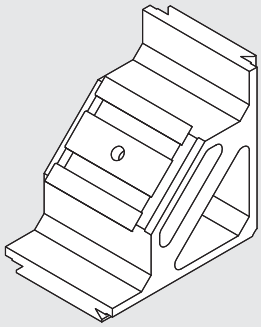


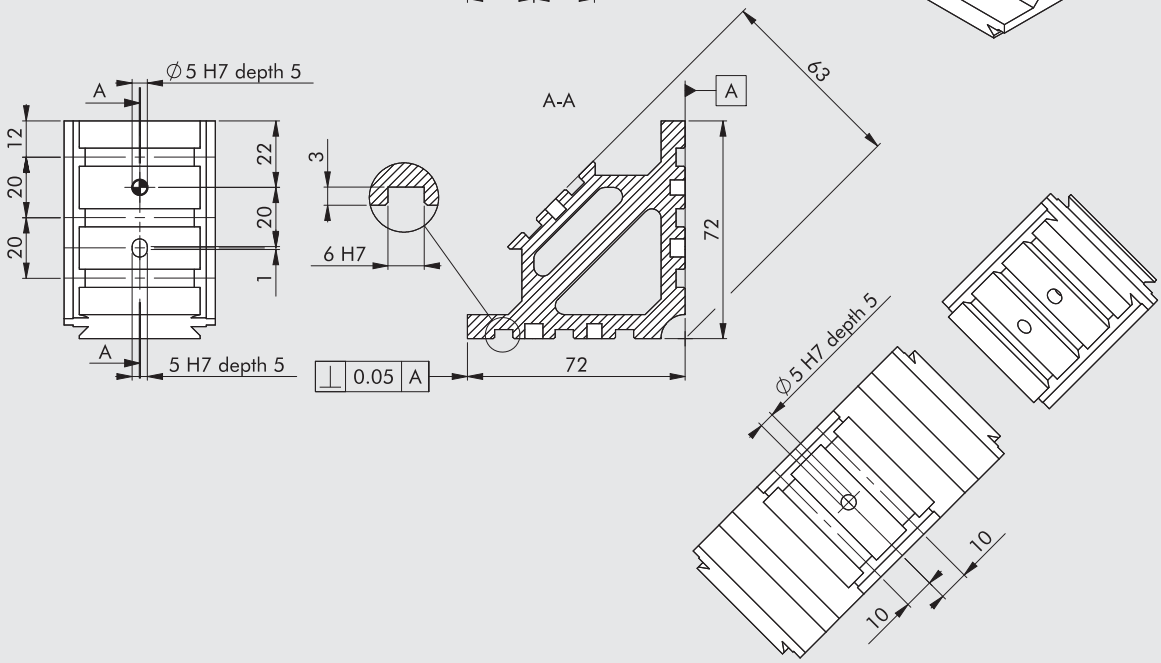
METAL WORK PNEUMATIC

LONGITUDINAL BRACKET, CODE W0950005200K

NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.



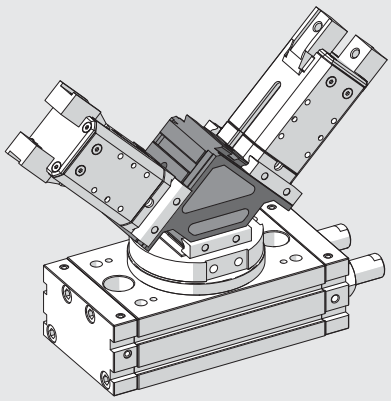




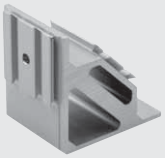
Adaptor suitable for the rotated coupling of two or three V-Lock components, with two right-angle supporting surfaces and parallel grooves.
The third surface is at 45° angle and the grooves are parallel to those in the other two faces.

Material	Anodized aluminium
Weight	0.235 kg

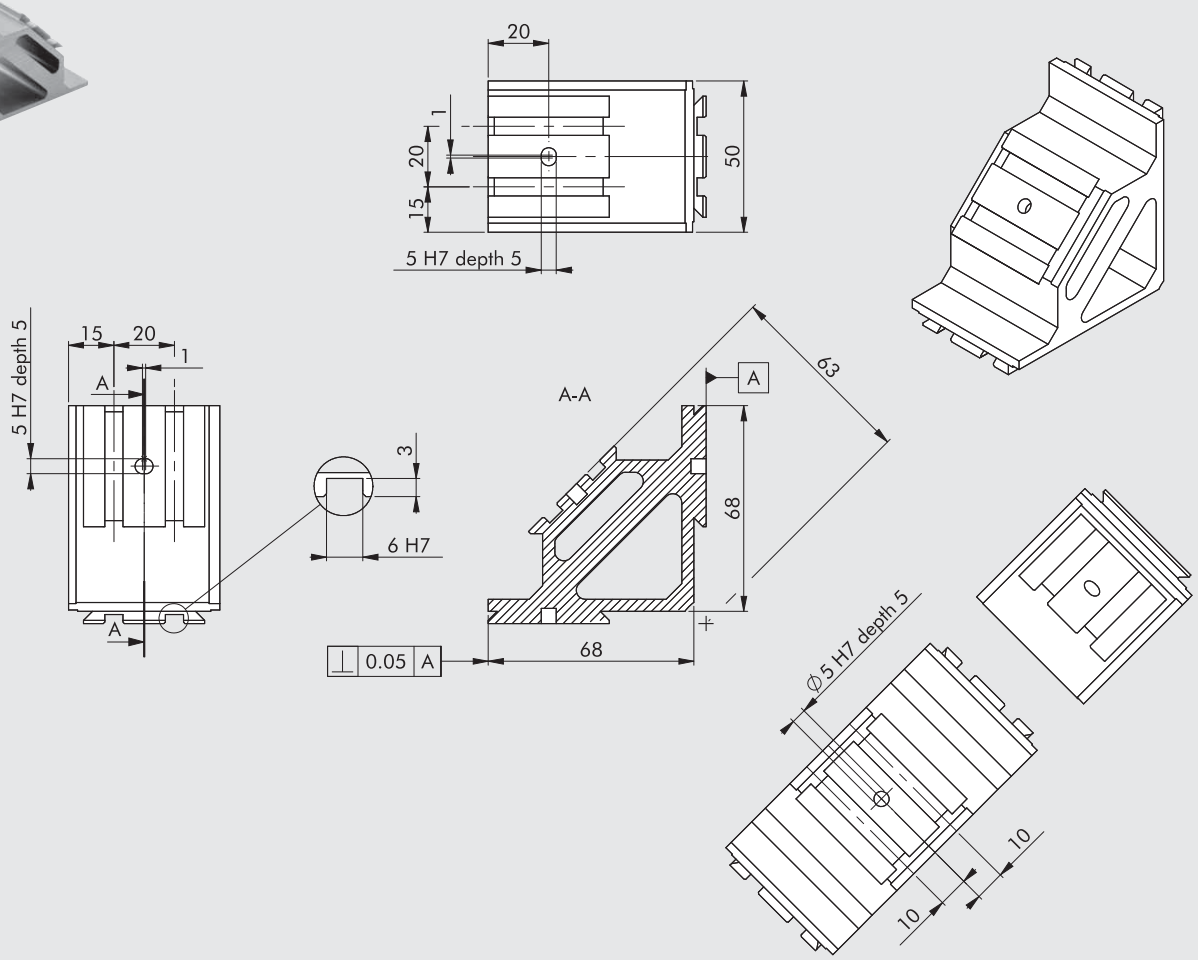
EXAMPLE OF APPLICATION



TRANSVERSAL BRACKET, CODE W0950005201K



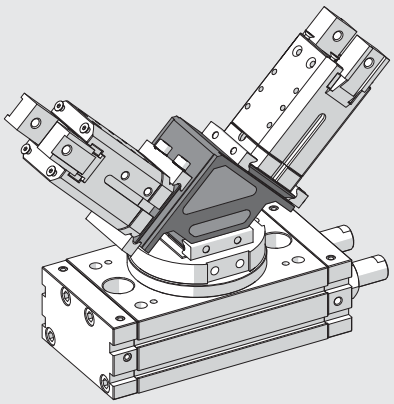
NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.



Adaptor suitable for the rotated coupling of two or three V-Lock components, with two supporting surfaces at right angles. The third surface is at 45° angle. All the grooves are parallel.

Material	Anodized aluminium
Weight	0.218 kg

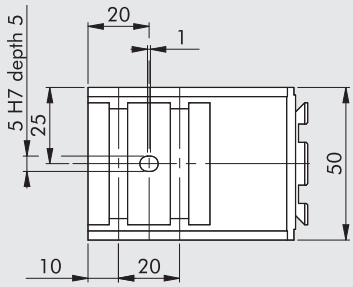
EXAMPLE OF APPLICATION

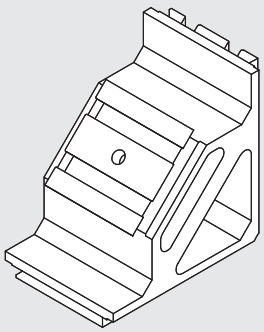


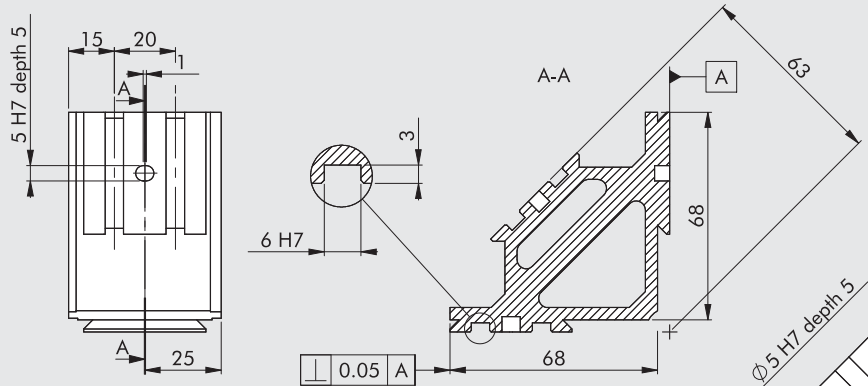
METAL WORK PNEUMATIC

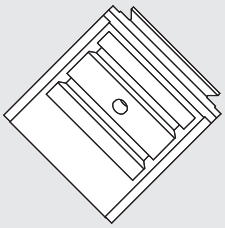
CROSS BRACKET, CODE W0950005202K

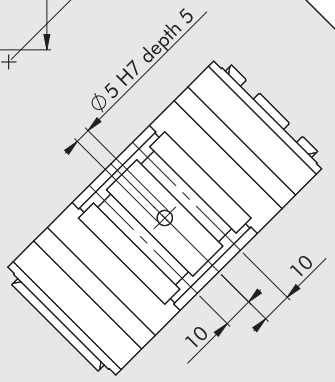
NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.







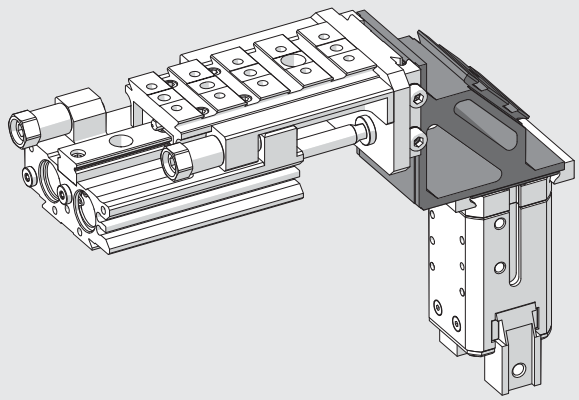




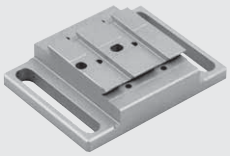
Adaptor suitable for the rotated coupling of two or three V-Lock components, with two right-angled supporting surfaces and grooves at right angles.
The third surface is at 45° angle.

Material	Anodized aluminium
Weight	0.218 kg

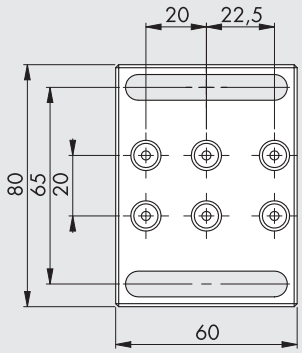
EXAMPLE OF APPLICATION

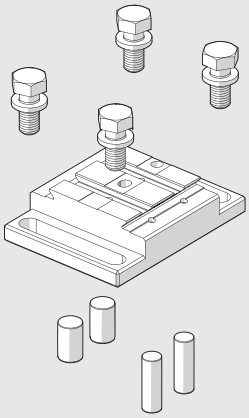


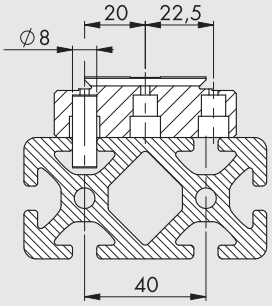
LONGITUDINAL ADAPTOR, CODE 0950008001K

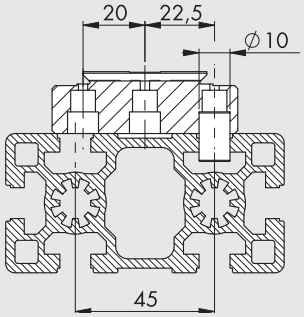


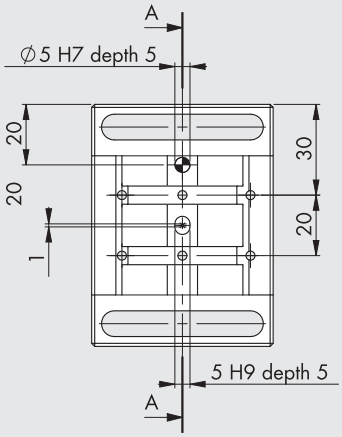
NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.

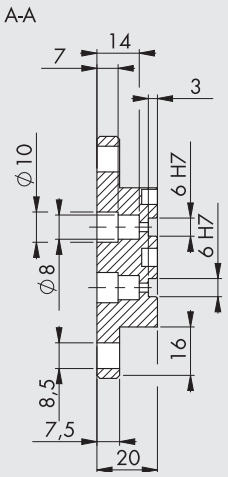








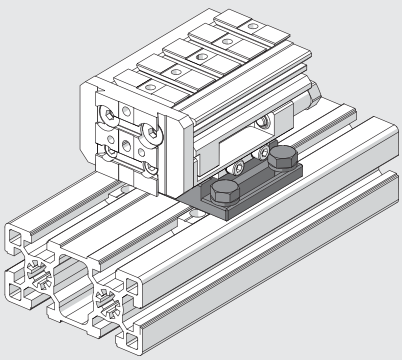




An adaptor for fixing V-Lock components longitudinally onto extruded profiles, with slots with 40 or 45 mm centre distance or 8 or 10 mm width.
If the slots have a 40 mm centre distance, insert two pins in the slots 20 mm from the axis of the adaptor and use them as an alignment reference.
If the slots have a 45 mm centre distance, use the 22.5 mm pin slots.

Kit contents:		
1 longitudinal adaptor	Material	Anodized aluminium
	Weight	0.164 kg
2 cylindrical pins Ø 10 x 16		
2 cylindrical pins Ø 8 x 24		
4 galvanised M8 x 16 screws		

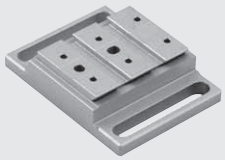
EXAMPLE OF APPLICATION

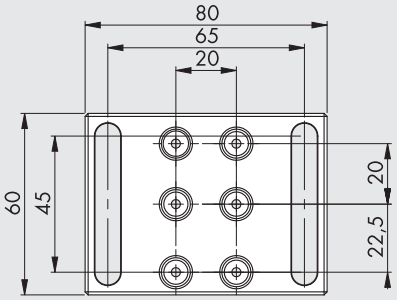


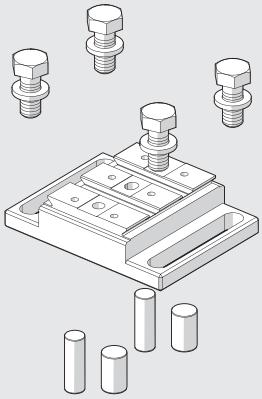
METAL WORK PNEUMATIC

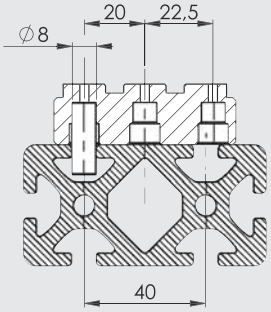
TRANSVERSAL ADAPTOR, CODE 0950008002K

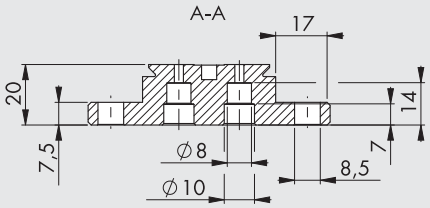
NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.

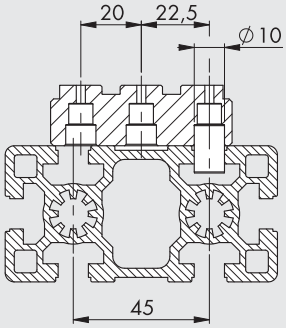


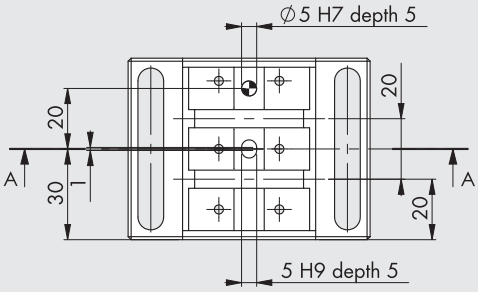


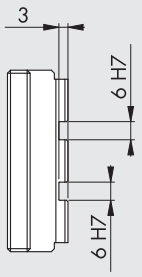








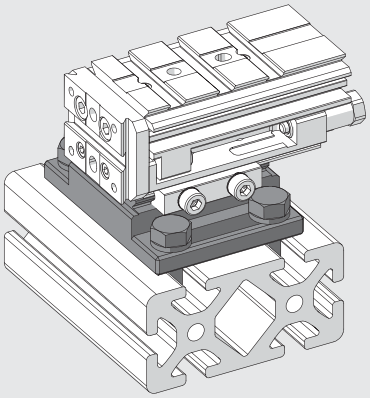




An adaptor for fixing V-Lock components transversally onto extruded profiles, with slots with 40 or 45 mm centre distance or 8 or 10 mm width.
If the slots have a 40 mm centre distance, insert two pins in the slots 20 mm from the axis of the adaptor and use them as an alignment reference.
If the slots have a 45 mm centre distance, use the 22.5 mm pin slots.

Kit contents:		
1 transversal adaptor:	Material	Anodized aluminium
	Weight	0.160 kg
2 cylindrical pins Ø 10 x 16		
2 cylindrical pins Ø 8 x 24		
4 galvanised M8 x 16 screws		

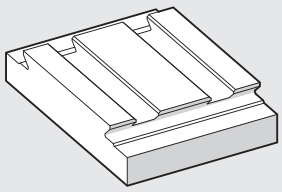
EXAMPLE OF APPLICATION



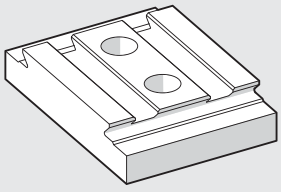
V-Lock TRANSFORMER

V-Lock transformers can be used to connect components other than V-Lock to the system or V-Lock components to other types of frames (e.g. bases, plates and walls). V-Lock transformers can be supplied without fixing screw holes or pinholes. This means that you can create the desired configuration.
For other similar adapters, see **chapter V-Lock Gripper accessories**.
The example below shows how to transform an S11 slide into a V-Lock slide.

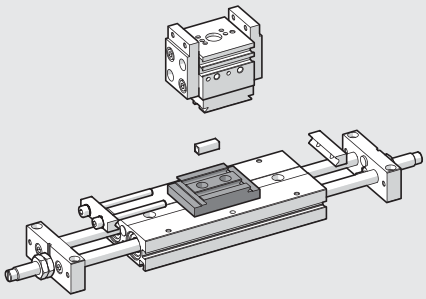
Start from V-Lock transformer



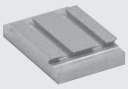
Drill a hole where required

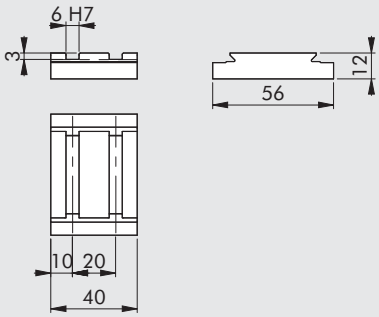


Apply to the component



2-GROOVE V-Lock TRANSFORMER, CODE 0950008012K

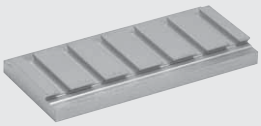


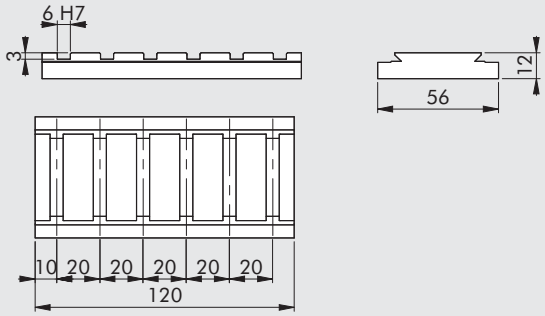


Weight: 0.060 kg
Material: anodized aluminium

NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.

6-GROOVE V-Lock TRANSFORMER, CODE 0950008016K

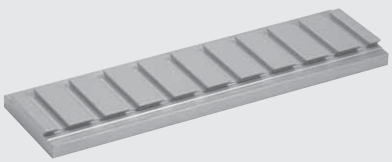


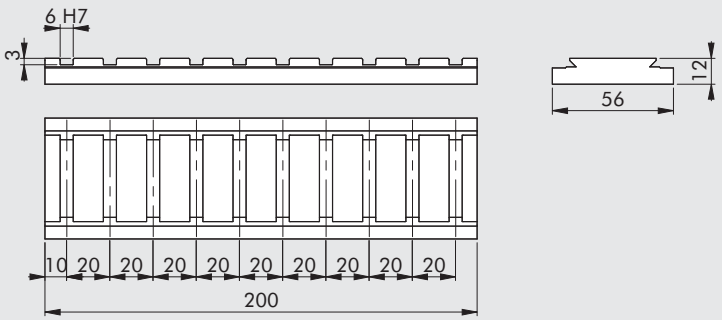


Weight: 0.181 kg
Material: anodized aluminium

NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.

10-GROOVE V-Lock TRANSFORMER, CODE 0950008020K



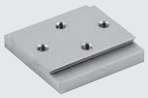


Weight: 0.301 kg
Material: anodized aluminium

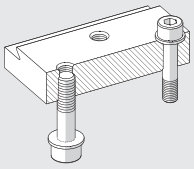
NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.

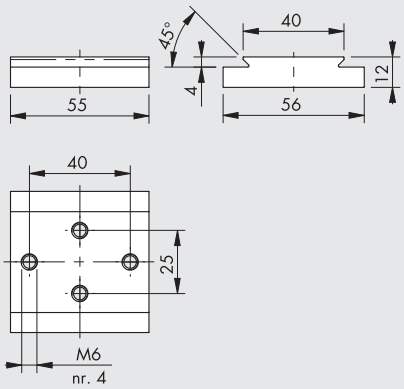
METAL WORK PNEUMATIC

QS TRANSFORMER L = 55, CODE 0950008050K



Fixing from below with M6 screw, or from above with through M5 screw.





Weight: 0.087 kg
Material: anodized aluminium

NOTES

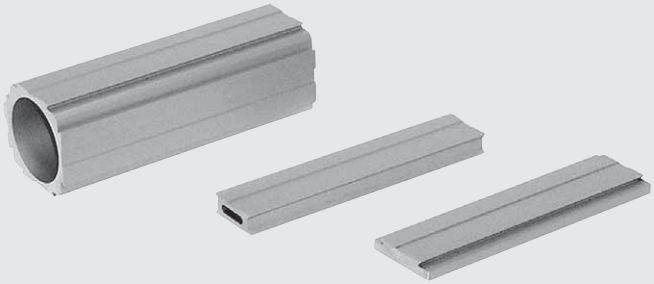
NOTES

METAL WORK PNEUMATIC

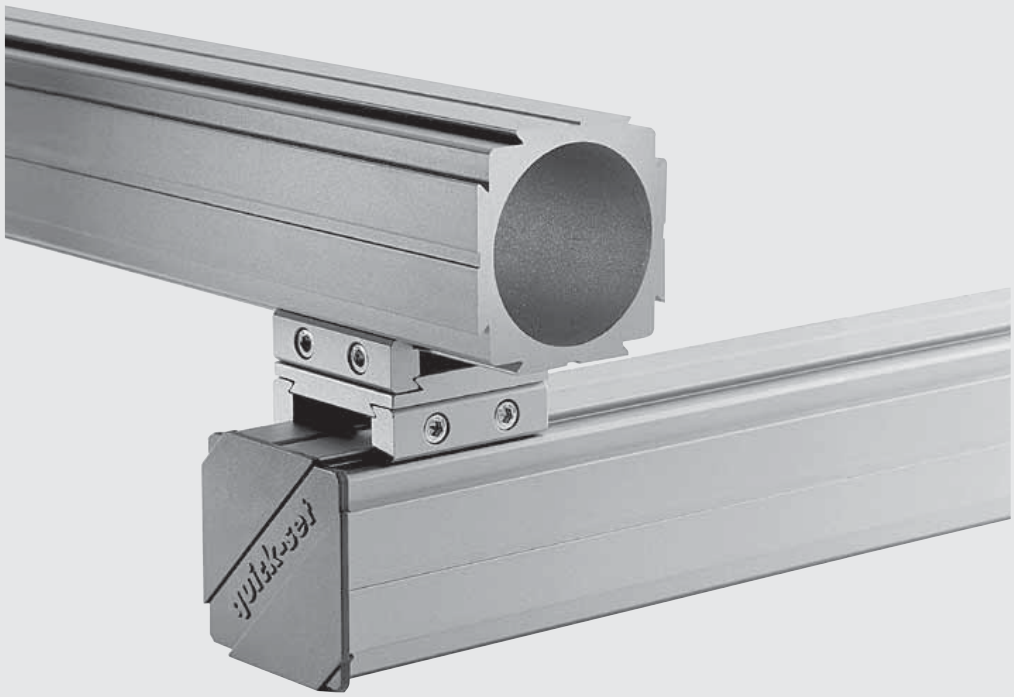
NOTES

PROFILES

The Quick-Set fixing system is the natural complement to modular components for V-Lock automation. The two systems share the same dovetail coupling system.
All types of structures can be quickly installed using Quick-Set profiles and accessories, including simple lightweight supports and complete assembly and testing lines. Couplings between profiles are accurate, very sturdy and vibration resistant. They are suitable for use in both static and dynamic applications. The profiles can be cut to measure using a die cutter and without requiring any machining; no need for holes or junction pinholes.
Dovetail joints can withstand higher loads than T-grooved joints; the reciprocal resistance of two screw-coupled joints is over 3000 N.
All the locking screws can be accessed at all times. The installations can be dismantled and reused.
On specific request, the sections can be cut to the desired length.
The part number of cut-to-size sections is formed by adding 4 characters identifying the length in mm just before the letter K.
For example, the part number of the bearing section TP-66-40, length 850 mm, will be W095000580**0850**K.
In addition to the products shown in this catalogue and available from Metal Work stock, all the other Montech® Quick-Set components can be supplied on request.

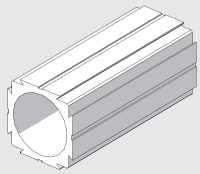


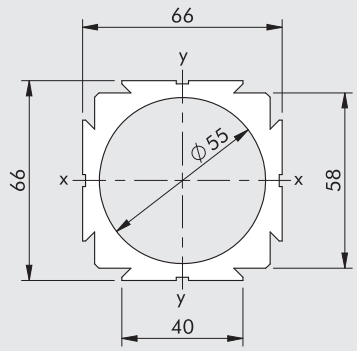
EXAMPLES OF APPLICATION



METAL WORK PNEUMATIC

TP-66-40-3M SUPPORTING PROFILE, CODE W0950005800K

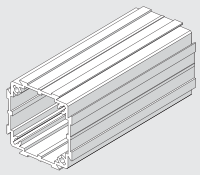


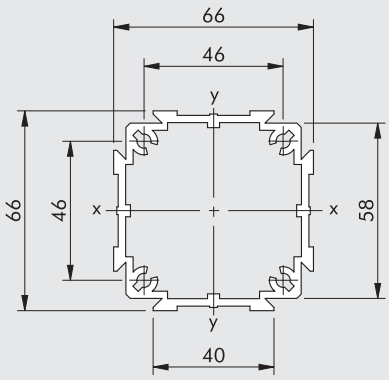


Profile to DIN 17615 (precision profiles)

Length	3000 mm
Profile surface	1480 mm^2
Flexural modulus	Wx = Wy = 23 cm^3
Moment of inertia	Jx = Jy = 76 cm^4
Length tolerance	±2 mm (DIN 7168 average)
Torsion tolerance	1 mm/m
Straightness tolerance	0.5 mm/m
Material	Anodized aluminium heat set
Weight	3.996 kg/m

LP-66-40-3M LIGHTWEIGHT PROFILE, CODE W0950005801K

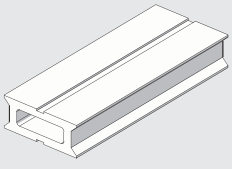


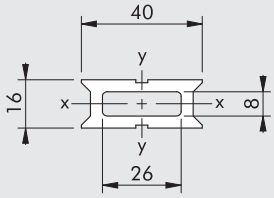


Profile to DIN 17615 (precision profiles)

Length	3000 mm
Profile surface	809 mm^2
Flexural modulus	Wx = Wy = 13 cm^3
Moment of inertia	Jx = Jy = 45 cm^4
Length tolerance	±2 mm (DIN 7168 average)
Torsion tolerance	1 mm/m
Straightness tolerance	0.5 mm/m
Material	Anodized aluminium heat set
Weight	2.186 kg/m

TP-16-40-2M SUPPORTING PROFILE, CODE W0950005802K

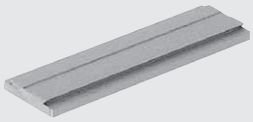


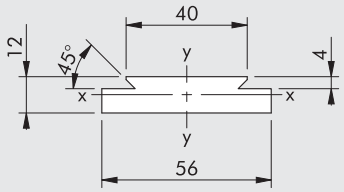


Profile to DIN 17615 (precision profiles)

Length	2000 mm
Profile surface	368 mm^2
Flexural modulus	Wx = 1.025 cm^3 Wy = 1.640 cm^3
Moment of inertia	Jx = 0.820 cm^4 Jy = 3.28 cm^4
Length tolerance	±1.2 mm (DIN 7168 average)
Torsion tolerance	1 mm/m
Straightness tolerance	0.5 mm/m
Material	Anodized aluminium heat set
Weight	0.980 kg/m

AP-56-40-2M ADAPTER PROFILE, CODE W0950005803K

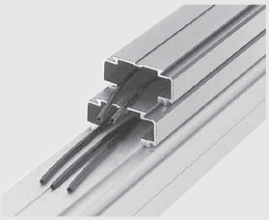


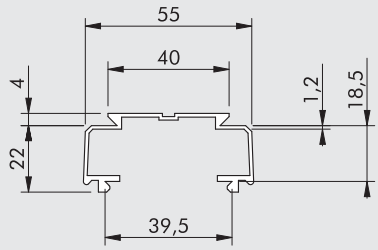


Profile to DIN 17615 (precision profiles).
Used for making adaptors.

Length	2000 mm
Profile surface	600 mm^2
Flexural modulus	Wx = 1.04 cm^3
	Wy = 4.83 cm^3
Moment of inertia	Jx = 0.67 cm^4
	Jy = 13.53 cm^4
Length tolerance	±1.2 mm (DIN 7168 average)
Torsion tolerance	1 mm/m
Straightness tolerance	0.5 mm/m
Material	Anodized aluminium heat set
Weight	1.620 kg/m

KFM-40-2M CABLE CARRIER PROFILE, CODE W0950005804K

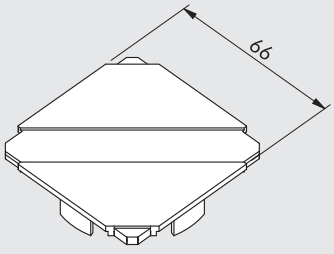




Profile to DIN 17615 (precision profiles).
Snap-in profile for the laying of pneumatic hoses and electrical cables.

Length	2000 mm
Length tolerance	±1.2 mm (DIN 7168 average)
Material	Anodized aluminium heat set
Weight	0.549 kg/m

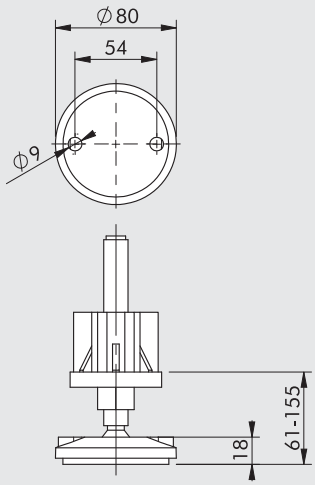
AK-66-40 PLASTIC CAP, CODE W0950005810K



End cap for TP-66-40 and LP-66-40 bearing profiles.

Material	Light grey ABS
Weight	2.5 g

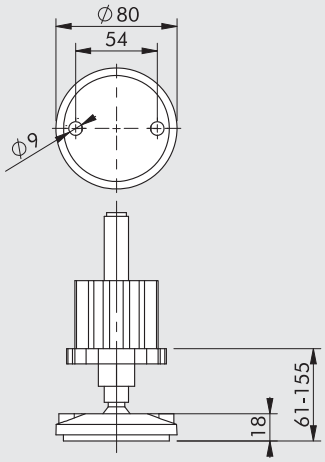
GFTP-66-40 ARTICULATED FOOT, CODE W0950005814K



Articulated foot with adaptor for TP-66-40 bearing profile.

Maximum axial load	5000 N
Material	Black plastic plate. Threaded rod in galvanised steel.
Weight	0.350 kg

GFLP-66-40 ARTICULATED FOOT, CODE W0950005815K



Articulated foot with adaptor for LP-66-40 lightweight profile.

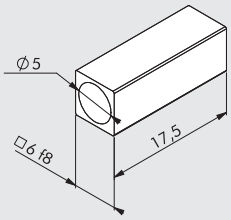
Maximum axial load	5000 N
Material	Black plastic plate. Threaded rod in galvanised steel.
Weight	0.400 kg

NOTES

V-Lock ACCESSORIES AND SPARE PARTS

ACCESSORIES

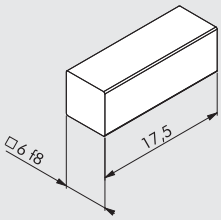
V-Lock HOLLOW KEY



Code	Description
W0950005150K	V-Lock hollow key kit

Note: Kit of 5 stainless steel 6 x 6 hollow keys

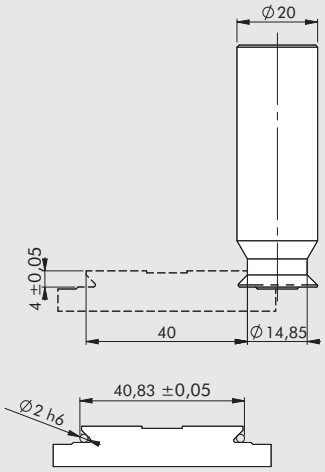
V-Lock SOLID KEY



Code	Description
W0950005151K	V-Lock key kit

Note: Kit of 5 stainless steel solid 6 x 6 keys

V-Lock profile tool



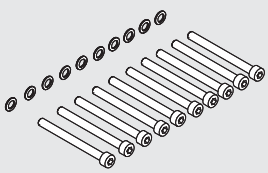
Code	Description
9000770	Tool for V-Lock profile

Workable materials: aluminium – steel

Note: This tool can be used to obtain the dovetail V-Lock profile on parts and/or components without it (e.g. plates, jibs and columns).

SPARE PARTS

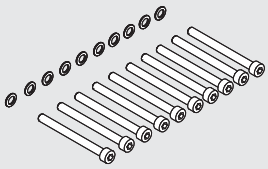
V-Lock SCREW KIT



Code	Description
W0950005170K	K screw kit

Note: Kit of 10 galvanised M5x55 screws (class 8.8) and 10 galvanised knurled M5 washers

Quick-Set SCREW KIT



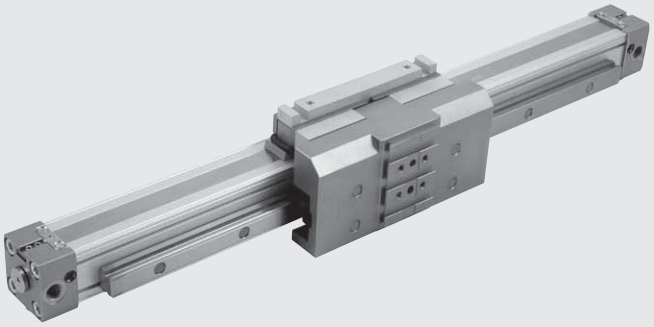
Code	Description
W0950005171K	QS screw kit

Note: Kit of 10 galvanised M5x50 screws (class 8.8) and 10 galvanised knurled M5 washers

RODLESS CYLINDER WITH BALL RECIRCULATING GUIDE SERIES V-Lock

METAL WORK PNEUMATIC

V-Lock rodless cylinders come with bores Ø 16, Ø 25 and Ø 32.
Their main feature is that the carriage support has a dovetail with V-Lock grooves for mounting other components in the V-Lock family.
The provision of threaded holes and centring pins allows non-V-Lock components to be fixed onto the carriage.
The fixing foots also use the V-Lock system, so the cylinder can be fixed onto something else using K or QS elements.
The carriage support is mounted on ball-recirculation pads that run on tempered guides and can withstand very high loads and moments.
Main features of V-Lock rodless cylinders:



- extruded anodized aluminium alloy cylinder liner;
- sensor grooves in the liner;
- longitudinal pneumatic seal system using stainless steel non-deformable strips;
- very high load capacities acting in any direction, without affecting the cylinder carriage in any way;
- tempered steel guide anchored firmly to the cylinder liner;
- ball-bearing pads made using special technology to allow very silent operation and long maintenance intervals;
- built-in adjustable pneumatic cushioning;
- provision for the application of adjustable stops and shock absorbers;
- with diameter 32 cylinders, the valves can be fixed onto the liner using the retracting sensor grooves, without the need for intermediate brackets.

TECHNICAL DATA

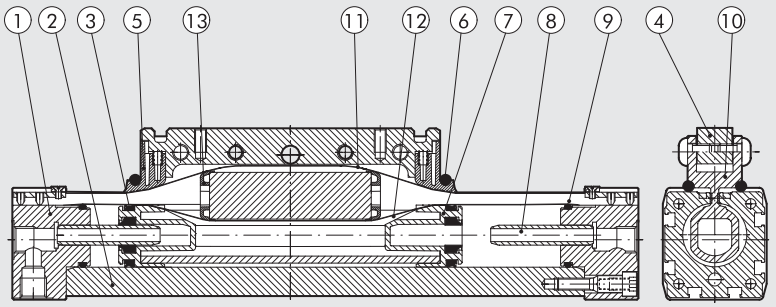
Operating pressure	bar	1 to 8
	MPa	0.1 to 0.8
	psi	14.5 to 116
Temperature range	°C	−10 to +80
	°F	14 to 176
Fluid		If unlubricated 50 µm unfiltered air is used, lubrication must be deactivated
Bore	mm	Ø 16; 25; 32
Design		Double-acting rodless cylinder with direct transmission system
Strokes	mm	Ø 16: from 100 to 1350 with intervals of 1
		Ø 25: from 100 to 2300 with intervals of 1
		Ø 32: from 100 to 2300 with intervals of 1
Threaded ports		M5, 1/8", 1/4"
Fixing position		Free
Max. speed with or without shock absorbers	m/s	≤1
Notes		**For speeds lower than 0.2 m/s, to prevent bounce, use the No stick-slip version with unlubricated.**
		When operating conditions exceed the values shown in the "Diagram of speed and maximum cushionable load", it is advisable to use the version with external shock absorbers
Lubrication		Every 2000 km or once a year (grease code 9910506)

WEIGHTS

Ø	Version 275_ _ _ _ _ _ _ _CNK		Version 276_ _ _ _ _ _ _ _CNK	
	Weight [g] Stroke = 0	Weight [g] every mm	Weight [g] Stroke = 0	Weight [g] every mm
16	500	1.79	758	1.79
25	1676	2.99	2208	2.99
32	3168	5.04	4381	5.04

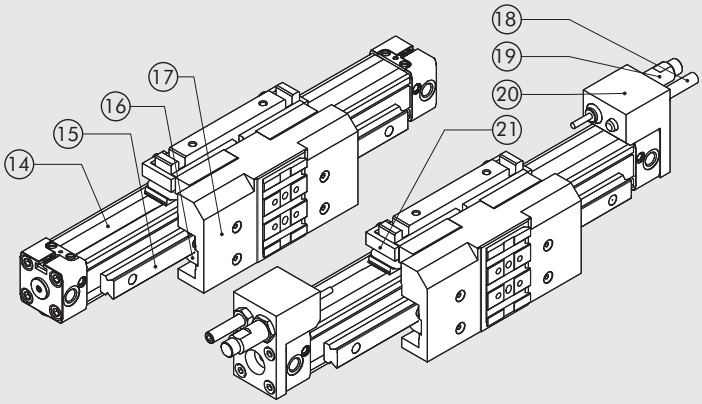
COMPONENTS

① CYLINDER HEAD: aluminium alloy
② LINER: shaped anodized aluminium alloy
③ PISTON GASKET: NBR o FKM/FPM
④ CENTRAL ELEMENT: aluminium alloy
⑤ WIPER RING: Hostaform®
⑥ OR-SEAL: FKM/FPM
⑦ PISTON: Hostaform®
⑧ CUSHIONING CONE: aluminium alloy
⑨ STATIC OR-SEAL: NBR or FKM/FPM
⑩ CARRIAGE: aluminium alloy
⑪ BOUTER STRIP: stainless steel
⑫ INNER STRIP: stainless steel
⑬ BAND SUPPORT: Hostaform®

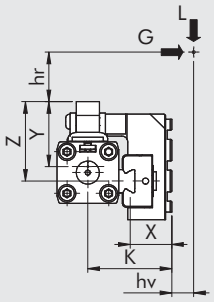


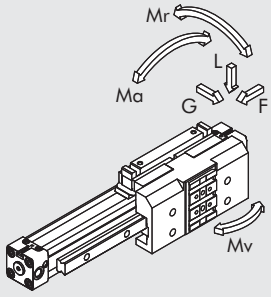
For version 275_ _ _ _ _ _ _ CNK
⑭ CYLINDER: see above
⑮ GUIDE: hardened steel
⑯ PAD: steel with hardened ball recirculation
⑰ CARRIAGE SUPPORT: anodized aluminium

For version 276_ _ _ _ _ _ _ CNK
In addition to the above details:
⑱ END-OF-STROKE STUD PIN: galvanized steel, complete with 2 galvanised steel nuts
⑲ DECELERATOR: burnished steel, complete with 2 galvanised or burnished steel nuts
⑳ DECELERATOR SUPPORT: anodized aluminium
㉑ BRACKET: hardened-andtempered galvanized steel



DIMENSIONING - MOMENTS AND FORCES





Ø	Actual force F at 6 bar [N]	Cushioning stroke [mm]	K [mm]	X [mm]	Y [mm]	Z [mm]	Max. load L [N]	Max. load G [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
16	110	15	35	16	29	33	500	500	16	15	16
25	250	21	50.5	21	44	51.5	1500	1500	100	50	100
32	420	26	59	22.5	53.5	70	3000	3000	200	100	200

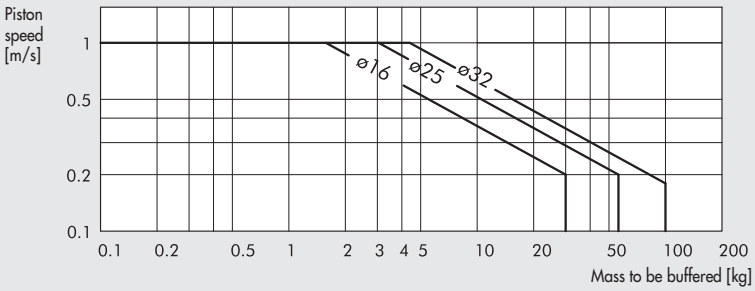
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.
$Ma = F \cdot (hr + Y)$ $Mr = G \cdot (hr + z) + L \cdot (hv + X)$ $Mv = F \cdot (K + hv)$

$$\frac{Ma}{Ma_{max}} + \frac{Mr}{Mr_{max}} + \frac{Mv}{Mv_{max}} + \frac{L}{L_{max}} + \frac{G}{G_{max}} \leq 1$$

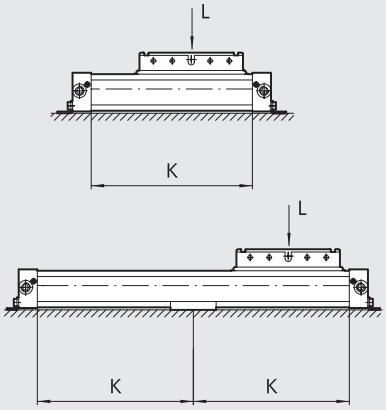
METAL WORK PNEUMATIC

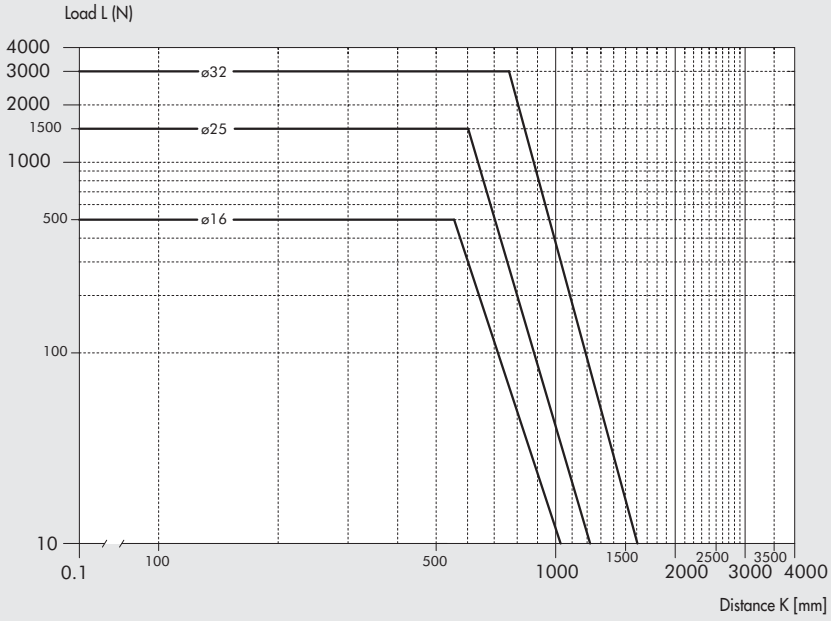
DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact, which would damage it, it is necessary to annul the kinetic energy of the moving mass and the energy generated.
The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders.
The diagram shows the speeds and cushionable masses for the various diameters at a pressure of 6 bar.

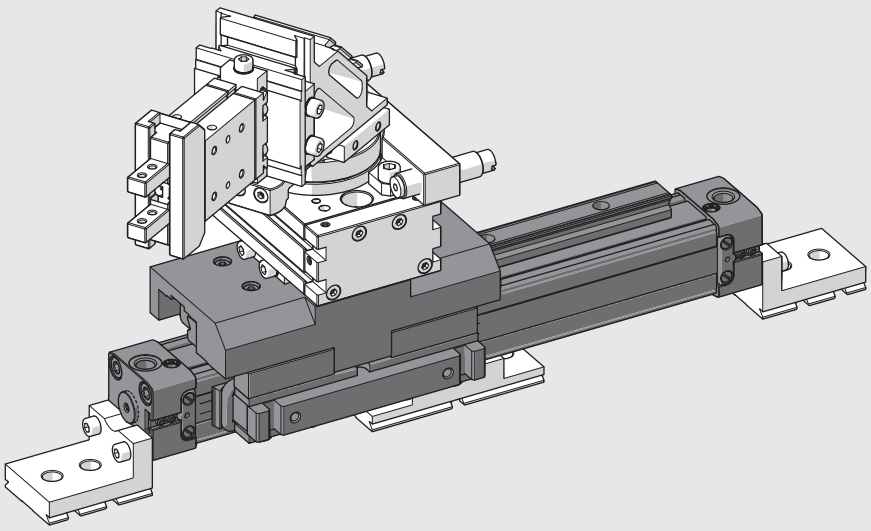


MAXIMUM LOAD BASED ON DISTANCE BETWEEN SUPPORTS



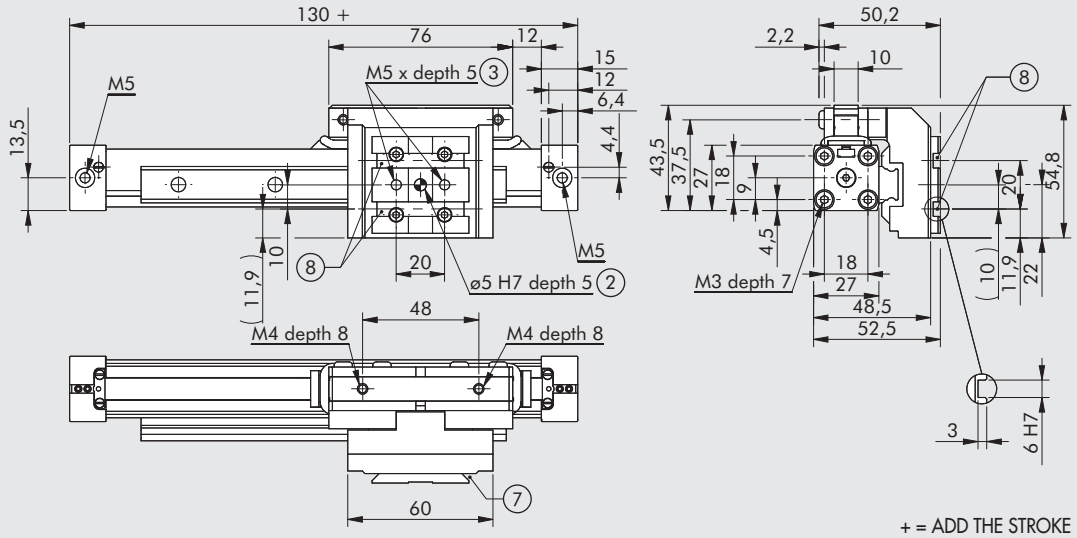


EXAMPLES OF APPLICATION



DIMENSIONS

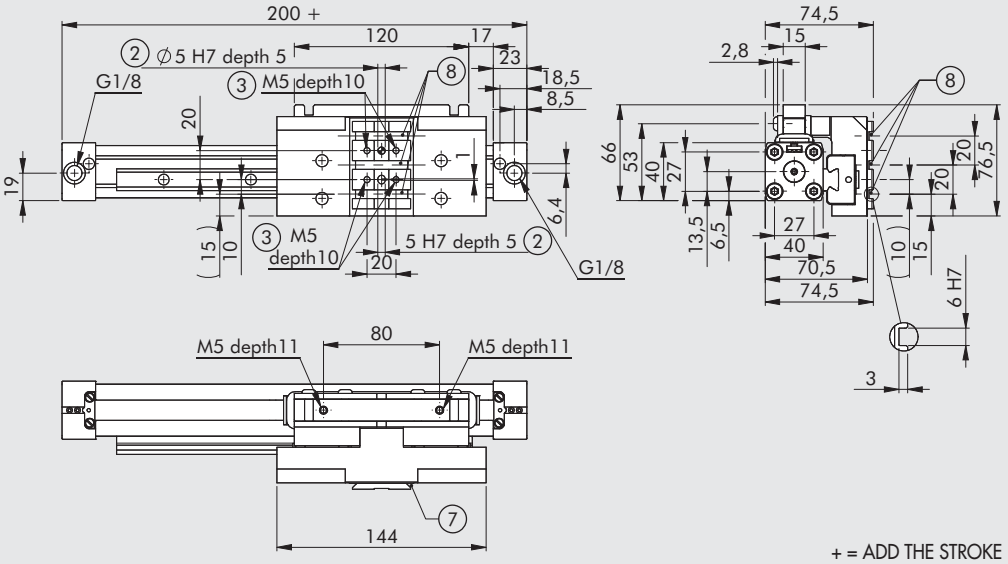
Ø 16



② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

+ = ADD THE STROKE

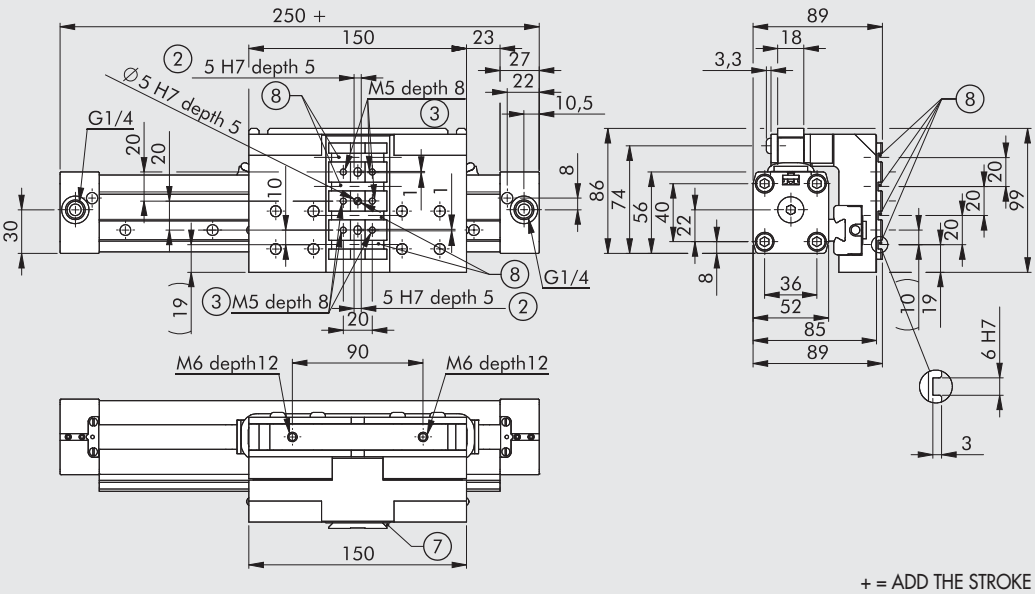
Ø 25



② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

+ = ADD THE STROKE

Ø 32



② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

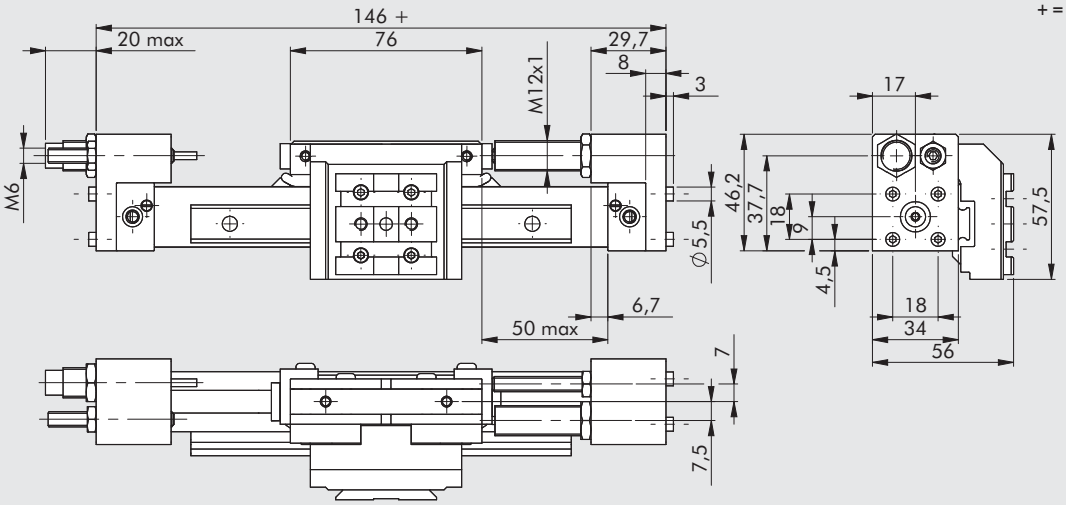
+ = ADD THE STROKE

METAL WORK PNEUMATIC

DIMENSIONS OF VERSION WITH DECELERATORS

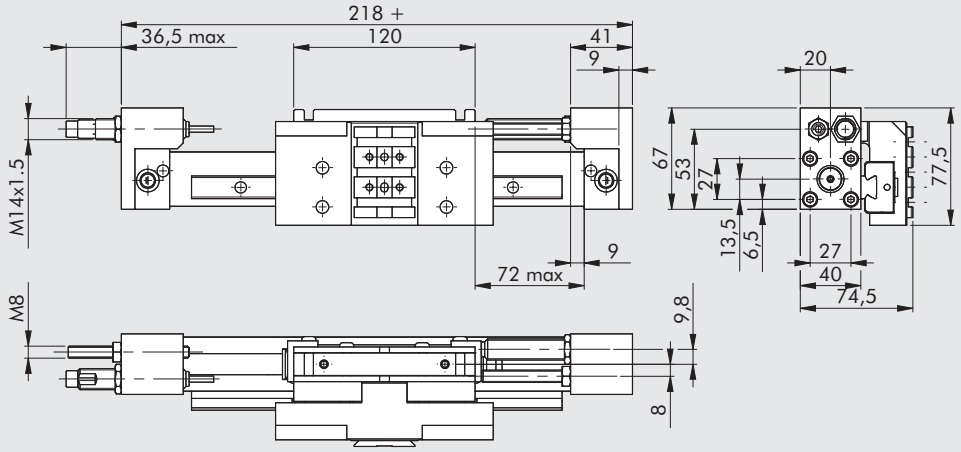
Ø 16

+ = ADD THE STROKE



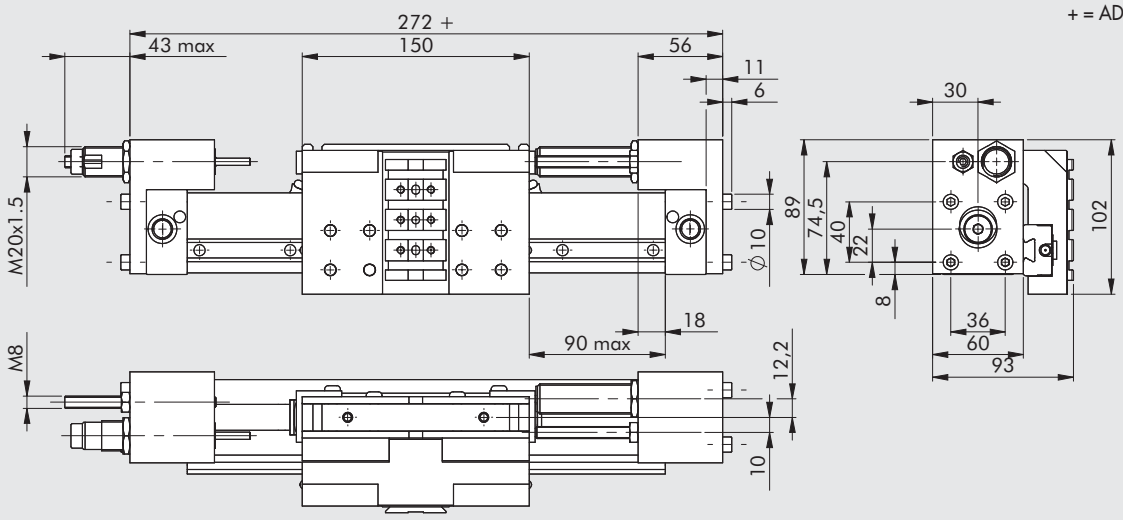
Ø 25

+ = ADD THE STROKE



Ø 32

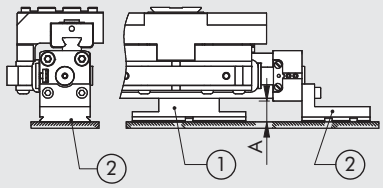
+ = ADD THE STROKE



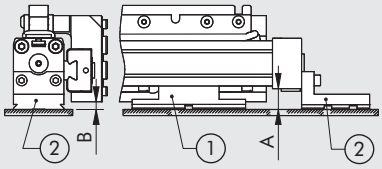
Ø	Stroke	Max. cushioning		Max. impact	Max. thrust
		For stroke [J]	For hour [J]	force [N]	force [N]
16	10	4.5	14125	1000	220
25	16	18	34000	2800	530
32	22	40	53700	3750	890

ASSEMBLY DIAGRAMS

275 (horizontal)

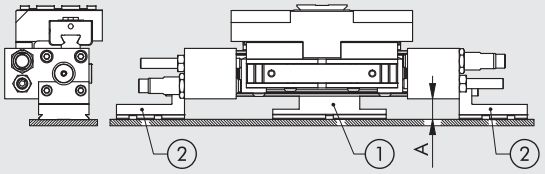


275/276 (vertical)

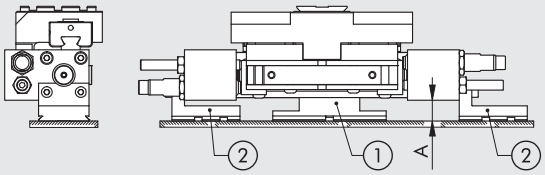


276 (horizontal)

Ø 16 - 25



Ø 32



Ø	A	Horizontal		A	B	Vertical	
		Intermediate support code (1)	Foot code (2)			Intermediate support code (1)	Foot code (2)
16	17	**W0950164004K**	**W0950167001K**	17	5.7	**W0950164004K**	**W0950167001K**
25	16.5	**W0950254004K**	**W0950257001K**	16.5	6	**W0950254004K**	**W0950257001K**
32	17.5	**W0950324004K**	**W0950327001K**	17.5	4.5	**W0950324004K**	**W0950327001K**

KEY TO CODES

CYL	27	5	0	32	0100	C	N	K
	TYPE			**BORE**	**STROKE**		**GASKETS**	**FAMILY**
	27 Rodless cylinder	**5** Dual-acting, cushioned, magnetic, with ball recirculation guides ▲ **6** Dual-acting, cushioned, with ball recirculation guides + adjustable stops and decelerators	**0** Magnetic **S** Non-magnetic ■ **G** No stick-slip	16 25 32	**Ø 16**: 100 to 1350 mm **Ø 25** and **32**: 100 to 2300 mm		**N** NBR gaskets	**K** V-Lock

■ **Use at speeds lower than 0.2 m/s to prevent bounce. Use unlubricated air only.**

▲ For use in conditions exceeding those shown in the "Diagram of speed and maximum cushionable load" on page **A3**.39.

NOTES

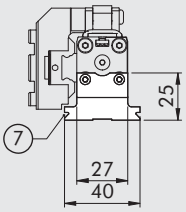
ACCESSORIES: FIXINGS

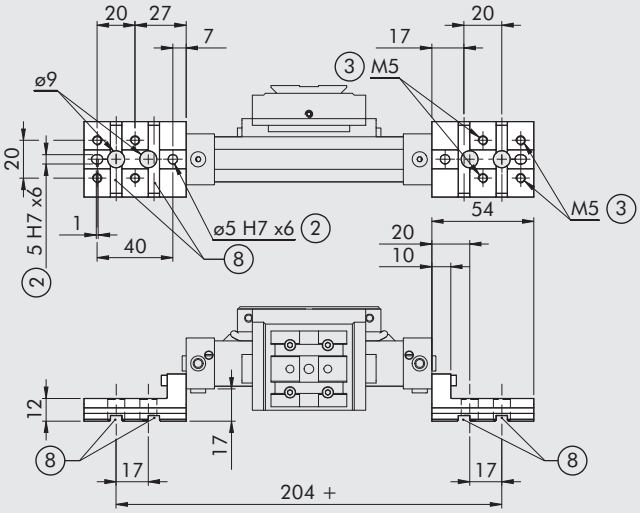
FOOT Ø 16, CODE W0950167001K

+ = ADD THE STROKE

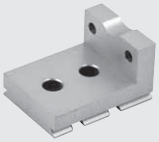
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see
chapter V-Lock adaptors
⑧ Slot for "V-Lock" precision key

Weight: 68 g
Note: One element per pack, complete with 2 short screws for fixing to the head and 2 long screws for use when a decelerator support is prese





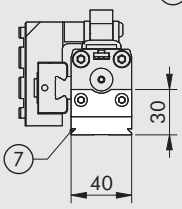
FOOT Ø 25, CODE W0950257001K

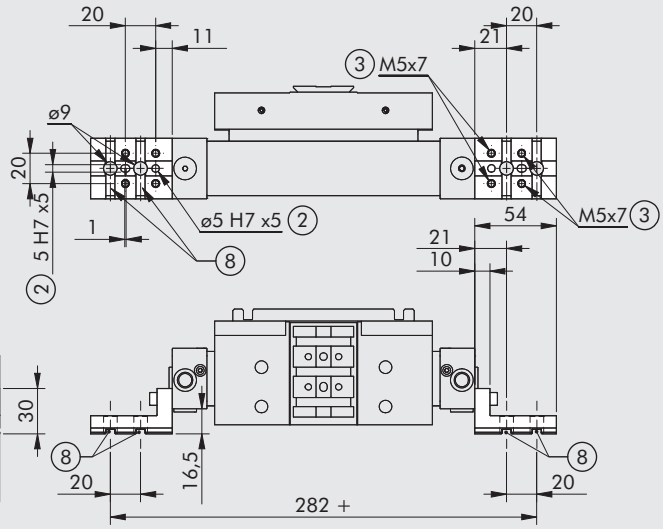


+ = ADD THE STROKE

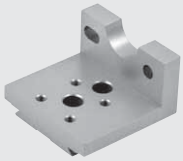
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see
chapter V-Lock adaptors
⑧ Slot for "V-Lock" precision key

Weight: 94 g
Note: One element per pack, complete with 2 short screws for fixing to the head and 2 long screws for use when a decelerator support is prese





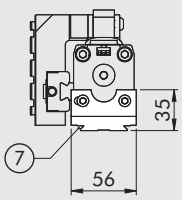
FOOT Ø 32, CODE W0950327001K

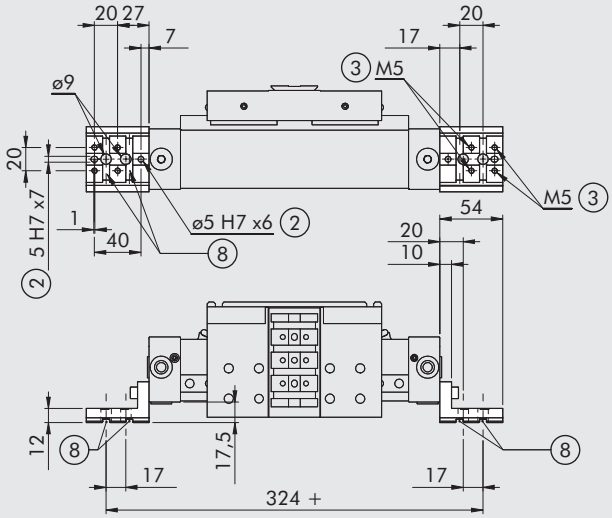


+ = ADD THE STROKE

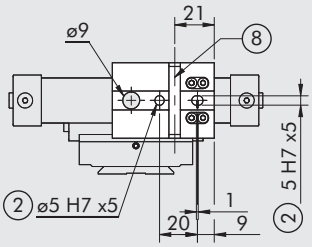
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see
chapter V-Lock adaptors
⑧ Slot for "V-Lock" precision key

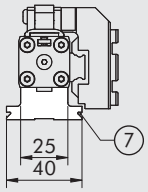
Weight: 148 g
Note: One element per pack, complete with 2 short screws for fixing to the head and 2 long screws for use when a decelerator support is prese

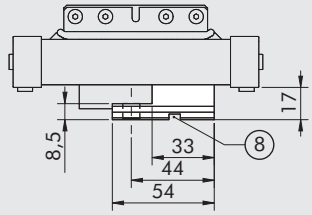




INTERMEDIATE SUPPORT Ø 16, CODE W0950164004K



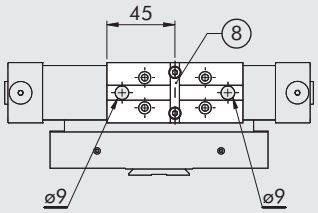


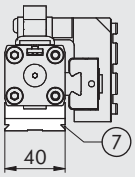


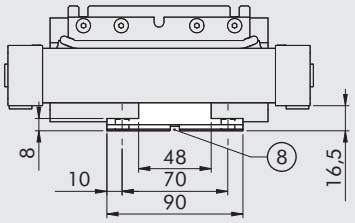
② Holes for centring pins
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see
chapter V-Lock adaptors
⑧ Slot for "V-Lock" precision key

Weight: 70 g
Note: 1 per pack, complete with 4 screws

INTERMEDIATE SUPPORT Ø 25, CODE W0950254004K



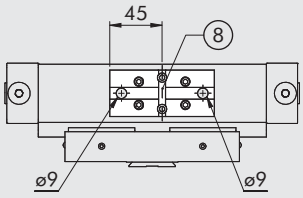


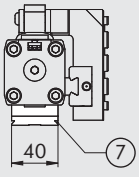


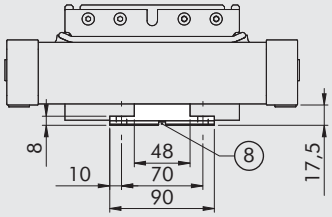
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see
chapter V-Lock adaptors
⑧ Slot for "V-Lock" precision key

Weight: 127 g
Note: Plate supplied with 2 screws

INTERMEDIATE SUPPORT Ø 32, CODE W0950324004K







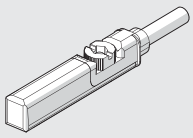
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see
chapter V-Lock adaptors
⑧ Slot for "V-Lock" precision key

Weight: 136 g
Note: 1 support + 4 screws and 4 fixing plates

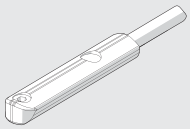
ACCESSORIES: MAGNETIC SENSORS

RETRACTING SENSOR

SENSOR, SQUARE TYPE
Latest generation, secure fixing

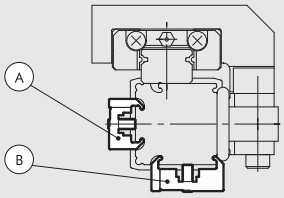


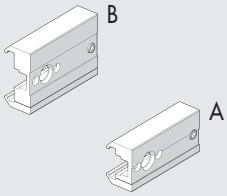
SENSOR, OVAL TYPE
Traditional



For codes and technical data, see **chapter A6**.

Ø 16 SENSOR SUPPORT

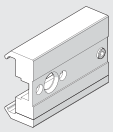




Code Sensor support	Description Sensor support	Type Sensor support	Mounting on the carriage opposite side	Mounting on the guide opposite side
0950164003	Sensor support short	A	•	
0950164001	Sensor support std	B		•

Note: Supplied cmplete with 2 screw, 1 pin

Ø 25 SENSOR SUPPORT

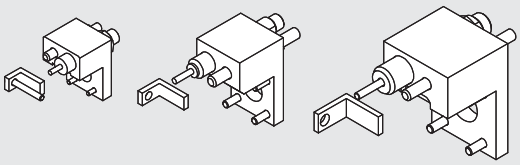


Code	Description
0950164001	Sensor support STD

Note: Supplied with 1 stud pin, 2 screws

ACCESSORIES: DECELERATORS

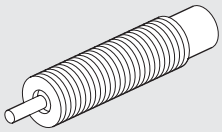
ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS KIT



Code	Description	Weight [g]
0950164002K	Rodless cylinder limit switch and shock absorbers Ø 16 V-Lock	133
0950254002K	Rodless cylinder limit switch and shock absorbers Ø 25 V-Lock	267
0950324002K	Rodless cylinder limit switch and shock absorbers Ø 32 V-Lock	610

Note: Kit contents: 1 decelerator support, 1 decelerator, 1 decelerator nut, 1 stop grub screw, 1 grub screw nut, 1 bracket, 1 bracket screw (for Ø 16 only), 4 support locking screws.

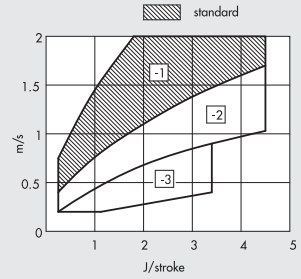
SHOCK ABSORBERS



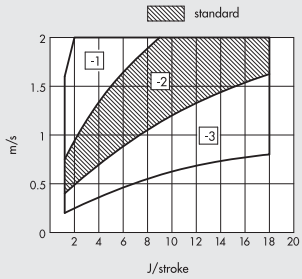
Code	Description	Ø
0950004003	Shock absorbers ECO15 MF1 + nut M12x1	16
0950004004	Shock absorbers ECO25 MC2 + nut M14x1.5	25
0950004005	Shock absorbers ECO50 MC2 + nut M20x1.5	32

GRAPHS TO HELP CHOOSE THE RIGHT SHOCK ABSORBERS

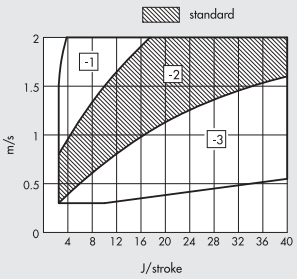
Ø 16



Ø 25



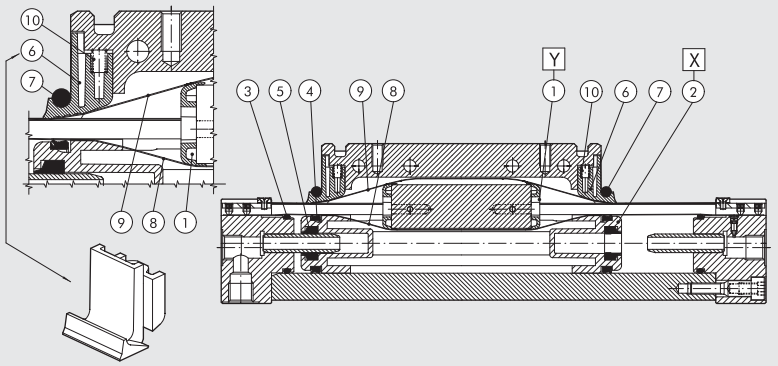
Ø 32

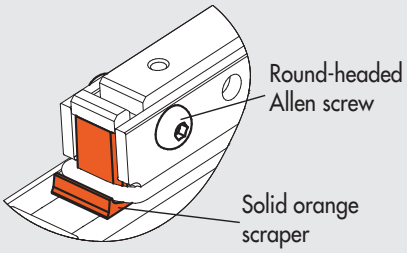


The dotted areas indicate that the SHOCK ABSORBERS is supplied standard. Other options can be selected depending on the speed [m/sec] and the maximum work force [J/stroke] to dissipate at each stroke. Refer to the diagrams above to select the correct option.

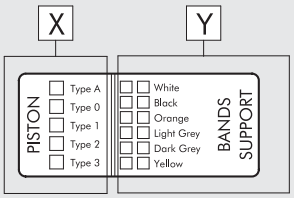
SPARES

① Band support kit
② Piston kit
③ ④ ⑤ ⑥ ⑦ ⑩ NBR gaskets Kit (FKM/FPM for ⑦)
⑧ ⑨ Bands Kit (inner/outer)





Spare parts label on one cylinder side



BANDS SUPPORT KIT POS 1 (Y)

Ø	Code White	Code Black	Code Orange	Code Light grey	Code Dark grey	Code Yellow
16	0090165080	0090165081	0090165082	0090165083	0090165084	0090165085
25	0090255080	0090255081	0090255082	0090255083	0090255084	0090255085
32	0090325080	0090325081	0090325082	0090325083	0090325084	0090325085

PISTON KIT POS 2 (X)

Ø	Code Type 0 (0 rings)	Code Type 1 (1 rings)	Code Type 2 (2 rings)	Code Type 3 (3 rings)	Code Type A (4 rings)	Code Yellow
16	0090165015	0090165016	0090165017	0090165018	–	0090165085
25	0090255015	0090255016	0090255017	0090255018	0090255019	0090255085
32	0090325015	0090325016	0090325017	0090325018	0090325019	0090325085

BANDS KIT (INNER AND OUTER) POS. 8-9

Ø	Code
16	0090166_ _ _ _
25	0090256_ _ _ _
32	0090326_ _ _ _

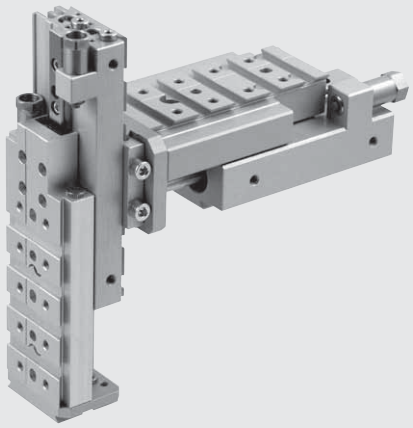
Complete the code with the 4 figure cylinder stroke.

NBR GASKET KIT POS. 3-4-5-6-7-10

Ø	Code
16	0090165022
25	0090255022
32	0090325022

COMPACT PRECISION SLIDE SERIES S14K

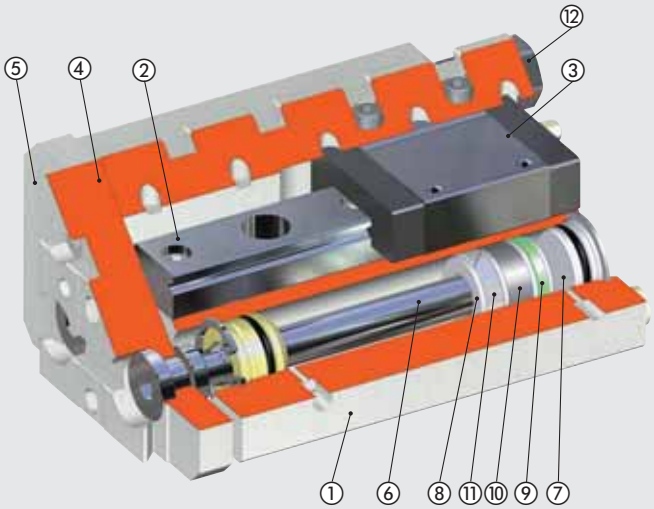
Flat, compact precision slides with two cylinders.
The fixed and moving parts are moved by a sturdy ball recirculation carriage running on hardened guides. Elastic mechanical stop or shock absorbers are used to achieve adjustable stop at the end of the stroke.
A three-position version is available allowing an intermediate stop.
Slots are provided in the body for end-of-stroke sensors.



TECHNICAL DATA		S14K-8	S14K-16	S14K-25
Operating pressure	bar	2 to 8		
	psi	29 to 116		
Temperature range	°C	–10 to +80		
Fluid		Dry or lubricated 10 µm filtered compressed air. Lubrication, if used, must be continuous		
Maximum speed	m/s	0.8 (we always suggest to use micro regulator)	0.8	0.8
Versions		With shock absorbers – With elastic mechanical stop		
Bore		2 x Ø 8	2 x Ø 16	2 x Ø 25
Piston rod diameter	mm	4	8	12
Strokes	mm	10, 20, 30, 40, 50, 80, 100	10, 20, 30, 40, 50, 80, 100, 125, 150	10, 20, 30, 40, 50, 80, 100, 125, 150, 200
Stroke reduction by adjusting the decelerators retraction	mm	16 extension / 16 retraction	12 extension / 12 retraction	30 extension / 30 retraction
Stroke reduction by adjusting the buffers retraction	mm	8 extension / 8 retraction	10 extension / 10 retraction	15 extension / 15 retraction
Maximum impact energy with hydraulic decelerators	J	2	5	20
Maximum impact energy with buffers	J	0.15	0.25	0.5
Sensors		Sensors Magnetic Hall or Reed		
Theoretical thrust force at 6 bar	N	60	240	589
Theoretical pull force at 6 bar	N	46	180	453
Repeatability in stop positions	mm	0.02 (with shock absorbers); 0.02 (with buffers and 5 bar minimum pressure)		
Monitoring position		Any		
Notes		Lubrication recommended: every 2 million cycles for strokes below 100 mm and 1 million for longer strokes (grease code 9910506)		

COMPONENTS

① SLIDE BODY: anodised aluminium
② GUIDE: hardened steel
③ CARRIAGE: recirculating ball bearings
④ MOVING PART: anodised aluminium
⑤ FRONT PLATE: anodised aluminium
⑥ PISTON ROD: stainless steel
⑦ END CAP: brass
⑧ PISTON: aluminium
⑨ GASKETS: polyurethane/NBR
⑩ MAGNET: plastoferrite/plastoneodymium
⑪ GUIDE STRIP: special technopolymer
⑫ STOP: stainless steel



WEIGHTS OF SLIDES AND OF MOVING MASSES

S14K Ø 8

Stroke [mm]	Total slide weight [kg]	Masses in movement [kg]
10	0.341	0.162
20	0.337	0.162
30	0.335	0.162
40	0.369	0.178
50	0.430	0.208
80	0.526	0.148
100	0.591	0.174

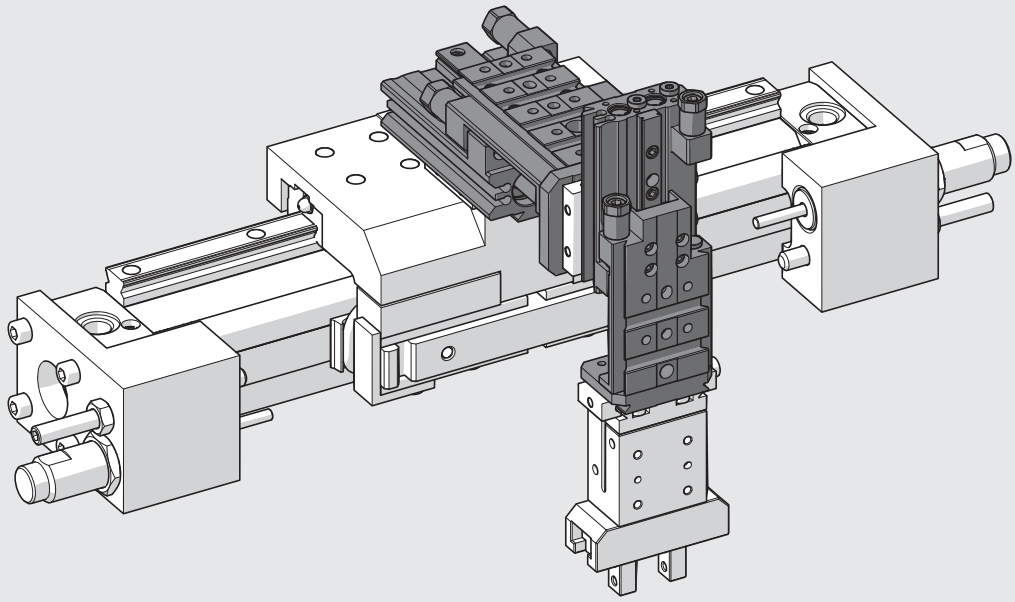
S14K Ø 16

Stroke [mm]	Total slide weight [kg]	Masses in movement [kg]
10	0.783	0.386
20	0.777	0.386
30	0.773	0.386
40	0.839	0.413
50	0.905	0.436
80	1.110	0.531
100	1.363	0.648
125	1.533	0.721
150	1.678	0.773

S14K Ø 25

Stroke [mm]	Total slide weight [kg]	Masses in movement [kg]
10	2.582	1.137
20	2.570	1.137
30	2.561	1.137
40	2.548	1.137
50	2.705	1.198
80	3.143	1.367
100	3.434	1.469
125	3.788	1.608
150	4.180	1.748
200	4.914	2.026

EXAMPLES OF APPLICATION



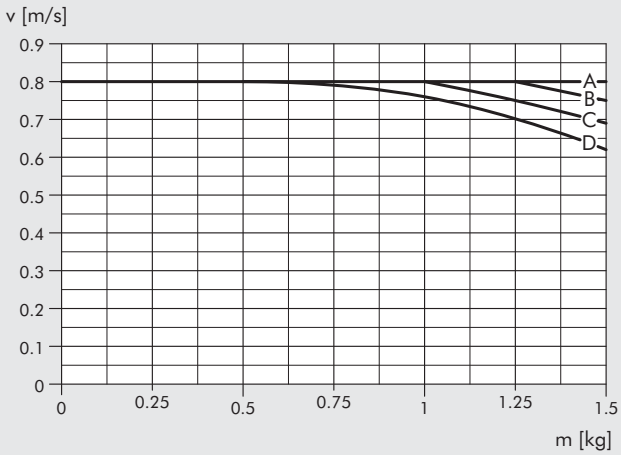
MAXIMUM LOADS AND SPEEDS

The graphs below show the maximum recommended movable loads (masses) [kg] as a function of the average traverse speed [m/s], defined as stroke/time, slide position (horizontal/vertical) and supply pressure.
The following stop versions are available:
- buffer: for lightweight applications, with a lower amount of energy to cushion (relatively low speeds and loads);
- shock absorbers: for heavy-duty applications, with more energy to cushion.

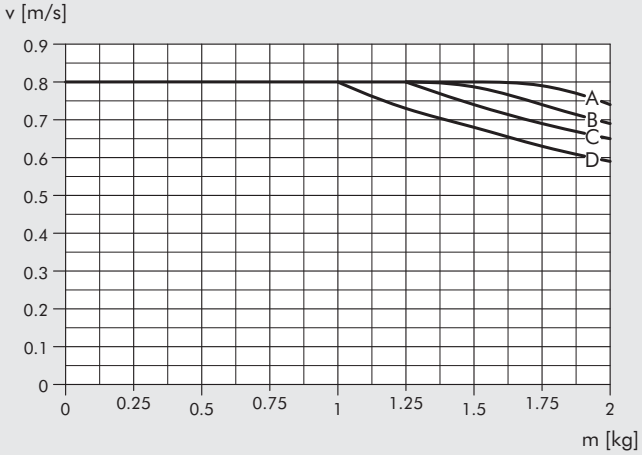
METAL WORK PNEUMATIC

MAXIMUM LOADS: VERSIONS WITH SHOCK ABSORBERS

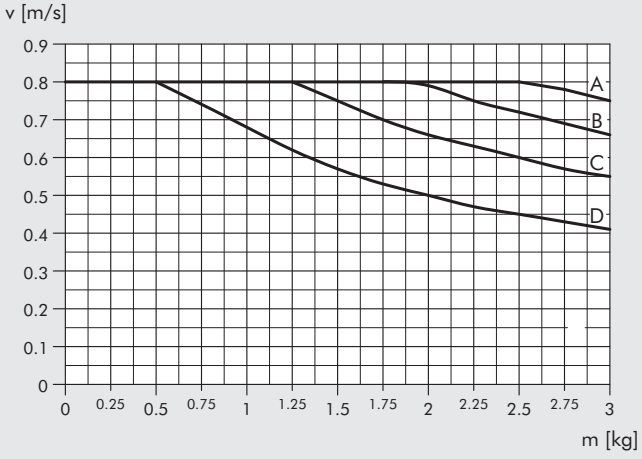
S14K **Ø 8** - Vertical orientation



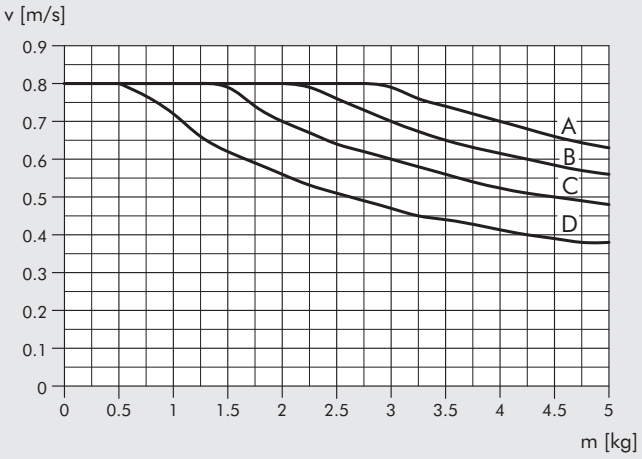
S14K **Ø 8** - Horizontal orientation



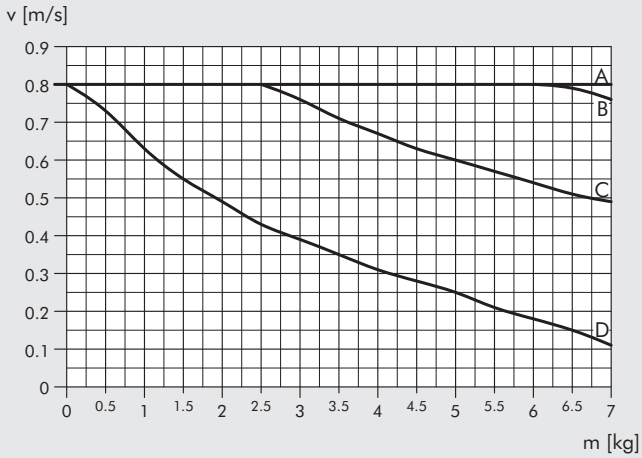
S14K **Ø 16** - Vertical orientation



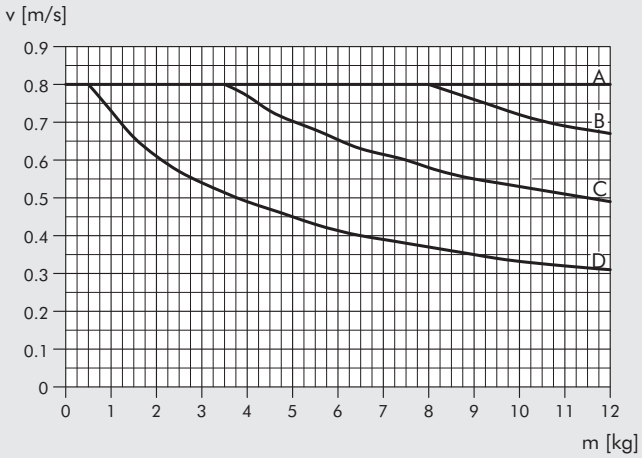
S14K **Ø 16** - Horizontal orientation



S14K **Ø 25** - Vertical orientation



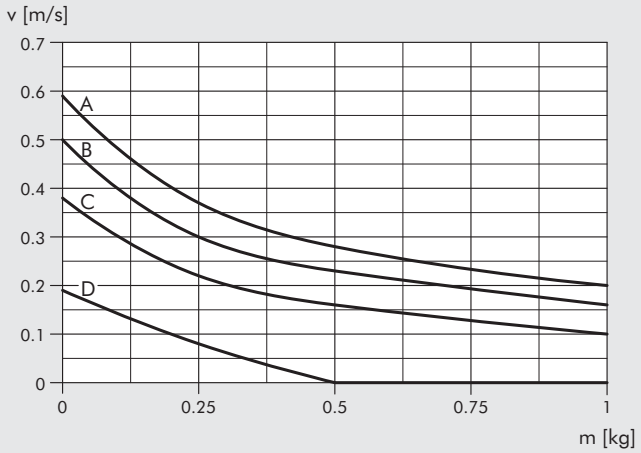
S14K **Ø 25** - Horizontal orientation



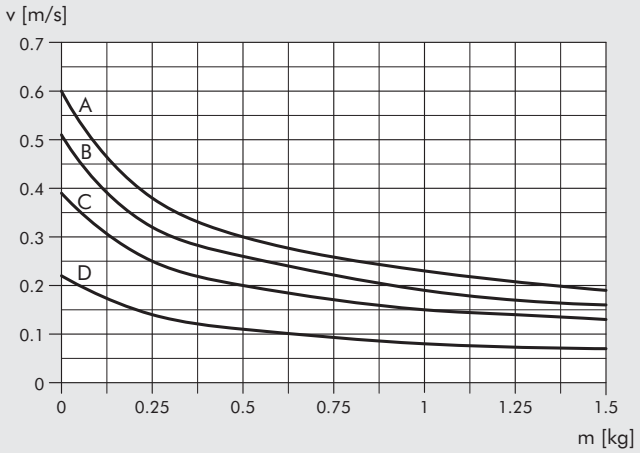
A = 2 bar B = 4 bar C = 6 bar D = 8 bar

MAXIMUM LOADS: VERSIONS WITH ELASTIC MECHANICAL STOP

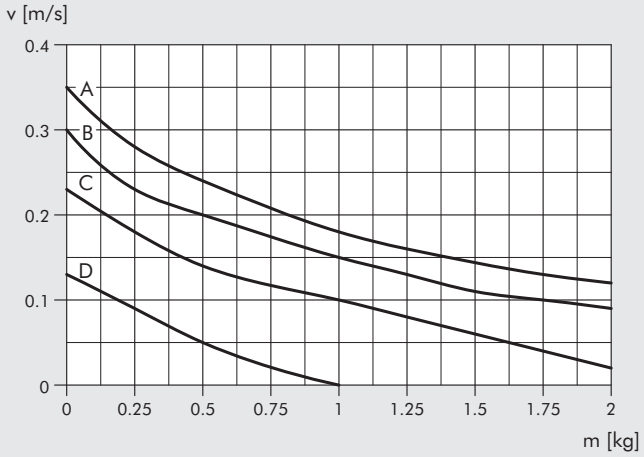
S14K **Ø 8** - Vertical orientation



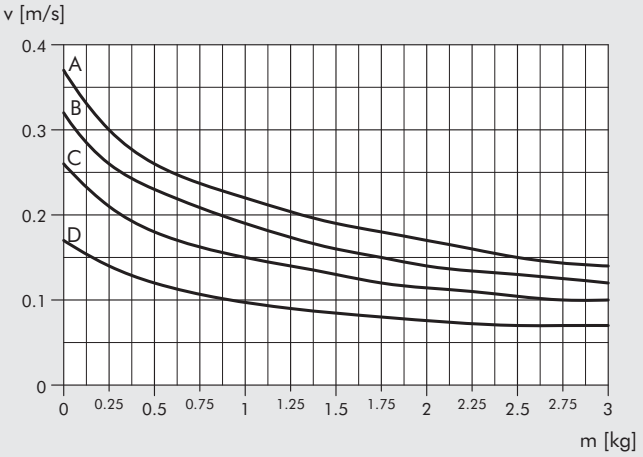
S14K **Ø 8** - Horizontal orientation



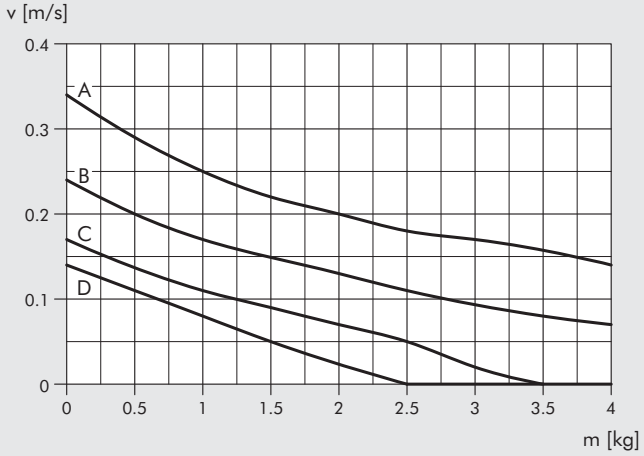
S14K **Ø 16** - Vertical orientation



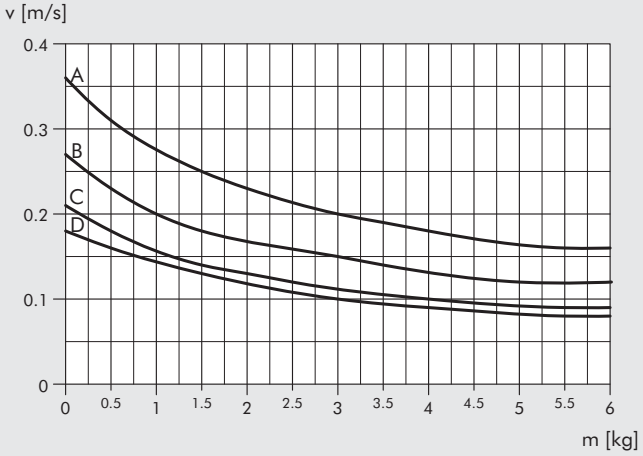
S14K **Ø 16** - Horizontal orientation



S14K **Ø 25** - Vertical orientation



S14K **Ø 25** - Horizontal orientation



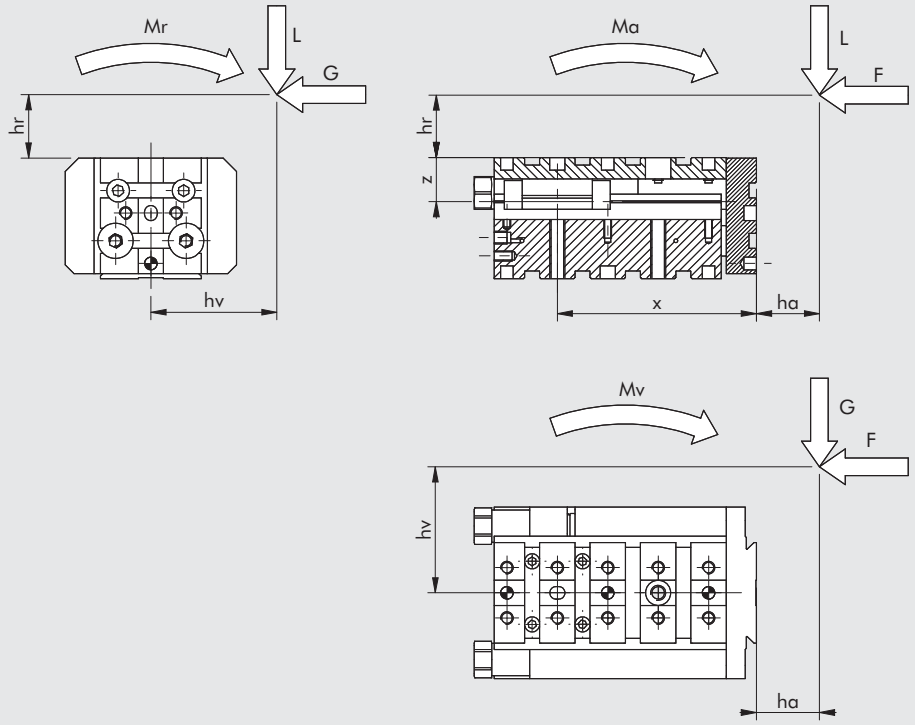
A = 2 bar B = 4 bar C = 6 bar D = 8 bar

METAL WORK PNEUMATIC

STATIC FORCES AND MOMENTS

To prevent the recirculating ball guide from getting damaged, the maximum static loads and moments applied must meet the following equations, where the lengths have to be given in metres.

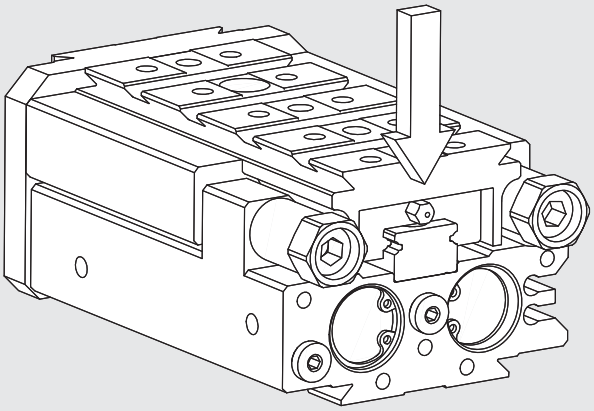
$$\frac{Ma}{Ma\ max} + \frac{Mr}{Mr\ max} + \frac{Mv}{Mv\ max} + \frac{L}{L\ max} + \frac{G}{G\ max} \leq 1$$



Sum of the moments, with the signs shown in the example:
Mr = L · hv - G · (hr+z)
Ma = -F · (hr+z) + L · (ha+x)
Mv = -F · hv + G · (ha+x)

Ø	Stroke [mm]	X [mm]	Z [mm]	G max [N]	L max [N]	Mr max [Nm]	Ma max [Nm]	Mv max [Nm]
8	10	61	14	309.1	368.0	1.8	1.3	1.1
	20	61	14	309.1	368.0	1.8	1.3	1.1
	30	61	14	309.1	368.0	1.8	1.3	1.1
	40	71	14	309.1	368.0	1.8	1.3	1.1
	50	83.5	14	398.2	474.1	2.7	2.7	2.2
	80	113.5	14	398.2	474.1	2.7	2.7	2.2
	100	133.5	14	398.2	474.1	2.7	2.7	2.2
16	10	67	17.5	962.6	1145.9	10.7	9.1	7.7
	20	67	17.5	962.6	1145.9	10.7	9.1	7.7
	30	67	17.5	962.6	1145.9	10.7	9.1	7.7
	40	79	17.5	962.6	1145.9	10.7	9.1	7.7
	50	79	17.5	962.6	1145.9	10.7	9.1	7.7
	80	119	17.5	962.6	1145.9	10.7	9.1	7.7
	100	146.5	17.5	962.6	1145.9	10.7	9.1	7.7
	125	171.5	17.5	962.6	1145.9	10.7	9.1	7.7
	150	196.5	17.5	962.6	1145.9	10.7	9.1	7.7
25	10	98	22	1423.1	1694.1	43.6	18	15.1
	20	98	22	1423.1	1694.1	43.6	18	15.1
	30	98	22	1423.1	1694.1	43.6	18	15.1
	40	98	22	1423.1	1694.1	43.6	18	15.1
	50	108	22	1423.1	1694.1	43.6	18	15.1
	80	138	22	1423.1	1694.1	43.6	18	15.1
	100	158	22	1423.1	1694.1	43.6	18	15.1
	125	183	22	1423.1	1694.1	43.6	18	15.1
	150	208	22	1423.1	1694.1	43.6	18	15.1
	200	258	22	1423.1	1694.1	43.6	18	15.1

LUBRICATION INSTRUCTIONS



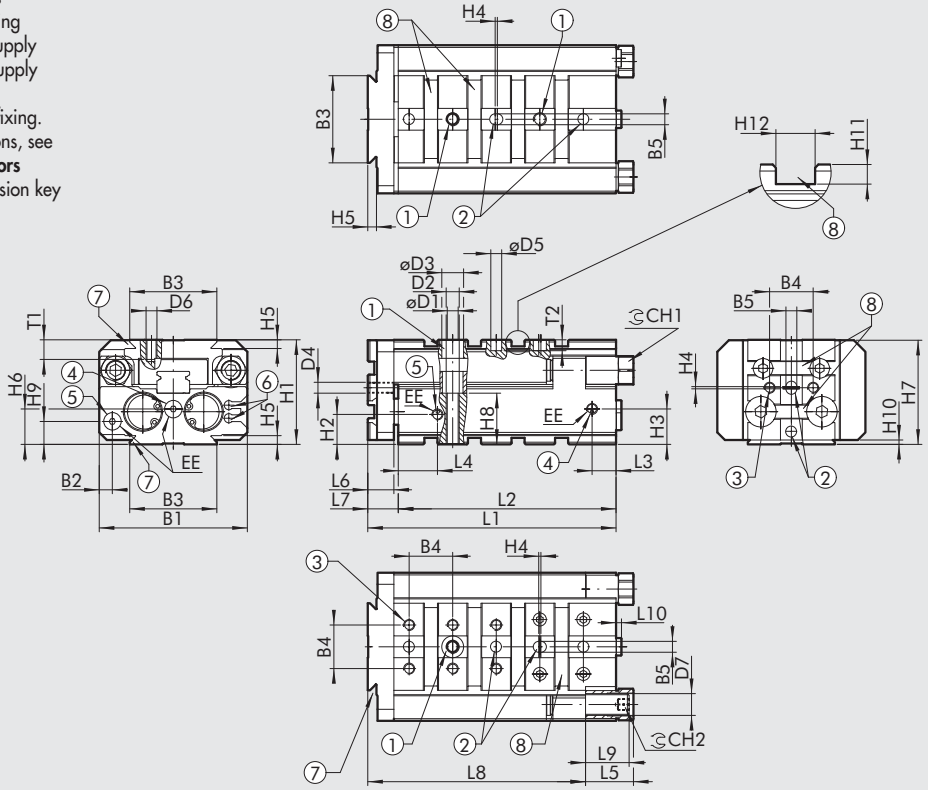
Ball recirculation carriages are supplied pre-lubricated.
They can be re-greased when necessary using the hole (Ø 8) or greasing Nipple (Ø 16 and Ø 25) provided.
The lubrication frequency depends on the environmental and operating conditions.
To ensure smooth movement and long life, we recommend an average lubrication interval of 2 million cycles for strokes less than 100 mm and 1 million for longer strokes.
A suitable bearing lubrication grease must be used (code 9910506).

NOTES

METAL WORK PNEUMATIC

DIMENSIONS

① Through holes for fixing actuators
② Holes for centring pins
③ Threaded holes for fixing
④ Piston rod extension supply
⑤ Piston rod retraction supply
⑥ Sensor fixing slots
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key



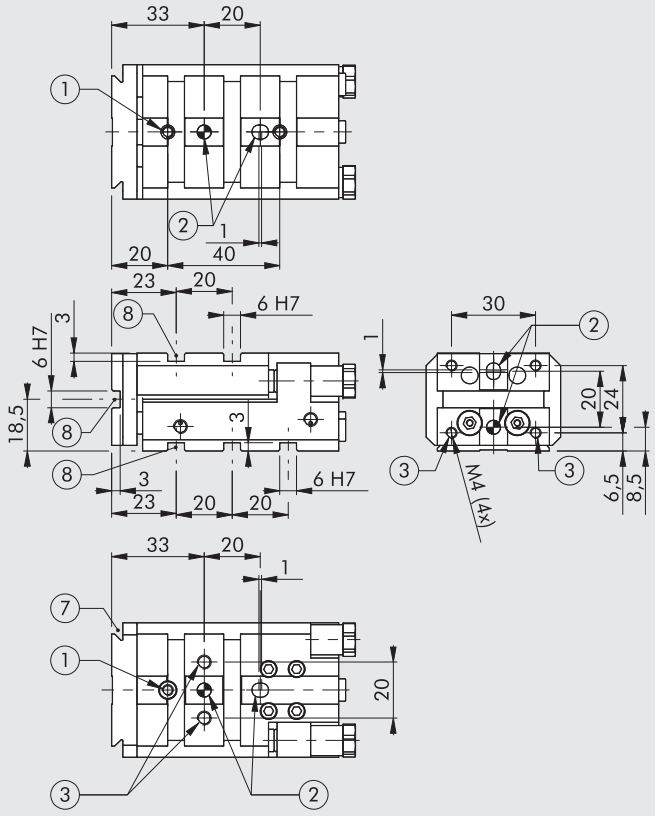
Ø	B1	B2	B3	B4	B5H7	øD1	D2	øD3	D4	øD5H7	D6	D7	EE	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12H7	T1	T2	CH1	CH2
8	48	7	40	-	5	3.3	M4	6	-	5	M5	M8x1	M5	35	8.8	11.3	1	4	10	34.8	17	7.5	2	3	6	6	5	11	4
16	68	6	40	20	5	5	M6	9.5	M5	5	M5	M10x1	M5	48	13.8	16.3	1	4	16.3	47.8	23.5	10.5	2	3	6	9	5	13	5
25	106	7.5	40	20	5	6.8	M8	11	M5	5	M5	M14x1.5	1/8"	64	17.3	23	1	4	17	63.8	35	12	2	3	6	10	5	18	6

ACCORDING TO THE STROKE

Ø	Stroke	L1	L2	L3	L4	L5	L6	L7	L8	L9		L10
										buffer decel.	shock absorbers	
	10	81	70	10	13.5	16	9	11	71	15	27.9	2.5
	20	81	70	10	13.5	16	9	11	71	15	27.9	2.5
	30	81	70	10	13.5	16	9	11	71	15	27.9	2.5
8	40	91	80	10	13.5	16	9	11	81	15	27.9	2.5
	50	106	95	10	13.5	16	9	11	96	15	27.9	2.5
	80	136	125	10	13.5	16	9	11	126	15	27.9	2.5
	100	156	145	10	13.5	16	9	11	146	15	27.9	2.5
	10	109	95	11	18	22	12	14	95	20	30.7	2.5
	20	109	95	11	18	22	12	14	95	20	30.7	2.5
	30	109	95	11	18	22	12	14	95	20	30.7	2.5
	40	119	105	11	18	22	12	14	105	20	30.7	2.5
16	50	129	115	11	18	22	12	14	115	20	30.7	2.5
	80	159	145	11	18	22	12	14	145	20	30.7	2.5
	100	179	165	11	18	22	12	14	165	20	30.7	2.5
	125	204	190	11	18	22	12	14	190	20	30.7	2.5
	150	229	215	11	18	22	12	14	215	20	30.7	2.5
	10	138	120	16.5	25	30	16	18	118	28	65.7	2.5
	20	138	120	16.5	25	30	16	18	118	28	65.7	2.5
	30	138	120	16.5	25	30	16	18	118	28	65.7	2.5
	40	138	120	16.5	25	30	16	18	118	28	65.7	2.5
25	50	148	130	16.5	25	30	16	18	128	28	65.7	2.5
	80	178	160	16.5	25	30	16	18	158	28	65.7	2.5
	100	198	180	16.5	25	30	16	18	178	28	65.7	2.5
	125	223	205	16.5	25	30	16	18	203	28	65.7	2.5
	150	248	230	16.5	25	30	16	18	228	28	65.7	2.5
	200	298	280	16.5	25	30	16	18	278	28	65.7	2.5

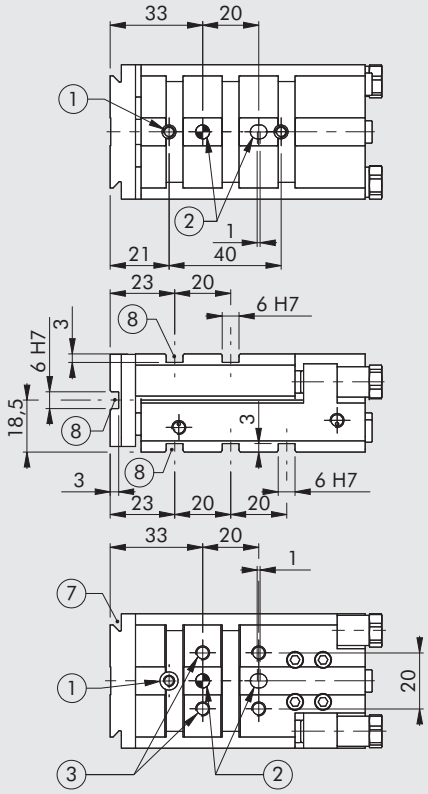
DIMENSIONS OF SLIDE S14K Ø 8

Ø 8 stroke 10; 20; 30 mm

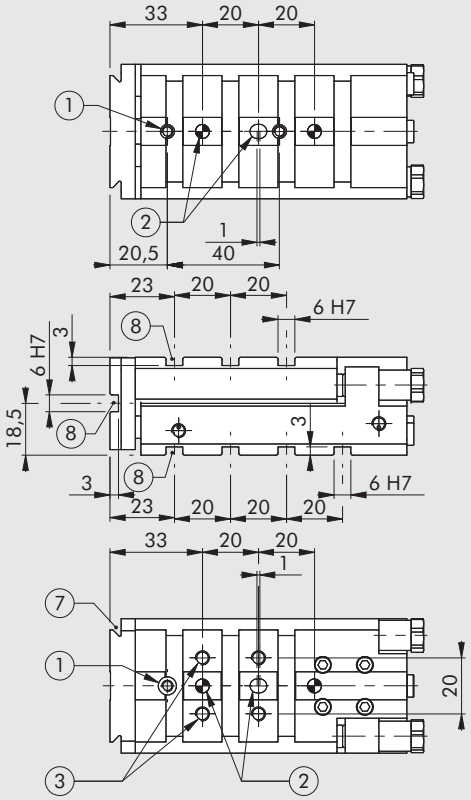


① Through holes for fixing actuators
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

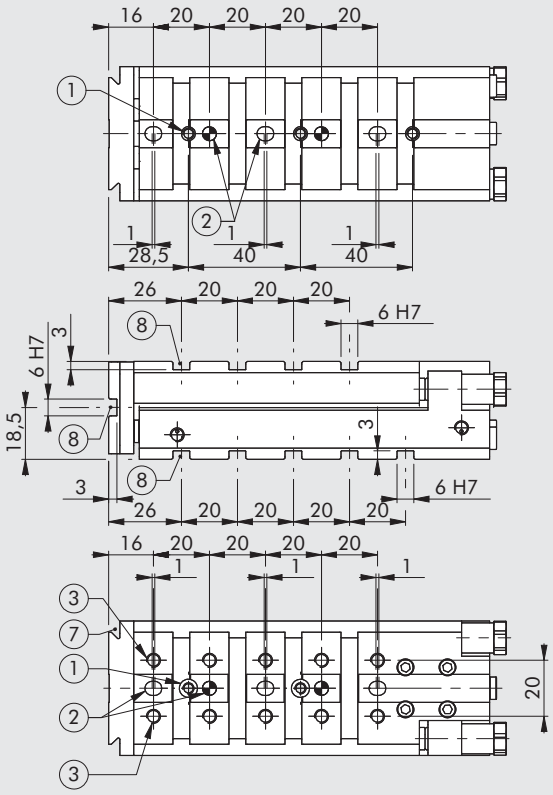
Ø 8 stroke 40 mm



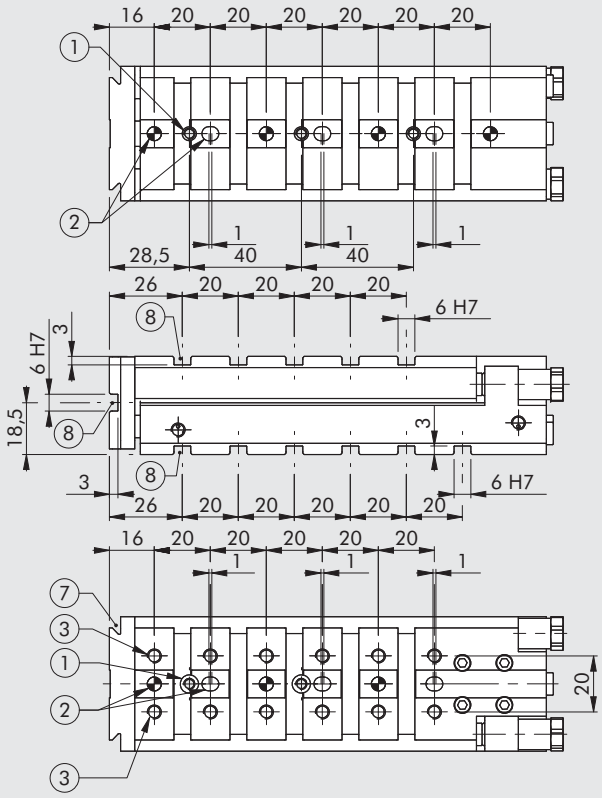
Ø 8 stroke 50 mm



Ø 8 stroke 80 mm



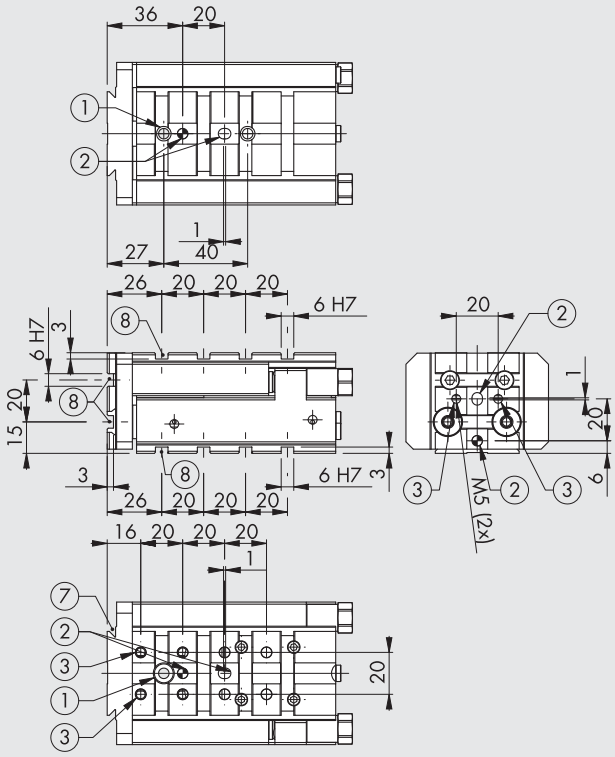
Ø 8 stroke 100 mm



NOTES

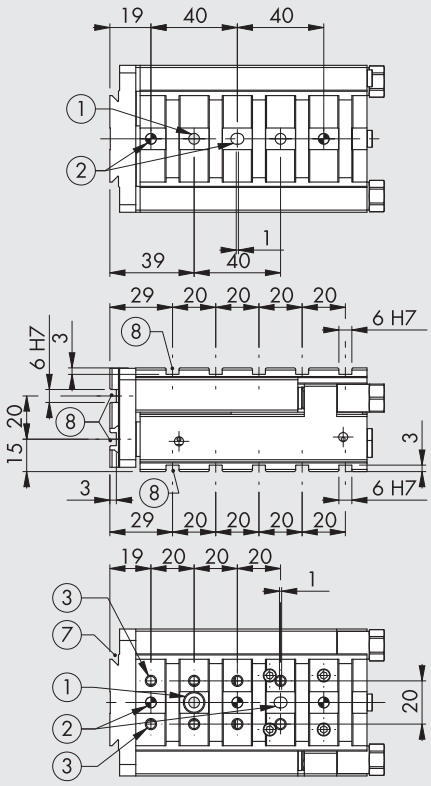
DIMENSIONS OF SLIDE S14K Ø 16

Ø 16 stroke 10; 20; 30 mm

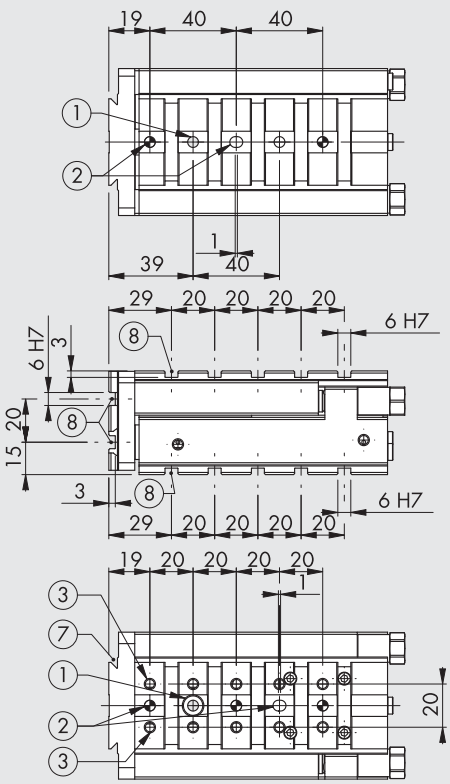


① Through holes for fixing actuators
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

Ø 16 stroke 40 mm

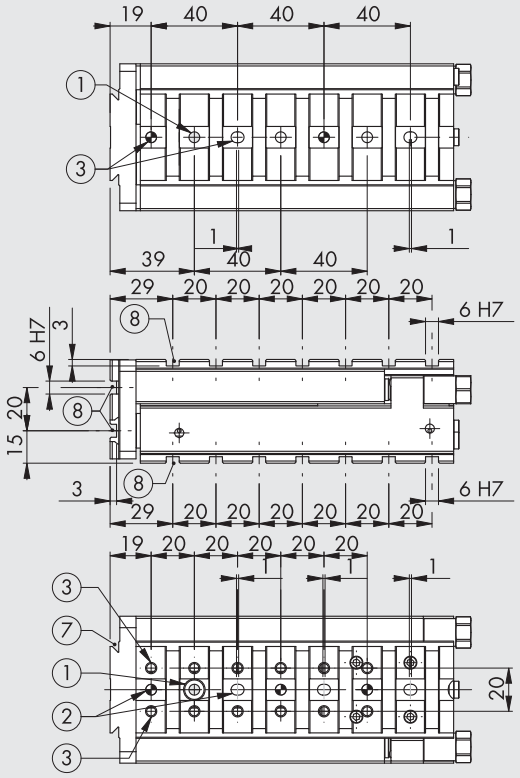


Ø 16 stroke 50 mm

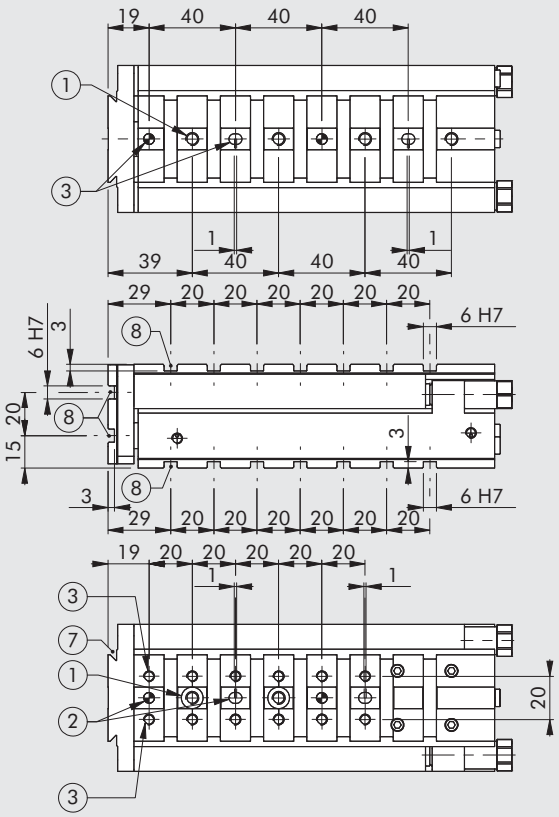


METAL WORK PNEUMATIC

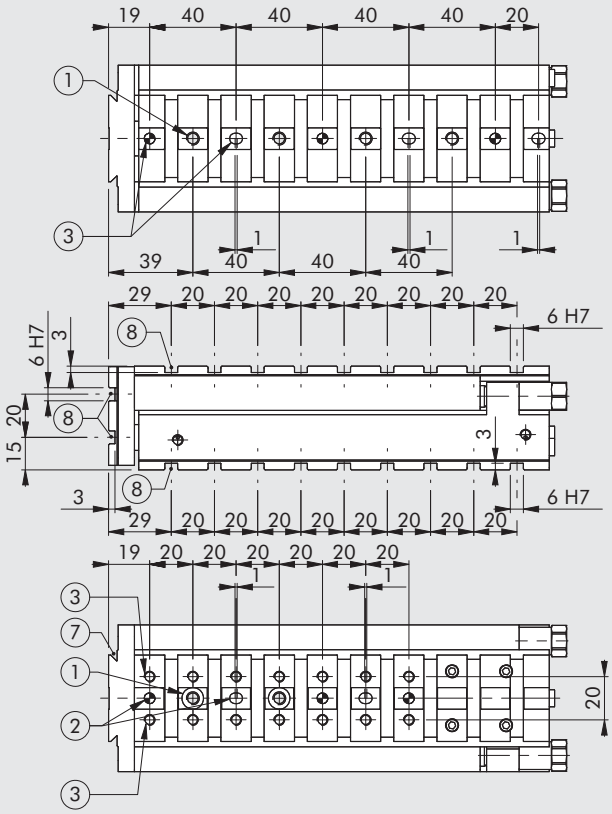
Ø 16 stroke 80 mm



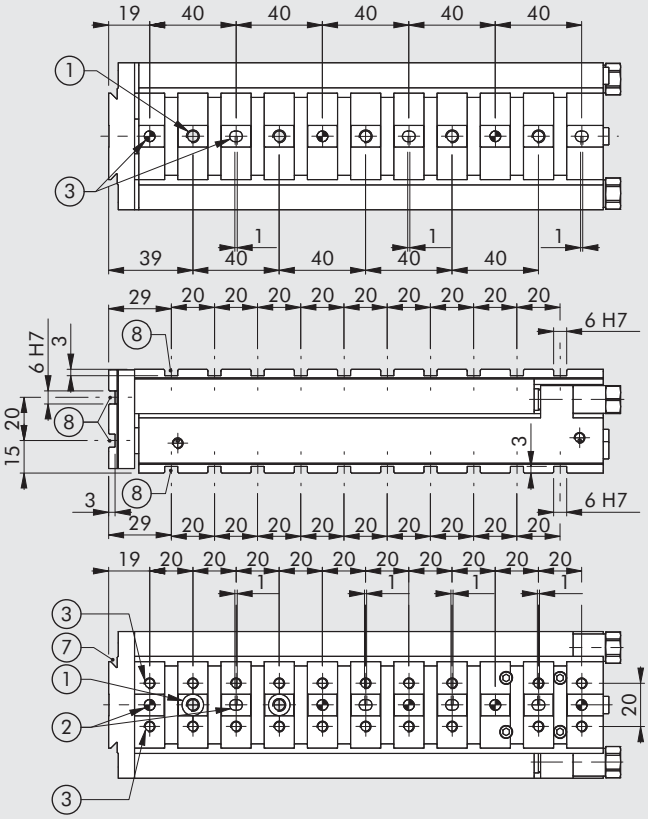
Ø 16 stroke 100 mm



Ø 16 stroke 125 mm

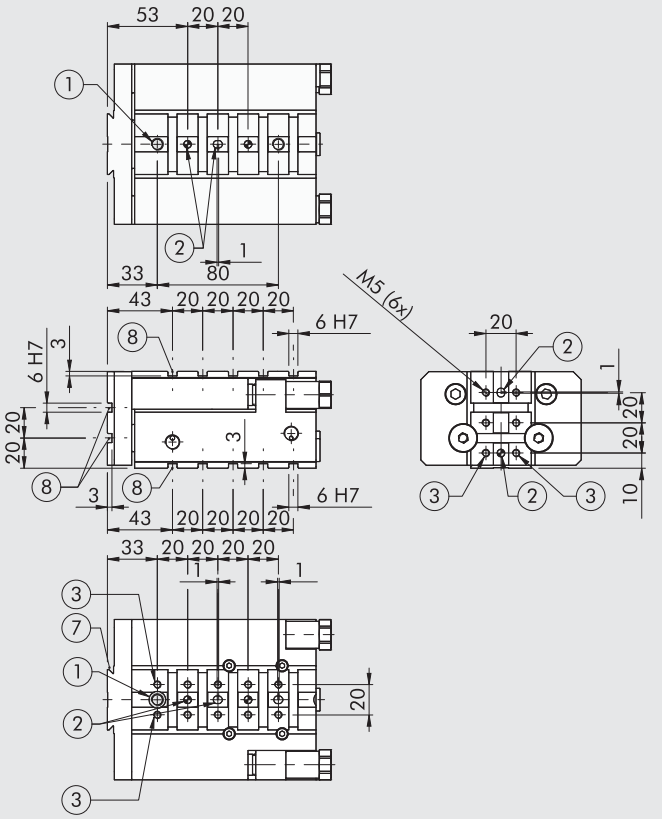


Ø 16 stroke 150 mm



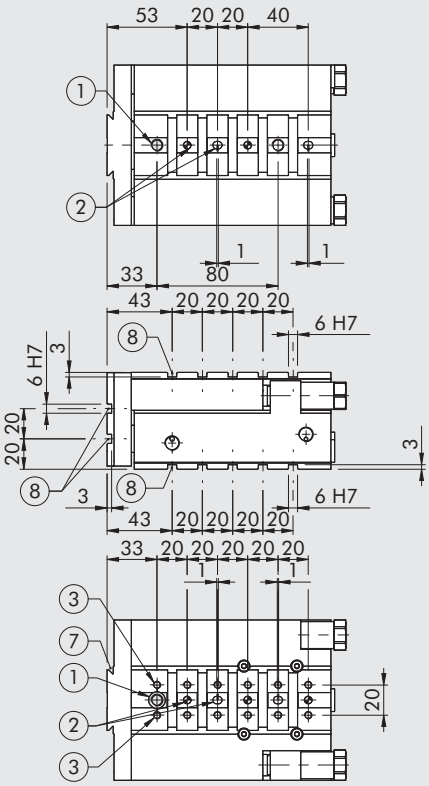
DIMENSIONS OF SLIDE S14K Ø 25

Ø 25 stroke 10; 20; 30; 40 mm

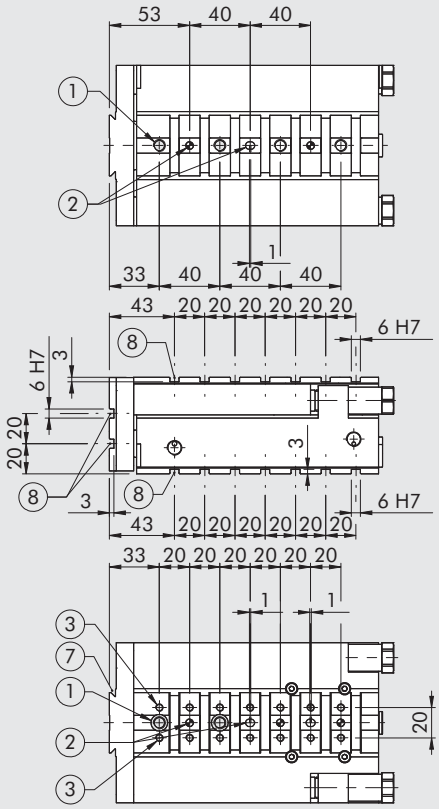


① Through holes for fixing actuators
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

Ø 25 stroke 50 mm

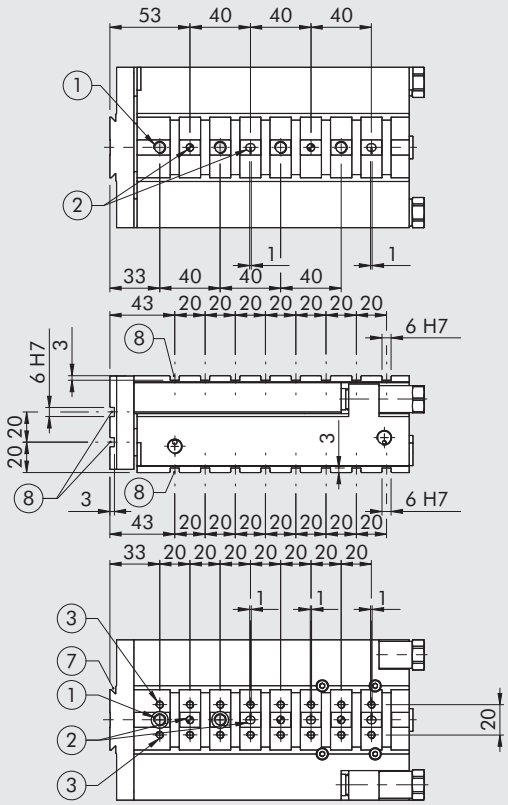


Ø 25 stroke 80 mm

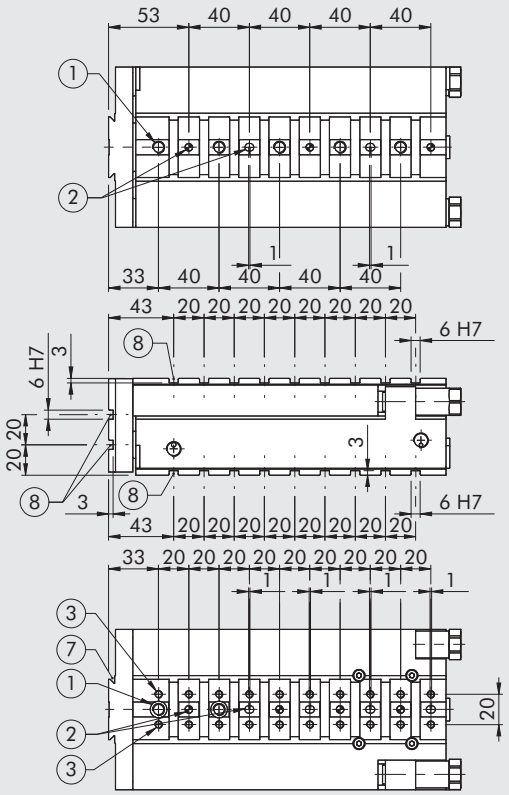


METAL WORK PNEUMATIC

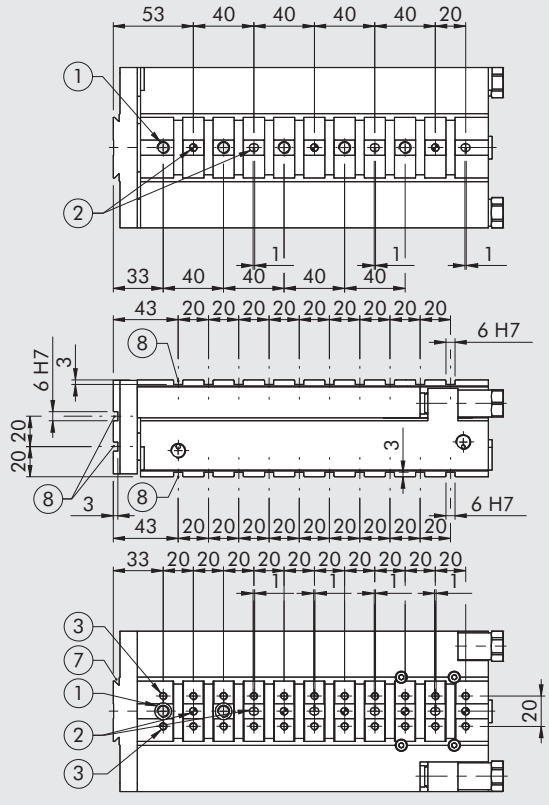
Ø 25 stroke 100 mm



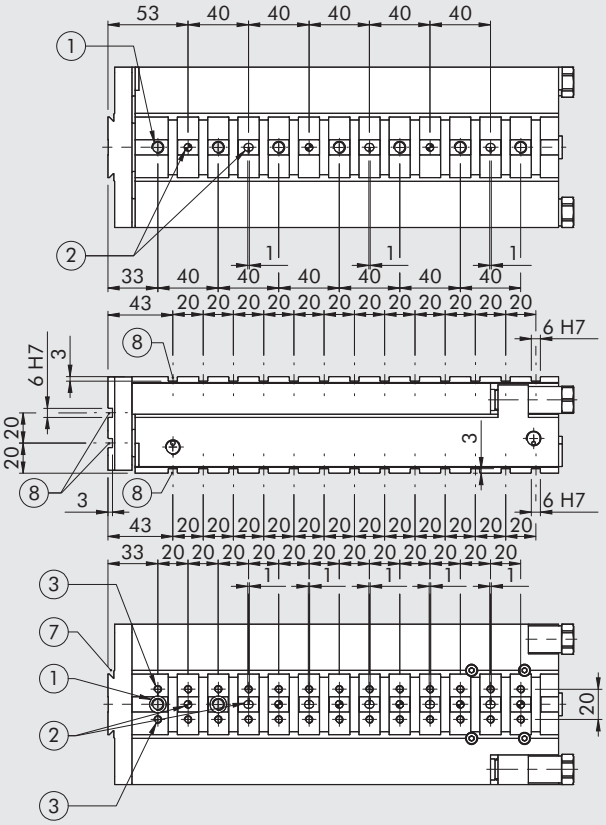
Ø 25 stroke 125 mm



Ø 25 stroke 150 mm

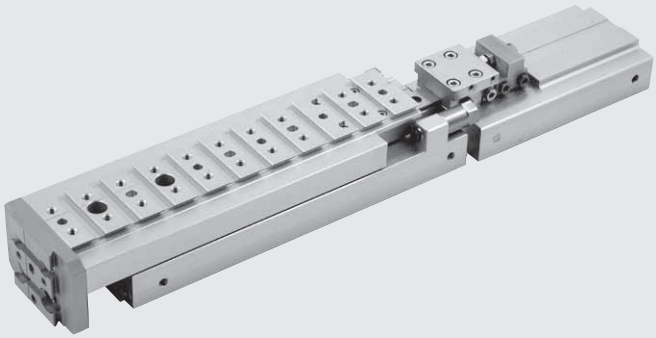


Ø 25 stroke 200 mm



THIRD-POSITION STOP DEVICE

Slide S14 can be supplied in a version with a third-position stop device for application where the slide needs to stop in an intermediate position (e.g. for depositing a workpiece).
A stop device is mounted in series with the slide and partialises the total stroke when supplied with compressed air.
The third-position stop device comes with a magnet on the piston and slots for sensors to monitor the position of the piston rod.

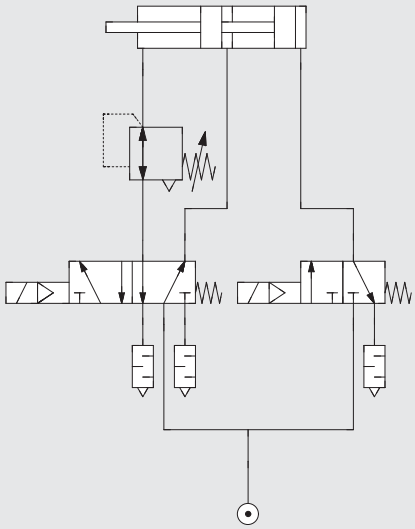


This device can be ordered with a free nominal stroke, up to the total length of the slide on which it is mounted, with 1 mm interval.
The stop position can be adjusted mechanically within ± 1.5 mm of the nominal stroke. For example, a stop device with a 30 mm stroke can limit the stroke of the slide by an adjustable length ranging from 28.5 to 31.5 mm.

	S14K-8	S14K-16	S14K-25
Maximum impact energy in intermediate position [J]	0.05	0.15	0.25

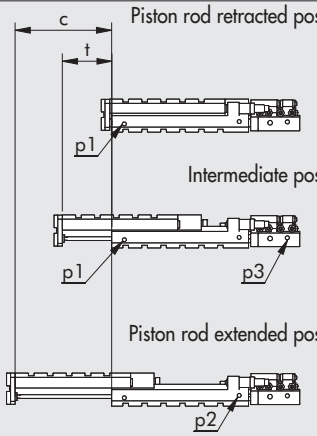
PNEUMATIC SYSTEM DIAGRAM

The third-position stop device can be operated by a 3/2 valve, as shown in the diagram.
The optional pressure regulator can be used to regulate the backpressure, and hence the useful force, in the first section of the stroke.



PNEUMATIC THRUST CHART

Supply diagram	Useful theoretical thrust [N] depending on pressure [bar]		
	S14K-8	S14K-16	S14K-25
Piston rod retracted position	p1 x 7.5	p1 x 30	p1 x 75.5
Intermediate position	p3 x 10 - p1 x 7.5	p3 x 40 - p1 x 30	p3 x 98 - p1 x 75.5
Piston rod extended position	p2 x 10	p2 x 40	p2 x 98

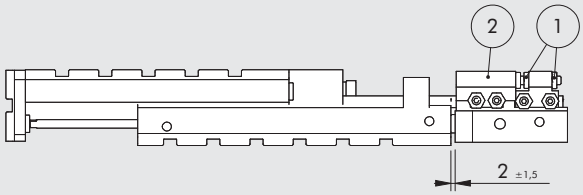


c = Slide S14K stroke
t = Third-position stop device stroke

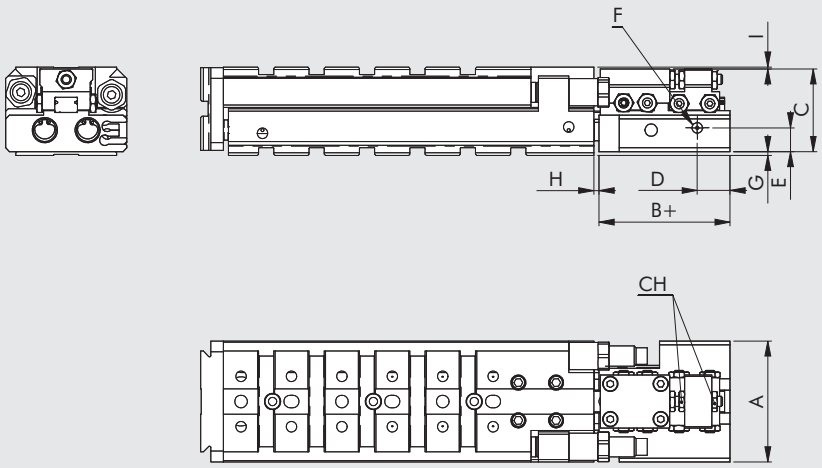
METAL WORK PNEUMATIC

FINE ADJUSTMENT

How to adjust the third position:
- Unscrew the lock nuts on the adjusting grub screw ①
- Regulate the position of the stop by adjusting the moving unit ②
- Tighten the lock nuts on the adjusting grub screw ①



DIMENSIONS OF THE THIRD-POSITION DEVICE FOR SLIDE S14K Ø 8 - Ø 16 - Ø 25



+ = Add the stroke of the third position
H = Adjusting the third position

Ø	A	B	C	D	E	F	G	H max	I	CH
8	48	52	33.3	13	9	M5	1	4	0.7	7
16	68	60	42	13	12	M5	3	4	3	8
25	106	85	59.5	16	16	1/8"	4	4	0.5	13

KEY TO CODES - STANDARD VERSION

W147	2	08	3	050	K
TYPE	**MODEL**	**BORE**	**STOP**	**STROKE**	**FAMILY**
Precision slide	**2** S14K	08 16 25	**3** With mechanical stop **5** With shock absorbers	See general technical data	**K** V-Lock

KEY TO CODES - VERSION WITH THIRD-POSITION STOP DEVICE

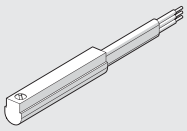
W147	2	08	3	050	020	K
TYPE	**MODEL**	**BORE**	**STOP**	**STROKE**	**THIRD POSITION STROKE**	**FAMILY**
Precision slide	**2** S14K	08 16 25	**3** With mechanical stop **5** With shock absorbers	See general technical data		**K** V-Lock

S14K SLIDE ACCESSORIES

V-Lock ACCESSORIES

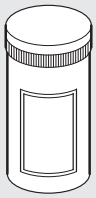
See page **A3**.36

SENSOR Ø 4



For codes and technical data, see **chapter A6**.

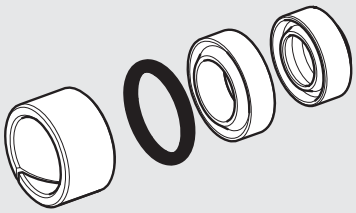
GREASE



Code	Description	Weight [g]
9910506	Tube of RHEOLUBE 363 AX1 grease	400

S14K SLIDE SPARE PARTS

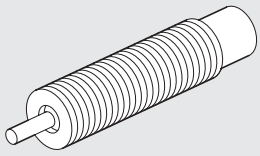
GASKET SPARE PARTS KIT



Code	Description
W1472089001K	S14K gasket kit Ø 8
W1472169001K	S14K gasket kit Ø 16
W1472259001K	S14K gasket kit Ø 25

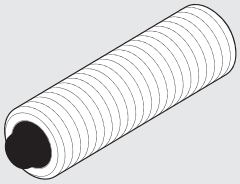
NOTE: kit contents: 1 guide strip, 1 piston rod gasket, 1 piston gasket, 1 end cap O-ring

SHOCK ABSORBERS



Code	Ø	Description
W0950005300	8	Shock absorbers - 2 M8 x 1
W0950005301	16	Shock absorbers - 2 M10 x 1
W0950005303	25	Shock absorbers - 2 M14 x 1.5

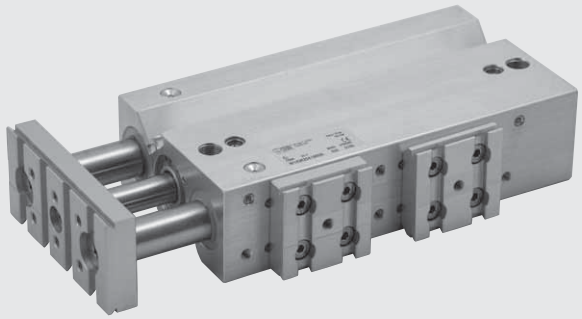
ELASTIC MECHANICAL STOP



Code	Ø	Description
W0950005400K	8	Elastic mechanical stop M8 x 1
W0950005401K	16	Elastic mechanical stop M10 x 1
W0950005402K	25	Elastic mechanical stop M14 x 1.5

COMPACT GUIDED CYLINDER SERIES CMPGK

The CMPGK is a functional, sturdy guided compact cylinder with a built-in guide unit.
The piston rod guide bushings are mounted directly in the anodised aluminium alloy cylinder liner.
Two different types of guides can be mounted as required: sintered bronze bushings coupled with chromed and ground carbon steel piston rods, or ball recirculation bushings with chromed and ground hardened steel piston rods.
Grooves are provided on one side of the body to accommodate retractable sensors.
Currently available is either a non-cushioned version with the end-of-stroke stop cushioned by NBR front gaskets, or a cushioned one with pins that can be adjusted to regulate progressive braking.
The front plate features the typical V-lock dovetail with grooves and holes.
V-Lock fixing elements can be fitted to the main body on any of the three surfaces identified as UP, SIDE and DOWN. The chosen surface has a grid of threaded holes and pinholes with one or two V-Lock plates, depending on the stroke.
The plates are mounted in a preset position, but they can be moved on the grid as required.



TECHNICAL DATA		CUSHIONED	NON-CUSHIONED
Operating pressure	bar	1 to 10	
	MPa	0.1 to 1	
	psi	14.5 to 145	
Temperature range	°C	-10 to +80	
	°F	14 to 176	
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous	
Bore	mm	16, 20, 25, 32, 40	
Standard stroke	mm	**Ø 16:** 20, 30, 40, 50	**Ø 16:** 30*, 40, 50, 75, 100, 150, 200
		Ø 20: 20, 30, 40, 50, 75, 100, 150, 200	**Ø 20:** 25, 30, 40, 50, 75, 100, 150, 200
		Ø 25: 20, 30, 40, 50, 75, 100, 150	**Ø 25:** 25, 30, 40, 50, 75, 100, 150, 200
		Ø 32: 25, 50, 75, 100, 150, 175	**Ø 32:** 25, 50, 75, 100, 150, 200
		Ø 40: 25*, 50, 75, 100, 150, 175	**Ø 40:** 50, 75, 100, 150, 200
Version		With bronze bushings - With ball bearings	
Sensor magnet		Standard	
Maximum impact energy	J	See diagram on **next page**	**Ø 16**: 0.06
			Ø 20: 0.14
			Ø 25: 0.2
			Ø 32: 0.4
			Ø 40: 0.6
Notes		* Side and Down versions only	

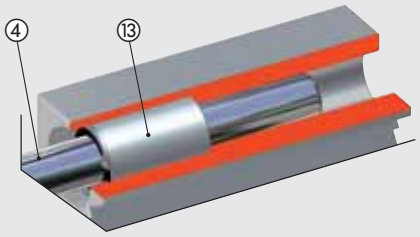
WEIGHTS

Ø	Non-cushioned		Cushioned	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
16	395	5.77	514	5.77
20	586	7.38	643	7.38
25	650	11.01	835	11.01
32	1042	17.51	1454	17.51
40	1128	19.04	1579	19.04

COMPONENTS

① BARREL: anodized aluminium alloy
② PISTON ROD: grinded chrome steel
③ GUIDE ROD: grinded chrome steel
④ GUIDE ROD: hardened and tempered chrome steel, grinded
⑤ REAR BASE: anodized aluminium alloy
⑥ FRONT BASE: anodized aluminium alloy
⑦ PISTON ROD GASKET: polyurethane
⑧ CUSHIONING GASKET: NBR
⑨ PISTON: aluminium alloy
⑩ MAGNET: plastoferrite
⑪ PISTON GASKET: NBR
⑫ SLIDE BUSHING: sintered bronze
⑬ BALL BEARINGS
⑭ DUST SCRAPER RING: NBR or FKM/FPM
⑮ GREASE NIPPLES: zinc-plated or stainless steel
⑯ FLANGE: anodized aluminium alloy
⑰ CUSHIONING NEEDLE: OT58 brass

Ball Bearings versions



Bronze bushings version

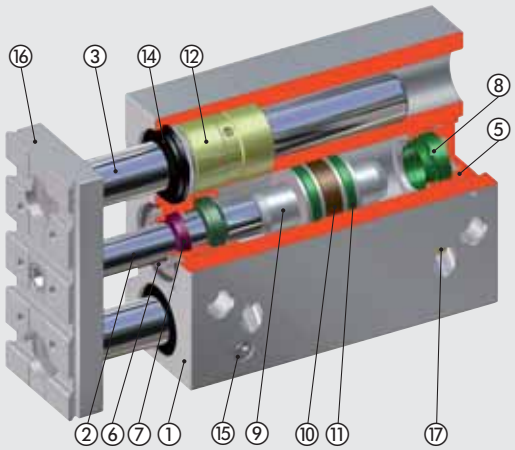
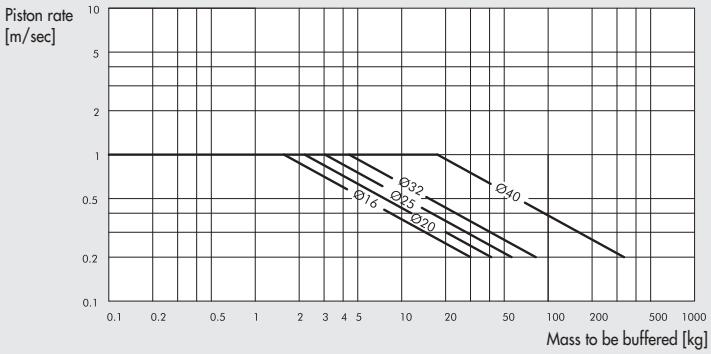
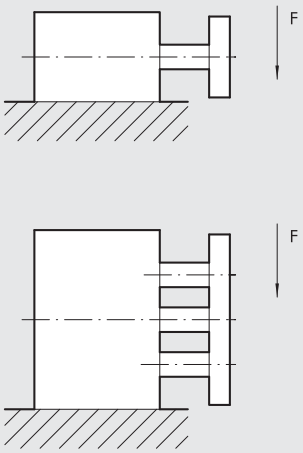


DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated. The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders. The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



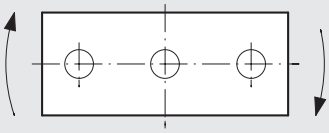
MAXIMUM SIDE LOAD



Ø	Guide unit	Stroke (mm)									
mm		20	25	30	40	50	75	100	150	175	200
16	Bushes	29	–	26	23	20	16	14	10	–	8
	Balls	31	–	27	38	34	29	24	12	–	8
20	Bushes	52	50	45	39	35	58	49	38	–	31
	Balls	56	–	48	79	70	54	50	27	–	32
25	Bushes	71	67	61	54	48	78	66	50	–	41
	Balls	72	68	62	78	73	60	52	37	–	30
32	Bushes	–	197	–	–	168	138	109	78	70	65
	Balls	–	89	–	–	60	276	217	138	122	110
40	Bushes	–	197	–	–	168	138	109	78	70	65
	Balls	–	89	–	–	60	276	217	138	122	110

N.B.: Forces are expressed in N

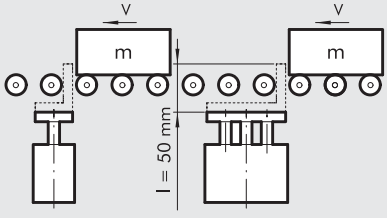
MAXIMUM TORQUE ON PLATE



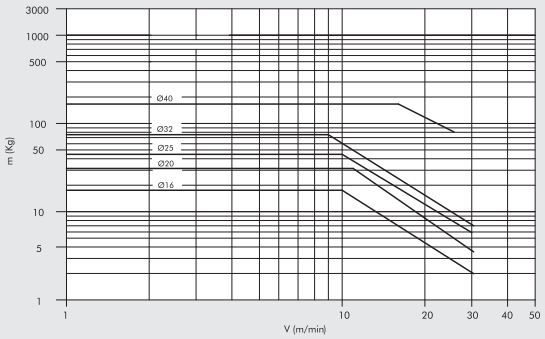
Ø	Guide unit	Stroke (mm)									
mm		20	25	30	40	50	75	100	150	175	200
16	Bushes	0.45	–	0.36	0.32	0.28	0.24	0.20	0.46	–	0.12
	Balls	0.60	–	0.50	0.72	0.65	0.54	0.45	0.35	–	0.25
20	Bushes	0.92	0.85	0.79	0.72	0.64	1.05	0.90	0.69	–	0.56
	Balls	1.28	–	1.08	1.78	1.59	1.24	1	0.61	–	0.49
25	Bushes	1.55	1.42	1.32	1.18	1.04	1.70	1.44	1.10	–	0.90
	Balls	1.98	1.78	1.70	2.16	2.20	1.66	1.4	1.02	–	0.82
32	Bushes	–	3.94	–	–	2.95	2.46	1.97	1.55	1.38	1.24
	Balls	–	1.97	–	–	1	2.96	2.44	2.40	2.43	2.18
40	Bushes	–	4.40	–	–	3.45	2.96	2.46	1.70	1.55	1.40
	Balls	–	2.46	–	–	1.45	6.38	5.4	3	2.73	2.40

N.B.: Forces are expressed in Nm

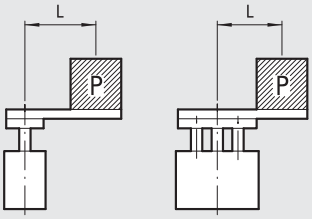
STOPPER FUNCTIONS



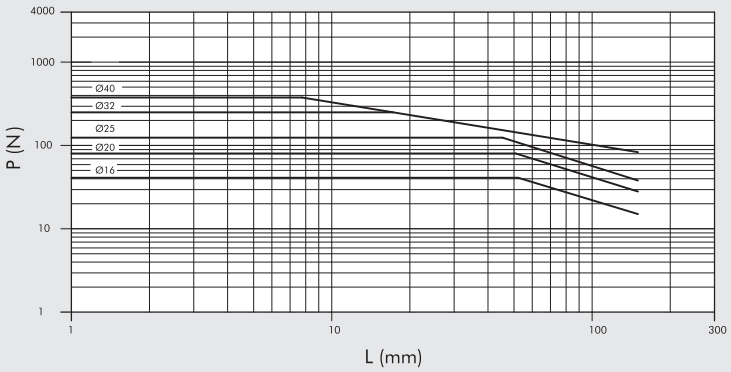
The graph refers to a 50 mm-stroke cylinder.



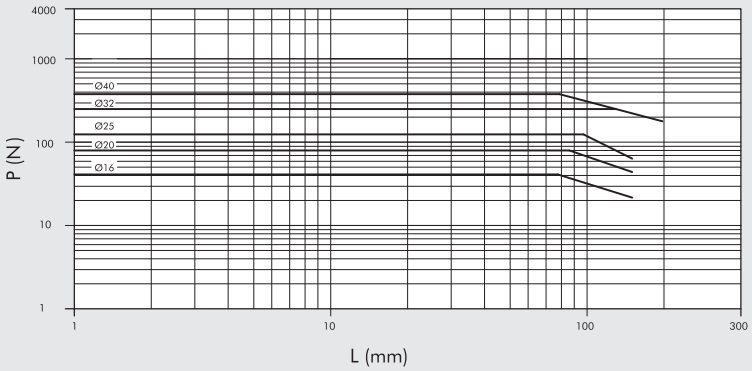
LIFTING FUNCTIONS



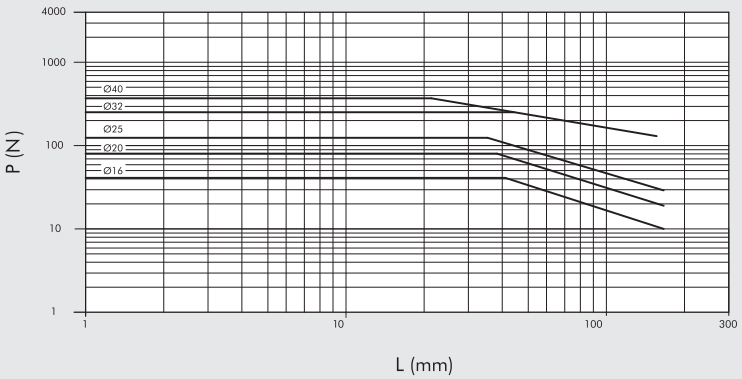
The graph refers from 25 to 50 mm-stroke cylinders with ball re-circulation guide unit



The graph refers from 75 to 100 mm-stroke cylinders with ball re-circulation guide unit

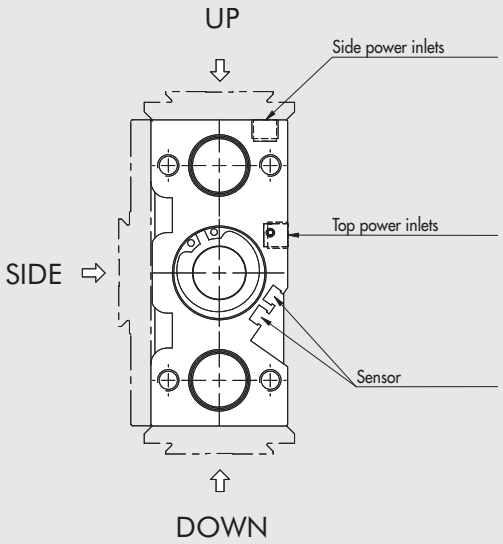


The graph refers to 50 mm-stroke cylinders with bushing guide unit



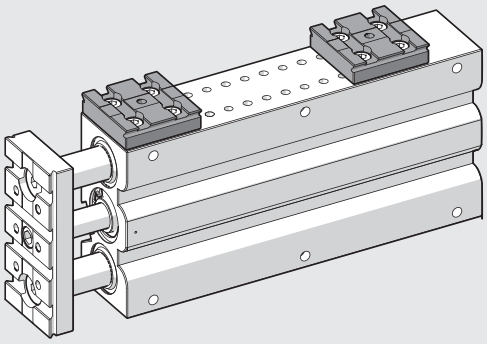
MOUNTING OPTIONS

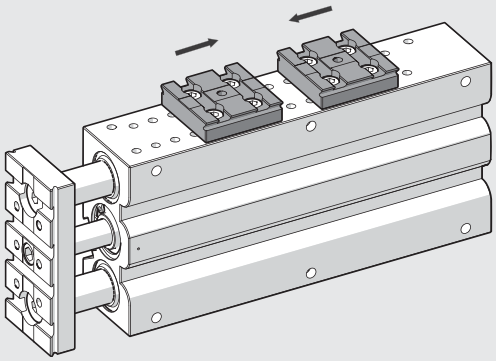
The surface of the body on which to mount the V-Lock plates must be specified at the coding stage. The surface is identified by a letter **U** (Up), **S** (Side) or **D** (Down).



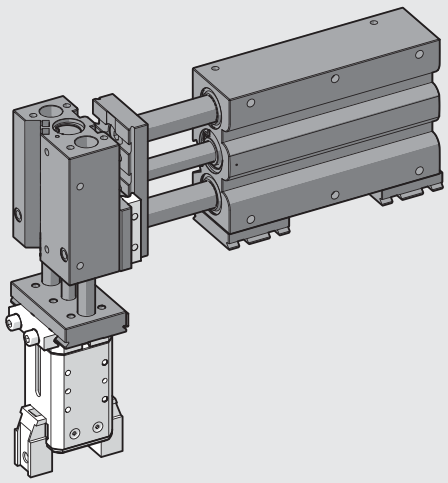
The chosen side of the CMPGK cylinder has a series of threaded holes and pinholes, and one or more V-Lock plates, depending on the stroke. The cylinder is delivered with a plate mounted in the foremost position and another, if provided, in the rearmost position.

The V-Lock plates can be moved as required and fixed to any of the threaded holes.



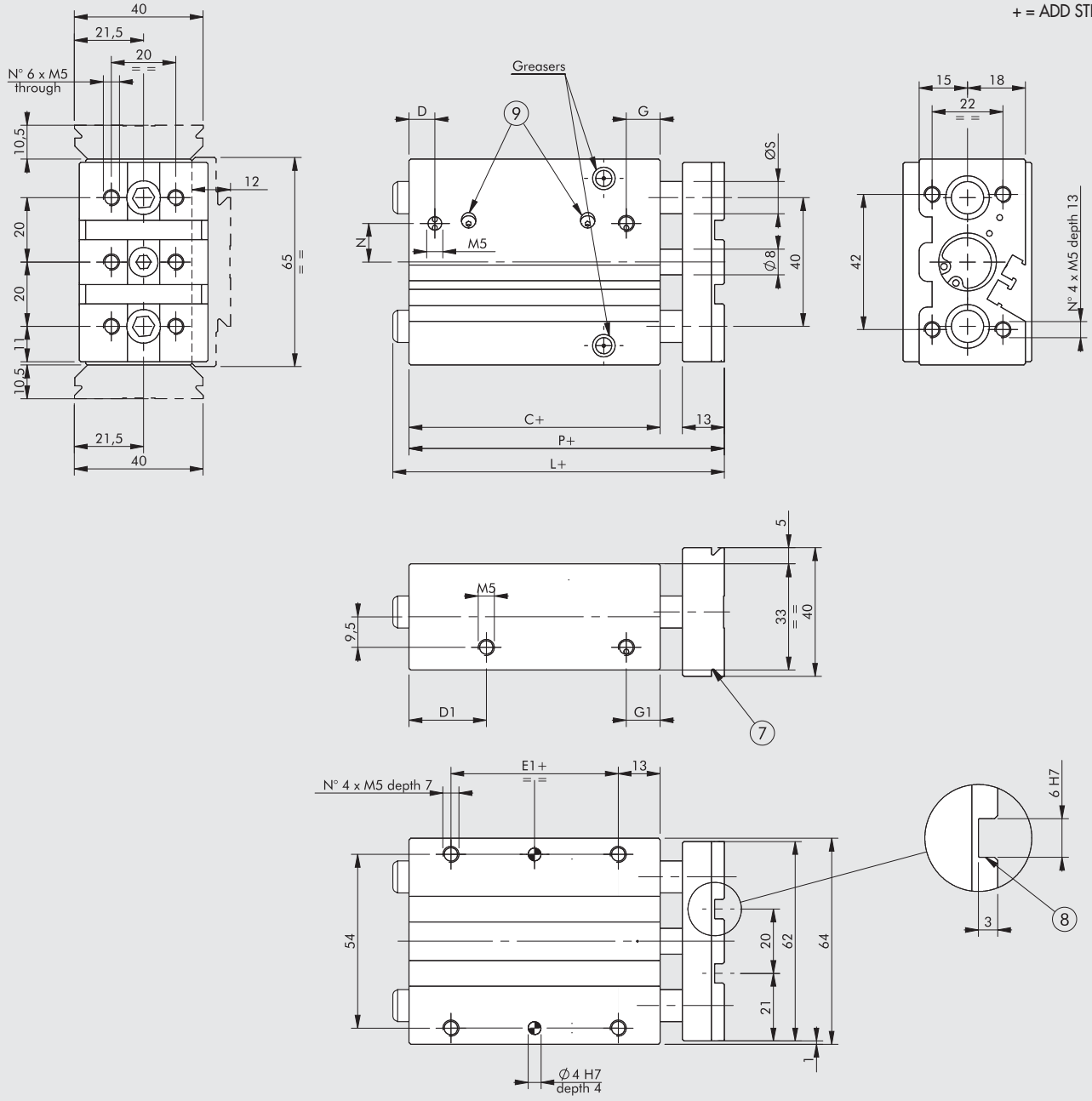


EXAMPLES OF APPLICATION



DIMENSIONS OF Ø 16, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 16, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key
⑨ Cushioning pins (in the cushioned version only)

Stroke	L
0 to 50	49
75 to 200	77.5

Stroke	L
0 to 50	76
75 to 200	104.5

NON-CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
33	8.5	20	7	11.5	11.5	see above		6.5	49	10	10

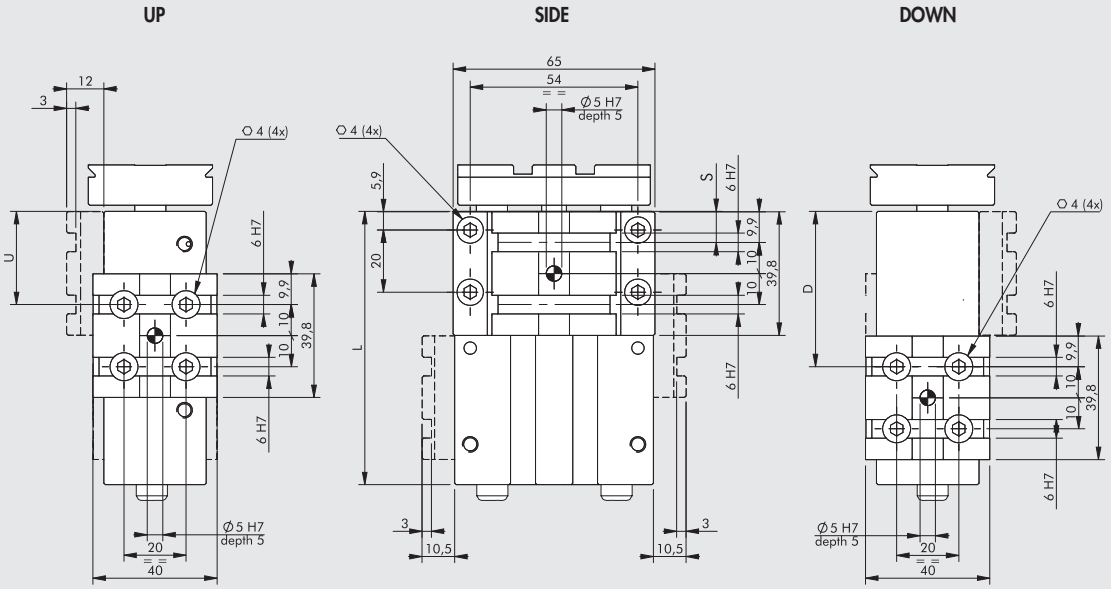
CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
58	8	24	32	10.5	10.5	see above		12	74	10	10

* Version BA (Bronze Bushings)
** Version BB (Ball Bearings)

METAL WORK PNEUMATIC

POSITION OF Ø 16 PLATES, BA AND BB NON-CUSHIONED VERSION
POSITION OF Ø 16 PLATES, BA AND BB CUSHIONED VERSION



NON-CUSHIONED

Stroke [mm]	30			40			50			75			100			150			200		
Position	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D
Possible positions (see page A3.67)	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10
	-	-	30	✱ 30	30	30	✱ 30	-	30	30	30	30	30	30	30	30	30	30	30	30	30
							-	-	50	50	50	50	50	-	50	50	50	50	50	50	50
										✱ 70	70	70	70	-	70	70	70	70	70	70	70
													✱ 90	90	90	90	90	90	90	90	90
																110	110	110	110	110	110
																✱ 130	130	130	130	130	130
																-	-	150	150	150	150
																			170	170	170
																			✱ 190	190	190
No. of V-Lock plates supplied	1			1			1			2			2			2			2		
L	63			73			83			108			133			183			233		

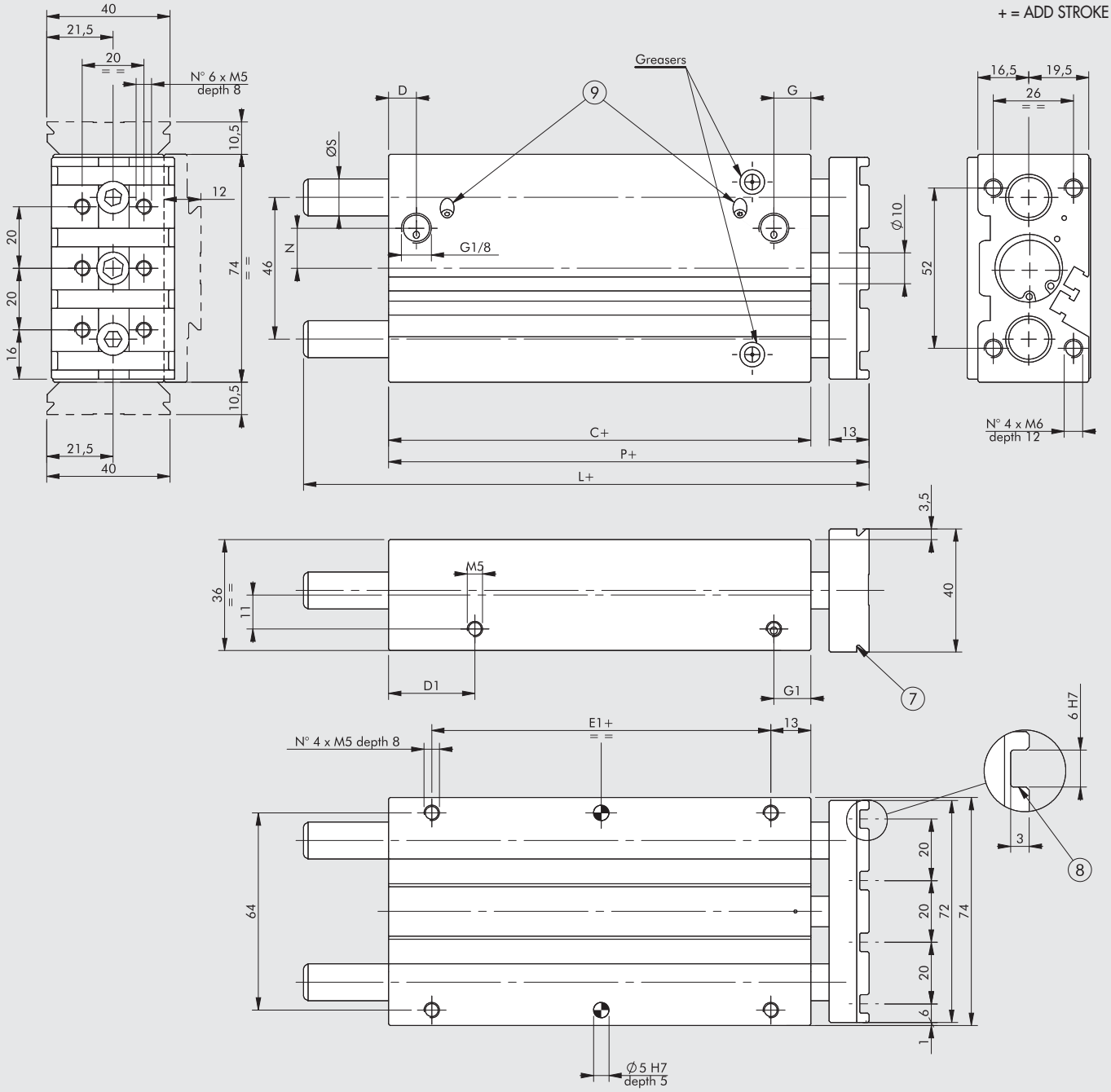
CUSHIONED

Stroke [mm]	20			30			40			50		
Position	U	S	D	U	S	D	U	S	D	U	S	D
Possible positions (see page A3.67)	-	10	-	-	10	-	-	10	-	-	10	-
	✱ 30	30	30	✱ 30	-	30	30	-	30	30	30	30
	-	-	50	-	-	50	✱ 50	-	50	✱ 50	50	50
							-	-	70	-	70	70
No. of V-Lock plates supplied	1			1			1			2		
L	78			88			98			108		

✱ Outlet side power supply not available

DIMENSIONS OF Ø 20, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 20, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key
⑨ Cushioning pins (in the cushioned version only)

Stroke	L
0 to 50	52
75 to 200	82

Stroke	L
0 to 50	81
75 to 200	108.5

NON-CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
37	9	20	10	11	11	see above		8.5	52	12	10

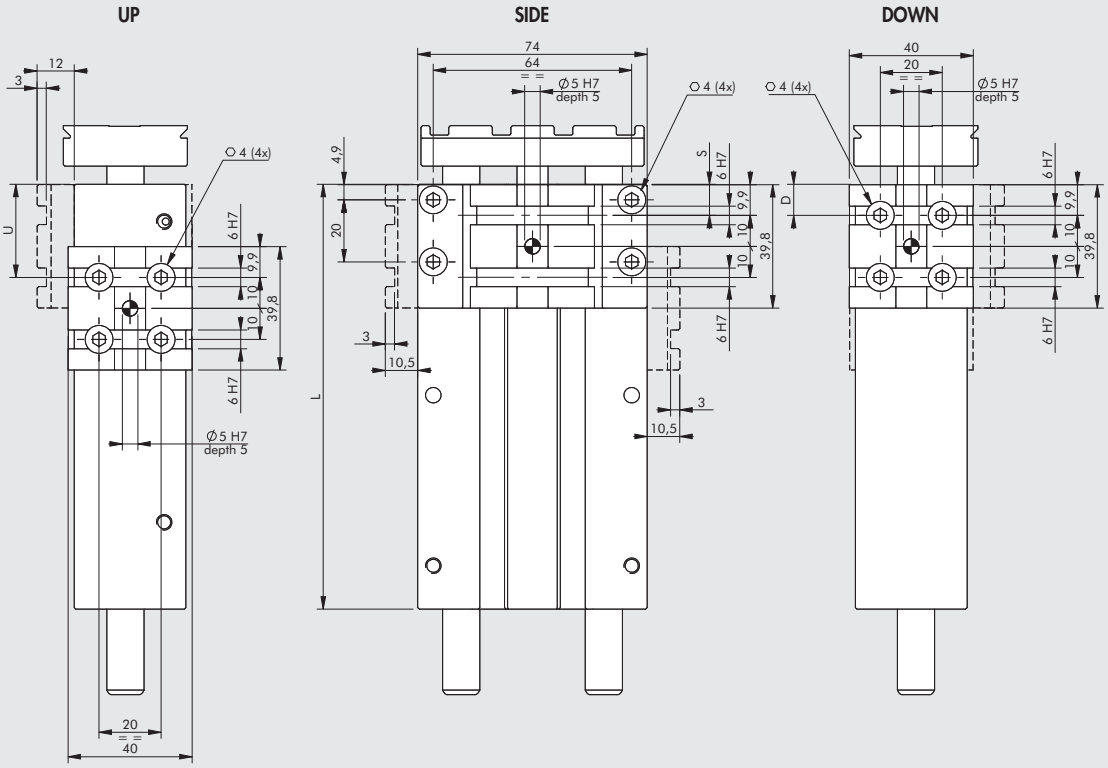
CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
62	9	28	35	12	12	see above		13	81	12	10

*** Version BA (Bronze Bushings)**
**** Version BB (Ball Bearings)**

METAL WORK PNEUMATIC

POSITION OF Ø 20 PLATES, BA AND BB NON-CUSHIONED VERSION
POSITION OF Ø 20 PLATES, BA AND BB CUSHIONED VERSION



NON-CUSHIONED

Stroke [mm]	25			30			40			50			75			100			150			200		
Position	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D
Possible positions (see page A3.67)	■ 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10
	-	-	30	-	30	30	✱ 30	30	30	30	-	30	30	30	30	30	30	30	30	30	30	30	30	30
										-	-	50	50	50	50	50	-	50	50	50	50	50	50	50
													✱ 70	70	70	70	-	70	70	70	70	70	70	70
																✱ 90	90	90	90	90	90	90	90	90
																			110	110	110	110	110	110
																			130	130	130	130	130	130
																			-	150	150	150	150	150
																						170	170	170
																						✱ 190	190	190
																						-	-	210
No. of V-Lock plates supplied	1			1			1			1			2			2			2			2		
L	62			67			77			87			112			137			187			237		

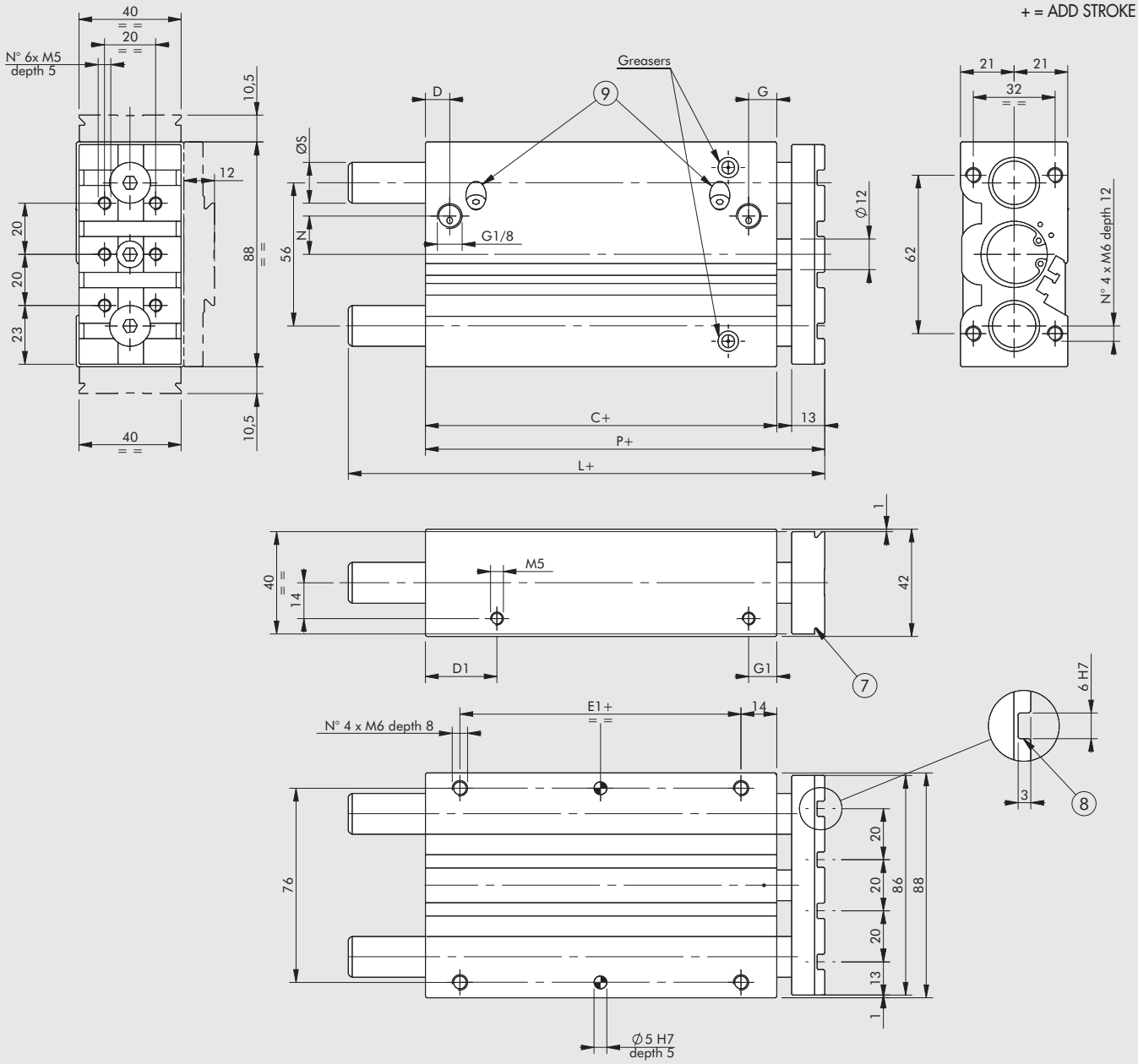
CUSHIONED

Stroke [mm]	20			30			40			50			75			100			150			200		
Position	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D
Possible positions (see page A3.67)	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10
	✱ 30	-	30	✱ 30	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
	-	-	50	-	-	50	✱ 50	50	50	✱ 50	50	50	50	-	50	50	50	50	50	50	50	50	50	50
							-	-	70	-	70	70	70	-	70	70	-	70	70	70	70	70	70	70
													✱ 90	90	90	90	-	90	90	-	90	90	90	90
																✱ 110	110	110	110	-	110	110	110	110
																-	-	130	130	130	130	130	130	130
																			✱ 150	150	150	150	150	150
																			-	170	170	170	170	170
																						190	190	190
																						✱ 210	210	210
																						-	-	230
No. of V-Lock plates supplied	1			1			1			1			2			2			2			2		
L	82			92			102			112			137			162			212			262		

✱ Outlet side power supply not available ● Return side power supply not available ■ Side power supply not available

DIMENSIONS OF Ø 25, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 25, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key
⑨ Cushioning pins (in the cushioned version only)

Stroke	L
0 to 50	52.5
75 to 200	82.5

Stroke	L
0 to 50	81.5
75 to 200	111.5

NON-CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
37.5	9	23	10	11	11	see above		8	52.5	16	16

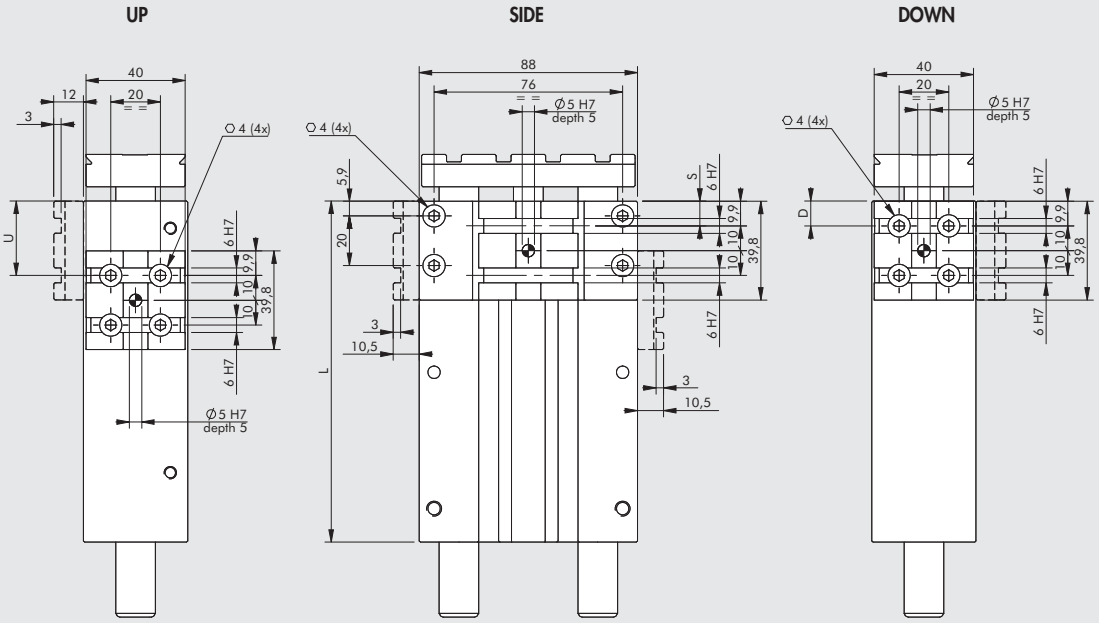
CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
62.5	9.5	28	35	11	11	see above		15	81.5	16	16

*** Version BA (Bronze Bushings)**
**** Version BB (Ball Bearings)**

METAL WORK PNEUMATIC

POSITION OF Ø 25 PLATES, BA AND BB NON-CUSHIONED VERSION
POSITION OF Ø 25 PLATES, BA AND BB CUSHIONED VERSION



NON-CUSHIONED

Stroke [mm]	25			30			40			50			75			100			150			200		
Position	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D
Possible positions (see page A3.67)	■ 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10
	-	-	30	-	30	30	✱ 30	30	30	✱ 30	-	30	30	30	30	30	30	30	30	30	30	30	30	30
							✱ 50	-	50	-	-	50	50	50	50	50	-	50	50	50	50	50	50	50
													✱ 70	70	70	70	-	70	70	70	70	70	70	70
																✱ 90	90	90	90	90	90	90	90	90
																-	-	110	110	110	110	110	110	110
																			✱ 130	130	130	130	130	130
																			-	150	150	150	150	150
																						170	170	170
																						✱ 190	190	190
																						-	-	210
No. of V-Lock plates supplied	1			1			1			1			2			2			2			2		
L	62.5			67.5			77.5			87.5			112.5			137.5			187.5			237.5		

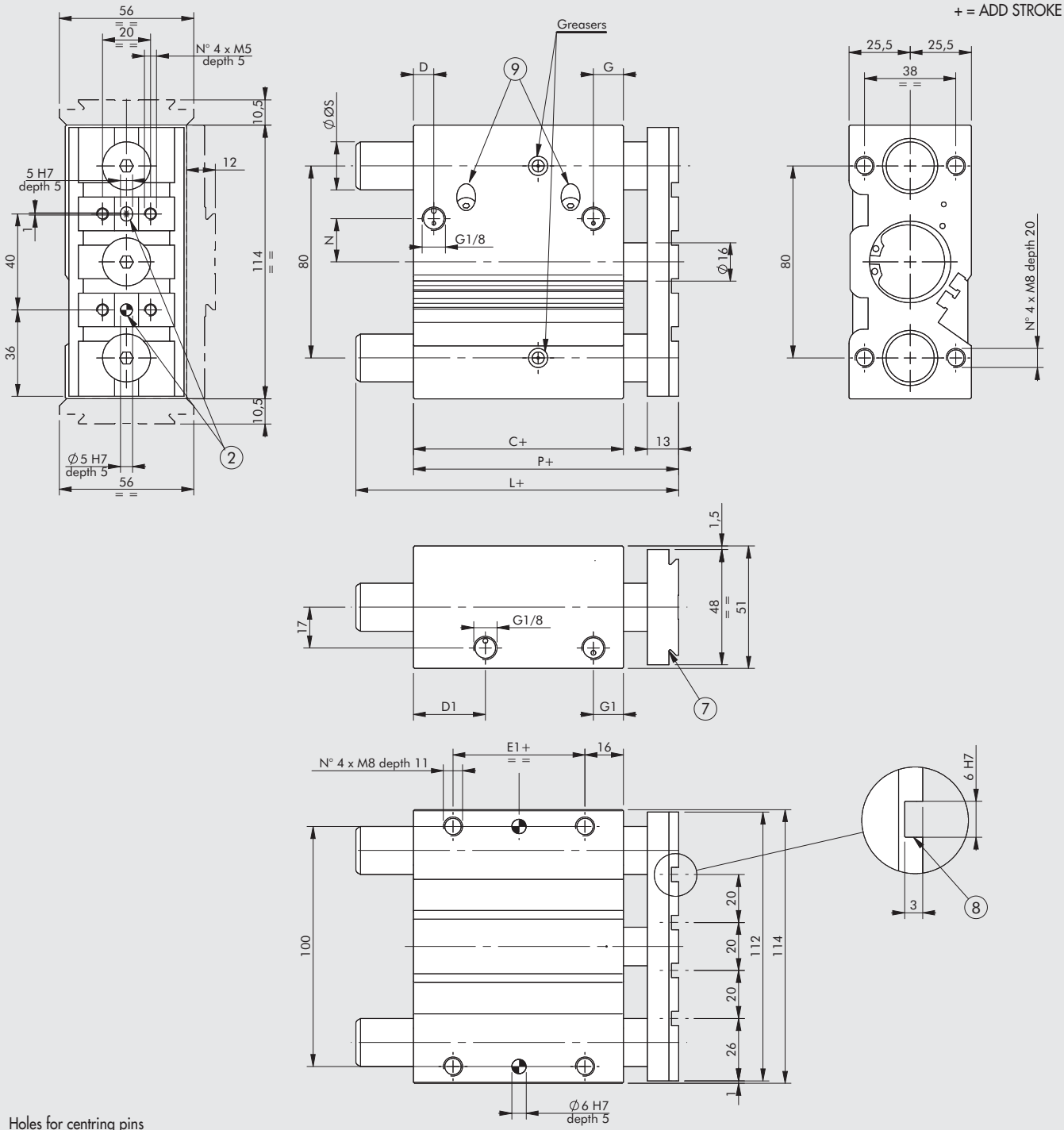
CUSHIONED

Stroke [mm]	20			30			40			50			75			100			150			
Position	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	
Possible positions (see page A3.67)	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	
	✱ 30	-	30	✱ 30	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
	-	-	50	-	-	50	✱ 50	50	50	✱ 50	50	50	50	-	50	50	50	50	50	50	50	
							-	-	70	-	70	70	70	-	70	70	-	70	70	70	70	
													✱ 90	90	90	90	-	90	90	-	90	
													✱ 110	-	110	✱ 110	110	110	110	-	110	
																-	-	130	130	130	130	
																			✱ 150	150	150	
																			-	170	170	
No. of V-Lock plates supplied	1			1			1			1			2			2			2			
L	82.5			92.5			102.5			112.5			137.5			162.5			212.5			

✱ Outlet side power supply not available ● Return side power supply not available ■ Side power supply not available

DIMENSIONS OF Ø 32, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 32, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



② Holes for centring pins
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key
⑨ Cushioning pins (in the cushioned version only)

NON-CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
37.5	9	26.5	5	12.5	12.5	76.5	76.5	14	52.5	20	20

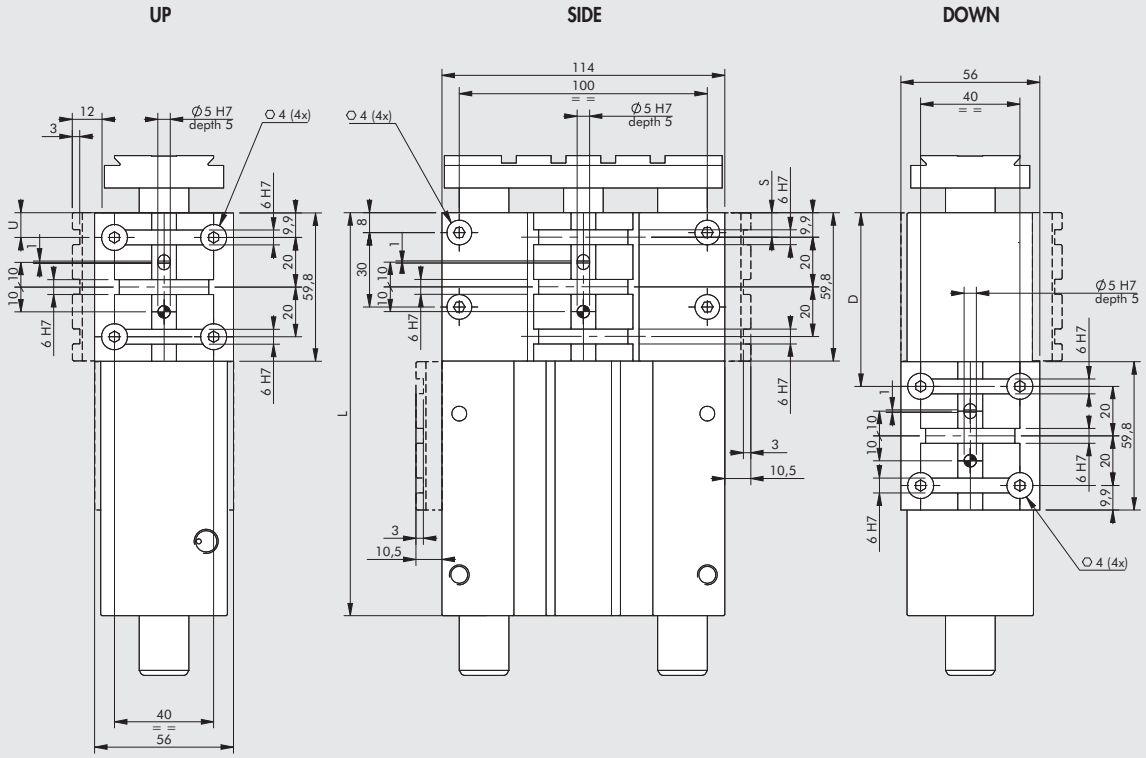
CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
62.5	8.5	25	30	12.5	12.5	109.5	109.5	18	85.5	20	20

*** Version BA (Bronze Bushings)**
**** Version BB (Ball Bearings)**

METAL WORK PNEUMATIC

POSITION OF Ø 32 PLATES, BA AND BB NON-CUSHIONED VERSION
POSITION OF Ø 32 PLATES, BA AND BB CUSHIONED VERSION



NON-CUSHIONED

Stroke [mm] / Position	25 U	25 S	25 D	50 U	50 S	50 D	75 U	75 S	75 D	100 U	100 S	100 D	150 U	150 S	150 D	200 U	200 S	200 D
Possible positions (see page **A3**.67)	■ 10	10	10	■ 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10
							-	40	-	-	-	-	-	40	-	-	40	-
										✱ 70	-	70	70	-	70	70	70	70
										-	100	-	-	-	-	-	100	-
													-	130	130	130	130	130
																-	160	-
																-	-	190
No. of V-Lock plates supplied	1			1			1			2			2			2		
L	62.5			87.5			112.5			137.5			187.5			237.5		

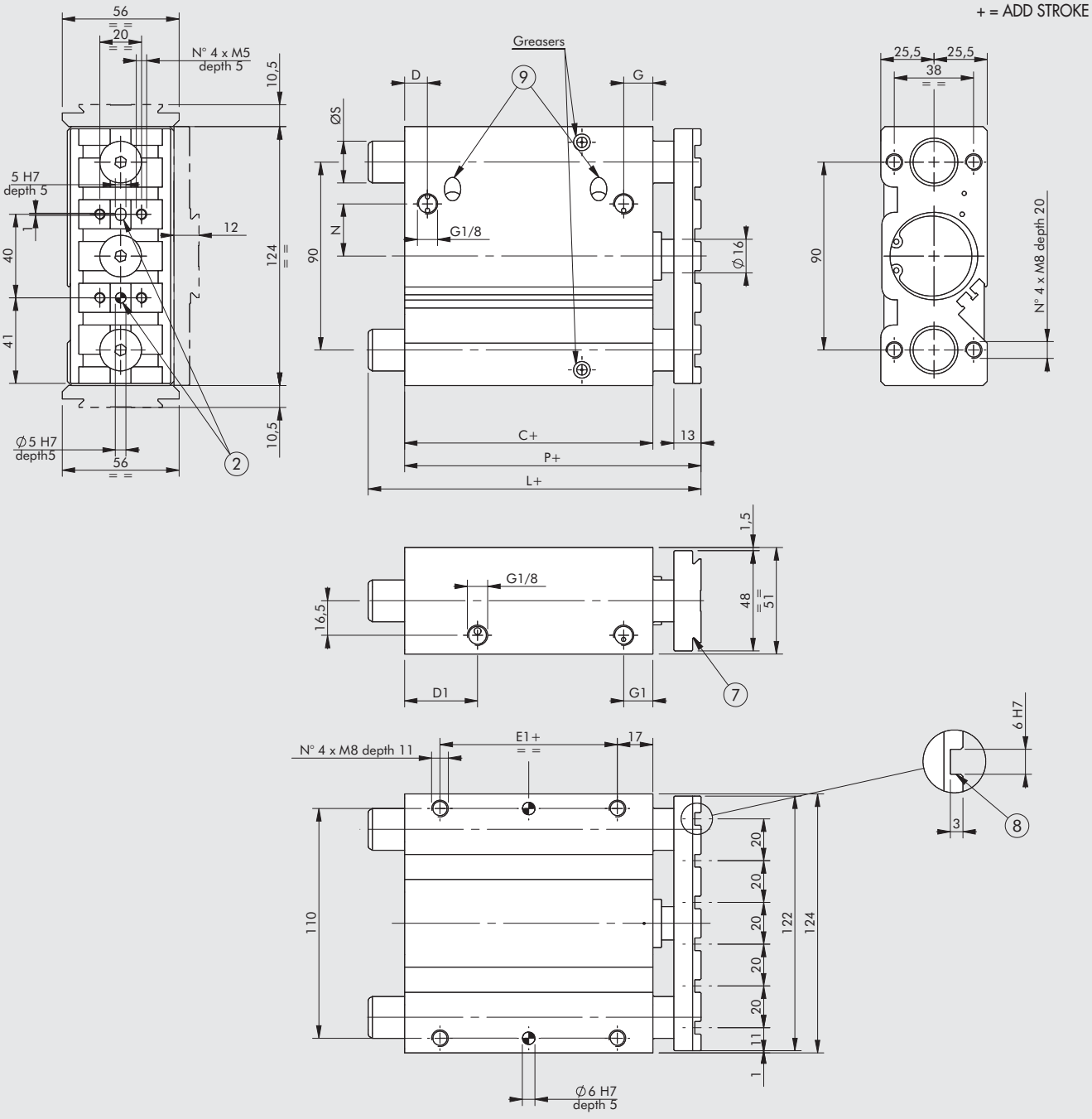
CUSHIONED

Stroke [mm] / Position	25 U	25 S	25 D	50 U	50 S	50 D	75 U	75 S	75 D	100 U	100 S	100 D	150 U	150 S	150 D	175 U	175 S	175 D
Possible positions (see page **A3**.67)	■ 10	-	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10
							-	-	-	-	40	-	-	40	-	-	40	-
							-	-	70	70	70	70	70	70	70	70	70	70
							-	100	-	-	100	-	-	100	-	-	100	-
													✱ 130	130	130	130	130	130
													-	160	-	-	160	-
																-	-	190
No. of V-Lock plates supplied	1			1			1			2			2			2		
L	87.5			112.5			137.5			162.5			212.5			237.5		

✱ Outlet side power supply not available ● Return side power supply not available ■ Side power supply not available

DIMENSIONS OF Ø 40, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 40, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



② Holes for centring pins
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key
⑨ Cushioning pins (in the cushioned version only)

NON-CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
44	10	35	10	14	14	76.5	76.5	21	59	20	20

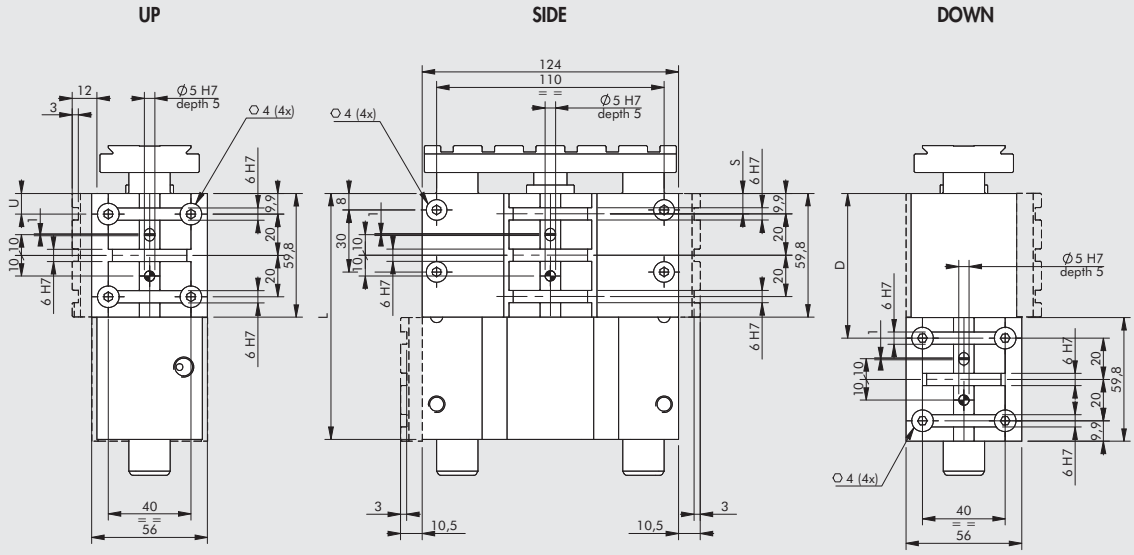
CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
69	11	35	35	14	14	109.5	109.5	25	92	20	20

*** Version BA (Bronze Bushings)**
**** Version BB (Ball Bearings)**

METAL WORK PNEUMATIC

POSITION OF Ø 40 PLATES, BA AND BB NON-CUSHIONED VERSION
POSITION OF Ø 40 PLATES, BA AND BB CUSHIONED VERSION



NON-CUSHIONED

Stroke [mm]	50			75			100			150			200		
Position	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D
Possible positions (see page A3.67)	■ 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10
	-	40	-	-	40	-	-	-	-	-	40	-	30	40	-
	-	-	-	✱ 70	-	70	✱ 70	-	70	70	-	70	70	70	70
										-	-	-	-	100	-
										✱ 130	130	130	130	130	130
													-	160	-
													-	190	190
No. of V-Lock plates supplied	1			1			1			2			2		
L	94			119			144			194			244		

CUSHIONED

Stroke [mm]	25			50			75			100			150			175		
Position	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D
Possible positions (see page A3.67)	-	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10	● 10	10	10
	-	40	-	-	40	-	-	-	-	-	40	-	-	40	-	-	40	-
				-	-	70	✱ 70	-	70	70	70	70	70	70	70	70	70	70
										-	100	-	-	100	-	-	100	-
													✱ 130	130	130	130	130	130
													-	160	-	-	160	-
																-	190	190
No. of V-Lock plates supplied	1			1			1			2			2			2		
L	94			119			144			169			219			244		

✱ Outlet side power supply not available ● Return side power supply not available ■ Side power supply not available

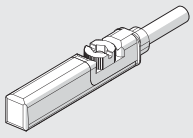
KEY TO CODES

CYL	W143	032	2	050	U	K
	TYPE	**DIAMETER**	**VERSION**	**STROKE**	**FIXING SIDE**	**FAMILY**
	Compact guided cylinder	**016** Ø 16 **020** Ø 20 **025** Ø 25 **032** Ø 32 **040** Ø 40	**2** Non-cushioned with bronze bushings **3** Non-cushioned with ball bearings **4** Cushioned with bronze bushings **5** Cushioned with ball bearings	CUSHIONED VERSION **Ø 16:** 20, 30, 40, 50 **Ø 20:** 20, 30, 40, 50, 75, 100, 150, 200 **Ø 25:** 20, 30, 40, 50, 75, 100, 150 **Ø 32:** 25, 50, 75, 100, 150, 175 **Ø 40:** 25*, 50, 75, 100, 150, 175 NOT CUSHIONED VERSION ◆ **Ø 16:** 30*, 40, 50, 75, 100, 150, 200 **Ø 20:** 25, 30, 40, 50, 75, 100, 150, 200 **Ø 25:** 25, 30, 40, 50, 75, 100, 150, 200 **Ø 32:** 25, 50, 75, 100, 150, 200 **Ø 40:** 50, 75, 100, 150, 200 * Side and Down versions only ◆ Other strokes on request but with the same cylinder dimensions as the standard stroke immediately above.	**U** Up **S** Side **D** Down	**K** V-Lock

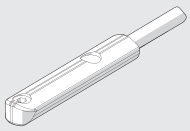
ACCESSORIES

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation, secure fixing



SENSOR, OVAL TYPE
Traditional

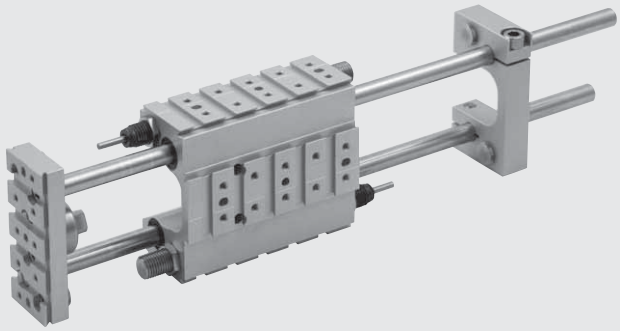


For codes and technical data, see **chapter A6**.

NOTES

GUIDE UNITS
SERIES GDHK AND GDMK

Guide units GDHK and GDMK guarantee excellent alignment and anti-rotation of the pneumatic cylinder connected to them.
They can be used either singly or in combination to obtain complete handling units. The typical dovetail profile with V-Lock slots allows assembly with other elements in the V-Lock series.



Guide units can be coupled with:
- ISO 6432 cylinders Ø 12, 16, 20 and Ø 25. **You can not use sensor circlip mod. DSW;**
- ISO 15552 series 3 cylinders Ø 32 and 40;
- ISO 15552 STD and type A cylinders Ø 32 and 40. **You can not apply position sensors.**
- Electric cylinder series Elektro ISO 15552 Ø32. It is a version with shorter columns; the cylinder must be an anti-rotation type because the guide coupling is rotary and cannot prevent piston rod rotation.

Series GDHK has bronze bushes and is more suitable for high loads.
Series GDMK has recirculating ball bushes and is more suitable for high speeds.

Guide units are available with 5 types of stop mechanism:
- without stops (stop is provided by the cylinder);
- with buffers for piston rod retraction;
- with a hydraulic shock absorber for piston rod retraction;
- with buffers for piston rod extension and retraction;
- with hydraulic shock absorbers for piston rod extension and retraction.

TECHNICAL DATA		Ø 12	Ø 16	Ø 20	Ø 25	Ø 32	Ø 40
Strokes	mm	From 1 to 600					
		The total stroke can be shortened using adjusting stops and/or the rear plate					
Stroke reduction via stop adjustment	mm	–14 per side		–22 per side		–40 per side	–35 per side
Temperature range	°C	–10 to +80					
Recommended maximum speed	m/s	1					
Rear plate torques	Nm	7 ±1		22 ±2			35 ±2
Guide column diameter	mm	10		12		16	20
Maximum impact energy							
with shock absorbers	Ec [J]	5		20		25	70
with buffers	Ec [J]	0.5		1		2	2
without stops		refer to the diagram on page **A3**.82					
Repeatability (at 6 bar)							
Versions with buffers	mm	±0.02 (with minimum pressure 5 bar)					
Versions with shock absorbers	mm	±0.02					
Lubrication		The guides are supplied lubricated. There are two greasers on the guide bodies (one per column) for periodic lubrication using a pump with a nozzle. The following greases are recommended: - version GDHK: code 9910502 (RHEOLUBE 362 HB) - version GDMK: code 9910506 (RHEOLUBE 363AX1) The lubrication interval depends on numerous factors such as load, temperature, speed, stroke, lubricant, environmental conditions and assembly position. **As a general rule, lubrication is recommended every 500.000 – 1.000.000 cycles.**					

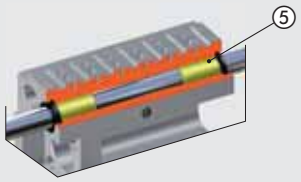
COMPONENTS

① BODY: anodised aluminium
② FRONT PLATE: anodised aluminium
③ REAR PLATE: anodised aluminium
④ STOP: tempered steel
⑤ COLUMN GUIDES:
- sintered bronze (for GDH version)
- recirculation ball bushes (for GDM version)

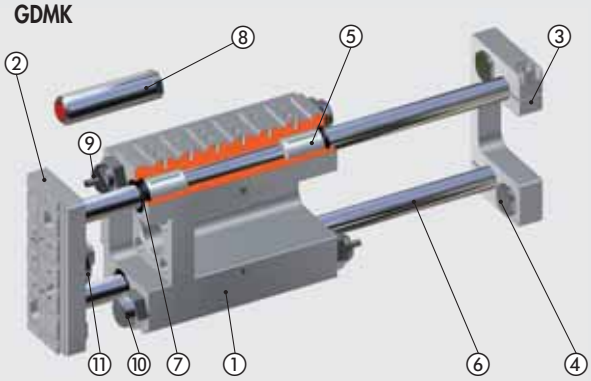
⑥ GUIDE COLUMNS:
- C45 grinded crome steel (for GDH version)
- tempered steel (for GDM version)

⑦ DUST SCRAPER RING: polyurethane or NBR
⑧ BUFFER
⑨ DECELERATOR
⑩ ADJUSTABLE STOP: tempered steel (for versions with shock absorbers)
⑪ COUPLING: C45 steel

GDHK

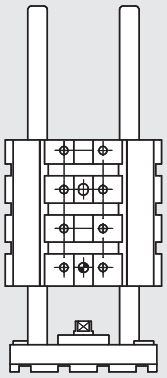


GDMK



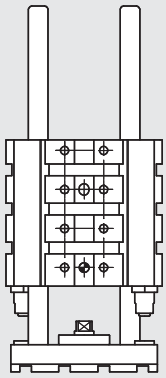
EXECUTIONS

00



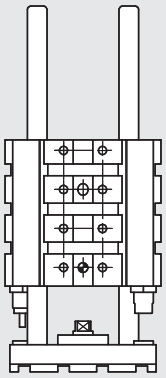
without stop

01



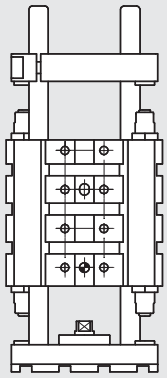
with front stop and buffers

02



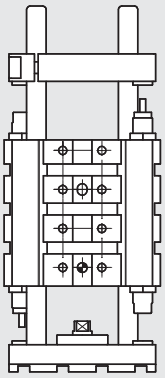
with front stop and shock absorber

03



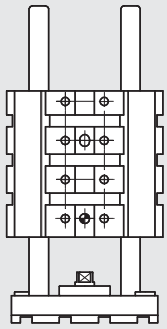
with front and rear stop and buffers

04



with front and rear stop and shock absorbers

05



with short columns for Elektro cylinder

WEIGHTS AND MOVING MASSES

TOTAL WEIGHTS

Ø mm	Weight [g] for Stroke = 0 mm — Execution 00	01	02	03	04	05	Weight [g] every mm
12-16	779	817	823	953	965	-	1.2
20-25	1412	1520	1534	1809	1837	-	1.8
32	2262	2582	2558	3161	3113	2137	3.1
40	4316	4836	4873	5864	5938	-	4.9

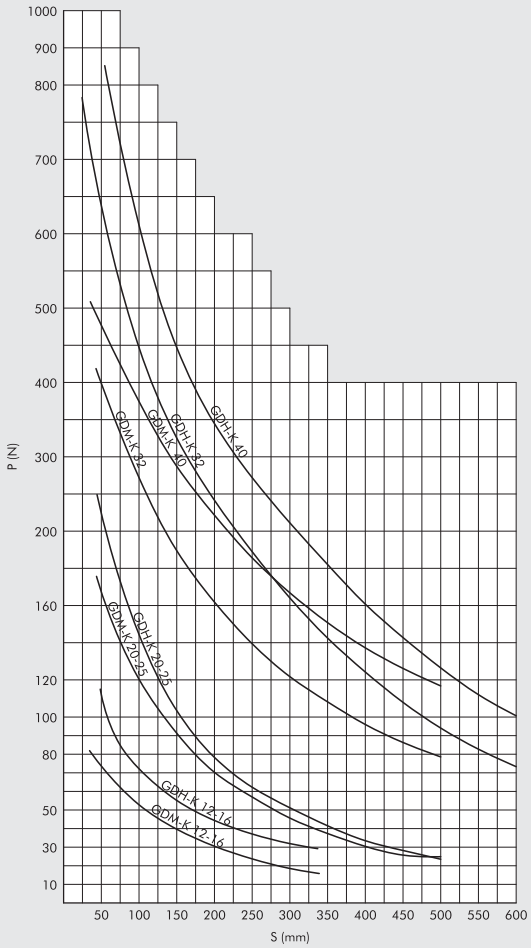
TOTAL MOVING MASSES

Ø mm	Weight [g] for Stroke = 0 mm — Execution 00	01	02	03	04	05	Weight [g] every mm
12-16	293	293	293	391	391	-	1.2
20-25	518	518	518	699	699	-	1.8
32	667	667	667	926	926	542	3.1
40	1670	1670	1670	2178	2178	-	4.9

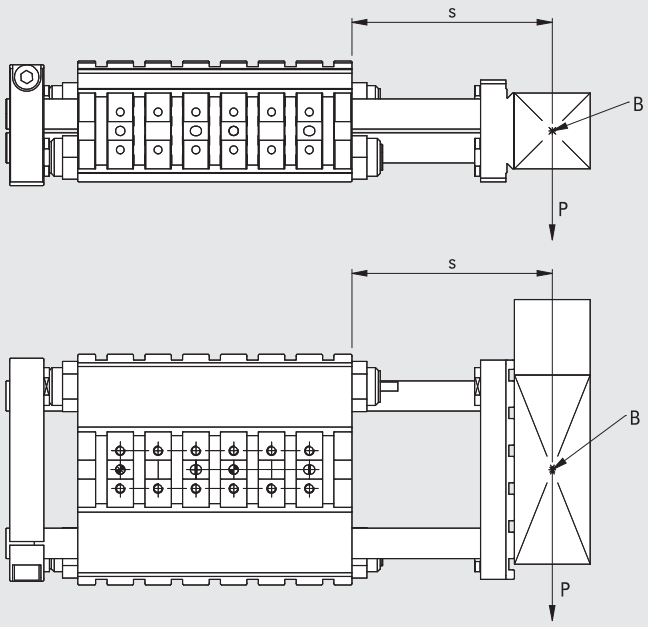
METAL WORK PNEUMATIC

LOAD DIAGRAM

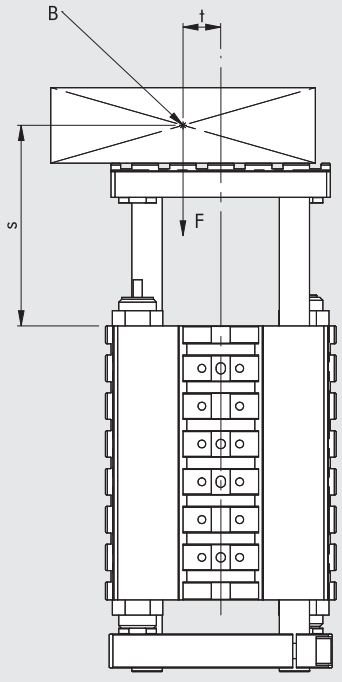
The graph on the right shows the maximum static load that can be applied to the guides as a function of the distance between the body of the guide and the barycenter of the load (with the piston rod extended).



HORIZONTAL APPLICATIONS



VERTICAL APPLICATIONS



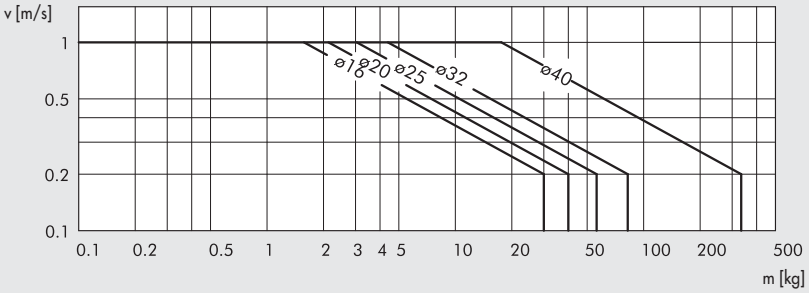
$$P = \frac{F \cdot t}{s}$$

B = Barycentre; S = Projection; P = Useful load

MAXIMUM LOADS AND SPEEDS

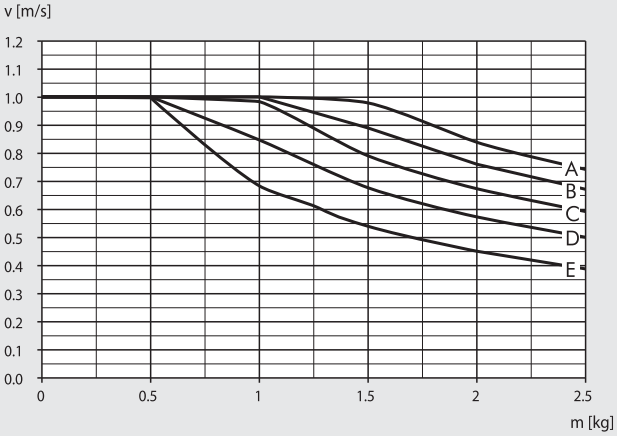
The graphs below show the maximum recommended movable loads "m" (masses) [kg] as a function of the average traverse speed "v" [m/s], defined as stroke/time, slide position (horizontal/vertical) and supply pressure.

MAXIMUM LOADS: VERSIONS WITHOUT STOPS

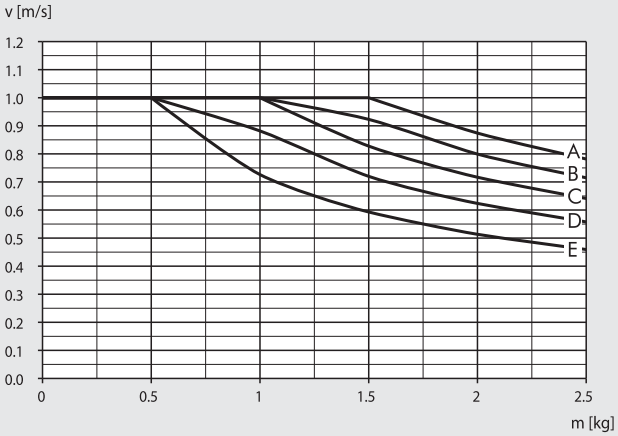


MAXIMUM LOADS: VERSIONS WITH SHOCK ABSORBERS

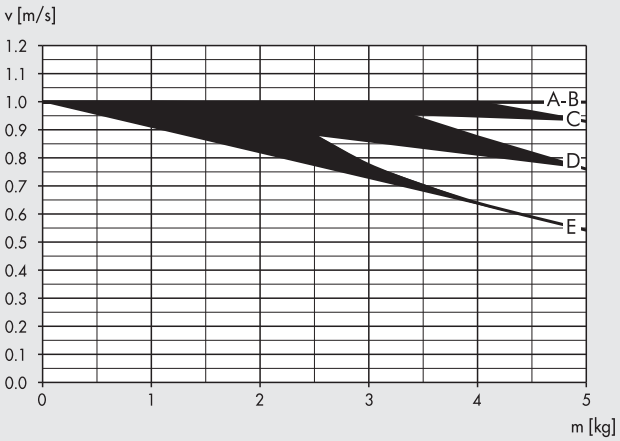
Ø 12-16 - Vertical orientation



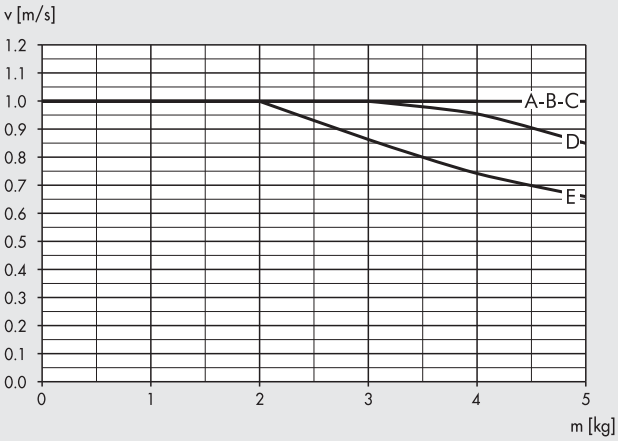
Ø 12-16 - Horizontal orientation



Ø 20-25 - Vertical orientation

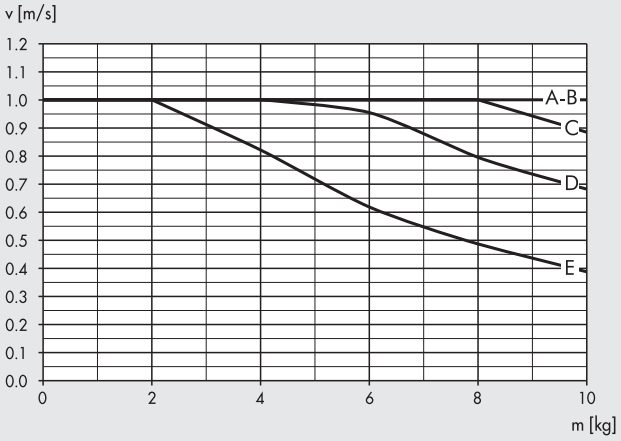


Ø 20-25 - Horizontal orientation

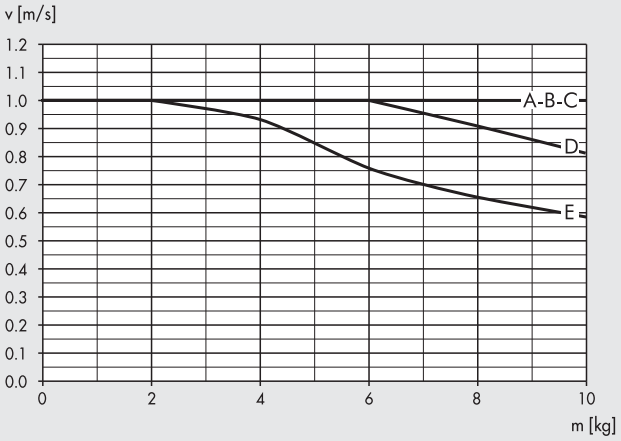


A = 2 bar B = 4 bar C = 6 bar D = 8 bar E = 10 bar

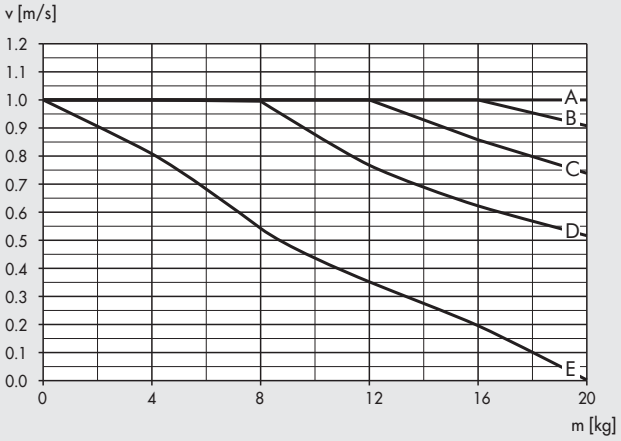
Ø 32 - Vertical orientation



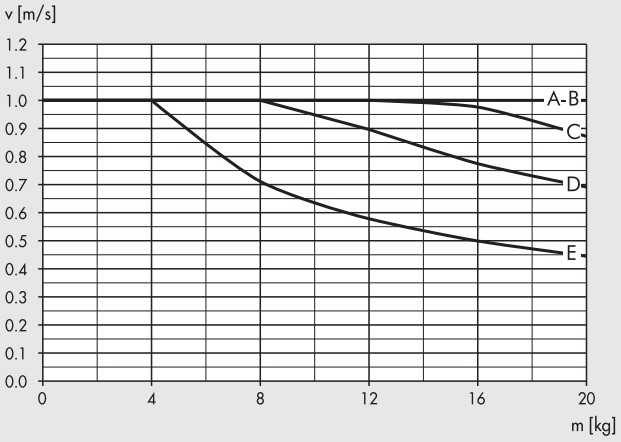
Ø 32 - Horizontal orientation



Ø 40 - Vertical orientation



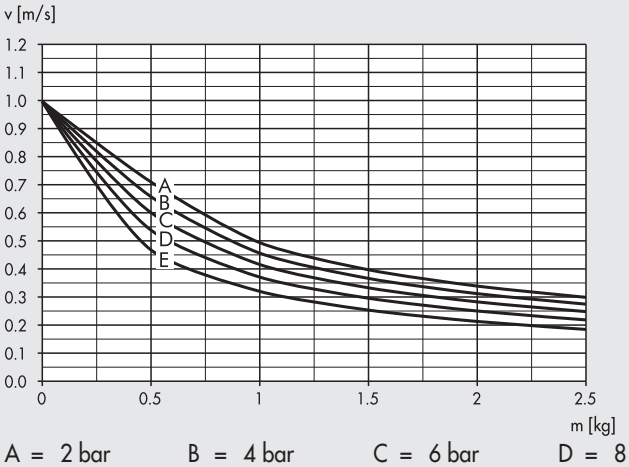
Ø 40 - Horizontal orientation



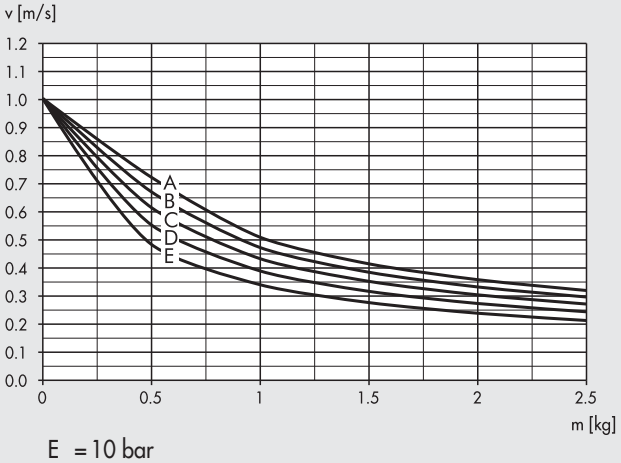
A = 2 bar B = 4 bar C = 6 bar D = 8 bar E = 10 bar

MAXIMUM LOADS: VERSIONS WITH BUFFERS

Ø 12-16 - Vertical orientation

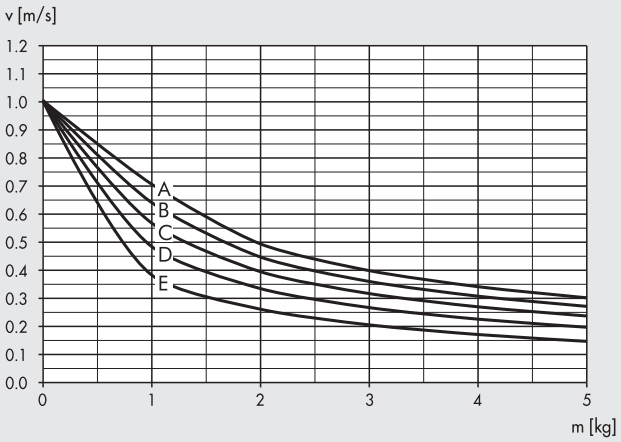


Ø 12-16 - Horizontal orientation

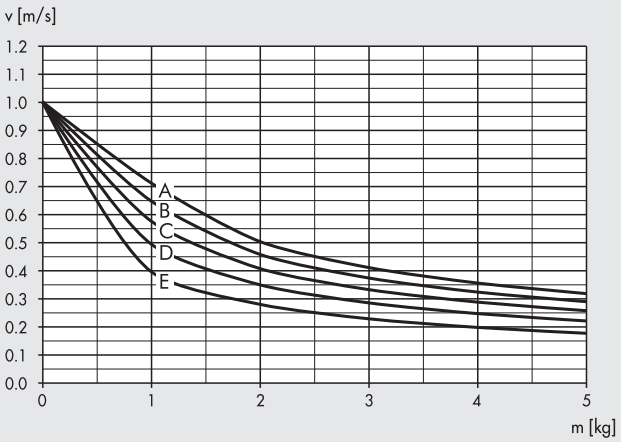


A = 2 bar B = 4 bar C = 6 bar D = 8 bar E = 10 bar

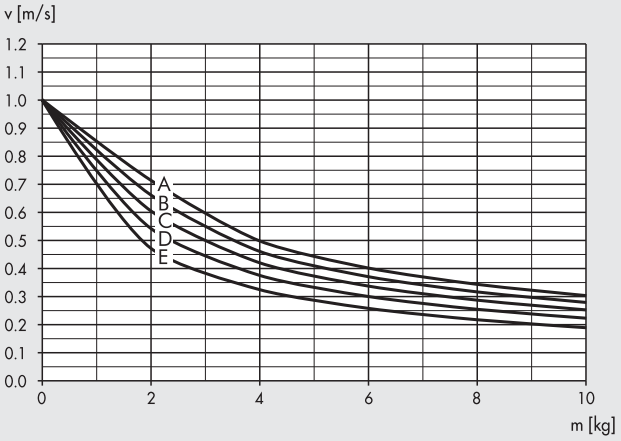
Ø 20-25 - Vertical orientation



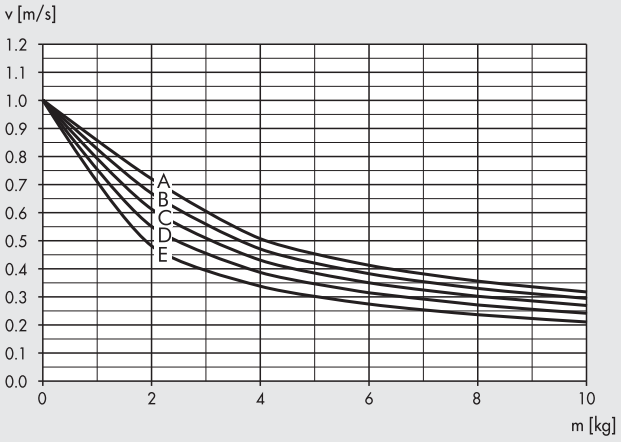
Ø 20-25 - Horizontal orientation



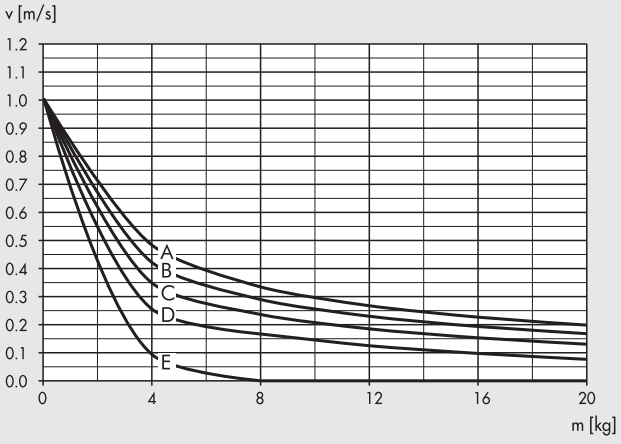
Ø 32 - Vertical orientation



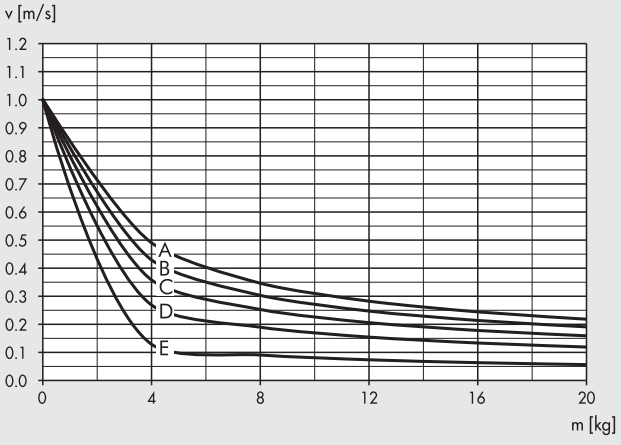
Ø 32 - Horizontal orientation



Ø 40 - Vertical orientation



Ø 40 - Horizontal orientation



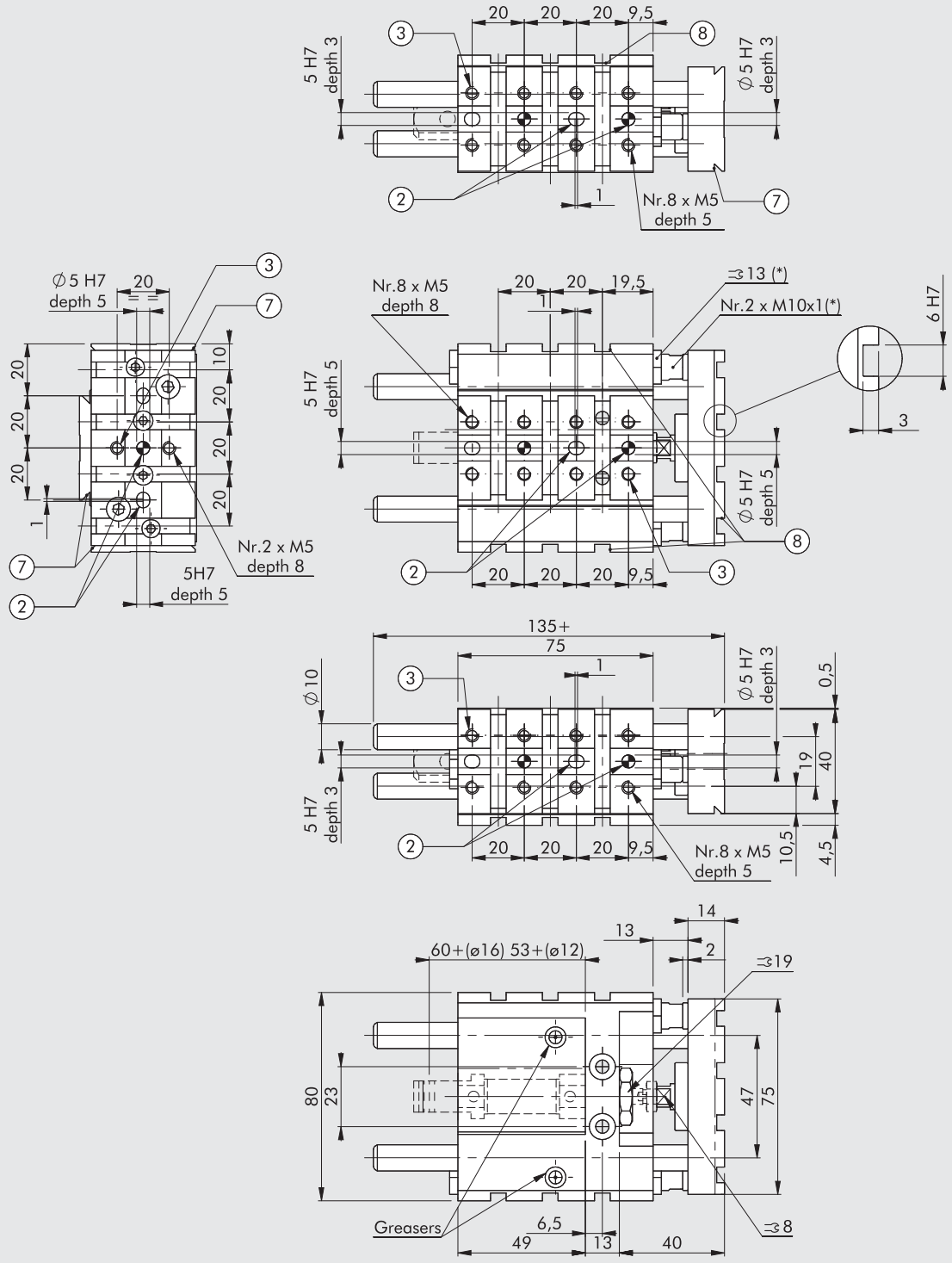
A = 2 bar B = 4 bar C = 6 bar D = 8 bar E = 10 bar

METAL WORK PNEUMATIC

DIMENSIONS Ø 12-16

Versions 00-01-02

+ = ADD THE STROKE

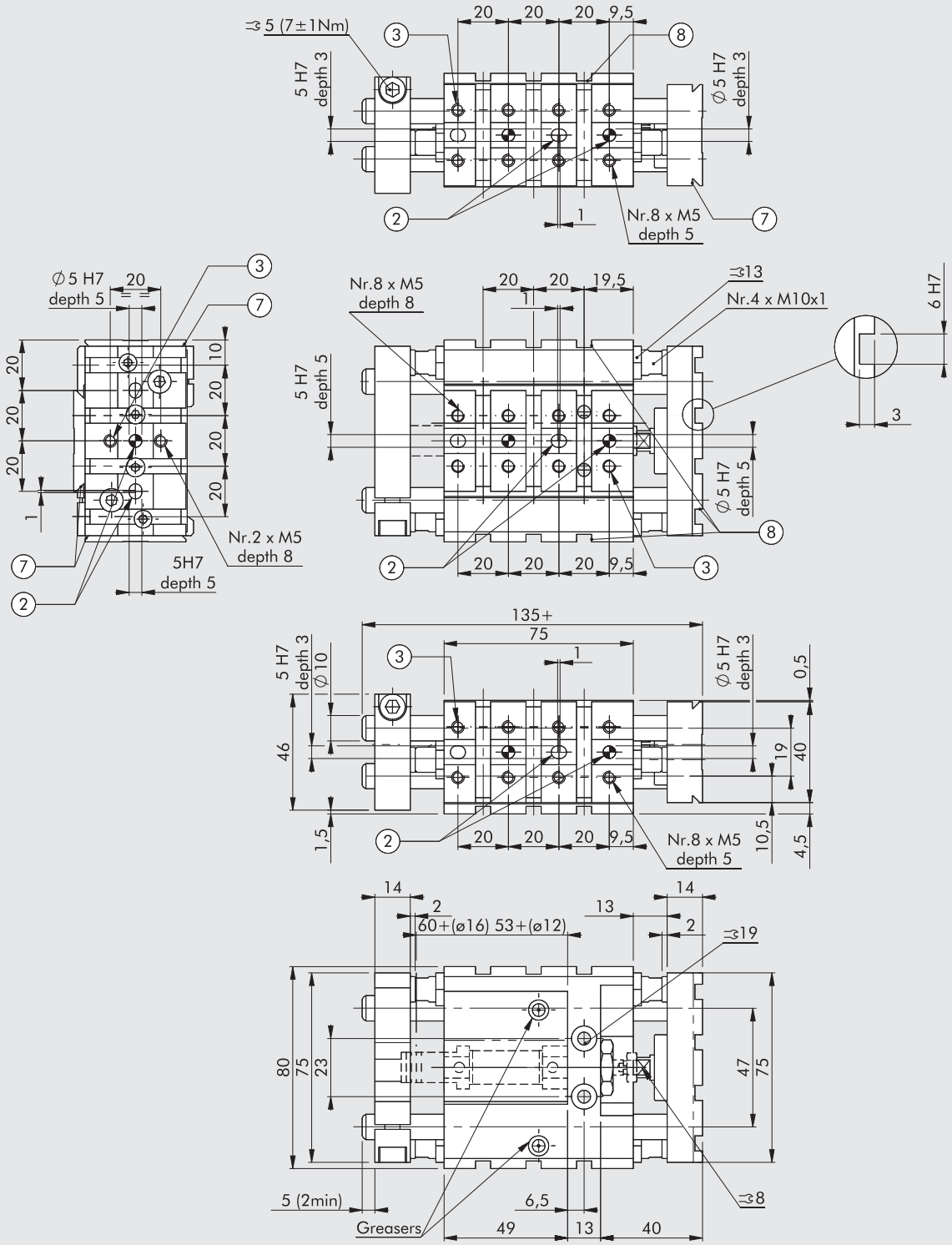


* Not present in version 00
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

DIMENSIONS Ø 12-16

Versions 03-04

+ = ADD THE STROKE



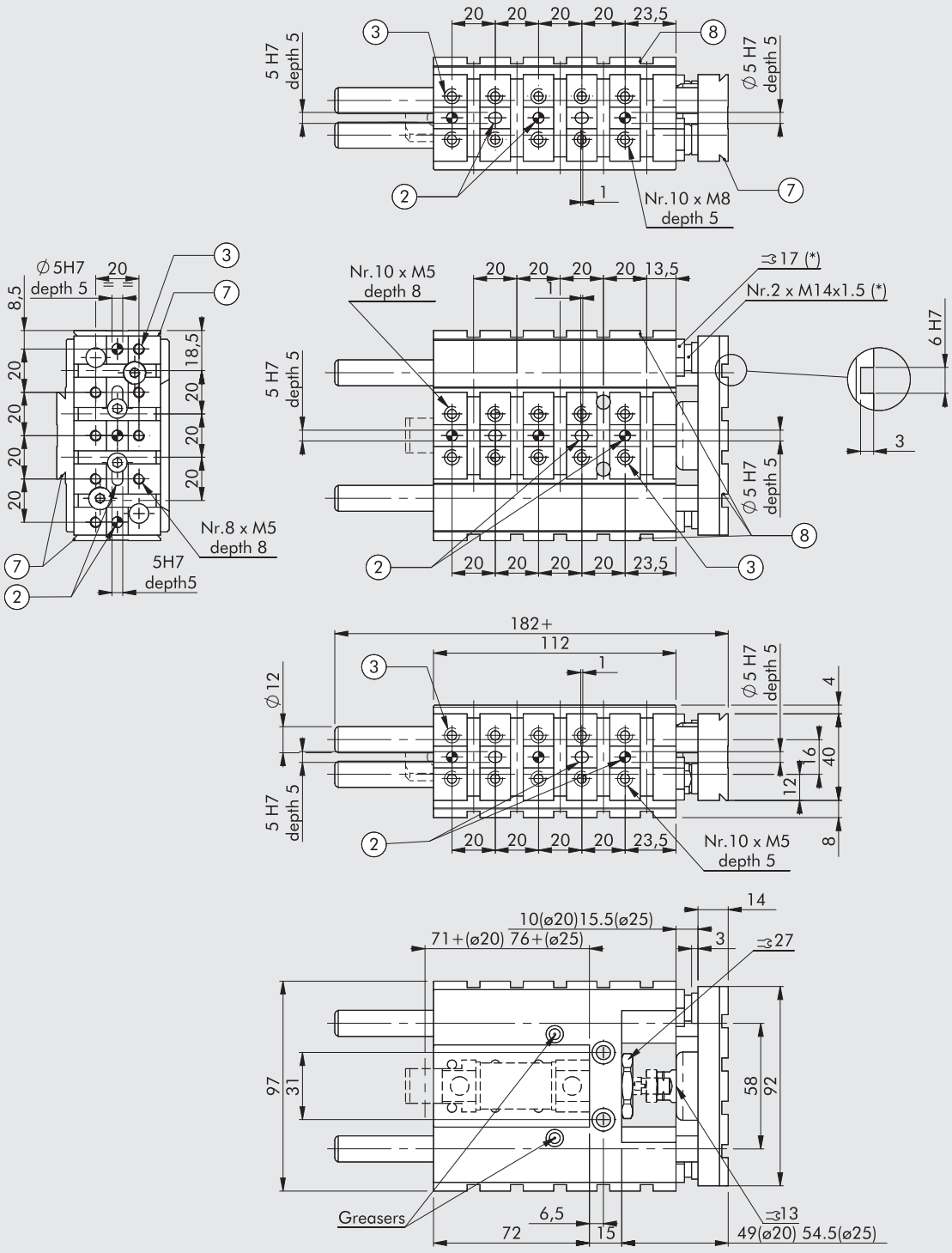
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

METAL WORK PNEUMATIC

DIMENSIONS Ø 20-25

Versions 00-01-02

+ = ADD THE STROKE

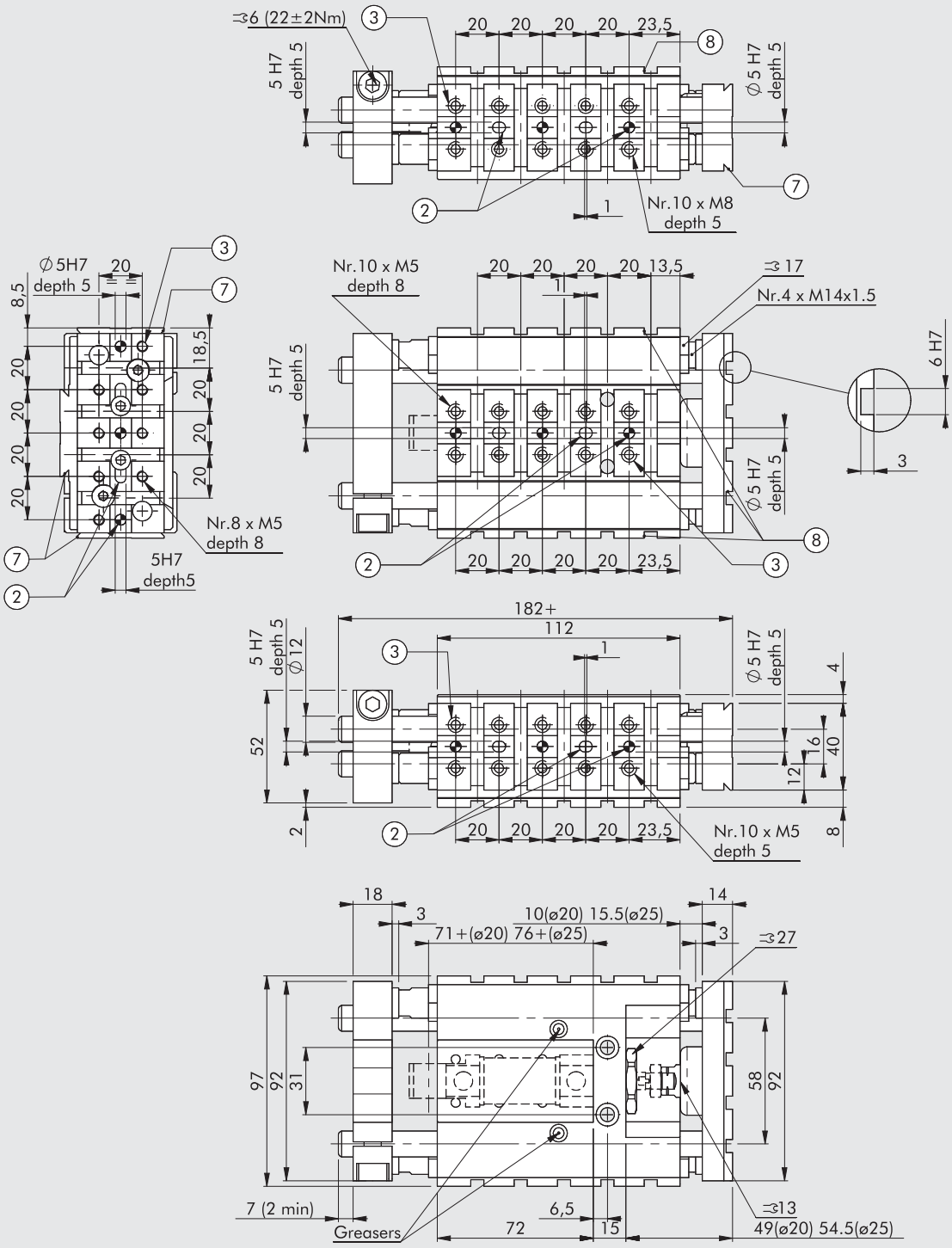


* Not present in version 00
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

DIMENSIONS Ø 20-25

Versions 03-04

+ = ADD THE STROKE



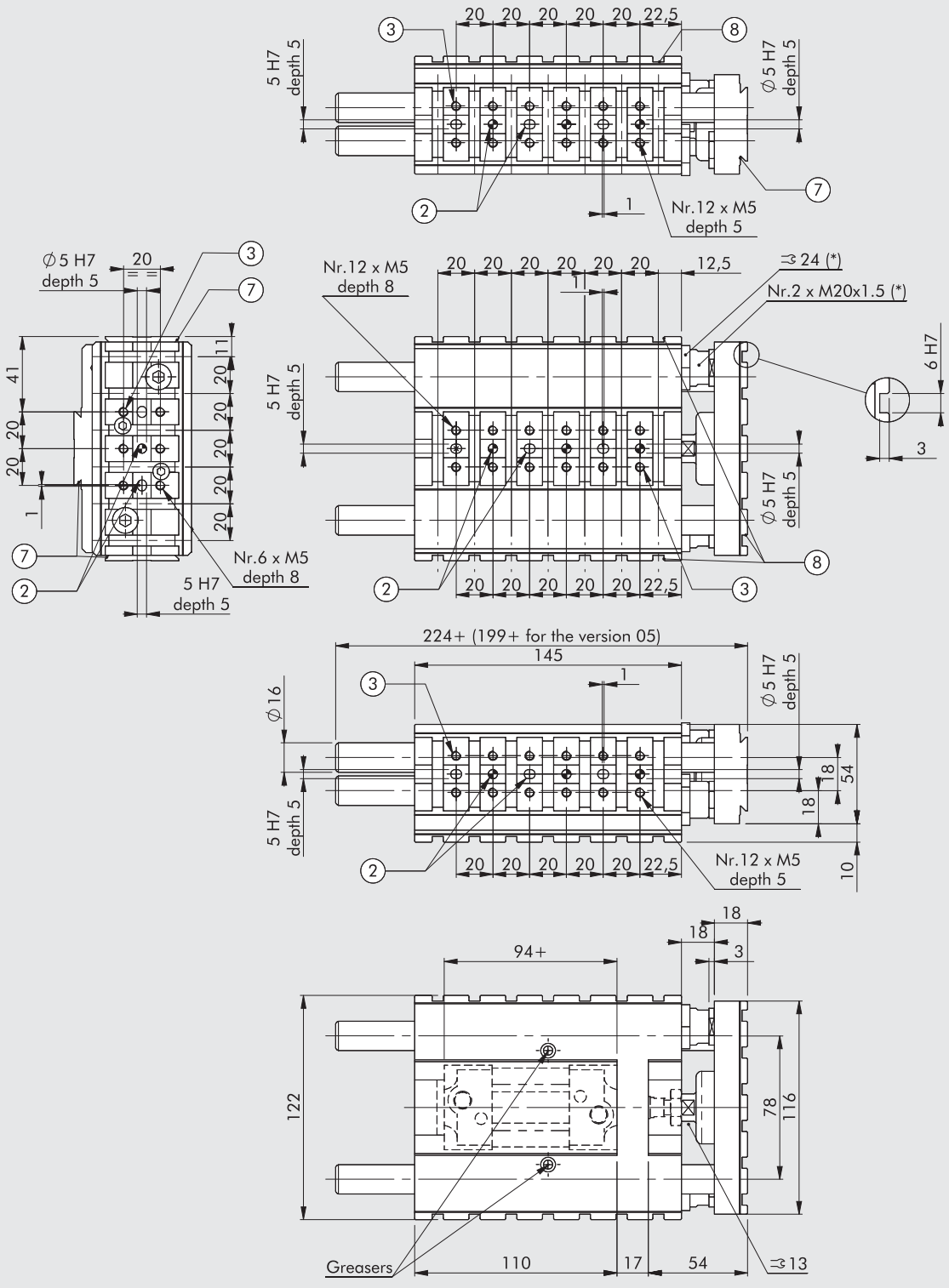
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

METAL WORK PNEUMATIC

DIMENSIONS Ø 32

Versions 00-01-02-05

+ = ADD THE STROKE

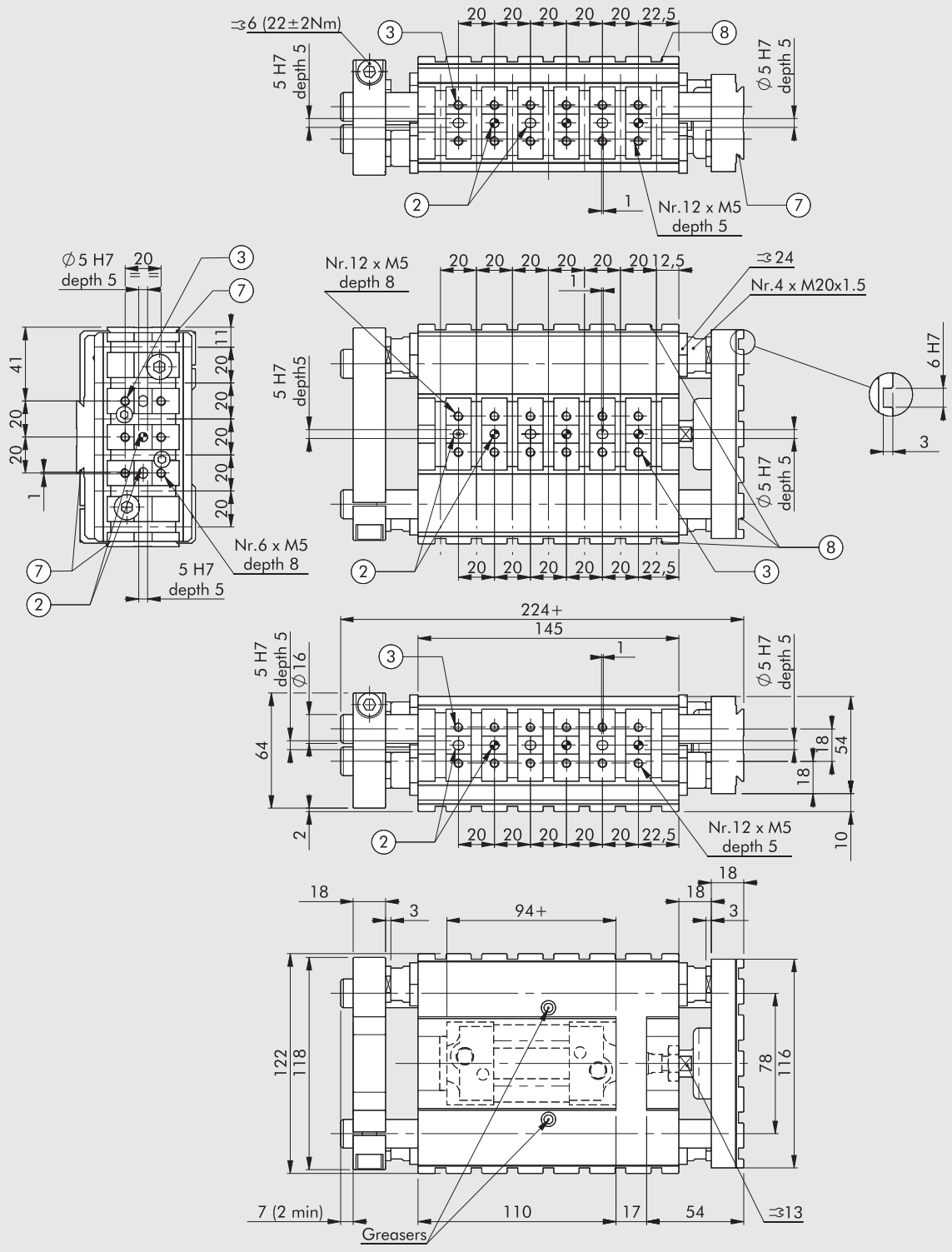


* Not present in version 00 and 05
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

DIMENSIONS Ø 32

Versions 03-04

+ = ADD THE STROKE



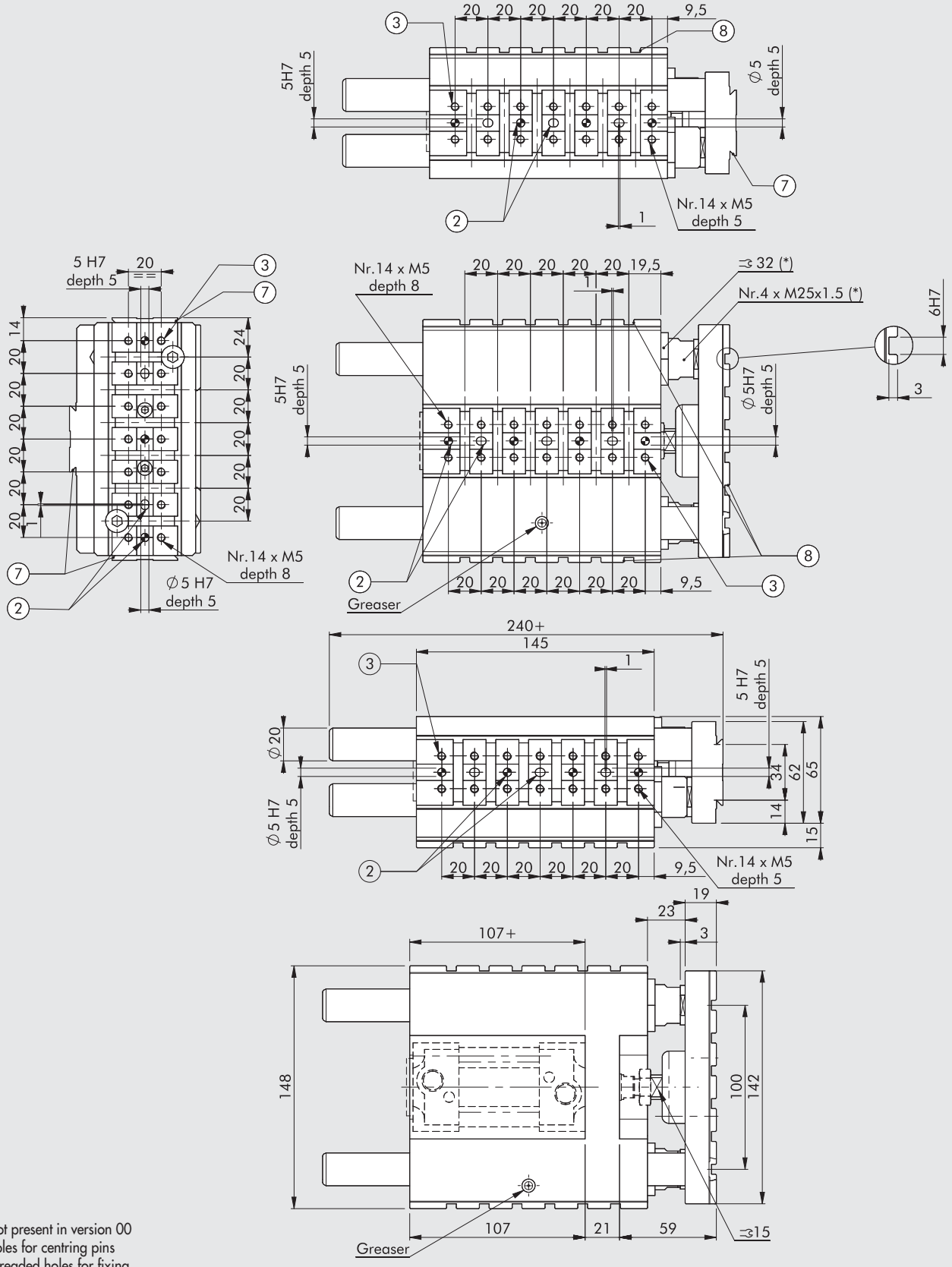
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

METAL WORK PNEUMATIC

DIMENSIONS Ø 40

Versions 00-01-02

+ = ADD THE STROKE

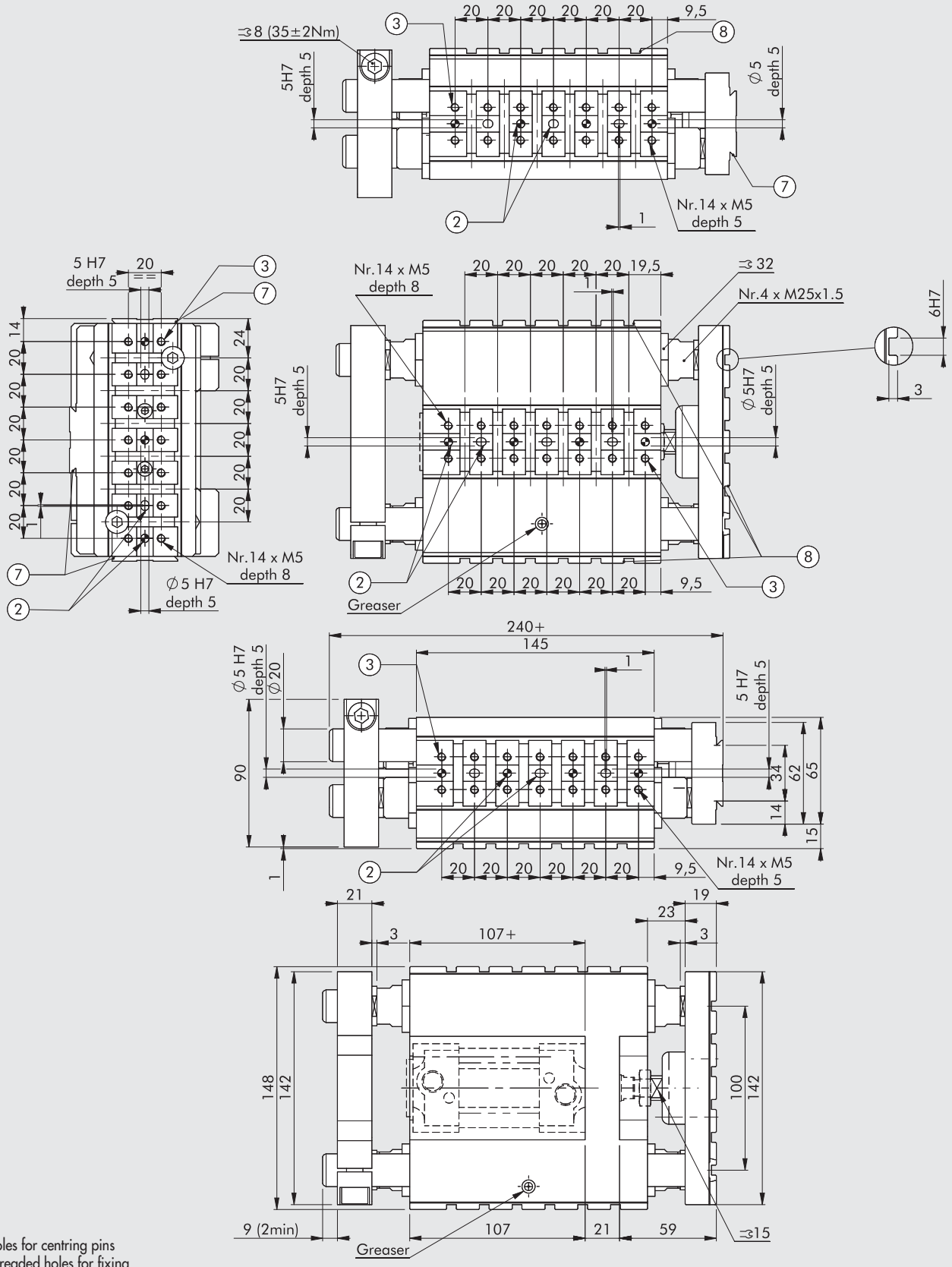


* Not present in version 00
② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

DIMENSIONS Ø 40

Versions 03-04

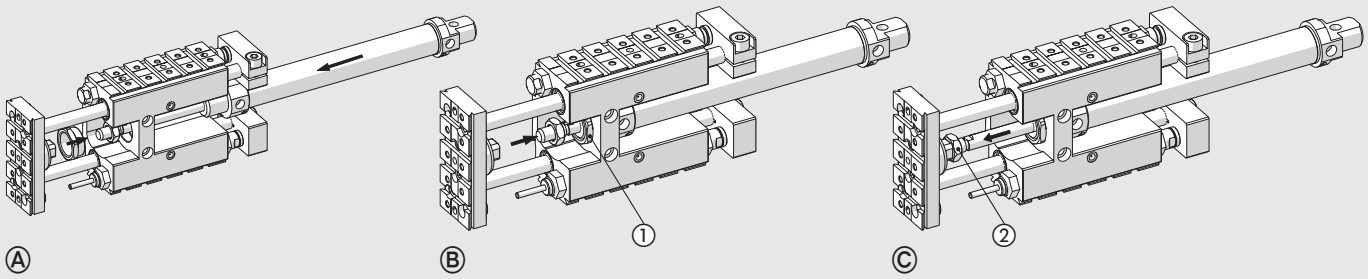
+ = ADD THE STROKE



② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

MOUNTING ON ISO 6432 CYLINDERS

For mounting on the body of ISO 6432 cylinders:
Ⓐ Insert the cylinder in the guide.
Ⓑ Retract the piston rod and tighten the nut ① from the front using a wrench, holding the front end of the cylinder firmly.
Ⓒ Screw the piston rod onto the coupling and tighten the nut ②.

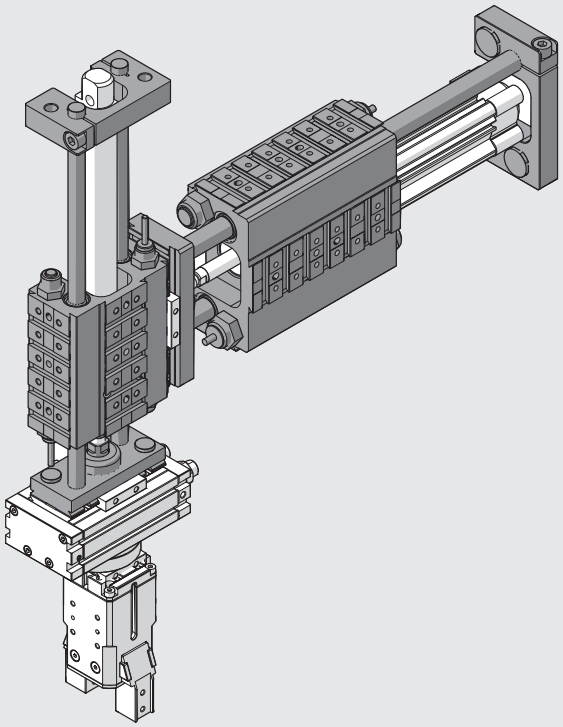


KEY TO CODES

W070	012	2	050	00	K
TYPE	**BORE**	**VERSION**	**STROKE**	**EXECUTION**	**FAMILY**
Guide unit	**012** 12 **012** 16 **020** 20 **025** 25 **032** 32 **040** 40	**2** Version H **3** Version M	See general technical data	**00** Without stop **01** With front stop and buffers **02** With front stop and shock absorber **03** With front and rear stops and buffers **04** With front and rear stops and shock absorbers ■ **05** With short columns for Elektro cylinder	**K** V-Lock

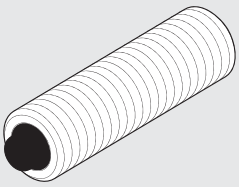
■ For Ø 32 only

EXAMPLES OF APPLICATION



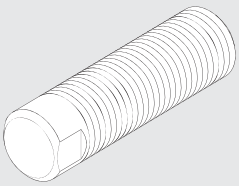
ACCESSORIES AND SPARE PARTS FOR GUIDE UNITS SERIES GDHK AND GDMK

ELASTIC MECHANICAL STOP



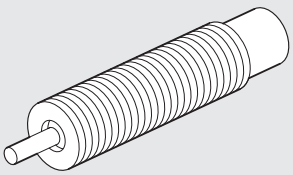
Code	Ø	Description
W0950005401K	12-16	Elastic mechanical stop M10x1 + nut
W0950005402K	20-25	Elastic mechanical stop M14x1.5 + nut
W0950005403K	32	Elastic mechanical stop M20x1.5 + nut
W0950005404K	40	Elastic mechanical stop M25x1.5 + nut

MECHANICAL STOPS



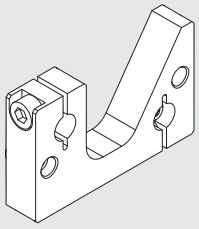
Code	Ø	Description
W0950005501K	12-16	Mechanical stop M10x1 + nut
W0950005502K	20-25	Mechanical stop M14x1.5 + nut
W0950005503K	32	Mechanical stop M20x1.5 + nut
W0950005504K	40	Mechanical stop M25x1.5 + nut

SHOCK ABSORBERS



Code	Ø	Description
W0950005301	12-16	Shock absorbers 2 M10x1 + nut
0950004004	20-25	Shock absorbers ECO25 MC2 + nut M14x1.5
0950004005	32	Shock absorbers ECO50 MC2 + nut M20x1.5
0950004006	40	Shock absorbers ECO100 MF2 + nut M25x1.5

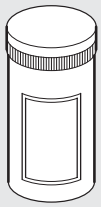
REAR PLATE KITS



Code	Ø	Description
W0950005600K	12-16	Rear plate kit GD_K
W0950005601K	20-25	Rear plate kit GD_K
W0950005602K	32	Rear plate kit GD_K
W0950005603K	40	Rear plate kit GD_K

Note: invidually packed with 2 screws

GREASE



Code	Description	Weight [g]
9910502	Tube of RHEOLUBE 362 grease (for GDHK version)	1000
9910506	Tube of RHEOLUBE 363 AX1 grease (for GDMK version)	400

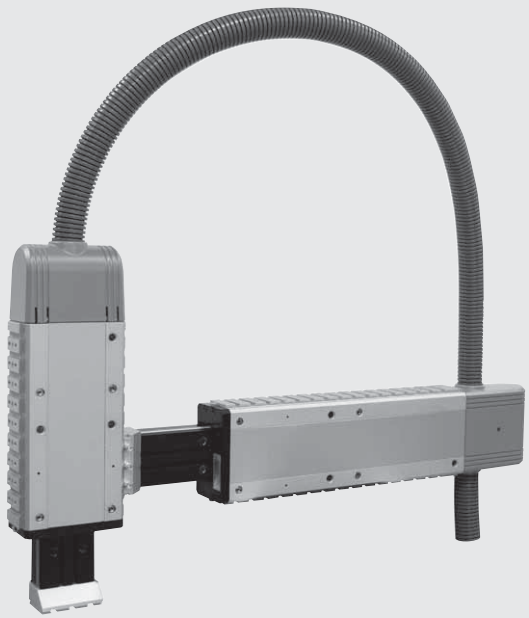
LINEAR UNITS SERIES LEPK

METAL WORK PNEUMATIC

The LEPK linear units are designed for horizontal or vertical mounting. They are driven by an ISO 6432 pneumatic cylinder that can be easily removed when it needs to be replaced.
The precision round bars, which are hardened and incorporated in the rectangular profile enclosed by the body, provide a reliable guide system without any backlash, jointly with the adjustable casters.
The stoke is limited by mechanical stops that are provided with a fine adjustment device and hydraulic shock-absorbers.
A LED visible through the openings provided in the body indicates the switching status. The final positions are controlled by inductive sensors (included in the supply). The front plate comes with V-Lock connections. Dovetail guides are provided on both sides of the body for the connection of the V-Lock or QS system.
The area of the body where to make the transversal grooves for connection with type K fixing elements can be specified at the time of the order. The encapsulated construction ensures the elimination of any points of hazard and increased silent operation.
The linear units are available in two versions:

- version A comes with a retracted position and an adjustable extended position;
- version B is designed to achieve a second supplementary adjustable extended position.

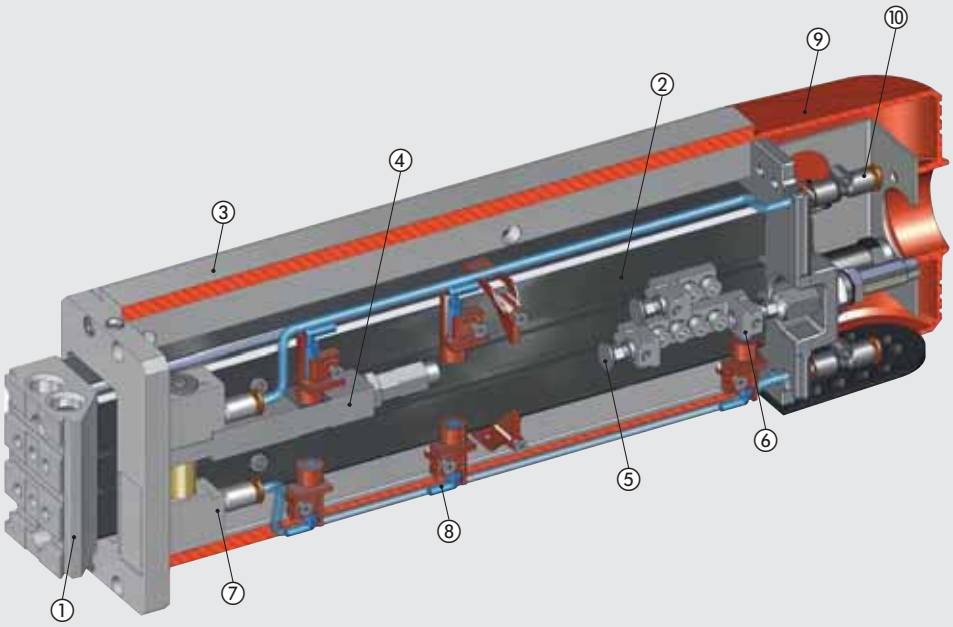
The LEPK units for vertical mounting can be equipped with a return spring to balance the weights. In the event of an emergency or a drop in pressure, the vertical slide is automatically pulled into the upper end-of-stroke position (slide fully retracted). For the orderly arrangement of cables and pipes, a hose pipe can be ordered. The linear unit for horizontal mounting can be supplied complete with an electrical terminal board.

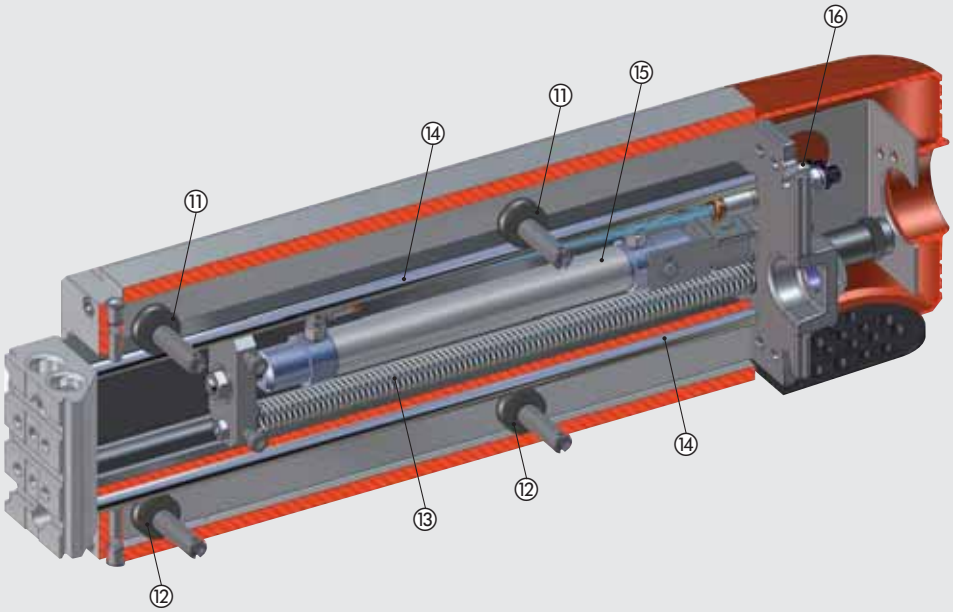


TECHNICAL DATA		LEPK-1-90-H		LEPK-1-160-H		LEPK-1-225-H		LEPK-2-320-H		LEPK-2-450-H		LEPK-1-60-V		LEPK-1-90-V		LEPK-1-160-V	
		Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B
Number of positions		2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3
Orientation		Horizontal										Vertical					
Operating pressure	bar	3 to 7															
	MPa	0.3 to 0.7															
	psi	43.5 to 101															
Temperature range	°C	-10 to 50															
	°F	14 to 122															
Fluid		Lubricated or unlubricated 20 µm filtered air. If lubricated air is used, lubrication must be continuous															
End position stop shock-absorption	mm	Hydraulic shock-absorbers															
End-position control		Inductive sensors with a LED visible from the outside															
Repeatability (on 100 strokes at constant conditions)	mm	< 0.005															
Piston diameter / Piston rod diameter	mm	16 / 6						20 / 8		25 / 10		16 / 6					
Stroke (min / max)	mm	15 to 90		15 to 160		15 to 225		50 to 320		50 to 450		15 to 60		15 to 90		15 to 160	
Intermediate useful stroke	mm	-	0 to 80	-	0 to 100	-	0 to 100	-	0 to 150	-	0 to 150	-	0 to 50	-	0 to 80	-	0 to 100
Theoretic force at 6 bar:																	
in thrust	N	106		106		106		165		260		Max. 90 (see page **A3**.101/102)					
in traction	N	90		90		90		137		218		Max. 150 (see page **A3**.101/102)					
Weight	kg	2.5	3.1	3.2	3.8	4.5	4.6	8	9.6	10.5	11	2.15	2.5	2.35	3	3.1	3.7
Weight of the moving mass	kg	0.68		0.83		1.25		2.29		3.12		0.61		0.68		0.83	
Maximum kinetic energy	J/stroke	5.88						19.6				5.88					
	J/h	25000						53000				25000					
Electrical protection class with PG29 pipe mounted (only for versions with a terminal board)		IP 42										-		-		-	
Relative air humidity (only for versions with a terminal board)		< 95 %										-		-		-	
Power connection cable (only for versions with a terminal board)		Max. 17 wires 0.14 - 0.5 mm² for max. 15 proximity switches +0 V +24 V										-		-		-	
Pneumatic connection		Pipe Ø 4						Pipe Ø 6				Pipe Ø 4					
Speed control		Flow regulators Ø 4 - M5						Flow regulators Ø 6 - 1/8"				Flow regulators Ø 4 - M5					

IMPORTANT: for maximum forces and moments, see page **A3**.97

COMPONENTS

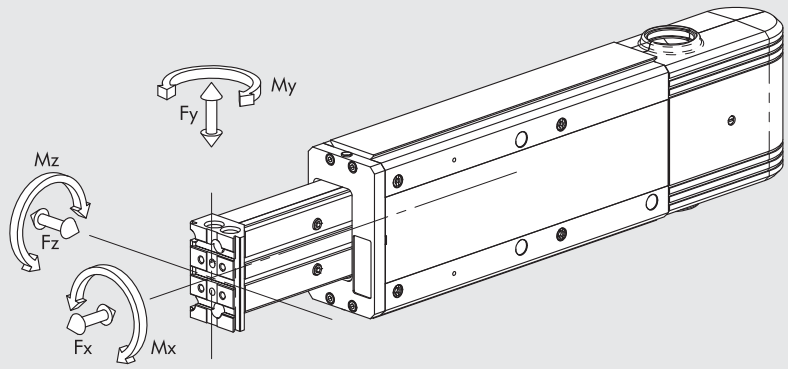




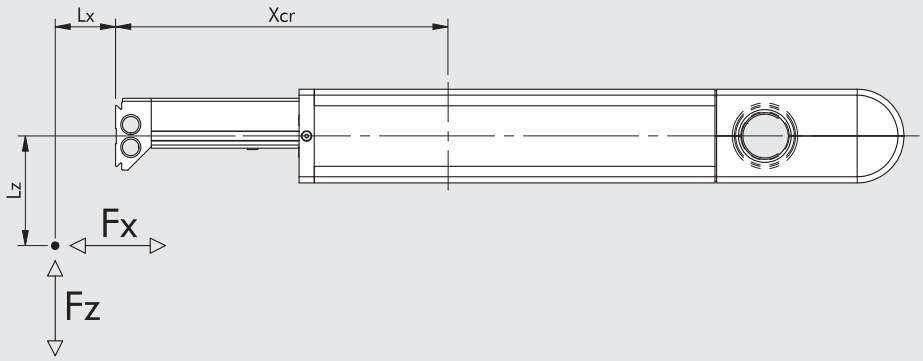
① FRONTAL INTERFACE: anodized aluminium
② SLIDING GUIDE: burnished aluminium
③ BODY: anodized aluminium
④ 3rd POSITION STOP: aluminium
⑤ ADJUSTABLE STOP: galvanized steel
⑥ FIXED STOP: galvanized steel
⑦ CONTROL CYLINDER, 3rd POSITION
⑧ INDUCTIVE SENSOR
⑨ GUARD: technopolymer
⑩ CYLINDER AIR SUPPLY FITTING, 3rd POSITION
⑪ ECCENTRIC ROLLER
⑫ CENTRIC ROLLER
⑬ RETURN SPRING: steel (optional for vertical versions only)
⑭ HARDENED GUIDE: hardened ground chromed steel
⑮ PNEUMATIC CYLINDER FOR HANDLING
⑯ FLOW REGULATOR FOR PNEUMATIC CYLINDER

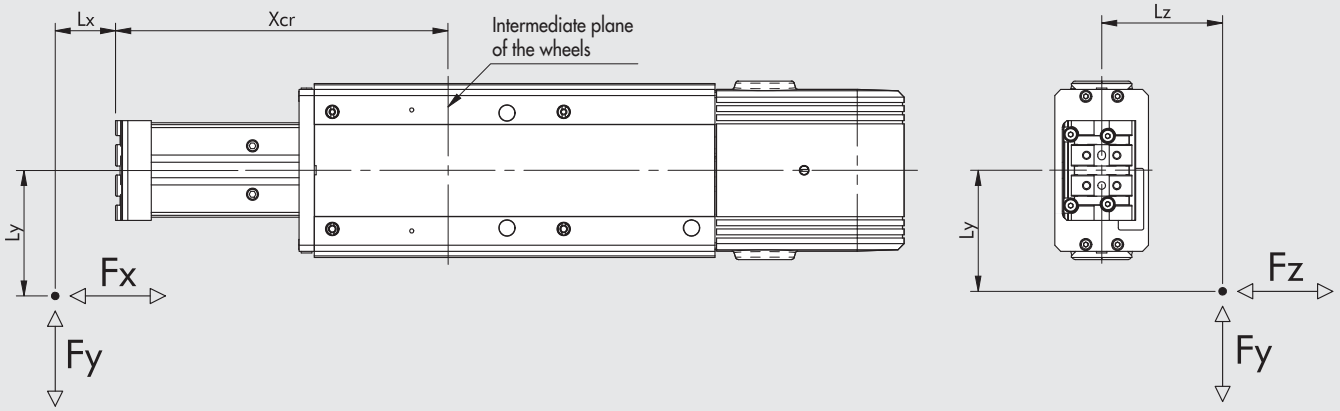
METAL WORK PNEUMATIC

DIAGRAM OF FORCES AND MOMENTS



Type	Xcr [mm]
LEPK-1-90-H-A	100
LEPK-1-90-H-B	128.5
LEPK-1-160-H-A	100
LEPK-1-160-H-B	134
LEPK-1-225-H-A	165
LEPK-1-225-H-B	165
LEPK-1-60-V-A	100
LEPK-1-60-V-B	115.5
LEPK-1-90-V-A	100
LEPK-1-90-V-B	128.5
LEPK-1-160-V-A	100
LEPK-1-160-V-B	134
LEPK-2-320-H-A	132
LEPK-2-320-H-B	179.5
LEPK-2-450-H-A	179.5
LEPK-2-450-H-B	179.5





Size	Fy [N]	Fz [N]	Mx [Nm]	My [Nm]	Mz [Nm]
LEPK-1	550	270	11	20	40
LEPK-2	1000	600	50	60	100

N.B.: The values are calculated on the basis of theoretical useful life of 10.000 km.

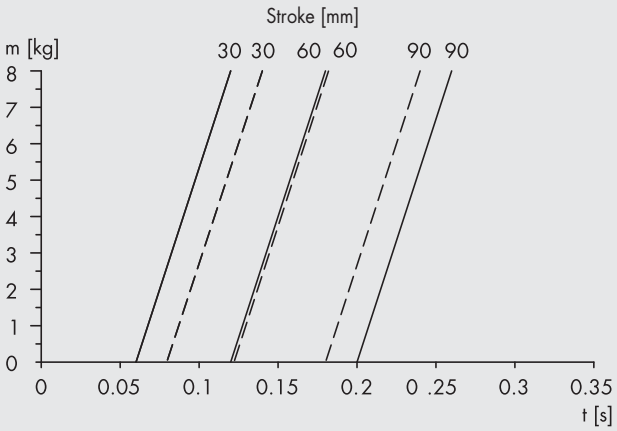
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

$Mx = Fz \cdot Ly + Fy \cdot Lz$ $My = Fz \cdot (Lx + Xcr) + Fx \cdot Lz$ $Mz = Fy \cdot (Lx + Xcr) + Fx \cdot Ly$

$$\frac{[Mx]}{Mx_{max}} + \frac{[My]}{My_{max}} + \frac{[Mz]}{Mz_{max}} + \frac{[Fy]}{Fy_{max}} + \frac{[Fz]}{Fz_{max}} \leq 1$$

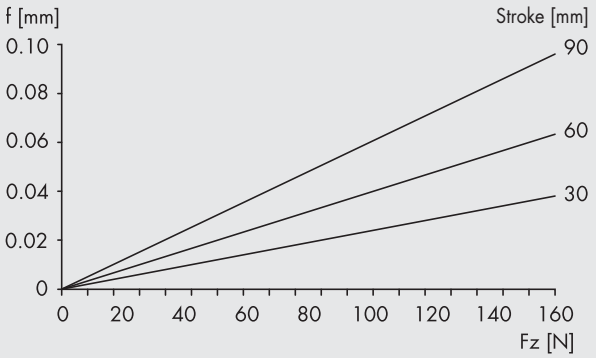
HORIZONTAL LAYOUT

LEPK-1-90-H-A/B - Diagram of traverse times



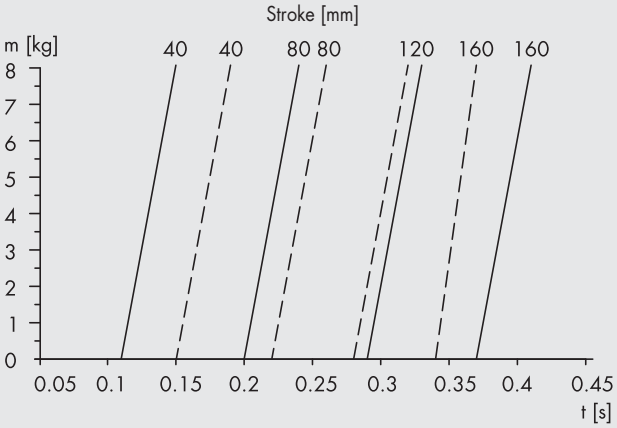
— — — Extension time
——— Retraction time at 5 bar without choke

LEPK-1-90-H-A/B - Stress-deformation diagram



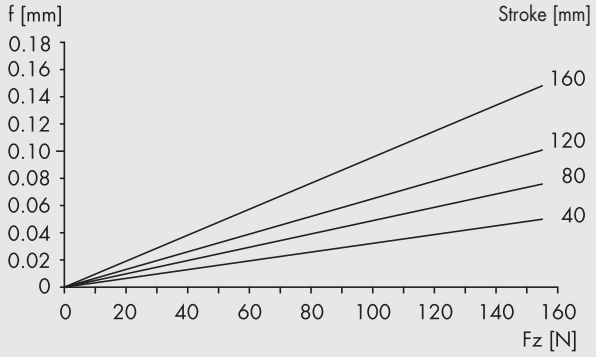
f = Deflection (measured at the locking plate)
Fz = The sum of all vertical forces

LEPK-1-160-H-A/B - Diagram of traverse times



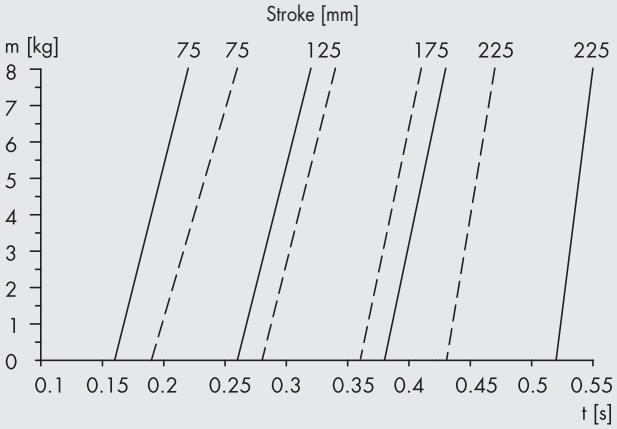
— — — Extension time
——— Retraction time at 5 bar without choke

LEPK-1-160-H-A/B - Stress-deformation diagram



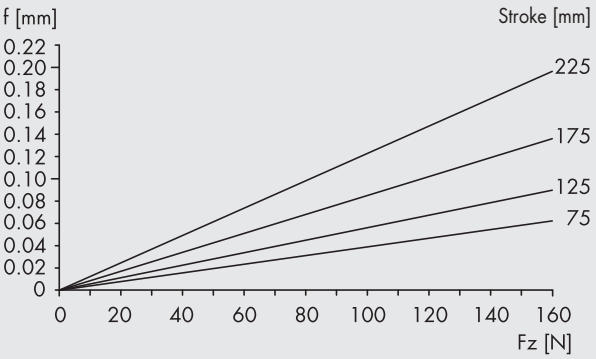
f = Deflection (measured at the locking plate)
Fz = The sum of all vertical forces

LEPK-1-225-H-A/B - Diagram of traverse times



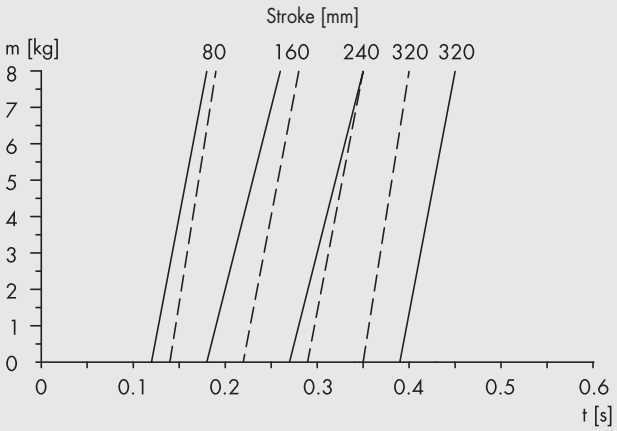
— — — Extension time
——— Retraction time at 5 bar without choke

LEPK-1-225-H-A/B - Stress-deformation diagram



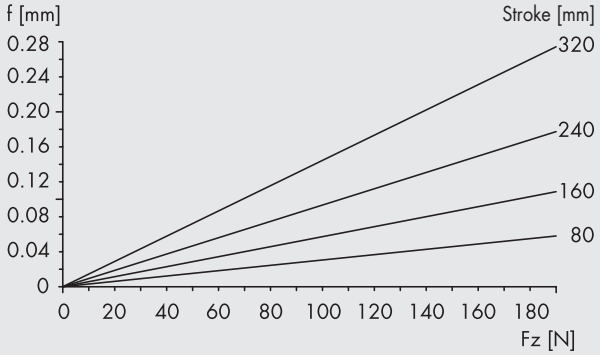
f = Deflection (measured at the locking plate)
Fz = The sum of all vertical forces

LEPK-2-320-H-A/B - Diagram of traverse times



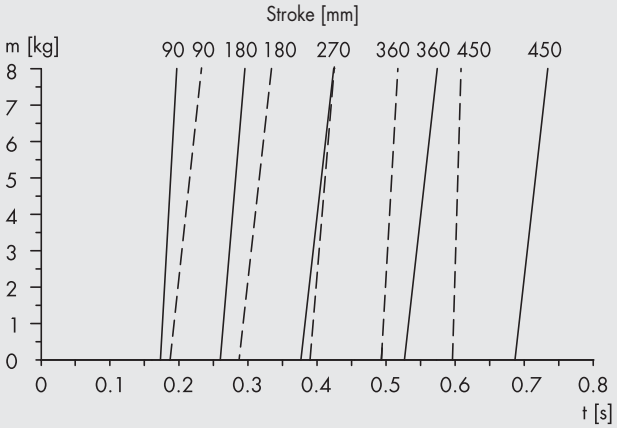
— — — Extension time
——— Retraction time at 5 bar without choke

LEPK-2-320-H-A/B - Stress-deformation diagram



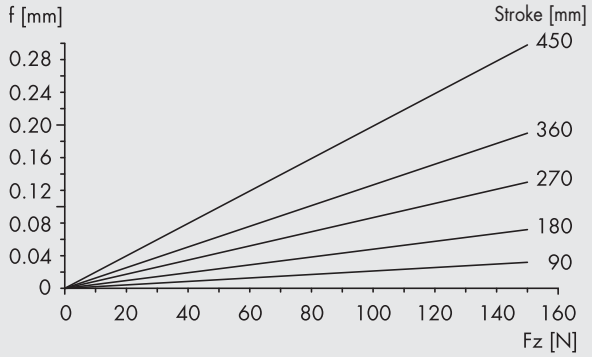
f = Deflection (measured at the locking plate)
Fz = The sum of all vertical forces

LEPK-2-450-H-A/B - Diagram of traverse times



— — — Extension time
——— Retraction time at 5 bar without choke

LEPK-2-450-H-A/B - Stress-deformation diagram



f = Deflection (measured at the locking plate)
Fz = The sum of all vertical forces

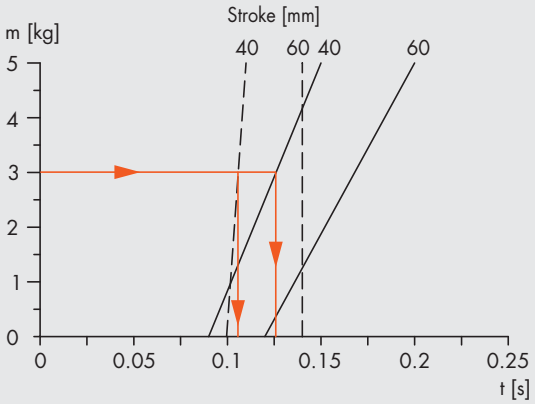
VERTICAL LAYOUT

EXAMPLE
LEPK-1-60-V-A/B - Traverse times

Extension time
m = 3 kg
Stroke = 40 mm
Result: t = 0.11 s

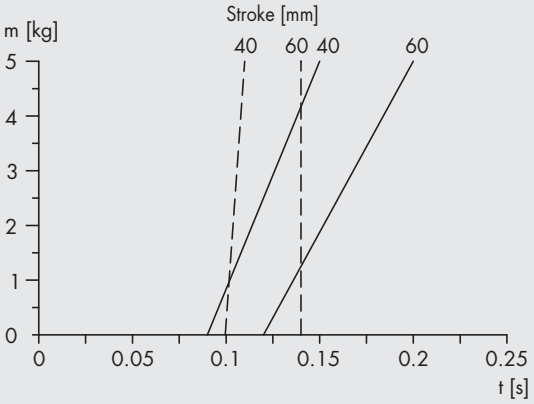
Retraction time
m = 3 kg
Stroke = 40 mm
Result: t = 0.13 s

m = Mass applied [kg]
t = Traverse times [s]
Stroke = Traverse stroke [mm]



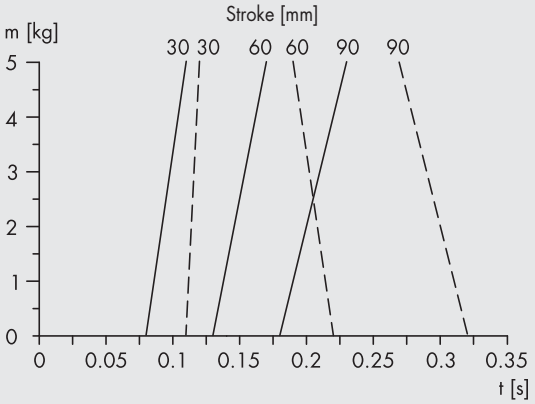
— — — Extension time
——— Retraction time at 5 bar without choke

LEPK-1-60-V-A/B - Diagram of traverse times



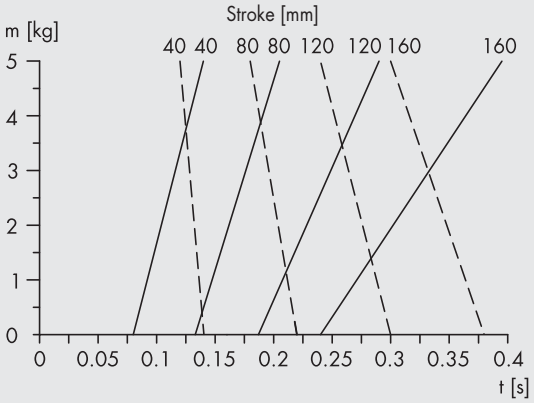
— — — Extension time
——— Retraction time at 5 bar without choke

LEPK-1-90-V-A/B - Diagram of traverse times



— — — Extension time
——— Retraction time at 5 bar without choke

LEPK-1-160-V-A/B - Diagram of traverse times

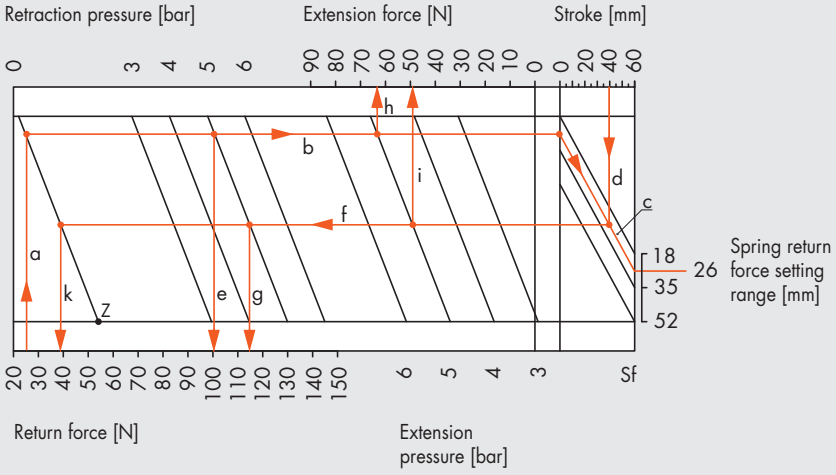


— — — Extension time
——— Retraction time at 5 bar without choke

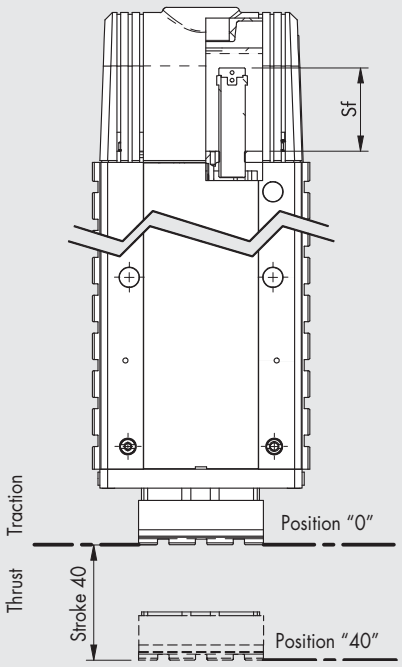
FORCES RELATING TO LEPK VERTICAL UNITS WITH SPRING

EXAMPLE
LEPK-1-60-V-A/B – Diagram of forces – Interpretation of the diagram of LEPK vertical unit forces

Stroke = 40 mm
Operating pressure = 5 bar
Mass applied = 2.5 kg (about 25 N)
Requirement = in no-pressure conditions (0 bar), the mass applied (2.5 kg) must move to the upper end-of-stroke position ("0")



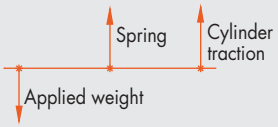
Vertical mounting position



1) Maintenance of the LEPK in position "0" with no pressure (stroke = 0 mm, pressure = 0 bar):
starting from the weight force of the mass to be lifted (25 N), and following the lines **a** - **b** - **c**, you can set the Sf = 26 mm and the following force values:

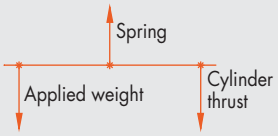
- **line e**: tractive force in position "0" and with a pressure of 5 bar in the cylinder on the front side (stroke = 0 mm, pressure = 5 bar): in the case in point, it is around 100 N.
  The mass applied must now be subtracted:
  F = 100 N - 25 N = 75 N

Traction position "0" p = 5 bar



- **line h**: thrust force in position "0" and with a pressure of 5 bar in the cylinder on the back side (stroke = 0 mm, pressure = 5 bar): in the case in point, it is about 65 N.
  The mass applied must now be added up, which gives:
  F = 65 N + 25 N = 90 N

Thrust position "0" p = 5 bar

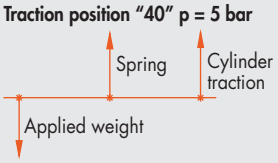


N.B.: As can be seen in the graph, for the LEPK-1-60-V, the maximum weight sustainable by the spring alone without pressure is about 55 N (with Sf = 52 mm). See point "**Z**" in the graph.

2) Verification of the forces with stroke setting to 40 mm:
starting from the 40 mm stroke and following the line **d** - **f** the following values of force are obtained:

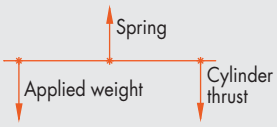
- **line g**: traction force in position "40" and with a pressure of 5 bar in the cylinder on the front side (stroke = 0 mm, pressure = 5 bar): in the case in point, it is around 115 N.
  The mass applied must now be subtracted, which gives:
  F = 115 N - 25 N = 90 N

Traction position "40" p = 5 bar



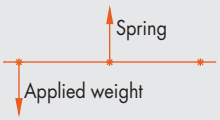
- **line i**: thrust force in position "40" and with a pressure of 5 bar in the cylinder on the back side (stroke = 40 mm, pressure = 5 bar): in the case in point, it is about 50 N.
  The mass applied must now be added up, which gives:
  F = 50 N + 25 N = 75 N

Thrust position "40" p = 5 bar

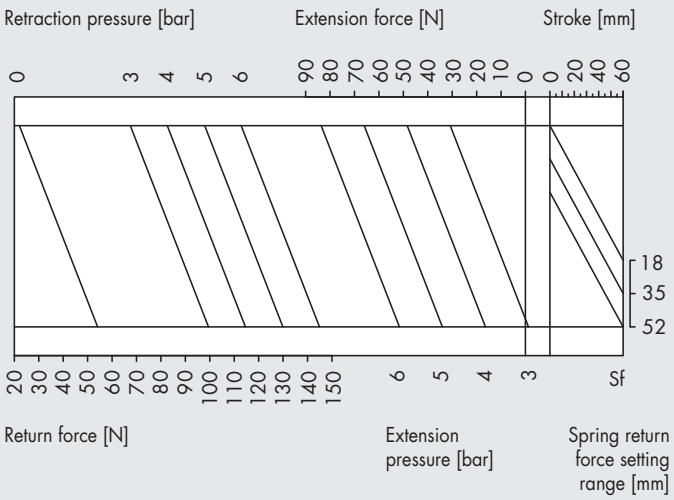


- **line k**: tractive force of the spring in position "40" and without pressure (stroke = 40 mm, pressure = 0 bar): in the case in point it is about 39 N.
  The mass applied must now be subtracted, which gives:
  F = 39 N - 25 N = 14 N

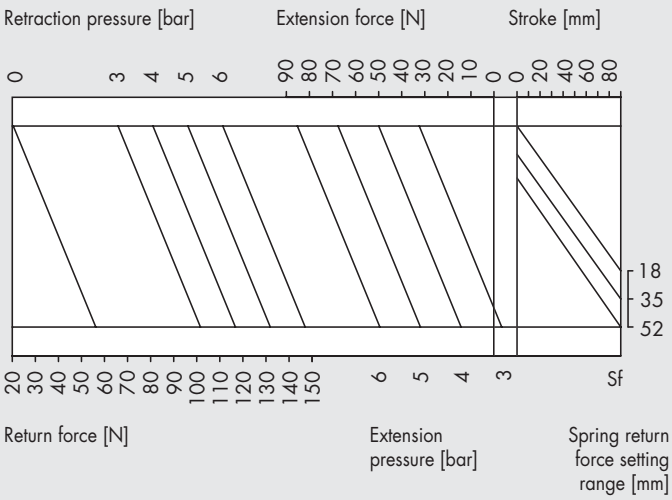
Traction position "40" p = 0 bar



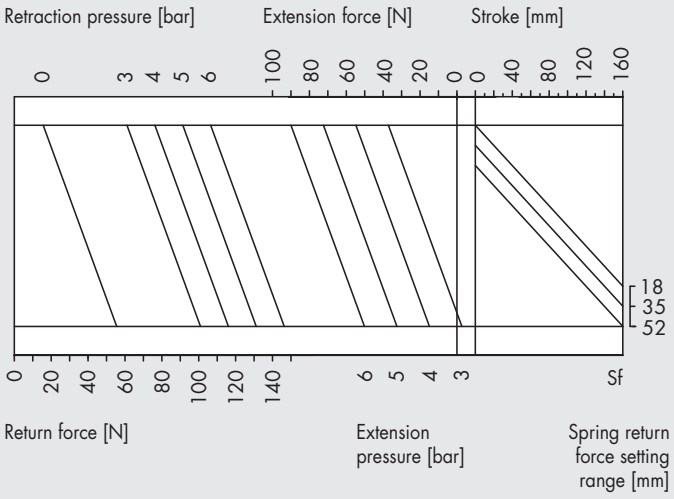
LEPK-1-60-V-A/B - Diagram of forces



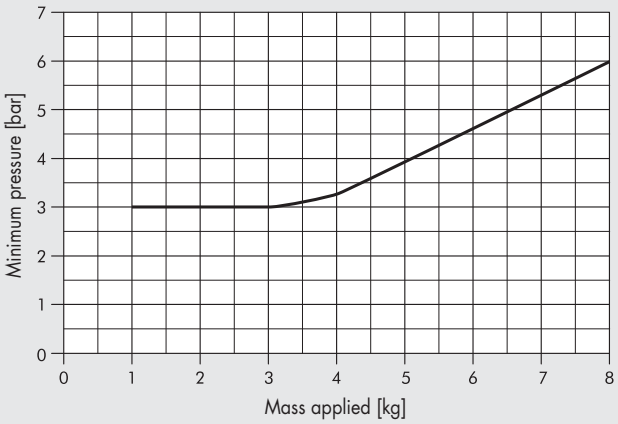
LEPK-1-90-V-A/B - Diagram of forces



LEPK-1-160-V-A/B - Diagram of forces

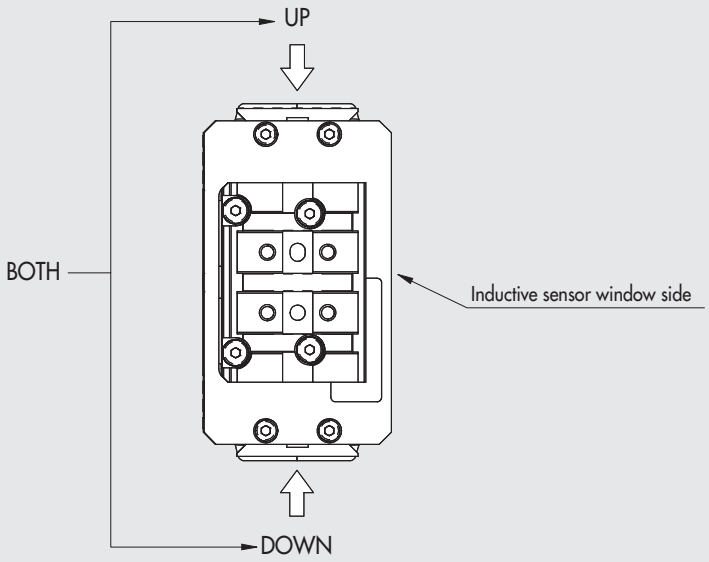


Minimum vertical retraction actuation pressure without spring



MOUNTING OPTIONS

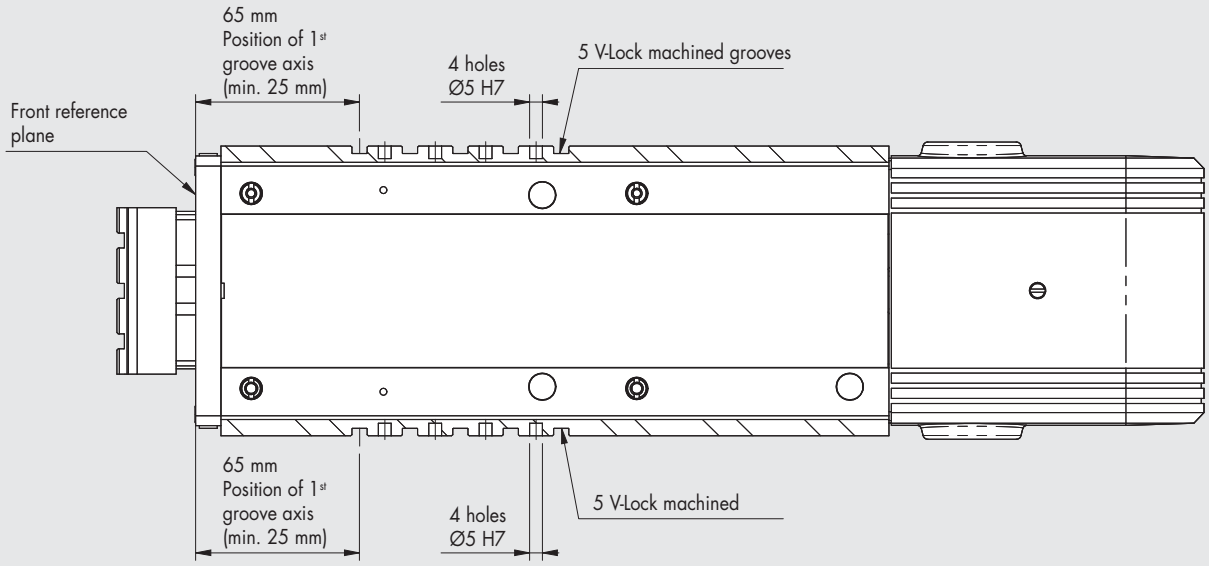
At the encoding stage, you need to determine whether to make the V-Lock grooves and on what side. Number "0" (Zero) identifies the no machining condition, while the letters "U" (Up), "D" (Down) and "B" (Both) identify the side where V-Lock connections must be provided.
The letters identify the position of machining in accordance with the diagram shown in the drawing below.



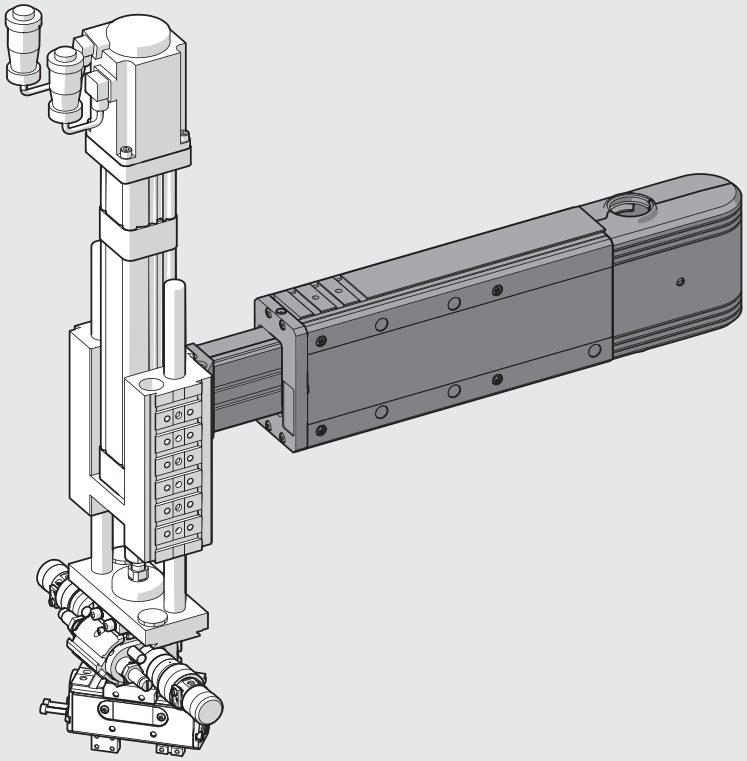
After determining the side of machining, you need to establish the point at which to perform the first V-Lock machining (the reference is the front plane).
The position of the first machining shall be in accordance with the following rules:
- minimum distance from the front reference plane: 25 mm;
- subsequent distances: starting from 25 mm, the distance is increased by 20 mm steps at a time (i.e. 25, 45, 65, 85, etc.).
The number of the V-Lock grooves to be machined is then indicated (the number of Ø5 H7 pinholes coincides with the number of grooves less 1).

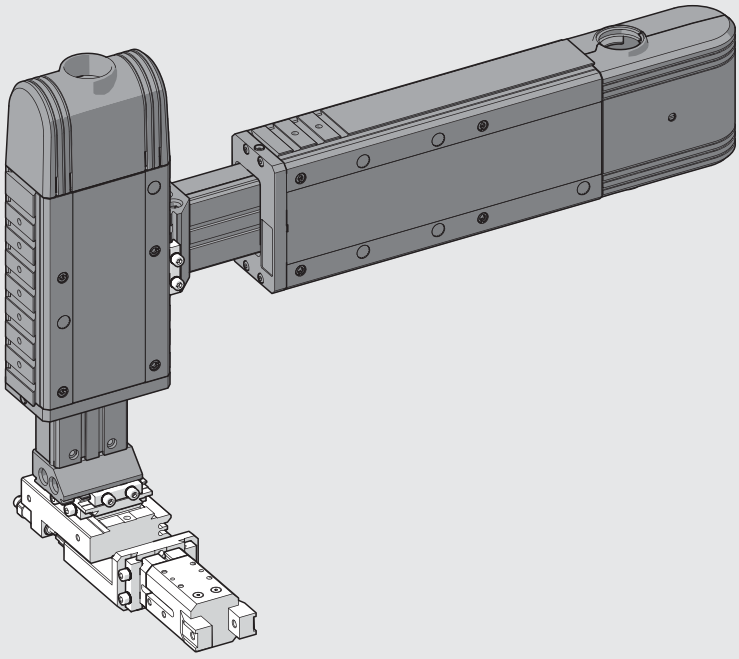
IMPORTANT!
If you decide for version "B", i.e. the one with the grooves machined on both sides of the body, the distance values and the number of grooves shall apply to both sides.

EXAMPLE
If you order an LEPK unit encoded **K1012H00090B06505K** the part ordered will be as follows:



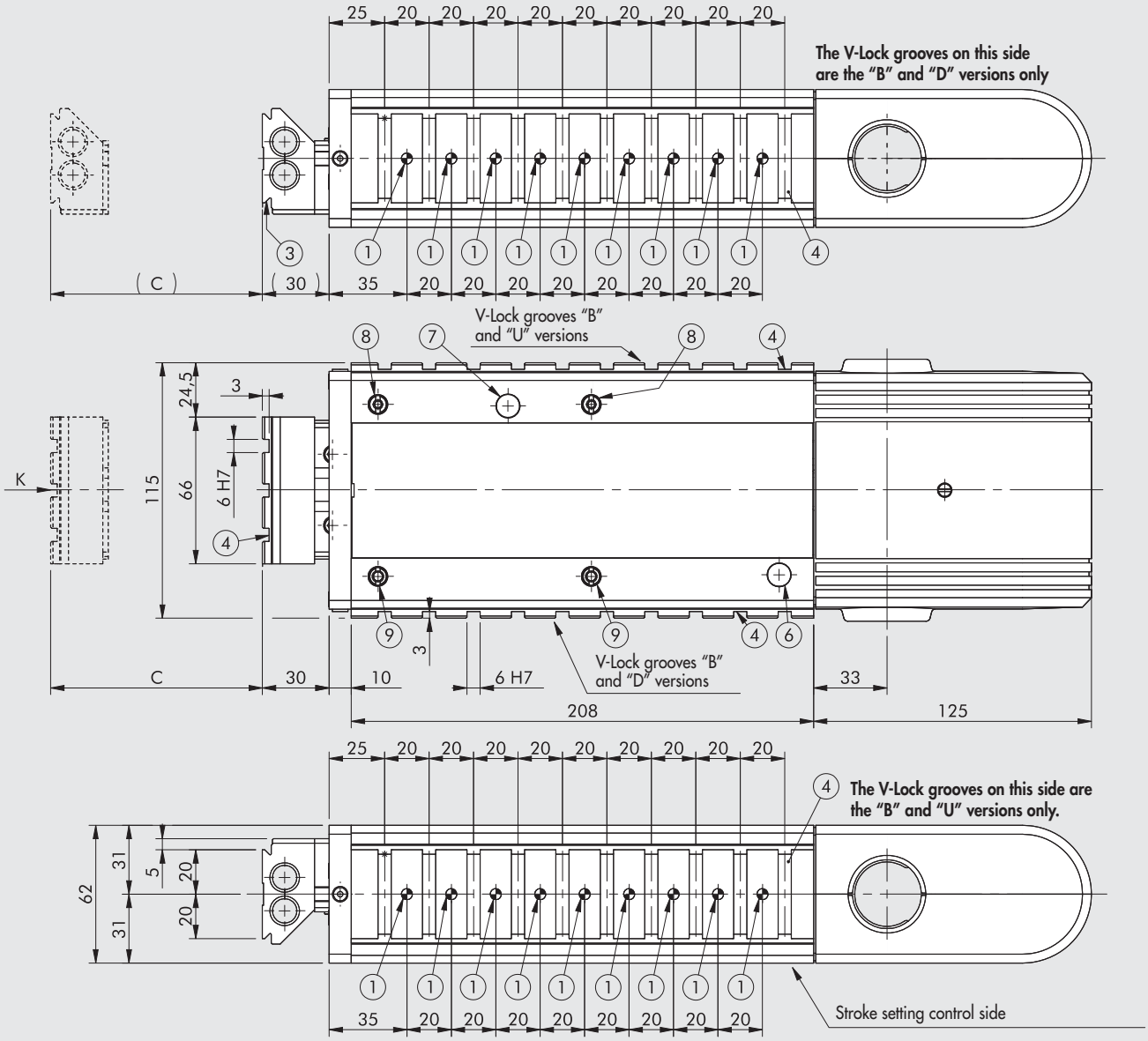
EXAMPLES OF APPLICATION





METAL WORK PNEUMATIC

DIMENSIONS OF THE LEPK-1-90-H-A LINEAR UNIT (horizontal, 2 positions)

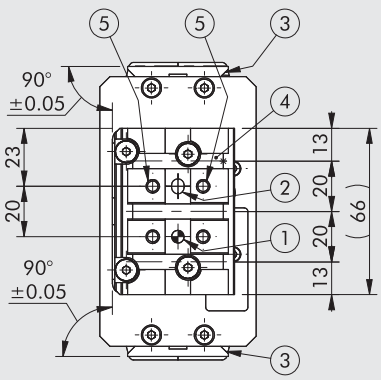


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod

IMPORTANT!
The drawing shows the code K101AH00090B02510K with the maximum number of V-Lock grooves (version BOTH)

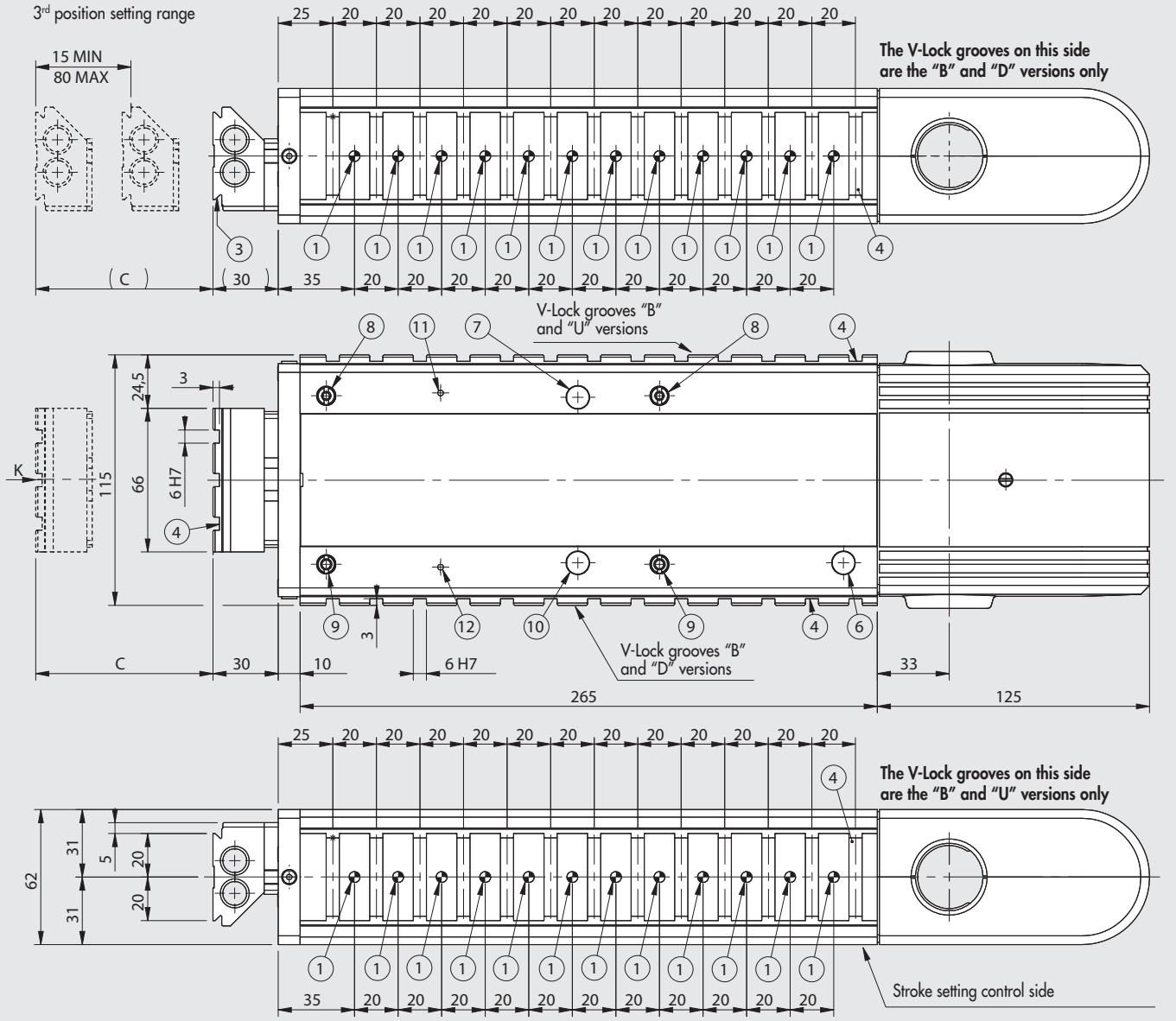
Code	Description	C
K101AH00090000000K K101AH00090B _ _ _ _ _ K K101AH00090D _ _ _ _ _ K K101AH00090U _ _ _ _ _ K	LEPK-1-90-H-A	15 to 90
K101AH20090000000K K101AH20090B _ _ _ _ _ K K101AH20090D _ _ _ _ _ K K101AH20090U _ _ _ _ _ K	LEPK-1-90-H-A without terminal board	

VIEWED FROM "K"



IMPORTANT. The LEPK-1-90-H-A can hold maximum 10 V-Lock grooves and hence a maximum of 9 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-90-H-B LINEAR UNIT (horizontal, 3 positions)

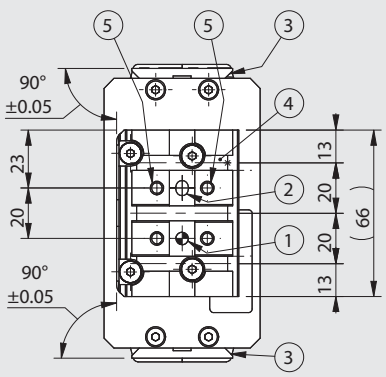


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod
⑩ Sensor LED inspection hole for 3rd position
⑪ Sensor LED inspection hole for 3rd position DISABLED
⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!
The drawing shows the code K101BH00090B02513K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101BH00090000000K K101BH00090B _ _ _ _ _ K K101BH00090D _ _ _ _ _ K K101BH00090U _ _ _ _ _ K	LEPK-1-90-H-B	15 to 90
K101BH20090000000K K101BH20090B _ _ _ _ _ K K101BH20090D _ _ _ _ _ K K101BH20090U _ _ _ _ _ K	LEPK-1-90-H-B without terminal board	

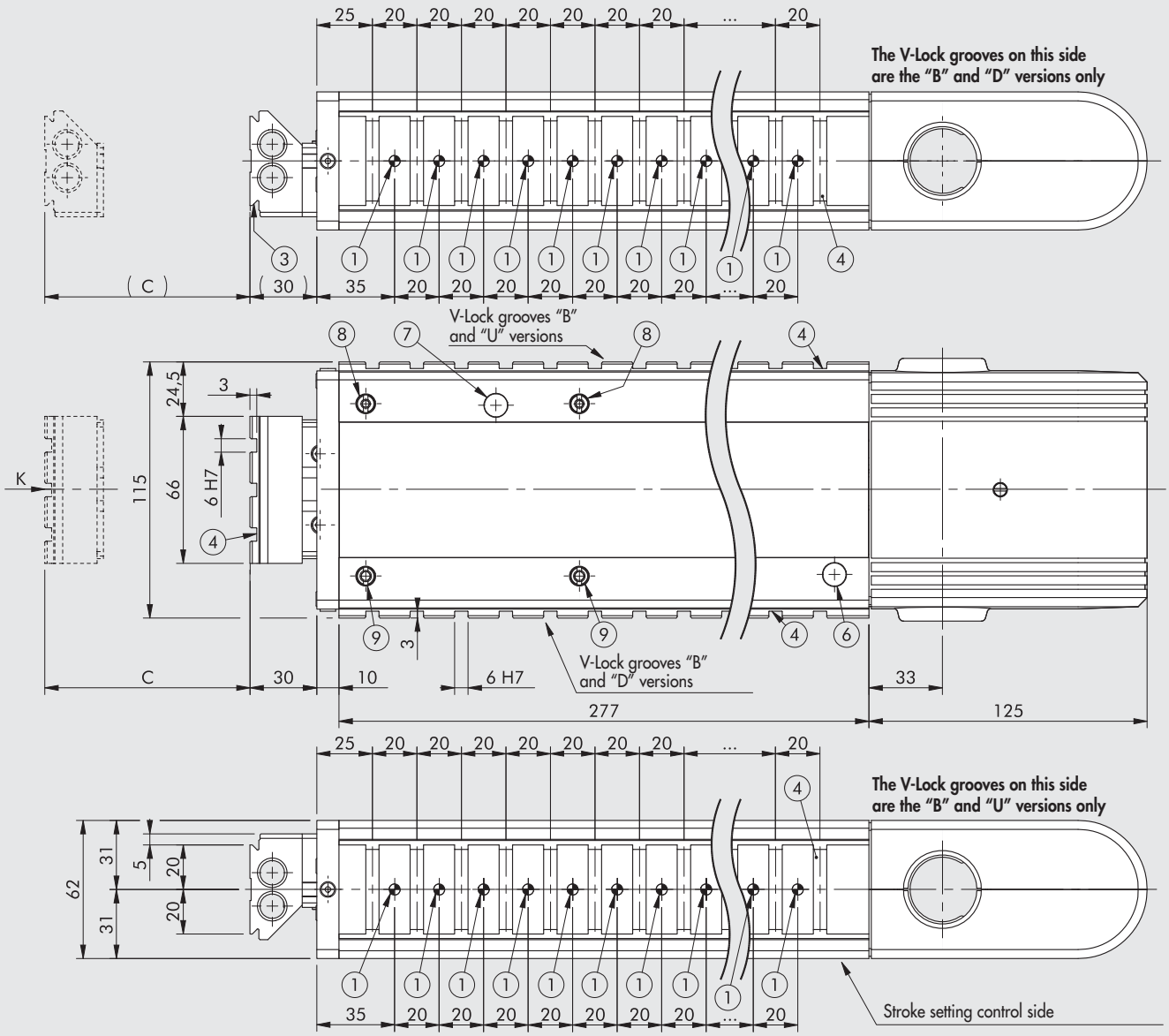
VIEWED FROM "K"



IMPORTANT. The LEPK-1-90-H-B can hold maximum 13 V-Lock grooves and hence a maximum of 12 Ø5 H7 pinholes.

METAL WORK PNEUMATIC

DIMENSIONS OF THE LEPK-1-160-H-A LINEAR UNIT (horizontal, 2 positions)

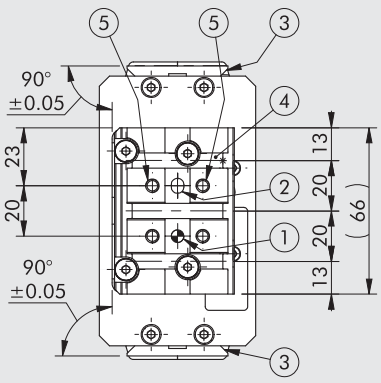


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod

IMPORTANT!
The drawing shows the code K101AH00160B02513K with the maximum number of V-Lock grooves (version BOTH)

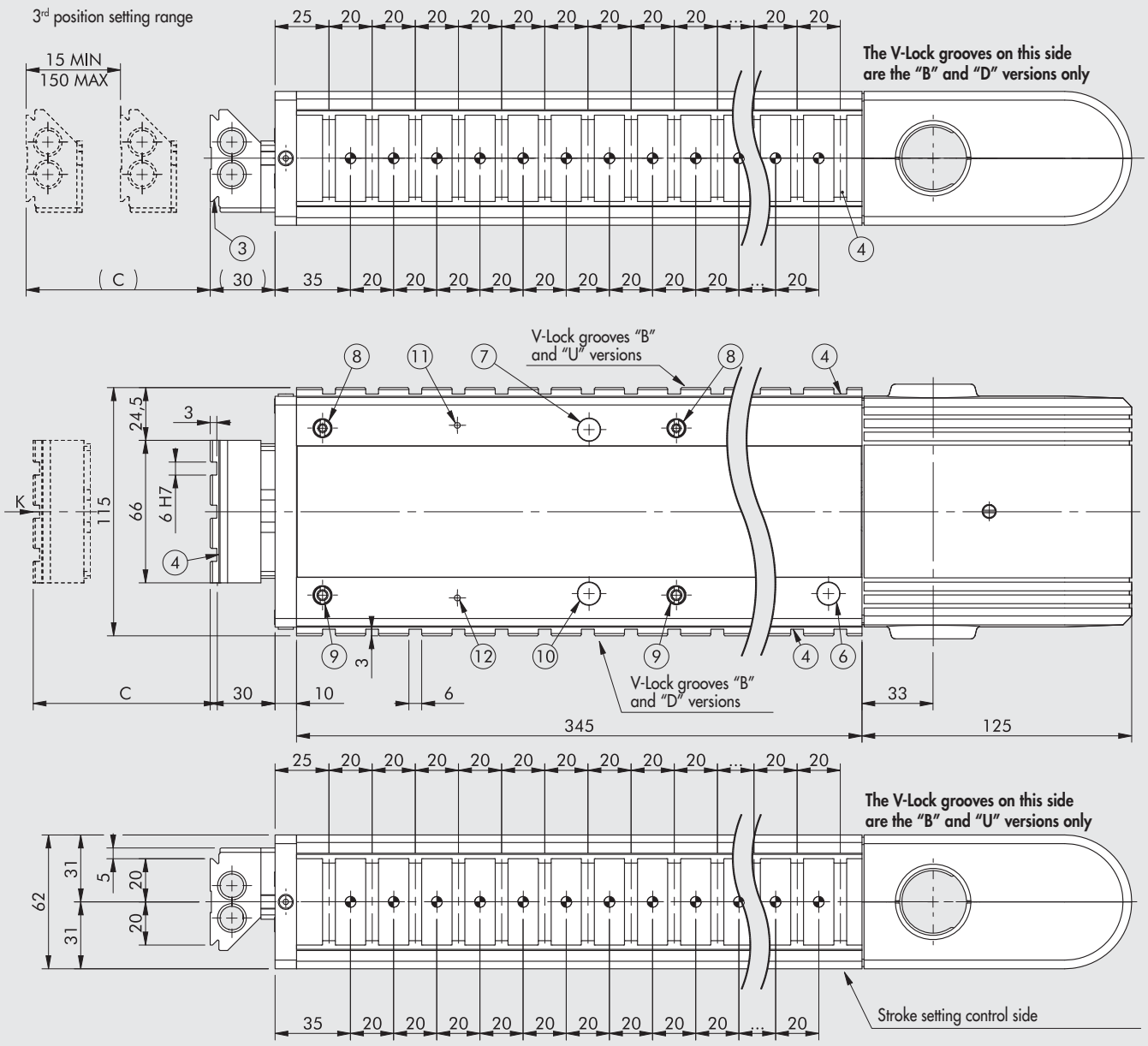
Code	Description	C
K101AH00160000000K K101AH00160B _ _ _ _ _ K K101AH00160D _ _ _ _ _ K K101AH00160U _ _ _ _ _ K	LEPK-1-160-H-A	15 to 160
K101AH20160000000K K101AH20160B _ _ _ _ _ K K101AH20160D _ _ _ _ _ K K101AH20160U _ _ _ _ _ K	LEPK-1-160-H-A without terminal board	

VIEWED FROM "K"



IMPORTANT. The LEPK-1-160-H-A can hold maximum 13 V-Lock grooves and hence a maximum of 12 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-160-H-B LINEAR UNIT (horizontal, 3 positions)

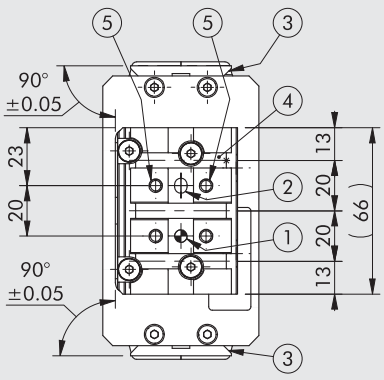


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod
⑩ Sensor LED inspection hole for 3rd position
⑪ Sensor LED inspection hole for 3rd position DISABLED
⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!
The drawing shows the code K101BH00160B02517K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101BH00160000000K K101BH00160B _ _ _ _ _ K K101BH00160D _ _ _ _ _ K K101BH00160U _ _ _ _ _ K	LEPK-1-160-H-B	15 to 160
K101BH20160000000K K101BH20160B _ _ _ _ _ K K101BH20160D _ _ _ _ _ K K101BH20160U _ _ _ _ _ K	LEPK-1-160-H-B without terminal board	

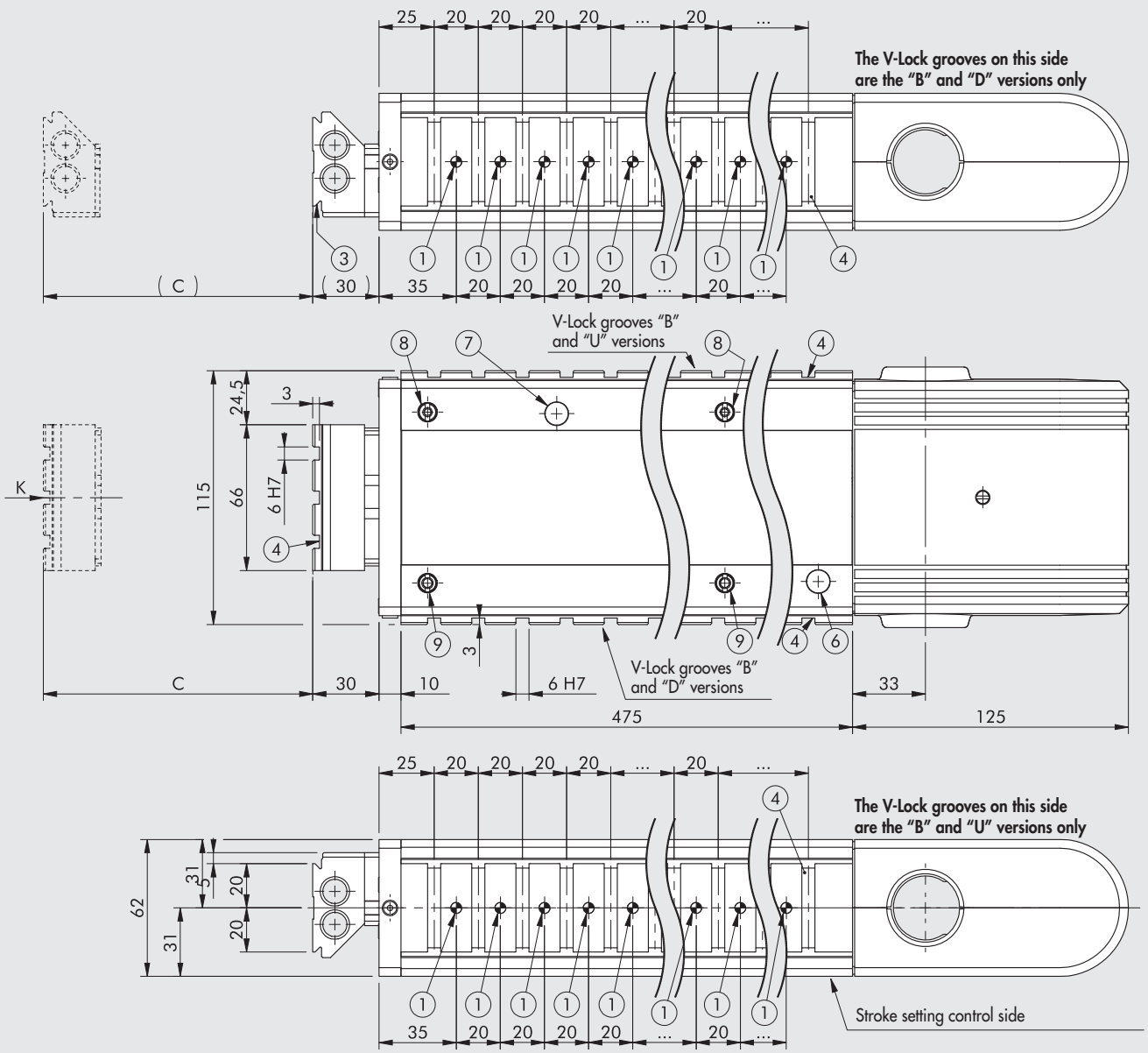
VIEWED FROM "K"



IMPORTANT. The LEPK-1-160-H-B can hold maximum 17 grooves and hence a maximum of 16 Ø5 H7 pinholes.

METAL WORK PNEUMATIC

DIMENSIONS OF THE LEPK-1-225-H-A LINEAR UNIT (horizontal, 2 positions)

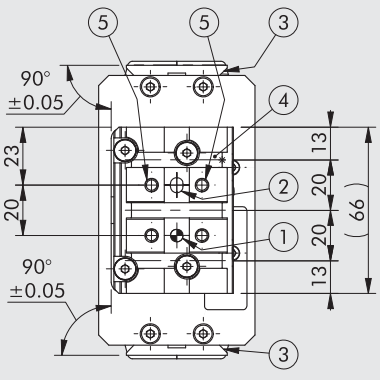


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod

IMPORTANT!
The drawing shows the code K101AH00225B02523K with the maximum number of V-Lock grooves (version BOTH)

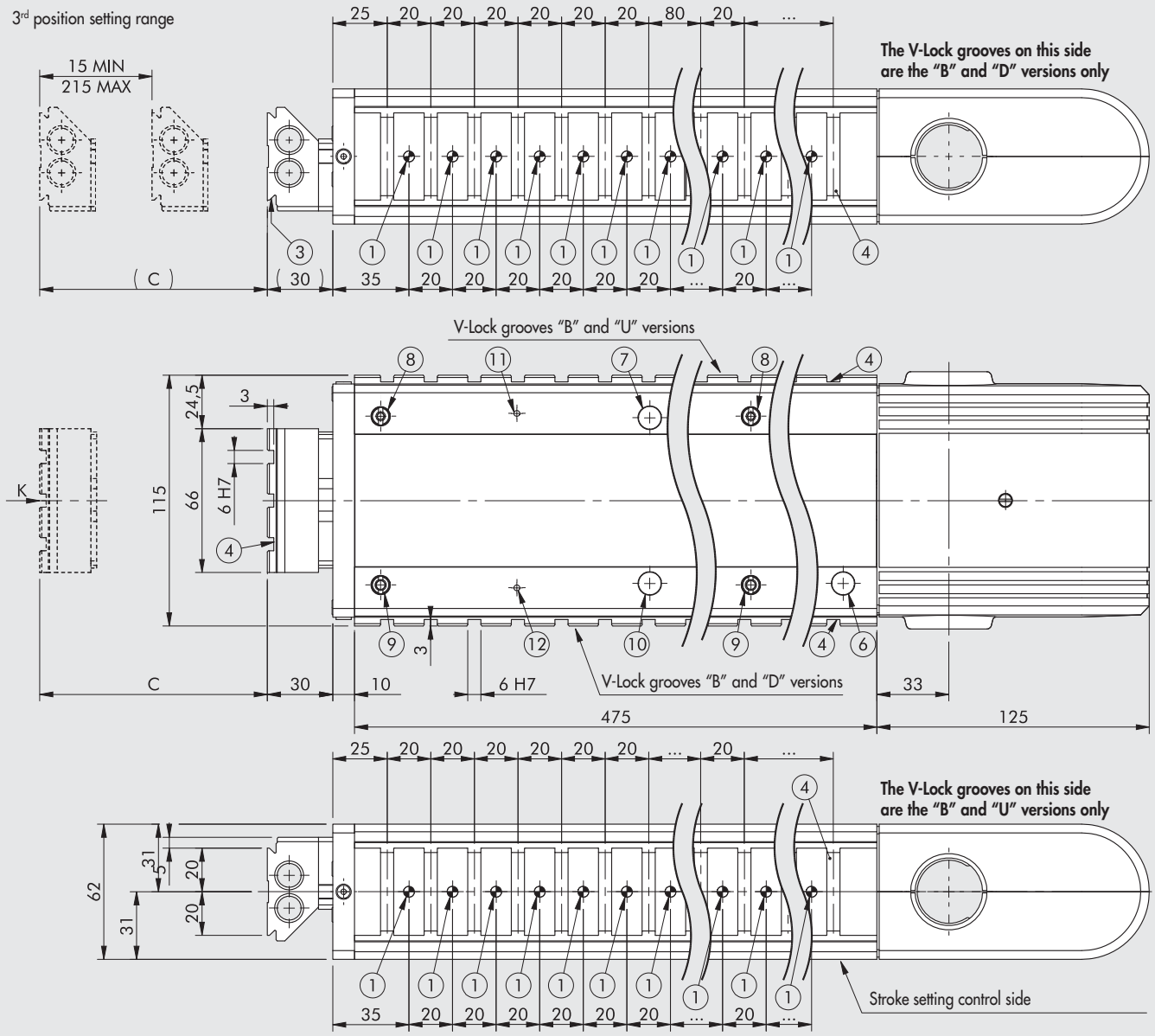
Code	Description	C
K101AH00225000000K **K101AH00225B _ _ _ _ _ K** **K101AH00225D _ _ _ _ _ K** **K101AH00225U _ _ _ _ _ K**	LEPK-1-225-H-A	15 to 225
K101AH20225000000K **K101AH20225B _ _ _ _ _ K** **K101AH20225D _ _ _ _ _ K** **K101AH20225U _ _ _ _ _ K**	LEPK-1-225-H-A without terminal board	

VIEWED FROM "K"



IMPORTANT. The LEPK-1-225-H-A can hold maximum 23 grooves and hence a maximum of 22 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-225-H-B LINEAR UNIT (horizontal, 3 positions)

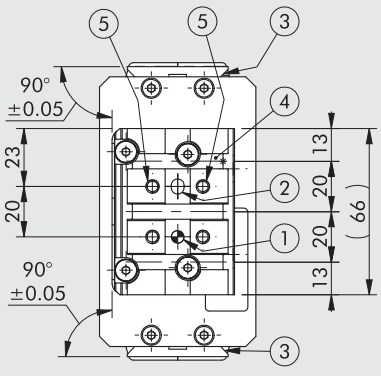


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod
⑩ Sensor LED inspection hole for 3rd position
⑪ Sensor LED inspection hole for 3rd position DISABLED
⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!
The drawing shows the code K101BH00225B02523K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101BH00225000000K K101BH00225B _ _ _ _ _ K K101BH00225D _ _ _ _ _ K K101BH00225U _ _ _ _ _ K	LEPK-1-225-H-B	15 to 225
K101BH20225000000K K101BH20225B _ _ _ _ _ K K101BH20225D _ _ _ _ _ K K101BH20225U _ _ _ _ _ K	LEPK-1-225-H-B without terminal board	

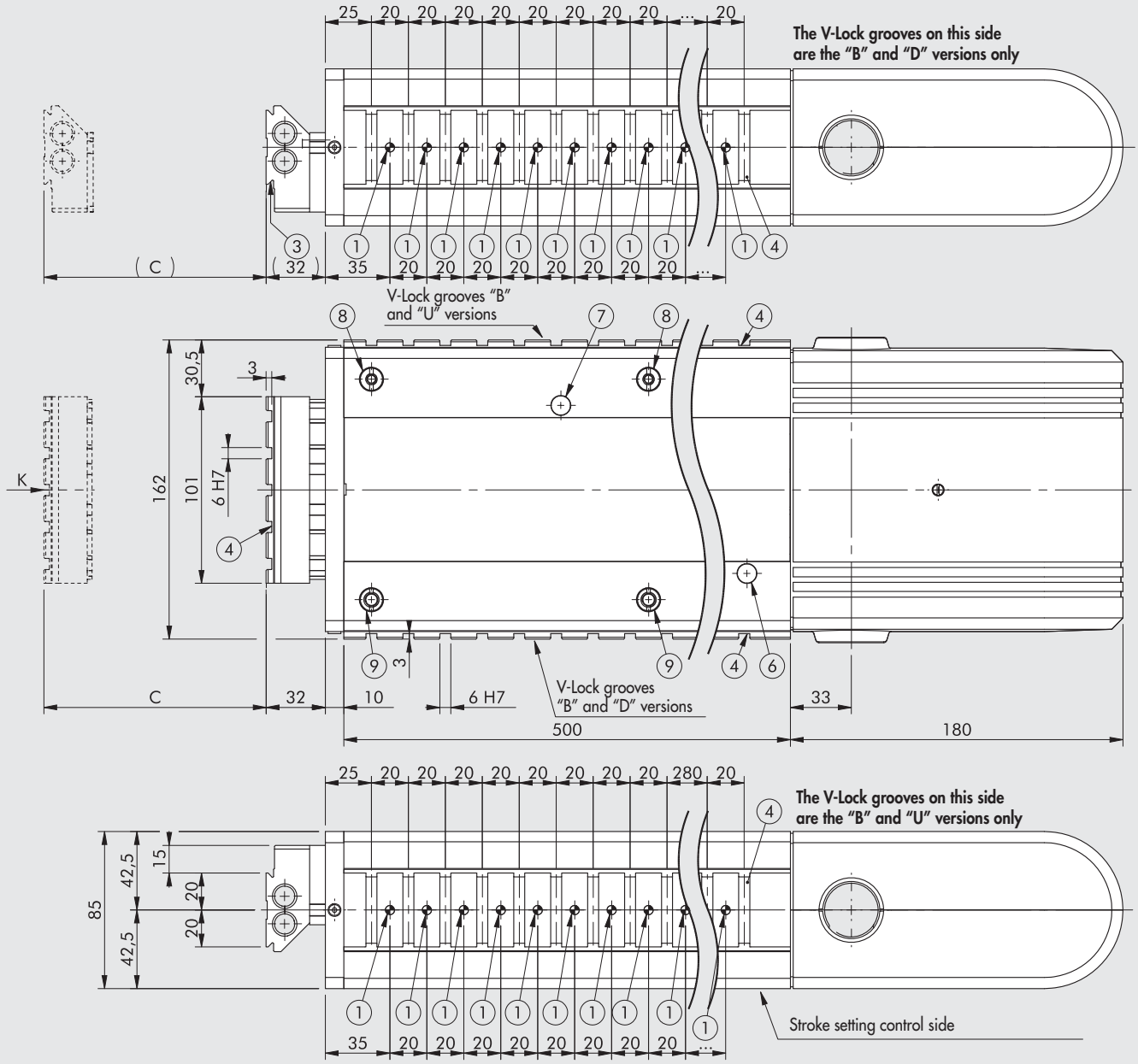
VIEWED FROM "K"



IMPORTANT. The LEPK-1-225-H-B can hold maximum 23 V-Lock grooves and hence a maximum of 22 Ø5 H7 pinholes.

METAL WORK PNEUMATIC

DIMENSIONS OF THE LEPK-2-320-H-A LINEAR UNIT (horizontal, 2 positions)

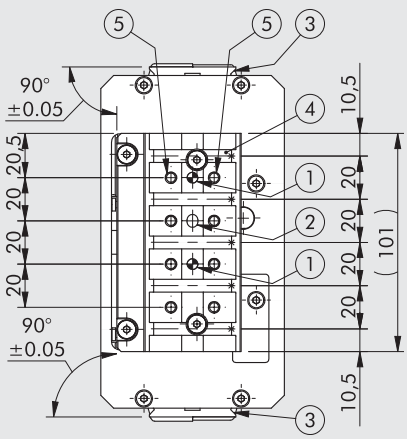


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod

IMPORTANT!
The drawing shows the code K102AH00320B02524K with the maximum number of V-Lock grooves (version BOTH)

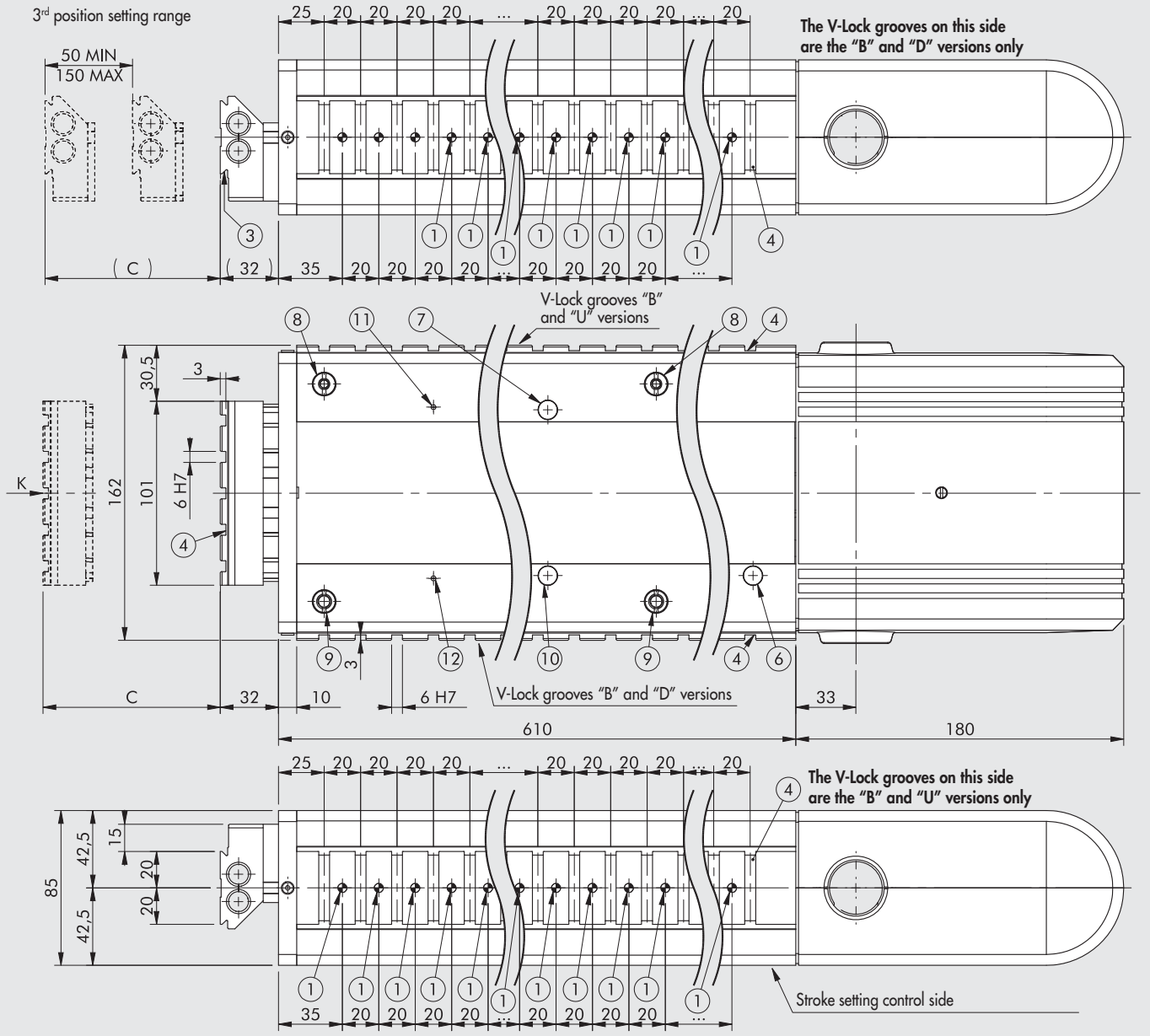
Code	Description	C
K102AH00320000000K K102AH00320B _ _ _ _ _ K K102AH00320D _ _ _ _ _ K K102AH00320U _ _ _ _ _ K	LEPK-2-320-H-A	50 to 320
K102AH20320000000K K102AH20320B _ _ _ _ _ K K102AH20320D _ _ _ _ _ K K102AH20320U _ _ _ _ _ K	LEPK-2-320-H-A without terminal board	

VIEWED FROM "K"



IMPORTANT. The LEPK-2-320-H-A can hold maximum 24 V-Lock grooves and hence a maximum of 23 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-2-320-H-B LINEAR UNIT (horizontal, 3 positions)

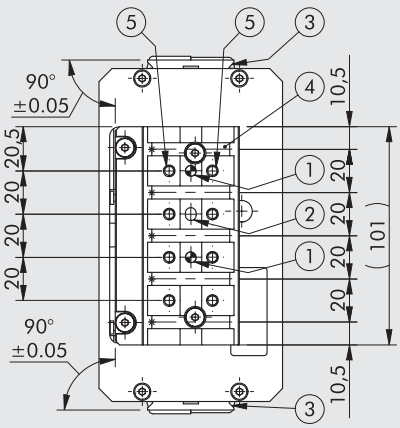


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod
⑩ Sensor LED inspection hole for 3rd position
⑪ Sensor LED inspection hole for 3rd position DISABLED
⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!
The drawing shows the code K102BH00320B02529K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K102BH00320000000K	LEPK-2-320-H-B	50 to 320
K102BH00320B _ _ _ _ _ K		
K102BH00320D _ _ _ _ _ K		
K102BH00320U _ _ _ _ _ K		
K102BH20320000000K	LEPK-2-320-H-B without terminal board	
K102BH20320B _ _ _ _ _ K		
K102BH20320D _ _ _ _ _ K		
K102BH20320U _ _ _ _ _ K		

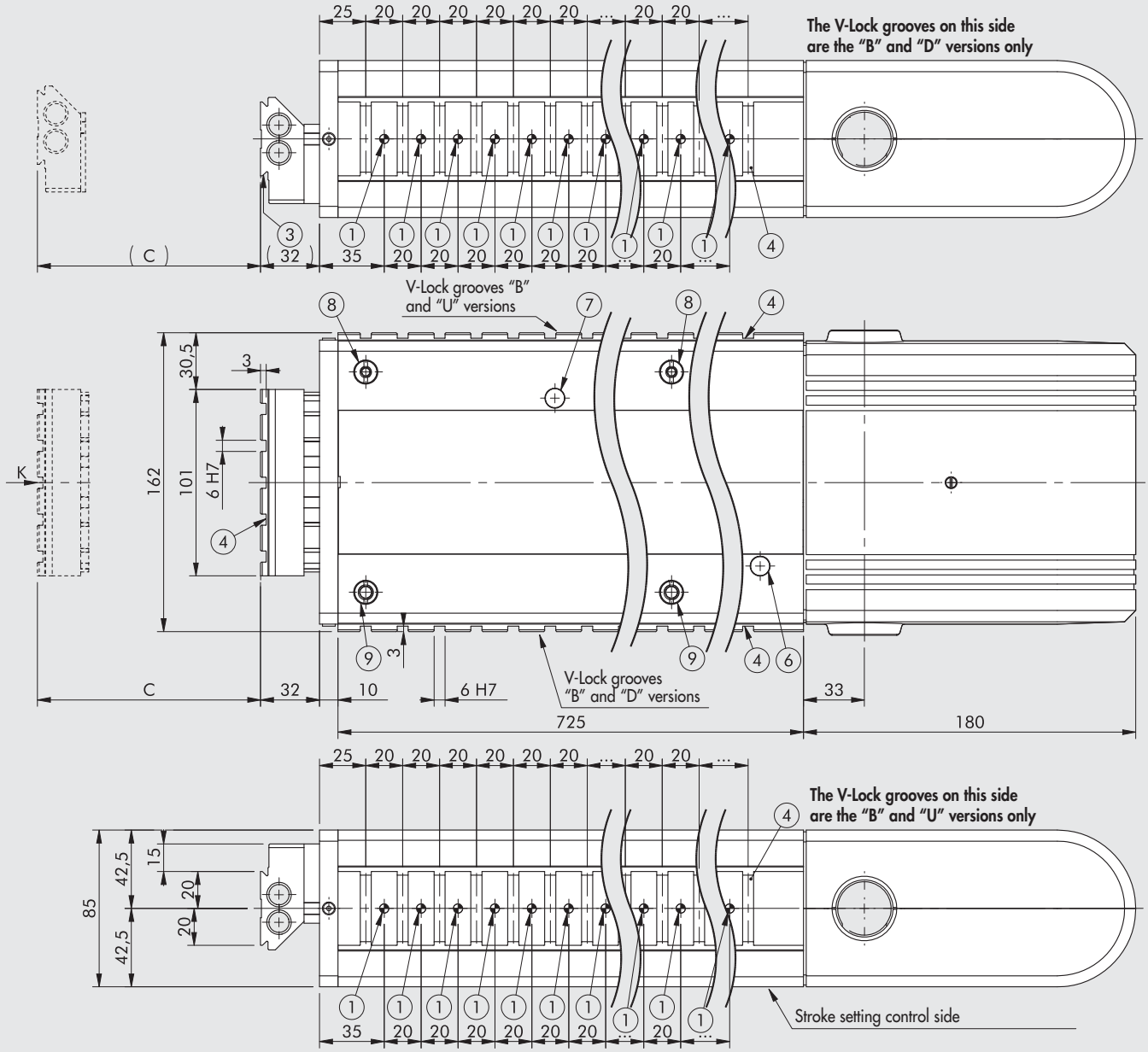
VIEWED FROM "K"



IMPORTANT. The LEPK-2-320-H-B can hold maximum 29 V-Lock grooves and hence a maximum of 28 Ø5 H7 pinholes.

METAL WORK PNEUMATIC

DIMENSIONS OF THE LEPK-2-450-H-A LINEAR UNIT (horizontal, 2 positions)

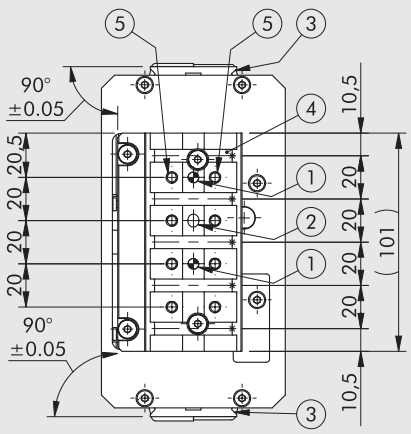


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod

IMPORTANT!
The drawing shows the code K102AH00450B02535K with the maximum number of V-Lock grooves (version BOTH)

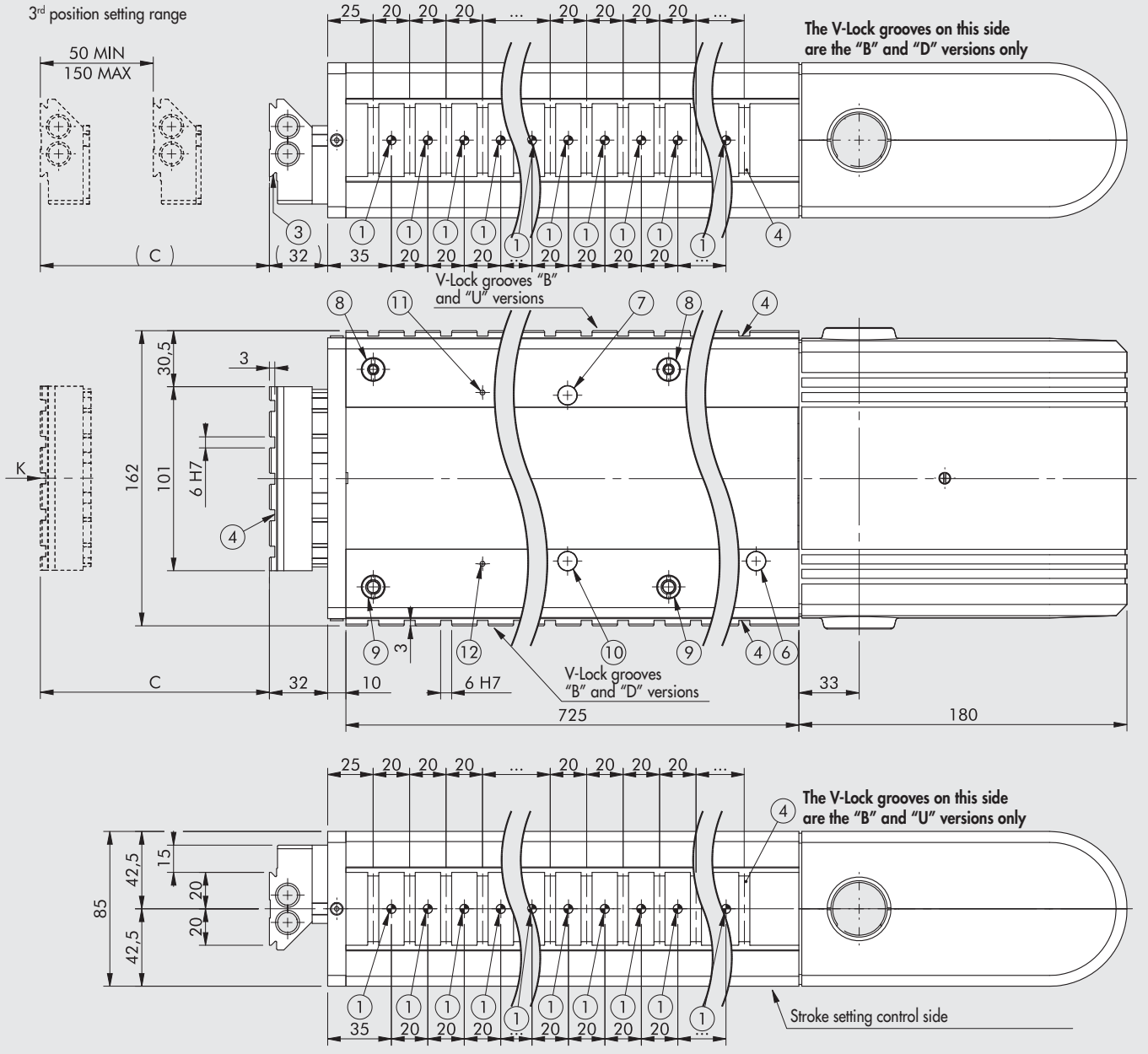
Code	Description	C
K102AH00450000000K	LEPK-2-450-H-A	50 to 450
K102AH00450B _ _ _ _ _ K		
K102AH00450D _ _ _ _ _ K		
K102AH00450U _ _ _ _ _ K		
K102AH20450000000K	LEPK-2-450-H-A without terminal board	
K102AH20450B _ _ _ _ _ K		
K102AH20450D _ _ _ _ _ K		
K102AH20450U _ _ _ _ _ K		

VIEWED FROM "K"



IMPORTANT. The LEPK-2-450-H-A can hold maximum 35 V-Lock grooves and hence a maximum of 34 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-2-450-H-B LINEAR UNIT (horizontal, 3 positions)

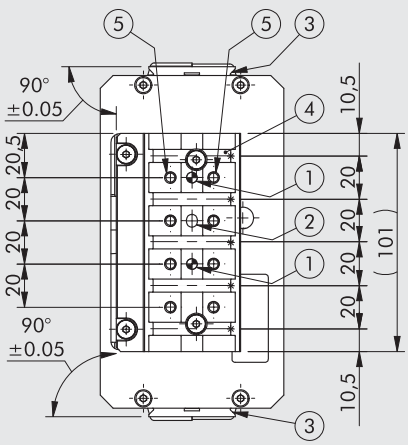


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod
⑩ Sensor LED inspection hole for 3rd position
⑪ Sensor LED inspection hole for 3rd position DISABLED
⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!
The drawing shows the code K102BH00450B02535K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K102BH00450000000K	LEPK-2-450-H-B	50 to 450
K102BH00450B _ _ _ _ _ K		
K102BH00450D _ _ _ _ _ K		
K102BH00450U _ _ _ _ _ K		
K102BH20450000000K	LEPK-2-450-H-B without terminal board	
K102BH20450B _ _ _ _ _ K		
K102BH20450D _ _ _ _ _ K		
K102BH20450U _ _ _ _ _ K		

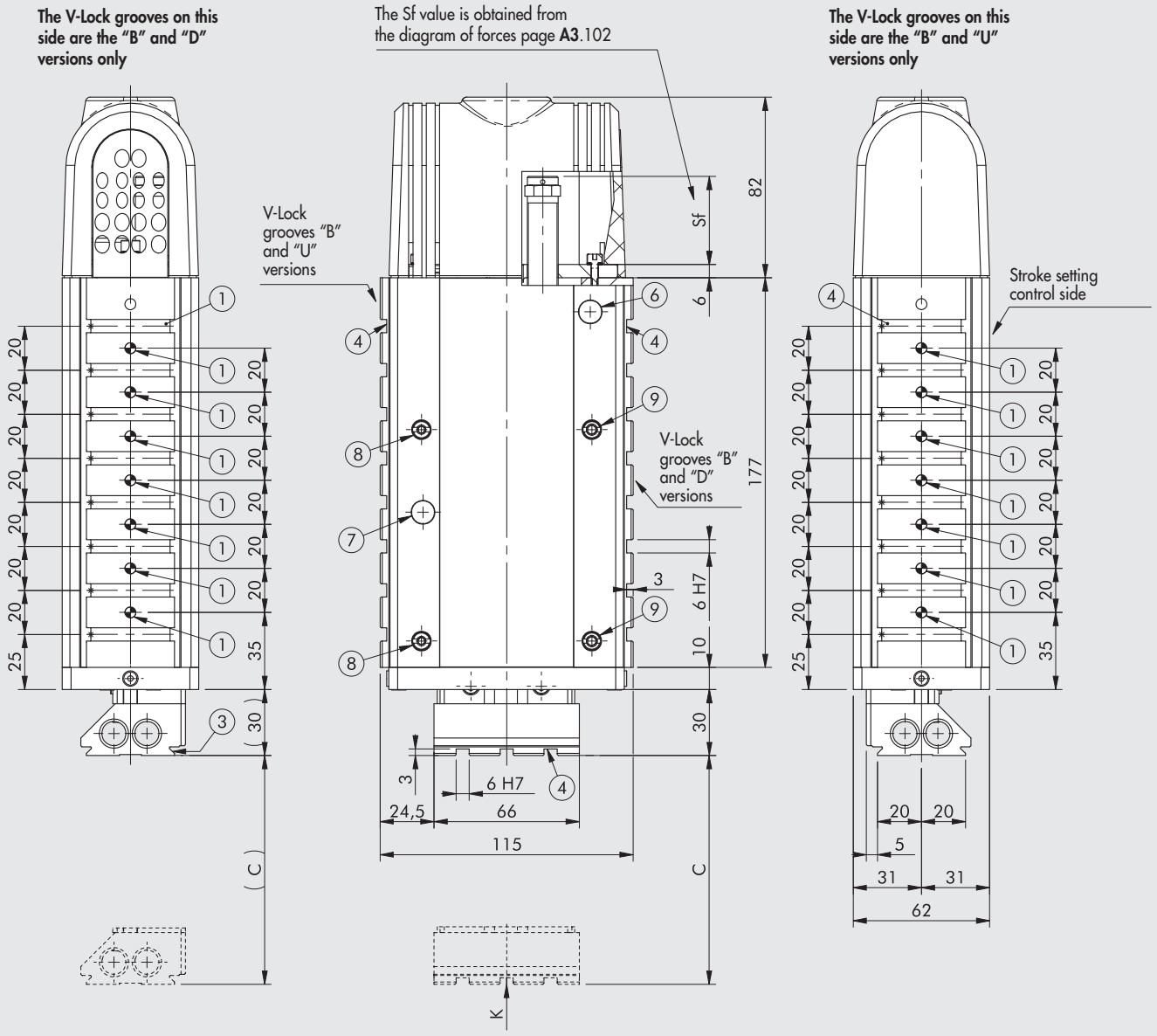
VIEWED FROM "K"



IMPORTANT. The LEPK-2-450-H-B can hold maximum 35 V-Lock grooves and hence a maximum of 34 Ø5 H7 pinholes.

METAL WORK PNEUMATIC

DIMENSIONS OF THE LEPK-1-60-V-A LINEAR UNIT (Vertical, 2 positions)

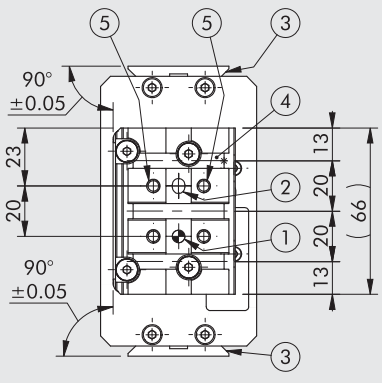


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod

IMPORTANT!
The drawing shows the code K101AV00060B02508K with the maximum number of V-Lock grooves (version BOTH)

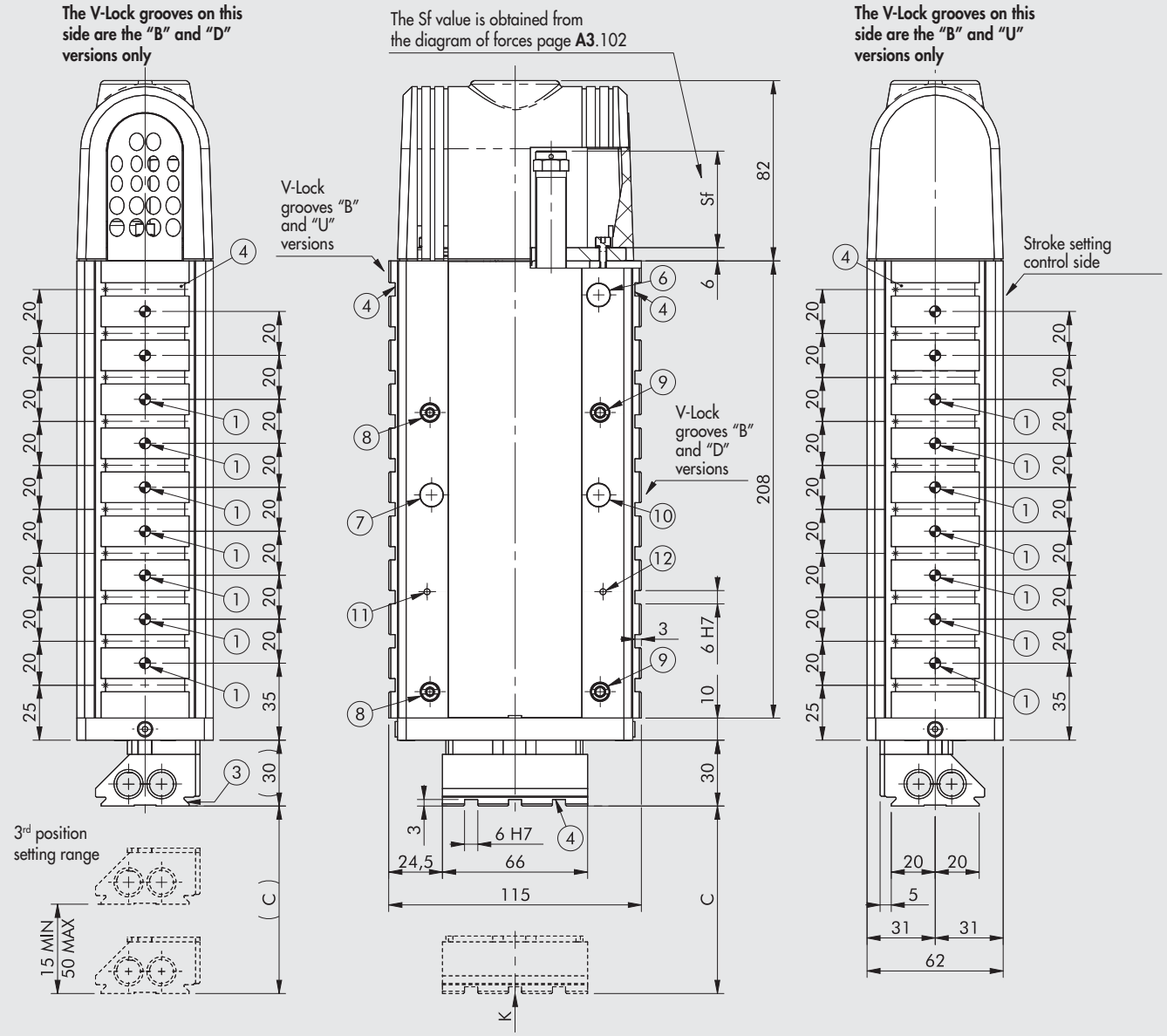
Code	Description	C
K101AV00060000000K K101AV00060B _ _ _ _ _ K K101AV00060D _ _ _ _ _ K K101AV00060U _ _ _ _ _ K	LEPK-1-60-V-A	15 to 60
K101AS20060000000K K101AS20060B _ _ _ _ _ K K101AS20060D _ _ _ _ _ K K101AS20060U _ _ _ _ _ K	LEPK-1-60-V-A without spring	

VIEWED FROM "K"



IMPORTANT. The LEPK-1-60-V-A can hold maximum 8 V-Lock grooves and hence a maximum of 7 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-60-V-B LINEAR UNIT (Vertical, 3 positions)

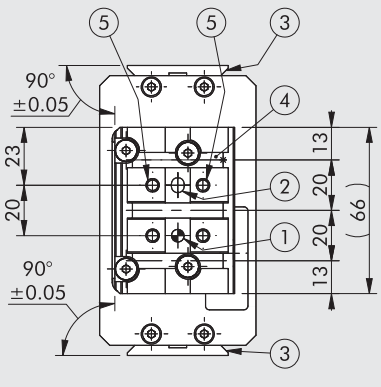


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod
⑩ Sensor LED inspection hole for 3rd position
⑪ Sensor LED inspection hole for 3rd position DISABLED
⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!
The drawing shows the code K101BV00060B02510K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101BV00060000000K **K101BV00060B _ _ _ _ _ K** **K101BV00060D _ _ _ _ _ K** **K101BV00060U _ _ _ _ _ K**	LEPK-1-60-V-B	15 to 60
K101BS20060000000K **K101BS20060B _ _ _ _ _ K** **K101BS20060D _ _ _ _ _ K** **K101BS20060U _ _ _ _ _ K**	LEPK-1-60-V-B without spring	

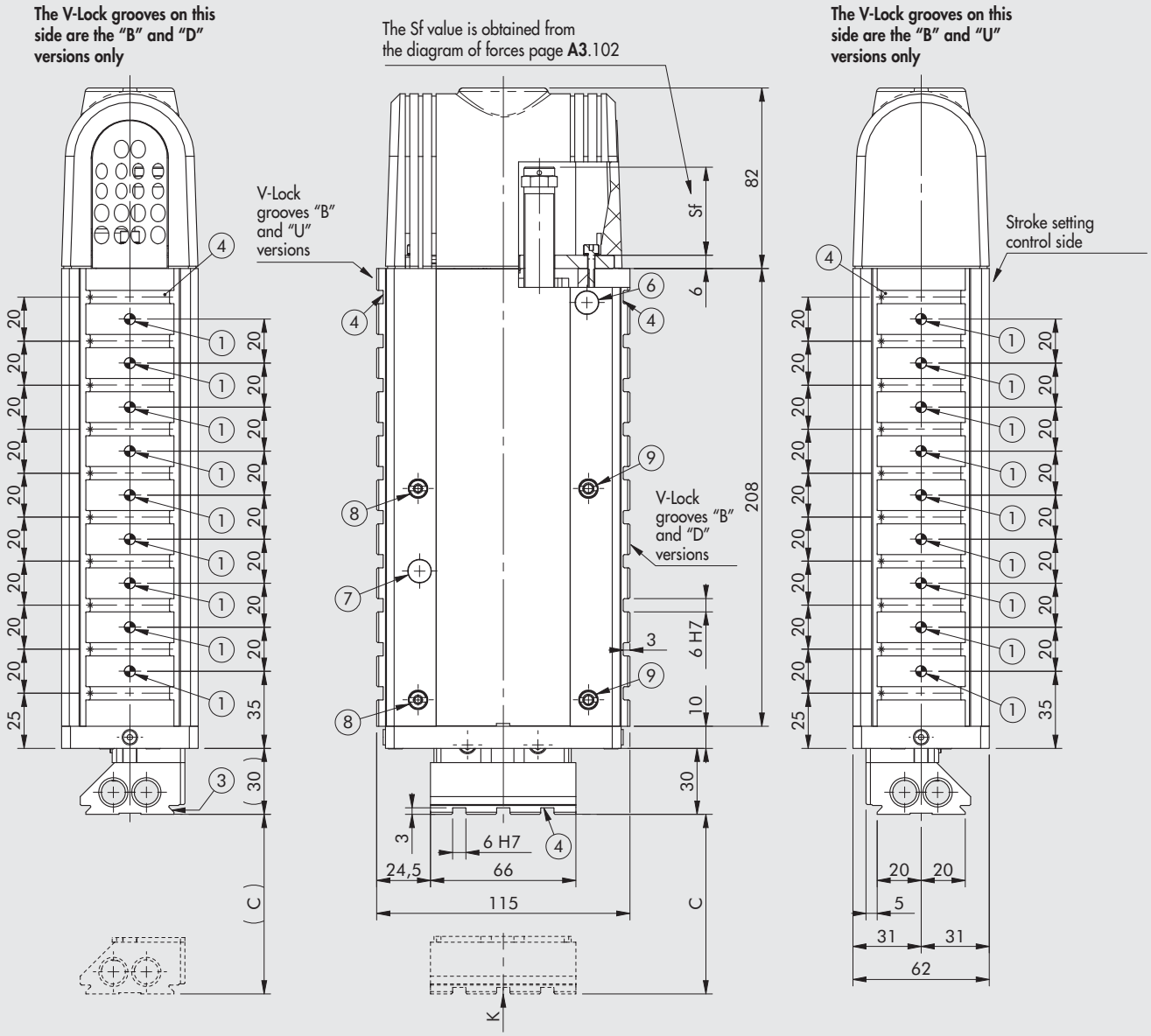
VIEWED FROM "K"



IMPORTANT. The LEPK-1-60-V-B can hold maximum 10 V-Lock grooves and hence a maximum of 9 Ø5 H7 pinholes.

METAL WORK PNEUMATIC

DIMENSIONS OF THE LEPK-1-90-V-A LINEAR UNIT (Vertical, 2 positions)

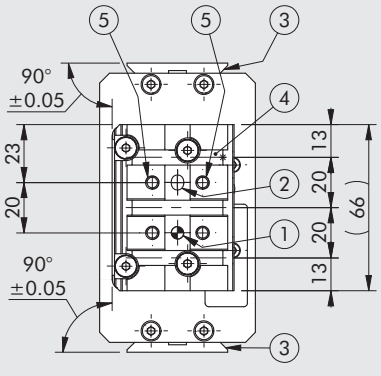


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod

IMPORTANT!
The drawing shows the code K101AV00090B02510K with the maximum number of V-Lock grooves (version BOTH)

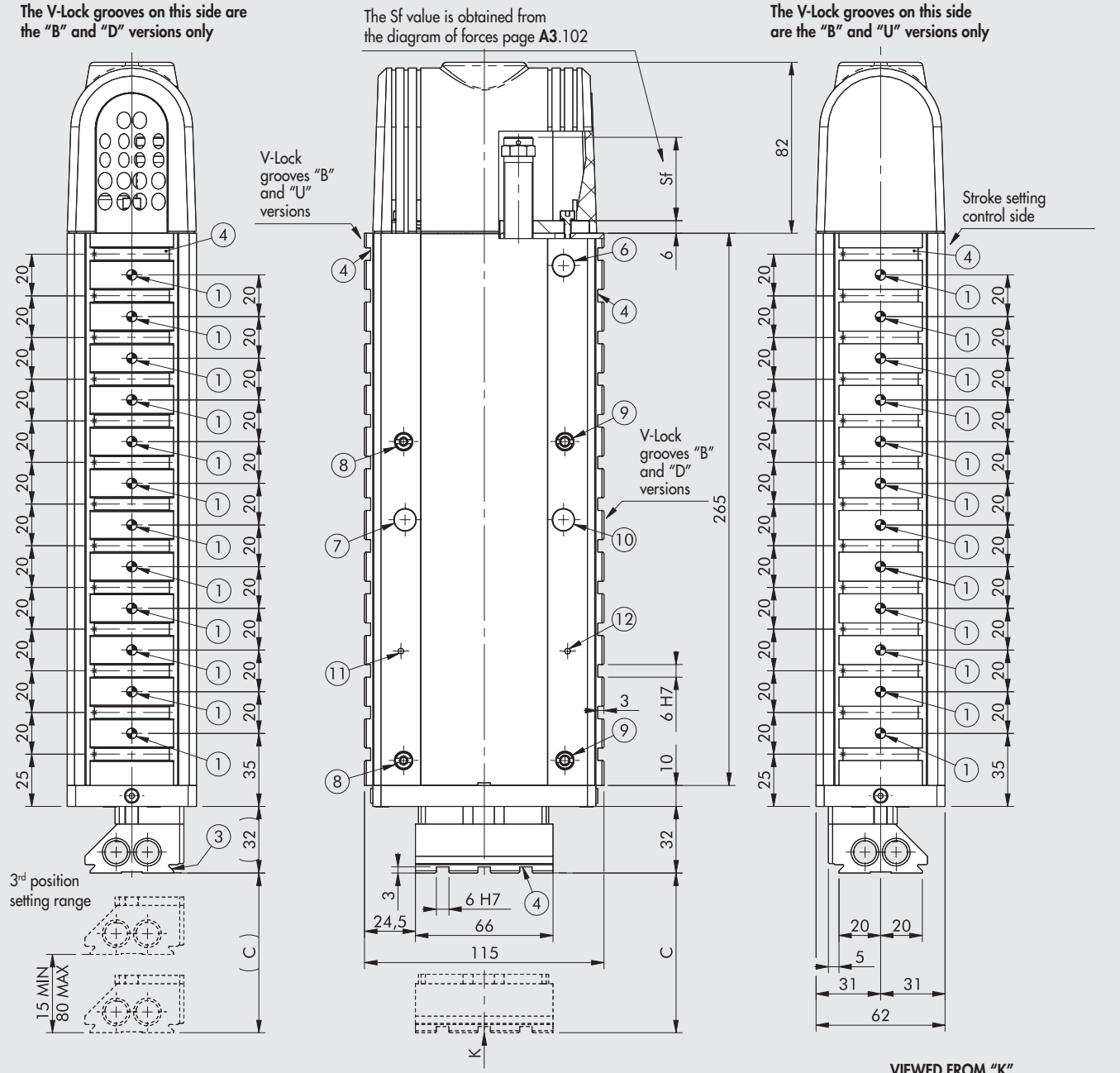
Code	Description	C
K101AV00090000000K K101AV00090B _ _ _ _ _ K K101AV00090D _ _ _ _ _ K K101AV00090U _ _ _ _ _ K	LEPK-1-90-V-A	15 to 90
K101AS20090000000K K101AS20090B _ _ _ _ _ K K101AS20090D _ _ _ _ _ K K101AS20090U _ _ _ _ _ K	LEPK-1-90-V-A without spring	

VIEWED FROM "K"



IMPORTANT. The LEPK-1-90-V-A can hold maximum 10 V-Lock grooves and hence a maximum of 9 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-90-V-B LINEAR UNIT (Vertical, 3 positions)

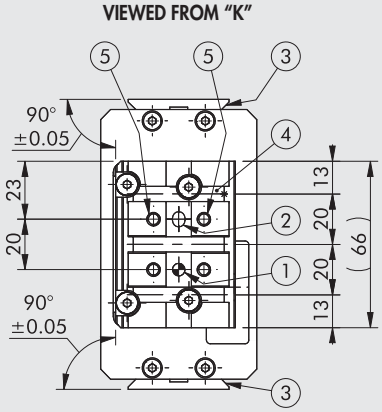


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod
⑩ Sensor LED inspection hole for 3rd position
⑪ Sensor LED inspection hole for 3rd position DISABLED
⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!
The drawing shows the code K101BV00090B02513K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101BV00090000000K K101BV00090B _ _ _ _ _ K K101BV00090D _ _ _ _ _ K K101BV00090U _ _ _ _ _ K	LEPK-1-90-V-B	15 to 90
K101BS20090000000K K101BS20090B _ _ _ _ _ K K101BS20090D _ _ _ _ _ K K101BS20090U _ _ _ _ _ K	LEPK-1-90-V-B without spring	

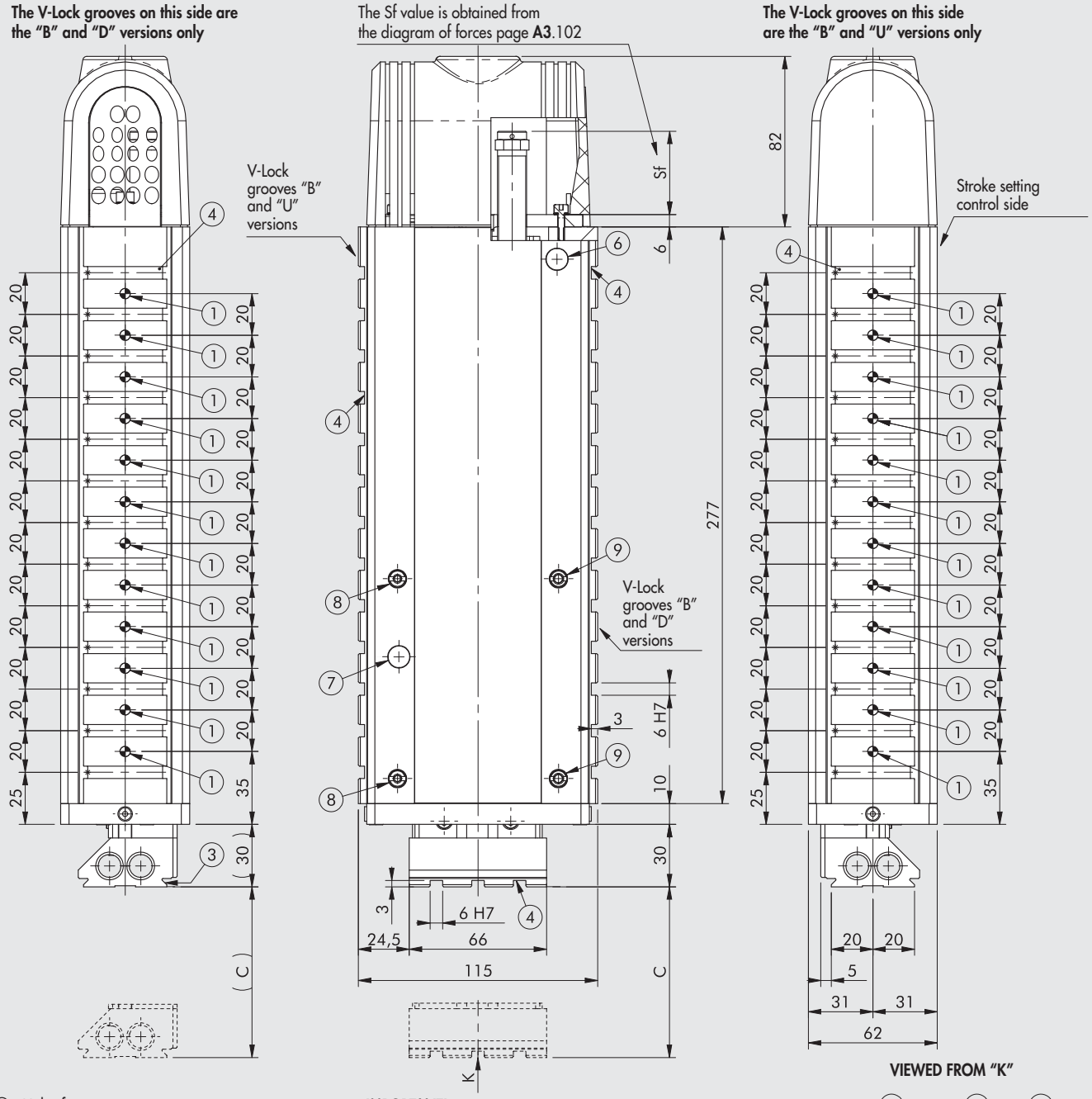
VIEWED FROM "K"



IMPORTANT. The LEPK-1-90-V-B can hold maximum 13 V-Lock grooves and hence a maximum of 12 Ø5 H7 pinholes.

METAL WORK PNEUMATIC

DIMENSIONS OF THE LEPK-1-160-V-A LINEAR UNIT (Vertical, 2 positions)

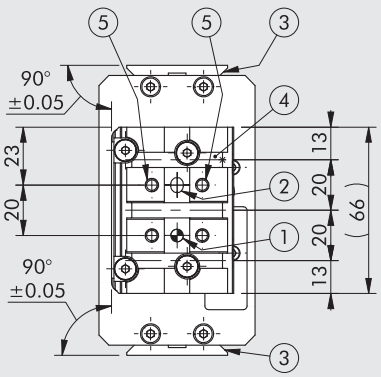


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod

IMPORTANT!
The drawing shows the code K101AV00160B02513K with the maximum number of V-Lock grooves (version BOTH)

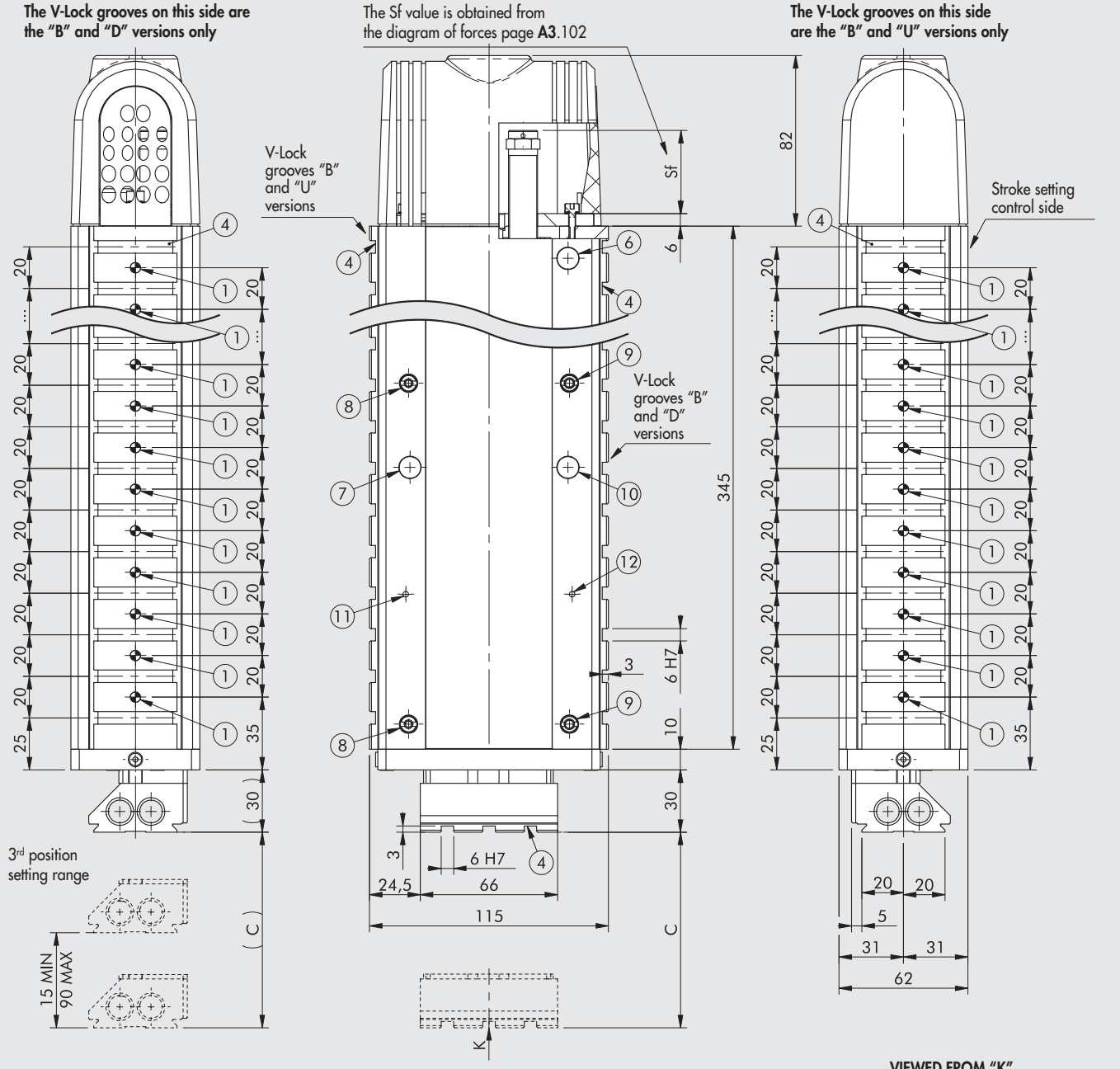
Code	Description	C
K101AV00160000000K K101AV00160B _ _ _ _ _ K K101AV00160D _ _ _ _ _ K K101AV00160U _ _ _ _ _ K	LEPK-1-160-V-A	15 to 160
K101AS20160000000K K101AS20160B _ _ _ _ _ K K101AS20160D _ _ _ _ _ K K101AS20160U _ _ _ _ _ K	LEPK-1-160-V-A without spring	

VIEWED FROM "K"



IMPORTANT. The LEPK-1-160-V-A can hold maximum 13 grooves and hence a maximum of 12 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-160-V-B LINEAR UNIT (Vertical, 3 positions)

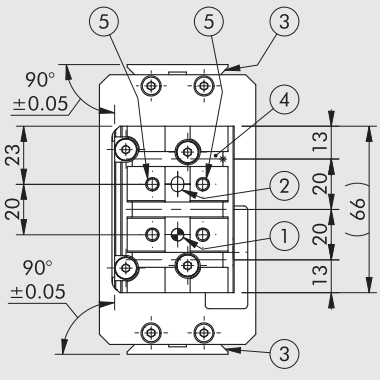


① Holes for centring pins
② Centring slot
③ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
④ Slot for "V-Lock" precision key
⑤ Threaded holes for fixing
⑥ Sensor LED inspection hole for the retracted position ("0")
⑦ Sensor LED inspection hole for the extended position
⑧ Eccentric rod for backlash take-up
⑨ Centric rod
⑩ Sensor LED inspection hole for 3rd position
⑪ Sensor LED inspection hole for 3rd position DISABLED
⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!
The drawing shows the code K101BV00160B02517K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101BV00160000000K	LEPK-1-160-V-B	15 to 160
K101BV00160B _ _ _ _ _ K		
K101BV00160D _ _ _ _ _ K		
K101BV00160U _ _ _ _ _ K		
K101BS20160000000K	LEPK-1-160-V-B without spring	
K101BS20160B _ _ _ _ _ K		
K101BS20160D _ _ _ _ _ K		
K101BS20160U _ _ _ _ _ K		

VIEWED FROM "K"



IMPORTANT. The LEPK-1-160-V-B can hold maximum 17 V-Lock grooves and hence a maximum of 16 Ø5 H7 pinholes.

METAL WORK PNEUMATIC

KEY TO CODES

K10	1	A	H	0	0	090	0	000	00	K
	SIZE	POSITION	ORIENTATION			STROKE	V-Lock CONNECTION	V-Lock POSITION	Number of V-Lock GROOVES	FAMILY
Linear units series LEPK	1 Size 1 ◀ 2 Size 2	A 2 positions B 3 positions	H Horizontal V Vertical (with return spring) S Vertical (without return spring)	0 Inductive sensors (with terminal board) ● 2 Inductive sensors (without terminal board)		▼ 060 ◆ 090 ◆ 160 ✚ 225 ✱ 320 ✱ 450	0 None B Grooves above and below D Grooves below U Grooves above	☐ 000 None ▲ _ _ _ Position	☐ 00 None ■ _ _ Number of grooves	K V-Lock

◀ Available only in horizontal orientation (H).
● Standard for the version with vertical orientation (V).
▼ Only size 1 - V/S
◆ Only size 1 - V/S/H
✚ Only size 1 - H
✱ Only size 2 - H
☐ Always use when "V-Lock connection" is equal to "0" (none)
▲ For connecting V-Lock "B" - "D" - "U" minimum value "025", the following values vary by steps of 20 mm (e.g. "045", "065" and "085").
For mounting options, see page **A3**.103

■ The maximum number of possible grooves is:

LEPK 1-60-V/S-A = n. 08	LEPK 1-160-V/S-A = n. 13
LEPK 1-60-V/S-B = n. 10	LEPK 1-160-V/S-B = n. 17
LEPK 1-90-V/S-A = n. 10	LEPK 1-225-H-A = n. 23
LEPK 1-90-V/S-B = n. 13	LEPK 1-225-H-B = n. 23
LEPK 1-90-H-A = n. 10	LEPK 2-320-H-A = n. 24
LEPK 1-90-H-B = n. 13	LEPK 2-320-H-B = n. 29
LEPK 1-160-H-A = n. 13	LEPK 2-450-H-A = n. 35
LEPK 1-160-H-B = n. 17	LEPK 2-450-H-B = n. 35

N.B.: The number of Ø5 H7 pinholes always coincides with the number of grooves ordered less 1.
For mounting options, see page **A3**.103

ORDERING CODES

Code	Description
LEPK-1 HORIZONTAL	
K101AH000900000000K	LEPK-1-90-H-A without V-Lock
K101AH00090B____K	LEPK-1-90-H-A V-Lock above and below
K101AH00090D____K	LEPK-1-90-H-A V-Lock above
K101AH00090U____K	LEPK-1-90-H-A V-Lock below
K101AH200900000000K	LEPK-1-90-H-A without V-Lock
K101AH20090B____K	LEPK-1-90-H-A V-Lock above and below
K101AH20090D____K	LEPK-1-90-H-A V-Lock above
K101AH20090U____K	LEPK-1-90-H-A V-Lock below
K101BH000900000000K	LEPK-1-90-H-B without V-Lock
K101BH00090B____K	LEPK-1-90-H-B V-Lock above and below
K101BH00090D____K	LEPK-1-90-H-B V-Lock above
K101BH00090U____K	LEPK-1-90-H-B V-Lock below
K101BH200900000000K	LEPK-1-90-H-B without V-Lock
K101BH20090B____K	LEPK-1-90-H-B V-Lock above and below
K101BH20090D____K	LEPK-1-90-H-B V-Lock above
K101BH20090U____K	LEPK-1-90-H-B V-Lock below
K101AH000160000000K	LEPK-1-160-H-A without V-Lock
K101AH00160B____K	LEPK-1-160-H-A V-Lock above and below
K101AH00160D____K	LEPK-1-160-H-A V-Lock above
K101AH00160U____K	LEPK-1-160-H-A V-Lock below
K101AH201600000000K	LEPK-1-160-H-A without V-Lock
K101AH20160B____K	LEPK-1-160-H-A V-Lock above and below
K101AH20160D____K	LEPK-1-160-H-A V-Lock above
K101AH20160U____K	LEPK-1-160-H-A V-Lock below
K101BH000160000000K	LEPK-1-160-H-B without V-Lock
K101BH00160B____K	LEPK-1-160-H-B V-Lock above and below
K101BH00160D____K	LEPK-1-160-H-B V-Lock above
K101BH00160U____K	LEPK-1-160-H-B V-Lock below
K101BH201600000000K	LEPK-1-160-H-B without V-Lock
K101BH20160B____K	LEPK-1-160-H-B V-Lock above and below
K101BH20160D____K	LEPK-1-160-H-B V-Lock above
K101BH20160U____K	LEPK-1-160-H-B V-Lock below
K101AH002250000000K	LEPK-1-225-H-A without V-Lock
K101AH00225B____K	LEPK-1-225-H-A V-Lock above and below
K101AH00225D____K	LEPK-1-225-H-A V-Lock above
K101AH00225U____K	LEPK-1-225-H-A V-Lock below
K101AH202250000000K	LEPK-1-225-H-A without V-Lock
K101AH20225B____K	LEPK-1-225-H-A V-Lock above and below
K101AH20225D____K	LEPK-1-225-H-A V-Lock above
K101AH20225U____K	LEPK-1-225-H-A V-Lock below
K101BH00225000000K	LEPK-1-225-H-B without V-Lock
K101BH00225B____K	LEPK-1-225-H-B V-Lock above and below
K101BH00225D____K	LEPK-1-225-H-B V-Lock above
K101BH00225U____K	LEPK-1-225-H-B V-Lock below
K101BH20225000000K	LEPK-1-225-H-B without V-Lock
K101BH20225B____K	LEPK-1-225-H-B V-Lock above and below
K101BH20225D____K	LEPK-1-225-H-B V-Lock above
K101BH20225U____K	LEPK-1-225-H-B V-Lock below
LEPK-1 VERTICAL	
K101AS20060000000K	LEPK-1-60-S-A without V-Lock
K101AS20060B____K	LEPK-1-60-S-A V-Lock above and below
K101AS20060D____K	LEPK-1-60-S-A V-Lock above
K101AS20060U____K	LEPK-1-60-S-A V-Lock below
K101AV20060000000K	LEPK-1-60-V-A without V-Lock
K101AV20060B____K	LEPK-1-60-V-A V-Lock above and below
K101AV20060D____K	LEPK-1-60-V-A V-Lock above
K101AV20060U____K	LEPK-1-60-V-A V-Lock below
K101BS20060000000K	LEPK-1-60-S-B without V-Lock
K101BS20060B____K	LEPK-1-60-S-B V-Lock above and below
K101BS20060D____K	LEPK-1-60-S-B V-Lock above
K101BS20060U____K	LEPK-1-60-S-B V-Lock below
K101BV20060000000K	LEPK-1-60-V-B without V-Lock
K101BV20060B____K	LEPK-1-60-V-B V-Lock above and below
K101BV20060D____K	LEPK-1-60-V-B V-Lock above
K101BV20060U____K	LEPK-1-60-V-B V-Lock below
K101AS20090000000K	LEPK-1-90-S-A without V-Lock
K101AS20090B____K	LEPK-1-90-S-A V-Lock above and below
K101AS20090D____K	LEPK-1-90-S-A V-Lock above
K101AS20090U____K	LEPK-1-90-S-A V-Lock below
K101AV20090000000K	LEPK-1-90-V-A without V-Lock
K101AV20090B____K	LEPK-1-90-V-A V-Lock above and below
K101AV20090D____K	LEPK-1-90-V-A V-Lock above
K101AV20090U____K	LEPK-1-90-V-A V-Lock below
K101BS20090000000K	LEPK-1-90-S-B without V-Lock
K101BS20090B____K	LEPK-1-90-S-B V-Lock above and below
K101BS20090D____K	LEPK-1-90-S-B V-Lock above
K101BS20090U____K	LEPK-1-90-S-B V-Lock below

ORDERING CODES

Code	Description
LEPK-1 VERTICAL	
K101BV20090000000K	LEPK-1-90-V-B without V-Lock
K101BV20090B____K	LEPK-1-90-V-B V-Lock above and below
K101BV20090D____K	LEPK-1-90-V-B V-Lock above
K101BV20090U____K	LEPK-1-90-V-B V-Lock below
K101AS20160000000K	LEPK-1-160-S-A without V-Lock
K101AS20160B____K	LEPK-1-160-S-A V-Lock above and below
K101AS20160D____K	LEPK-1-160-S-A V-Lock above
K101AS20160U____K	LEPK-1-160-S-A V-Lock below
K101AV20160000000K	LEPK-1-160-V-A without V-Lock
K101AV20160B____K	LEPK-1-160-V-A V-Lock above and below
K101AV20160D____K	LEPK-1-160-V-A V-Lock above
K101AV20160U____K	LEPK-1-160-V-A V-Lock below
K101BS20160000000K	LEPK-1-160-S-B without V-Lock
K101BS20160B____K	LEPK-1-160-S-B V-Lock above and below
K101BS20160D____K	LEPK-1-160-S-B V-Lock above
K101BS20160U____K	LEPK-1-160-S-B V-Lock below
K101BV20160000000K	LEPK-1-160-V-B without V-Lock
K101BV20160B____K	LEPK-1-160-V-B V-Lock above and below
K101BV20160D____K	LEPK-1-160-V-B V-Lock above
K101BV20160U____K	LEPK-1-160-V-B V-Lock below
LEPK-2 HORIZONTAL	
K102AH20320000000K	LEPK-2-320-H-A without V-Lock
K102AH20320B____K	LEPK-2-320-H-A V-Lock above and below
K102AH20320D____K	LEPK-2-320-H-A V-Lock above
K102AH20320U____K	LEPK-2-320-H-A V-Lock below
K102AH20320000000K	LEPK-2-320-H-A without V-Lock

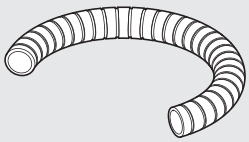
Code	Description
K102AH20320B____K	LEPK-2-320-H-A V-Lock above and below
K102AH20320D____K	LEPK-2-320-H-A V-Lock above
K102AH20320U____K	LEPK-2-320-H-A V-Lock below
K102BH00320000000K	LEPK-2-320-H-B without V-Lock
K102BH00320B____K	LEPK-2-320-H-B V-Lock above and below
K102BH00320D____K	LEPK-2-320-H-B V-Lock above
K102BH00320U____K	LEPK-2-320-H-B V-Lock below
K102BH20320000000K	LEPK-2-320-H-B without V-Lock
K102BH20320B____K	LEPK-2-320-H-B V-Lock above and below
K102BH20320D____K	LEPK-2-320-H-B V-Lock above
K102BH20320U____K	LEPK-2-320-H-B V-Lock below
K102AH20450000000K	LEPK-2-450-H-A without V-Lock
K102AH20450B____K	LEPK-2-450-H-A V-Lock above and below
K102AH20450D____K	LEPK-2-450-H-A V-Lock above
K102AH20450U____K	LEPK-2-450-H-A V-Lock below
K102AH20450000000K	LEPK-2-450-H-A without V-Lock
K102AH20450B____K	LEPK-2-450-H-A V-Lock above and below
K102AH20450D____K	LEPK-2-450-H-A V-Lock above
K102AH20450U____K	LEPK-2-450-H-A V-Lock below
K102BH00450000000K	LEPK-2-450-H-B without V-Lock
K102BH00450B____K	LEPK-2-450-H-B V-Lock above and below
K102BH00450D____K	LEPK-2-450-H-B V-Lock above
K102BH00450U____K	LEPK-2-450-H-B V-Lock below
K102BH20450000000K	LEPK-2-450-H-B without V-Lock
K102BH20450B____K	LEPK-2-450-H-B V-Lock above and below
K102BH20450D____K	LEPK-2-450-H-B V-Lock above
K102BH20450U____K	LEPK-2-450-H-B V-Lock below

ACCESSORIES

OIL

Code	Description	Volume [ml]
9910490	PARALIQ P 460	80

CABLE GUIDE



Code	Description	Length [mm]
095K2100850K	Cable guide LEPK-1-90-A/B 160-A	850
095K2100900K	Cable guide LEPK-1-160-B	900
095K2101200K	Cable guide LEPK-1-225-A/B	1200
095K2101550K	Cable guide LEPK-2-320-A/B	1550
095K2101700K	Cable guide LEPK-2-450-A/B	1700
095K2102500K	Cable guide LEPK	2500

NOTES

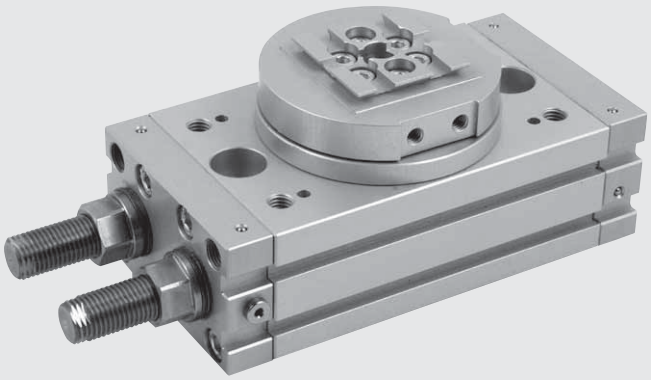
METAL WORK PNEUMATIC

NOTES

ROTARY ACTUATOR SERIES R3K

An actuator with a double rack and play take-up.
Angle of rotation adjustable from 0° to 180°.
These rotary actuators can be supplied with a mechanical stop or, for some sizes, a hydraulic decelerator.
There is also a version with external hydraulic decelerators with more kinetic energy.
The typical V-Lock dovetail and grooves are present on the turntable and the lower part of the body.
There are two grooves on either side for inserting retracting magnetic sensors.
There is a hole in the flange for air pipes or power cables.

N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.

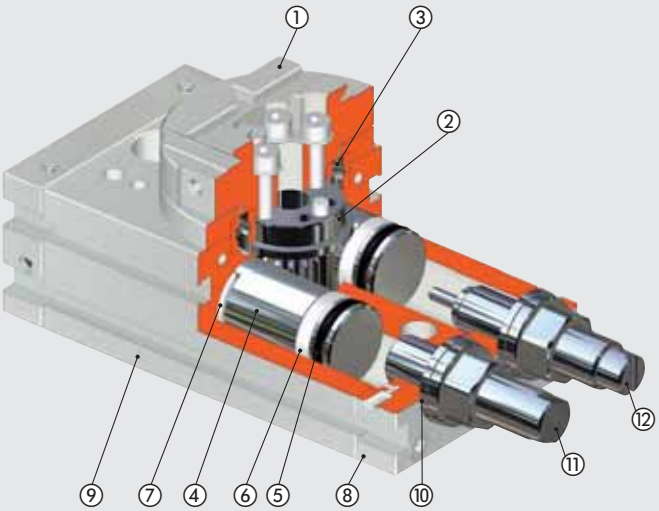


TECHNICAL DATA		R3K-16	R3K-20	R3K-25
Operating pressure	bar	3 to 7		
	MPa	0.3 to 0.7		
	psi	43 to 101		
Temperature range	°C	-10 to 80		
Fluid		Lubricated or unlubricated 20 µm filtered air. If lubricated air is used, lubrication must be continuous		
Bore	mm	2 x 16	2 x 20	2 x 25
Theoretical torque at 6 bar	Nm	0.9	1.8	4.6
Maximum axial load	N	74	135	300
Maximum radial load	N	78	137	450
Maximum overturning moment	Nm	2.4	4	9.7
Rotation time without load	s	0.2	0.2	0.2
Maximum kinetic energy:				
with mechanical stop	Joule	0.007	0.025	0.082
with inner decelerators	Joule	-	-	0.29
Weight	kg	0.66	1.13	2.17

COMPONENTS

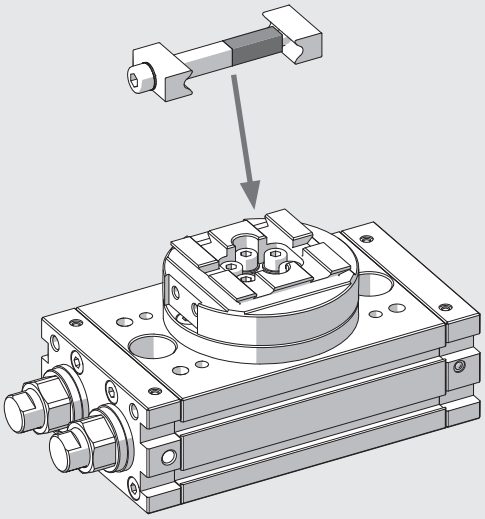
① ROTARY FLANGE: anodised aluminium
② PINION: hardened and tempered steel
③ BALL BEARING
④ PISTON / RACK: hardened and tempered steel
⑤ CUSHIONING GASKET: NBR
⑥ GUIDE PAD: PTFE
⑦ MAGNET: neodymium
⑧ HEAD: anodised aluminium
⑨ BARREL: anodised aluminium
⑩ GASKET: NBR

VERSIONS:
⑪ Stroke adjustment
⑫ Stroke adjustment with inside hydraulic shock absorbers (available from Ø 25)

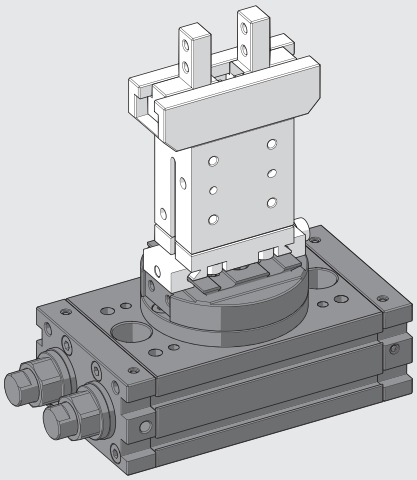


KEY DIAGRAM

Due to the design of turntables for R3K actuators, and to allow precision assembly with the K fixing elements, it is necessary to add a second key code W0950005151K to the one already present on the standard element.



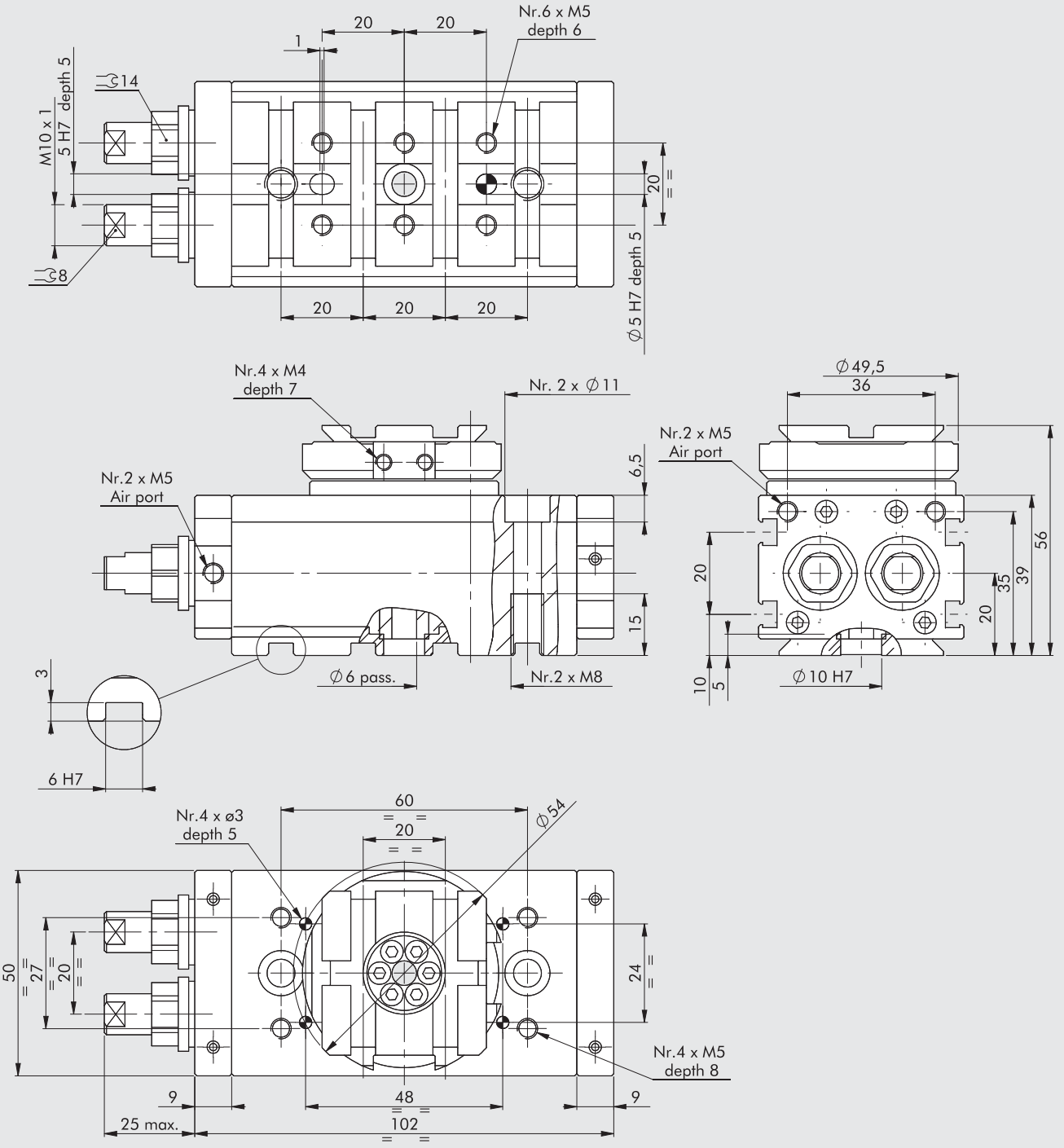
EXAMPLES OF APPLICATION



NOTES

ROTARY ACTUATOR R3K-16

NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.

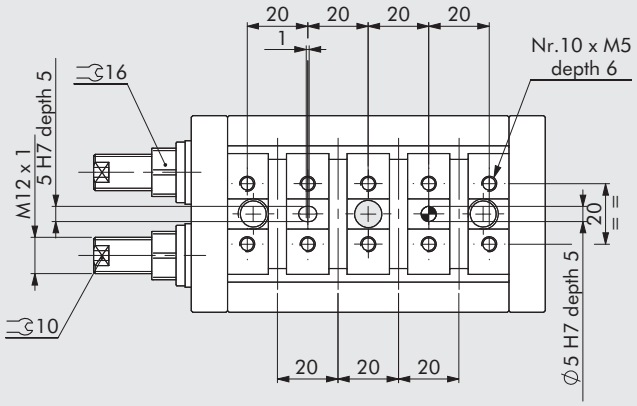


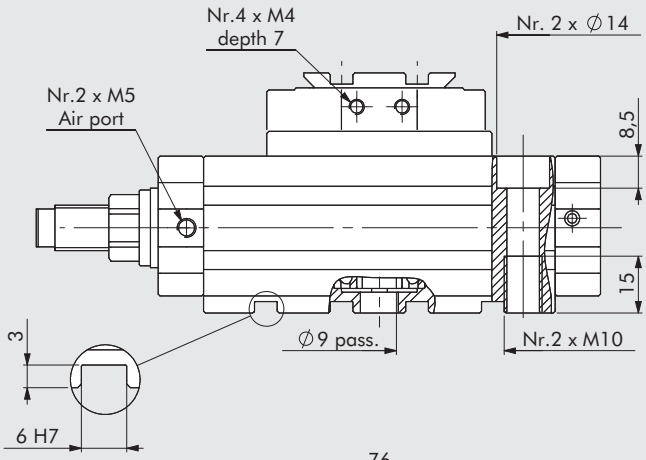
Code	Description
W1630162180K	Rotary actuator R3K-16

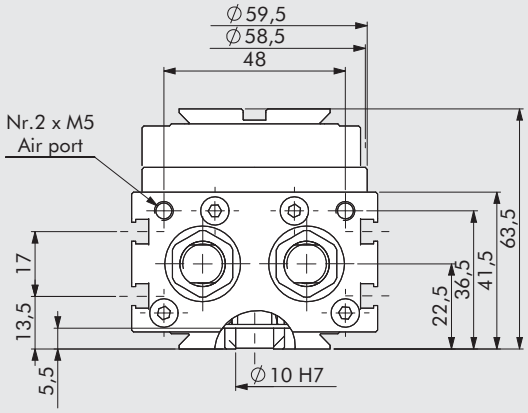
METAL WORK PNEUMATIC

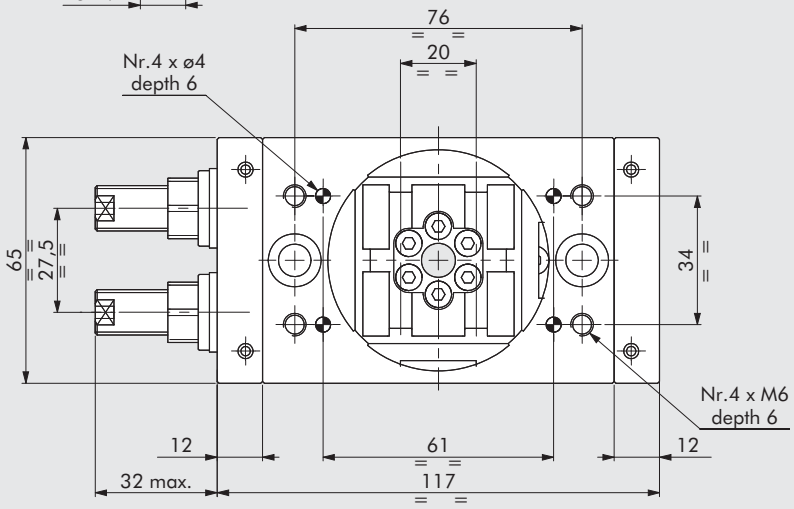
ROTARY ACTUATOR R3K-20

NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.





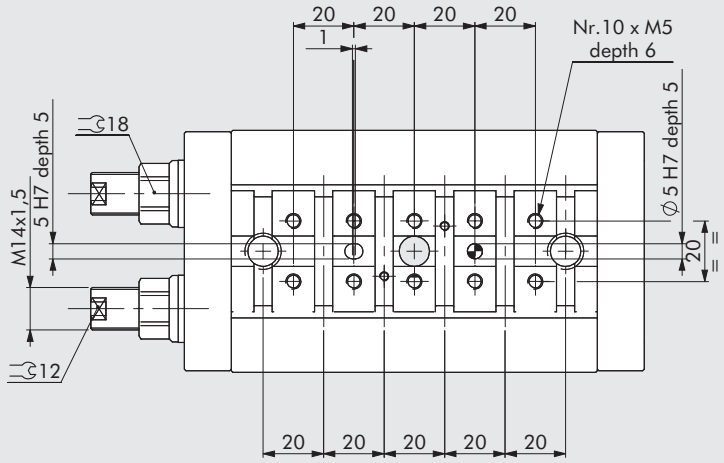


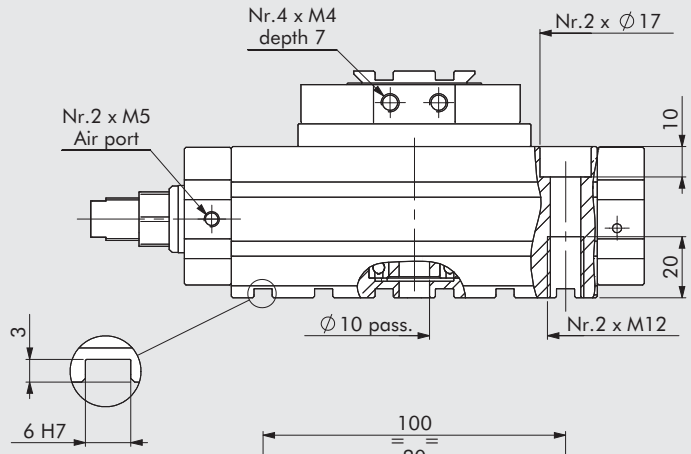


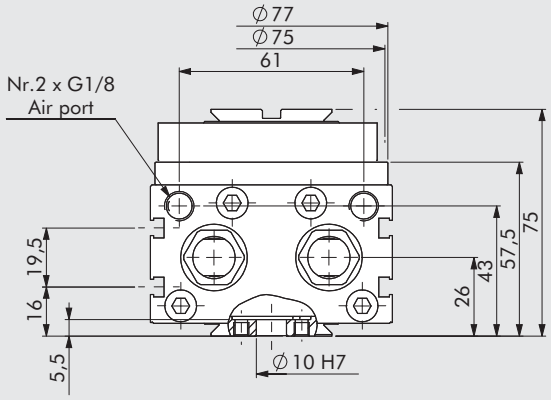
Code	Description
W1630202180K	Rotary actuator R3K-20

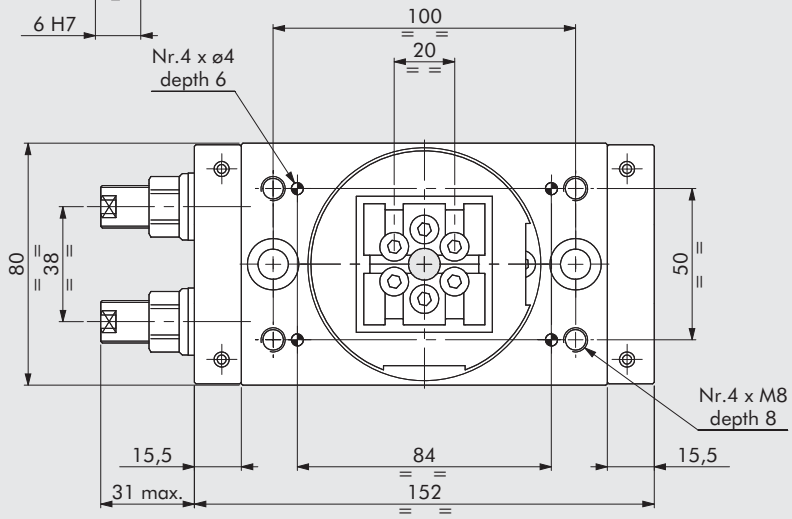
ROTARY ACTUATOR R3K-25

NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.









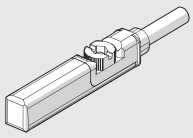
Code	Description
W1630252180K	Rotary actuator R3K-25
W1630253180K	Rotary actuator + shock absorbers R3K-25

ACCESSORIES

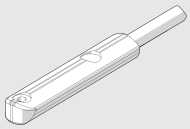
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

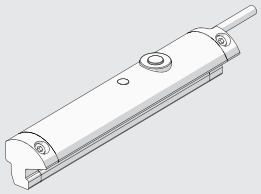


SENSOR, OVAL TYPE
Traditional



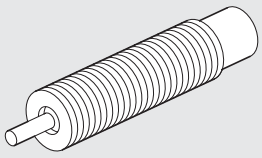
LTS POSITION SENSORS

For technical data and usage strokes see **chapter A6**.



SPARE PARTS

SHOCK ABSORBERS



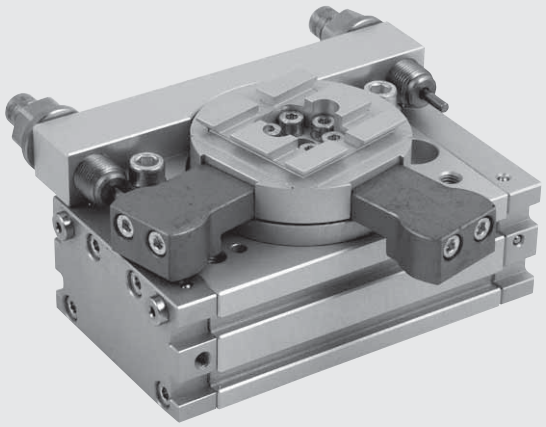
Code	Ø	Description
0950004015	Ø 25	Shock absorbers ECO S 25 MC2 short M14 x 1.5

NOTES

ROTARY ACTUATOR SERIES R3K WITH EXTERNAL SHOCK ABSORBERS

An actuator with a double rack and play take-up.
The hydraulic decelerators are mounted externally and act at a greater distance from the rotation axis compared to internal decelerators.
This means the amount of kinetic energy absorbed is 4-8 times greater than with internal decelerators.
Reduced longitudinal dimensions as there are no adjusting screws.
Available in versions with 90° and 180° rotation.
The typical V-Lock dovetail and grooves are present on the turntable and the lower part of the body.
There are two grooves on either side for inserting retracting magnetic sensors.
There is a hole in the flange for air pipes or power cables.

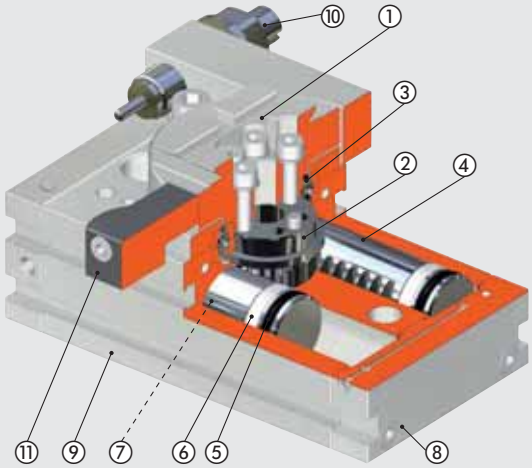
N.B.: The use of flow microregulators is recommended.
During setup, start with the microregulator CLOSED, then open it gradually until the desired speed is reached.



TECHNICAL DATA		R3K-16	R3K-20	R3K-25
Operating pressure	bar	3 to 7		
	MPa	0.3 to 0.7		
	psi	43 to 101		
Temperature range	°C	-10 to 80		
Fluid		Fluid Lubricated or unlubricated 20 µm filtered air. If lubricated air is used, lubrication must be continuous		
Bore	mm	2 x 16	2 x 20	2 x 25
Theoretical torque at 6 bar	Nm	0.9	1.8	4.6
Maximum axial load	N	74	135	300
Maximal radial load	N	78	137	450
Maximum overturning moment	Nm	2.4	4	9.7
Rotation time without load	s	0.2	0.2	0.2
Maximum kinetic energy	Joule	0.16	0.55	1.40
Weight	kg	0.76	1.43	2.86

COMPONENTS

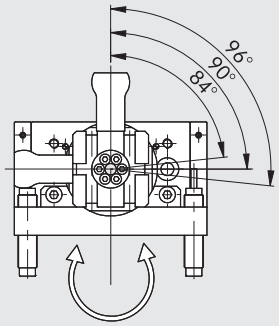
① ROTARY FLANGE: anodised aluminium
② PINION: hardened and tempered steel
③ BALL BEARING
④ PISTON / RACK: hardened and tempered steel
⑤ CUSHIONING GASKET: NBR
⑥ GUIDE PAD: PTFE
⑦ MAGNET: neodymium
⑧ HEAD: anodised aluminium
⑨ BARREL: anodised aluminium
⑩ STROKE REGULATOR WITH HYDRAULIC SHOCK ABSORBERS
⑪ Block for 90° version



METAL WORK PNEUMATIC

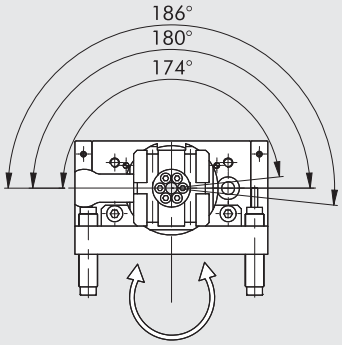
ANGLES OF ROTATION

90°



Hole position
for bottom pins

180°



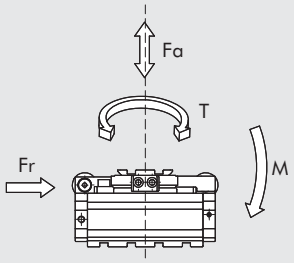
Hole position
for bottom pins

MAXIMUM KINETIC ENERGY Joule [J]

Ø	With flange, 90° rotation: W1630__4090K With flange, 180°rotation: W1630__4180K
16	0.16
20	0.55
22	0.85
25	1.40
30	1.85
40	3.35

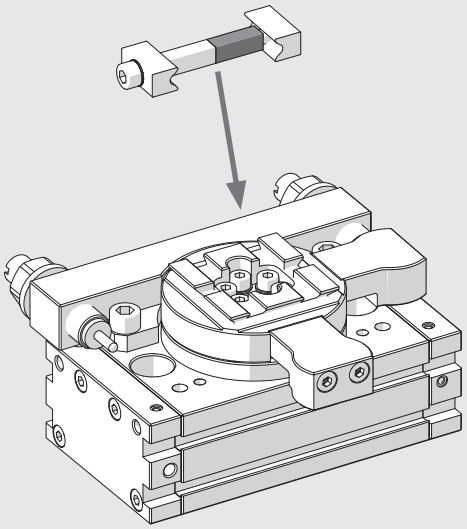
DIMENSIONS - FORCES AND MOMENTS

Ø	T Theoretical torque at 6 bar [Nm]	FA Max axial load [N]	FR Max radial load [N]	M Overturning moment [Nm]
16	0.9	74	78	2.4
20	1.8	135	137	4
22	2.7	195	360	5.3
25	4.6	300	450	9.7
30	9.3	340	490	12
40	22	360	560	18

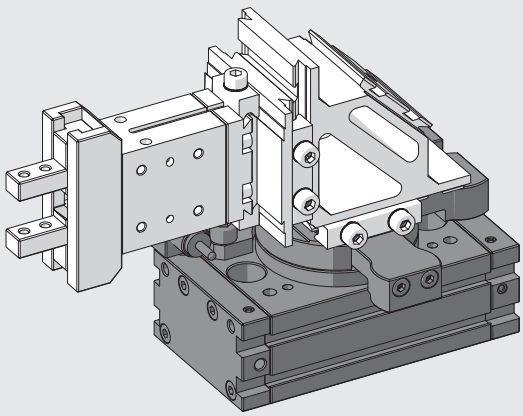


KEY DIAGRAM

Due to the design of turntables for R3K actuators, and to allow precision assembly with the K fixing elements, it is necessary to add a second key code W0950005151K to the one already present on the standard element.

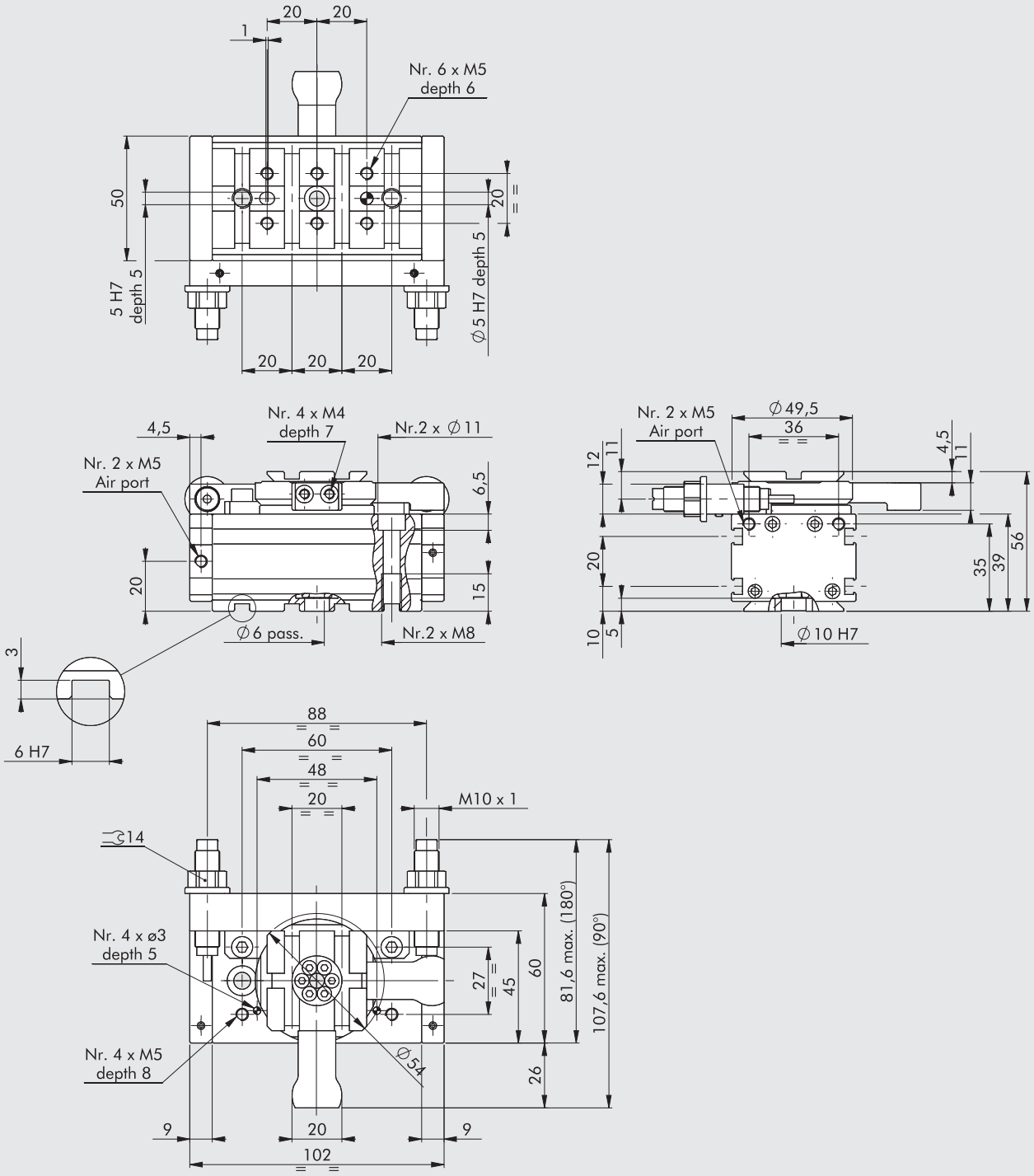


EXAMPLES OF APPLICATION



ROTARY ACTUATOR WITH EXTERNAL SHOCK ABSORBERS R3K-16 90/180°

NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.

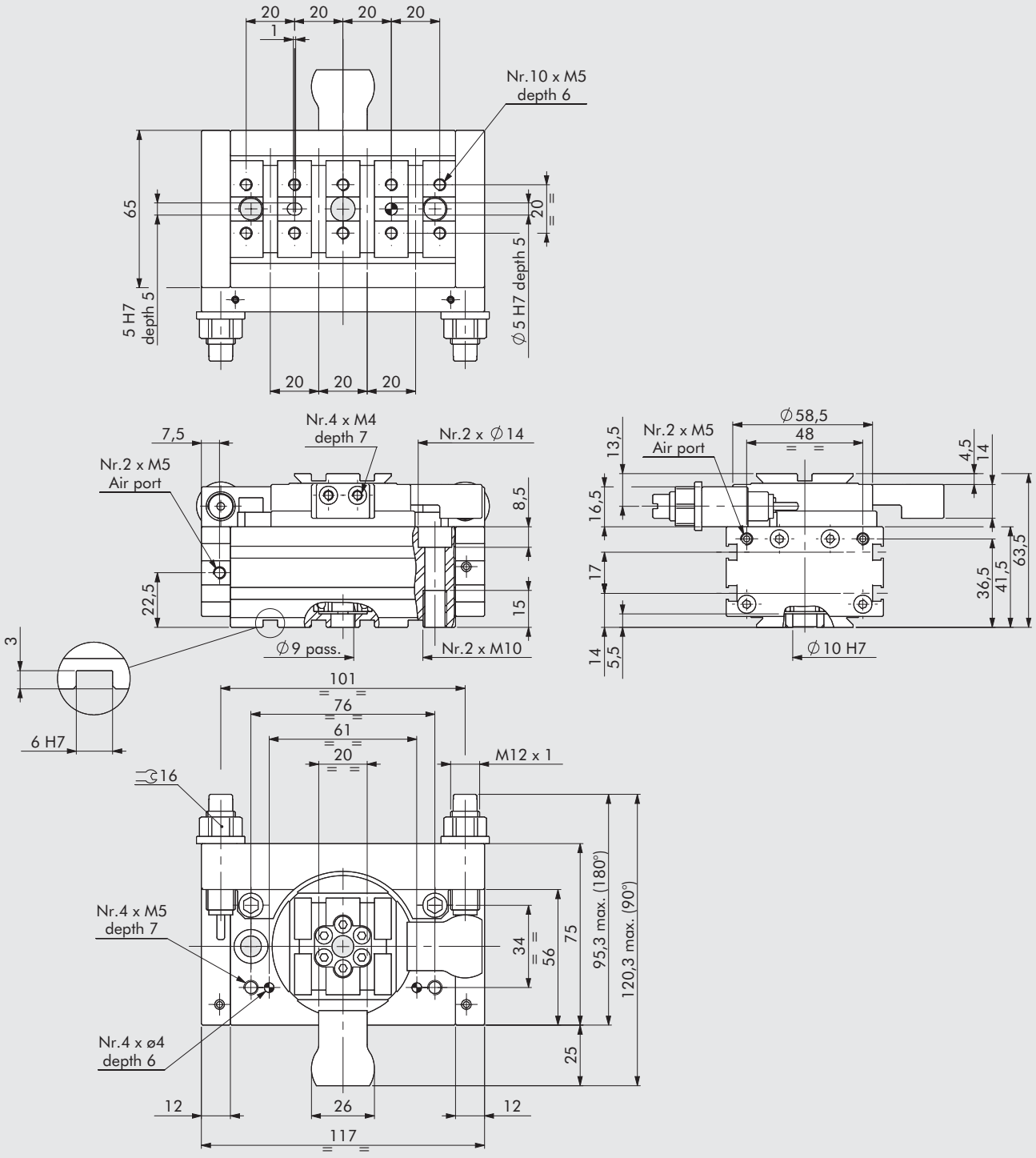


Code	Description
W1630164090K	Rotary actuator with external shock absorbers R3K-16-90
W1630164180K	Rotary actuator with external shock absorbers R3K-16-180

METAL WORK PNEUMATIC

ROTARY ACTUATOR WITH EXTERNAL SHOCK ABSORBERS R3K-20 90/180°

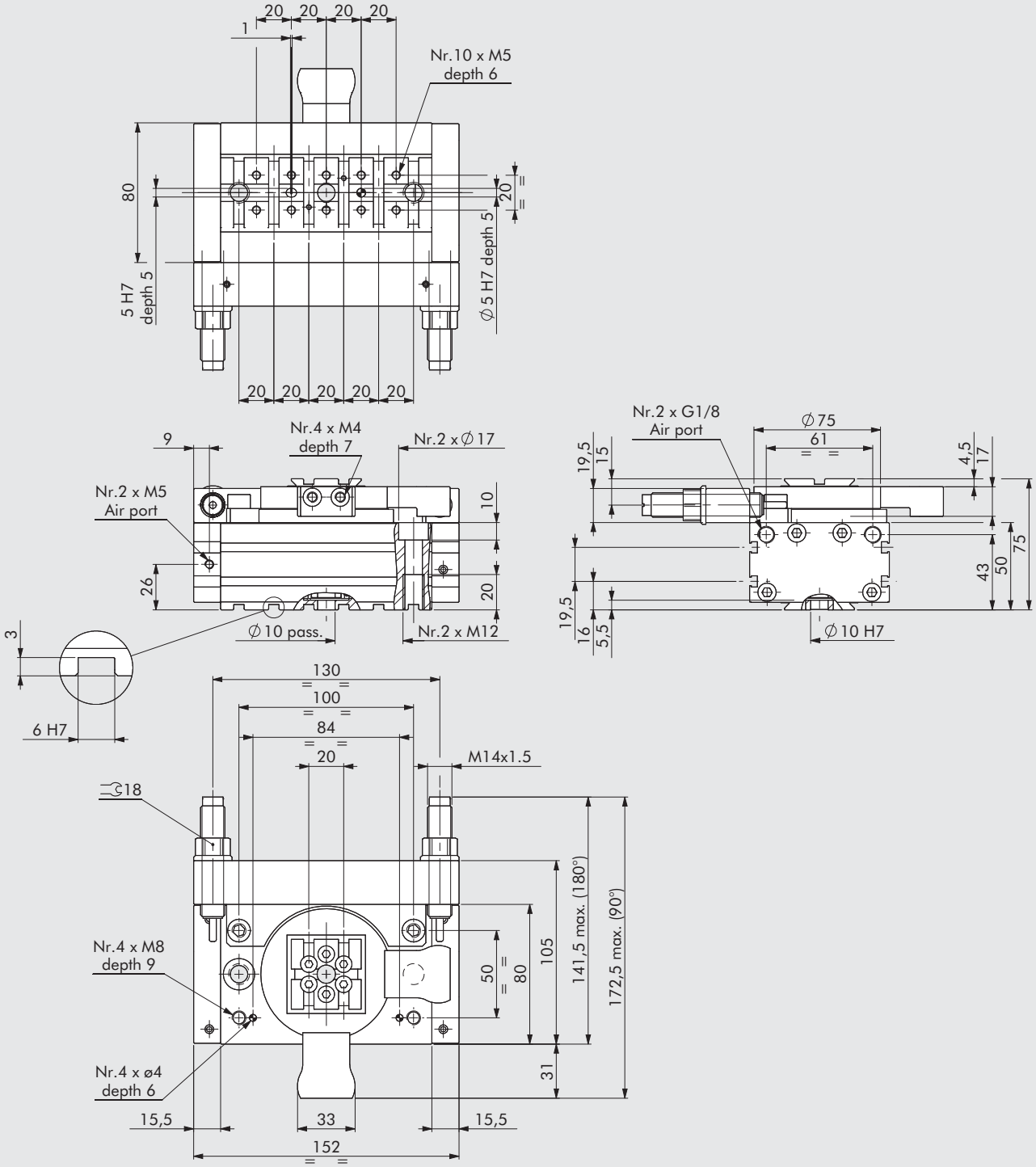
NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.



Code	Description
W1630204090K	Rotary actuator with external shock absorbers R3K-20-90
W1630204180K	Rotary actuator with external shock absorbers R3K-20-180

ROTARY ACTUATORS WITH EXTERNAL SHOCK ABSORBERS R3K-25 90/180°

NOTE: For standard dovetail dimensions see **chapter V-Lock Adaptors**.



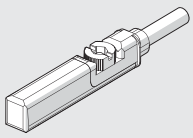
Code	Description
W1630254090K	Rotary actuator with external shock absorbers R3K-25-90
W1630254180K	Rotary actuator with external shock absorbers R3K-25-180

ACCESSORIES

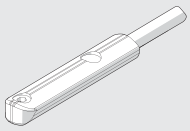
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing

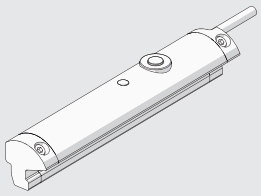


SENSOR, OVAL TYPE
Traditional



LTS POSITION SENSORS

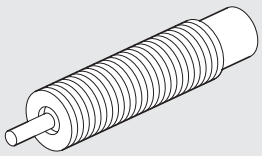
For technical data and usage strokes see **chapter A6**.



SPARE PARTS

SHOCK ABSORBERS

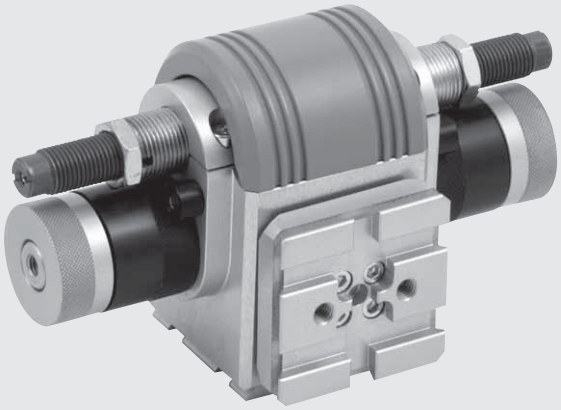
Code	Ø	Description
0950004009	Ø 16	Shock absorbers ECO 10 MF3 M10 x 1
0950004010	Ø 20	Shock absorbers ECO 15 MF4 M12 x 1
0950004015	Ø 25	Shock absorbers ECO S 25 MC2 short M14 x 1.5



NOTES

ROTARY ACTUATOR SERIES DAPK

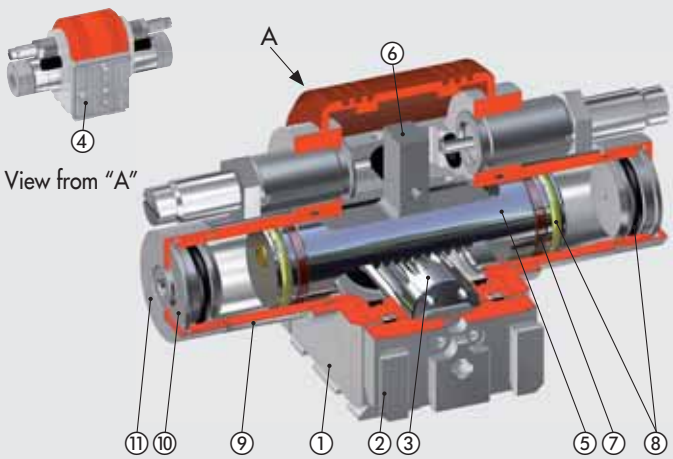
The DAPK rotary actuator is characterised by an exceptionally high level of performance, great ease of use, positioning accuracy and long life. It features a patented rack and pinion slack adjustment mechanism.
The angle of rotation can be adjusted between 0° and 180°.
A 3° overrun beyond 180° is also provided at each side.
The end position stops can be either elastic mechanical stop (for application with reduced mass and velocity) or hydraulic shock absorbers.
The end position can be detected using either the magnetic version, which is suitable for magnetic sensors, or the version suitable for inductive sensors. Versions with two, three and four positions are also available. The third and fourth position can be added at a later stage by installing the accessory provided. The versions with a pneumatic rotary distributor can be used to supply compressed air to the rotating plate from the inside, thus avoiding using external rotating pipes.
In this case the rotating plate can be chosen among the one mounted in-line and that tilted by 90°.
N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.



TECHNICAL DATA		DAPK-1	DAPIK-1	DAPK-2	DAPIK-2
Internal air flows		NO	YES	NO	YES
Operating pressure	bar	2 to 7			
	MPa	0.2 to 0.7			
	psi	29 to 101			
Temperature range	°C	-10 to 80			
	°F	14 to 176			
Fluid		Lubricated or unlubricated 20 µm filtered air. If lubricated air is used, lubrication must be continuous			
End position stop shock-absorption		Hydraulic shock-absorbers or elastic mechanical stop			
End-position control		Inductive sensors, magnetic sensors			
Rotation angle	°	Adjustable from 0 to 180			
Bore	mm	20		32	
Moment of inertia around the central axis	kg·m²	0.004		0.030	
Theoretical torque at 6 bar	Nm	1.1		3.8	
Maximum overturning moment	Nm	5		15	
Allowable axial tensile stress/compression	N	90 / 120		240 / 460	
Allowable critical strain energy:					
with elastic mechanical stop	Joule	0.02		0.06	
with shock absorbers	Joule	0.20		0.60	
Repeatability (on 100 strokes at constant conditions)	°	≤ 0.01		≤ 0.01 - 0.02	
Weight of the 2-position version	kg	0.56	0.71	1.50	1.73
Weight of the 3-position version	kg	0.66	0.80	1.67	1.90
Weight of the 4-position version	kg	0.76	0.89	1.84	2.07

COMPONENTS

① BODY: blank anodised aluminium
② PLATE: blank anodised aluminium
③ PINION: steel
④ INTERFACE COVER: blank anodised aluminium
⑤ RACK: steel
⑥ SECONDARY RACK: steel
⑦ GUIDE RING: special technopolymer
⑧ GASKETS: NBR
⑨ TUBE: hard-anodised aluminium
⑩ END CAP: blank anodised aluminium
⑪ COVER: blank anodised aluminium



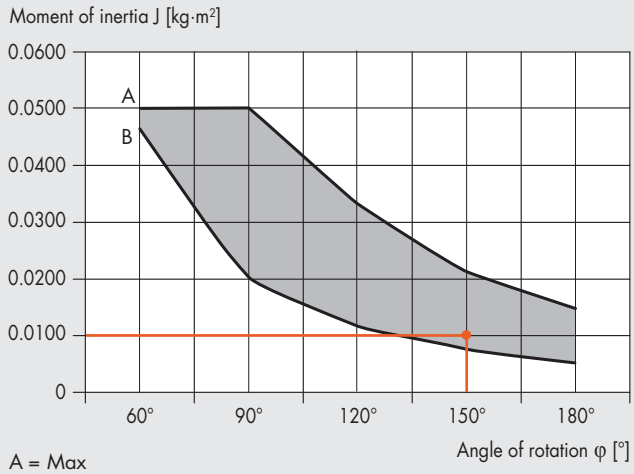
CHOOSING THE SHOCK-ABSORBER

For the correct use of the DAPK-1/DAPIK-1 and DAPK-2/DAPIK-2, use the shock-absorber that best suits the application.
For the DAPK-1/DAPIK-1, you can select only one shock-absorber.
For the DAPK-2/DAPIK-2, you can choose three types of shock-absorbers according to the following procedure:

EXAMPLE
DAPK-2 with:
- Moment of inertia applied to the rotary actuator: J = 0.0100 kg.m²
- Set angle of rotation: φ = 150 °

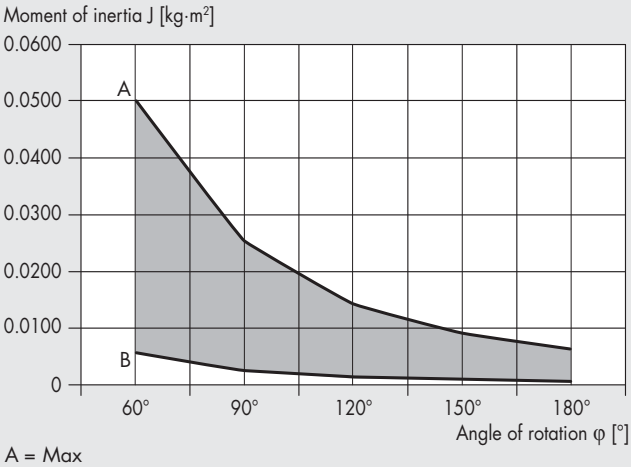
Requirement: Determine the shock-absorber that best suits the application:

1. Calculate the moment of inertia of the component applied to the DAPK-2/DAPIK-2 rotary actuator.
   In our case the value is J = 0.0100 kg.m²
2. Determine the angle of rotation that the rotary actuator must perform.
   In our case the value is φ = 150 °
3. Intersect the angle and moment of inertia in the diagrams "shock-absorber range of use" of the three types of shock-absorbers used. The shock-absorber whose point is inside the grey area shall be chosen.
   In our case the shock-absorber obtained is the "Shock-absorber on request" MC150EUMH2 average hardness (see encryption key).



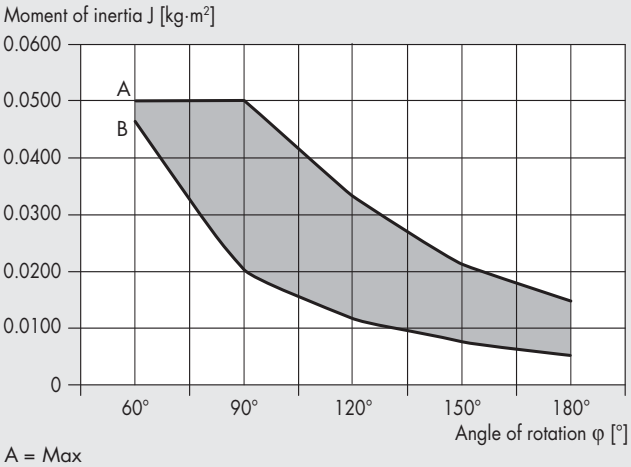
A = Max
B = Min

MC150EUMH STD shock-absorber range of use



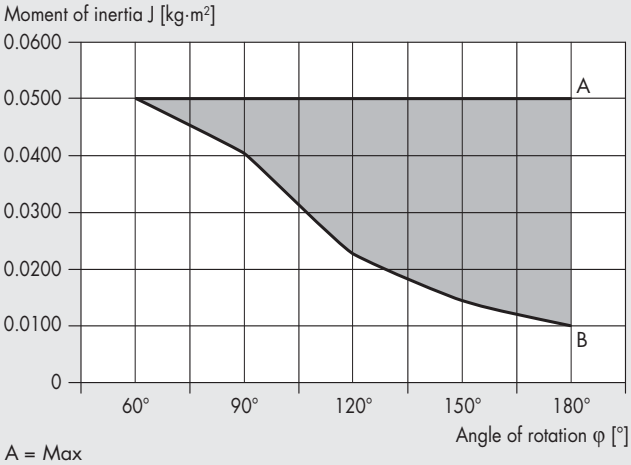
A = Max
B = Min

MC150EUMH2 medium hardness shock-absorber range of use



A = Max
B = Min

SC190EUM7 hard shock-absorber range of use



A = Max
B = Min

PERFORMANCE

The method used to determine the maximum theoretical number of cycles and theoretical time of a rotation is the same for both sizes of the DAPK/DAPIK, which involves the use of:

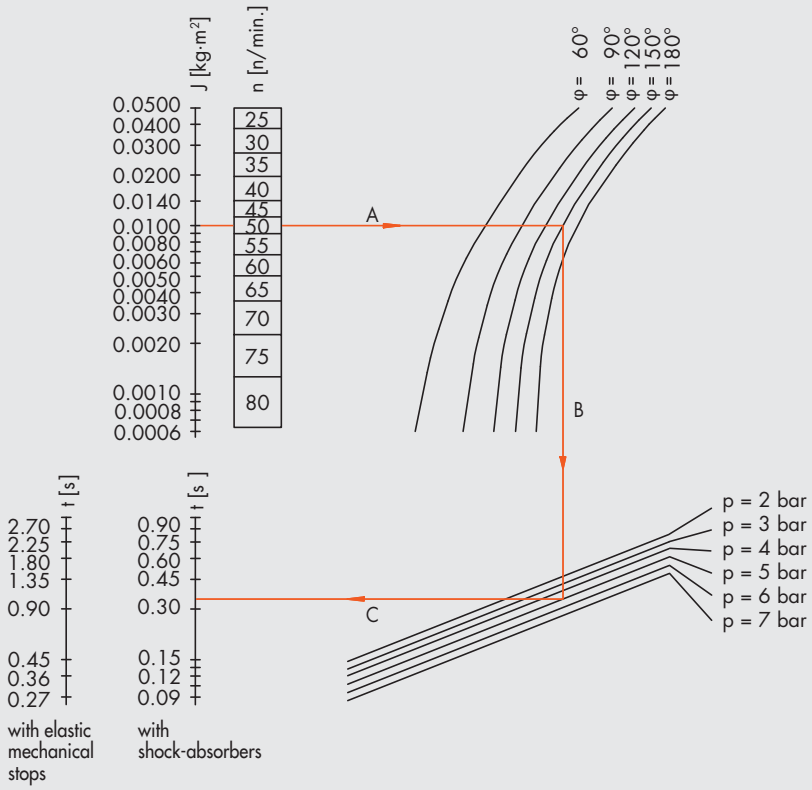
- "performance chart of DAPK-1/DAPIK-1 with hydraulic shock-absorbers and buffers";
- "performance chart of DAPK-2/DAPIK-2 with hydraulic shock-absorbers and buffers".

EXAMPLE

DAPK-2 with:

- Moment of inertia applied to the rotary actuator: J = 0.0100 kg.m^2
- Set angle of rotation: φ = 150 °
- Supply pressure: p = 5 bar

Requirement: Determine the maximum theoretical number of cycles and theoretical time of a rotation:



Applicability:

- Centre of gravity of the rotating mass on the axis of rotation. Axis of rotation in any position.
- Centre of gravity of the rotating mass outside the axis of rotation. Axis of rotation in a vertical position.

Example of hydraulic with shock-absorbers:
J = 0.010 kg·m^2
φ = 150°
p = 5 bar

Results:
n_{max} = 50 double strokes per minute
t = 0.34 s standard shock absorber

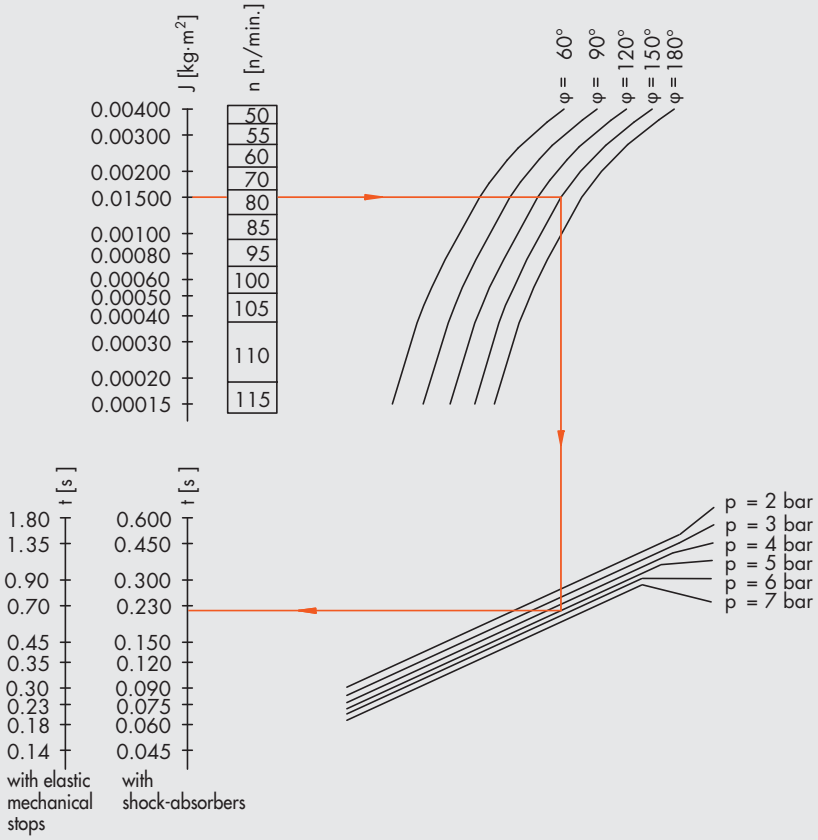
J = moment of inertia of mass
n = max. number of double strokes per minute for the version with shock-absorbers
p = pneumatic drive pressure
t = traverse time per stroke
φ = angle of rotation

1. Starting from the moment of inertia applied to the rotary actuator, the maximum number of settable theoretical cycles is determined (line A). In our case the value is = 50 cycles/min
2. When the line of the desired angle of rotation is intercepted, move down to the supply pressure (line B) and, by crossing the indexed scale "t" (line C), you obtain the theoretical time of a rotation.
3. In our case the value is t ≈ 0.35 sec.

IMPORTANT: the maximum number of cycles and the time of a rotation are theoretical data and as such, for particular applications, these values are unlikely to be achieved.

METAL WORK PNEUMATIC

PERFORMANCE GRAPHS FOR DAPK-1, DAPIK-1 WITH HYDRALIC SHOCK-ABSORBERS AND ELASTIC MECHANICAL STOPS



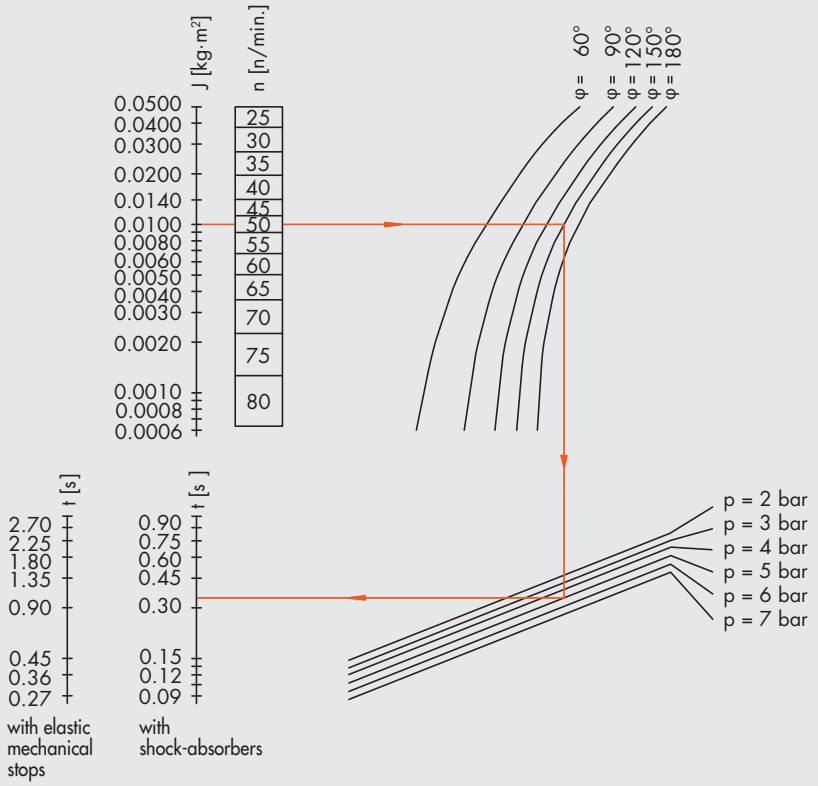
Applicability:
- Centre of gravity of the rotating mass on the axis of rotation. Axis of rotation in any position.
- Centre of gravity of the rotating mass outside the axis of rotation. Axis of rotation in a vertical position.

Example of hydraulic with shock-absorbers:
J = 0.0015 kg·m²
φ = 150°
p = 5 bar

Results:
n_{max} = 80 double strokes per minute
t = 0.22 s

J = moment of inertia of mass
n = max. number of double strokes per minute for the version with shock-absorbers
p = pneumatic drive pressure
t = traverse time per stroke
φ = angle of rotation

PERFORMANCE GRAPHS FOR DAPK-2, DAPIK-2 WITH HYDRALIC SHOCK-ABSORBERS AND ELASTIC MECHANICAL STOPS



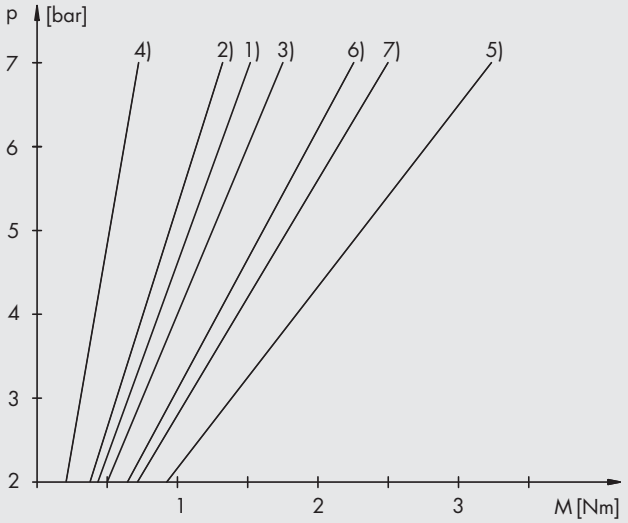
Applicability:
- Centre of gravity of the rotating mass on the axis of rotation. Axis of rotation in any position.
- Centre of gravity of the rotating mass outside the axis of rotation. Axis of rotation in a vertical position.

Example of hydraulic with shock-absorbers:
J = 0.010 kg·m²
φ = 150°
p = 5 bar

Results:
n_{max} = 50 double strokes per minute
t = 0.34 s standard shock absorber

J = moment of inertia of mass
n = max. number of double strokes per minute for the version with shock-absorbers
p = pneumatic drive pressure
t = traverse time per stroke
φ = angle of rotation

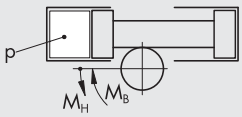
PRESSURE / TORQUE CHART DAPK-1, DAPIK-1, DZAK-1



p = drive pressure
M_H = moment of holding, i.e. the moment applicable from the outside to the stationary pinion shaft, with no pinion movement.
M_B = moment of movement, i.e. the moment available for the moving pinion shaft due to the effect of pneumatic drive.

2-POSITION VERSIONS

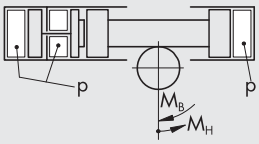
DAPK left /right end position



$M_H = p \cdot 0.21 \longrightarrow$ 1)
$M_B = p \cdot 0.18 \longrightarrow$ 2)

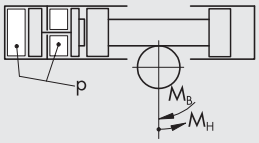
3-POSITION VERSIONS (DZAK)

DAPK against DZAK on the outlet



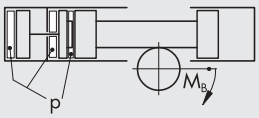
$M_H = p \cdot 0.25 \longrightarrow$ 3)
$M_B = p \cdot 0.10 \longrightarrow$ 4)

DZAK outlet, DAPK without pressure



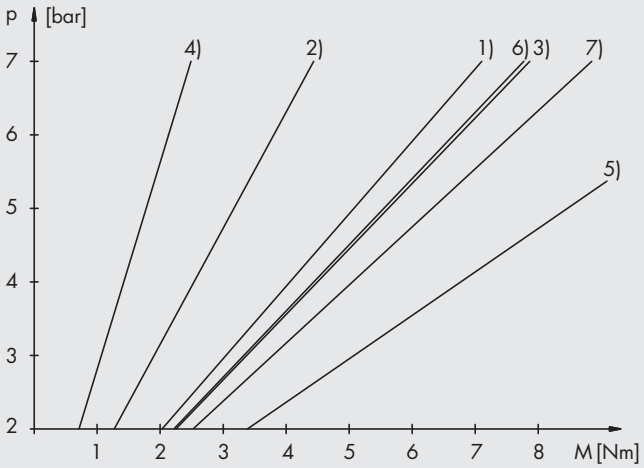
$M_H = p \cdot 0.46 \longrightarrow$ 5)
$M_B = p \cdot 0.32 \longrightarrow$ 6)

DAPK + DZAK



$M_B = p \cdot 0.35 \longrightarrow$ 7)

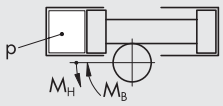
PRESSURE / TORQUE CHART DAPK-2, DAPIK-2, DZAK-2



p = drive pressure
M_H = moment of holding, i.e. the moment applicable from the outside to the stationary pinion shaft, with no pinion movement.
M_B = moment of movement, i.e. the moment available for the moving pinion shaft due to the effect of pneumatic drive.

2-POSITION VERSIONS

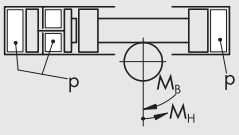
DAPK left /right end position



$M_H = p \cdot 1.01 \longrightarrow$ 1)
$M_B = p \cdot 0.63 \longrightarrow$ 2)

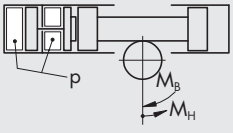
3-POSITION VERSIONS (DZAK)

DAPK against DZAK on the outlet



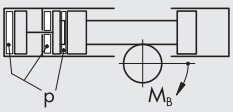
$M_H = p \cdot 1.12 \longrightarrow$ 3)
$M_B = p \cdot 0.35 \longrightarrow$ 4)

DZAK outlet, DAPK without pressure



$M_H = p \cdot 1.69 \longrightarrow$ 5)
$M_B = p \cdot 1.10 \longrightarrow$ 6)

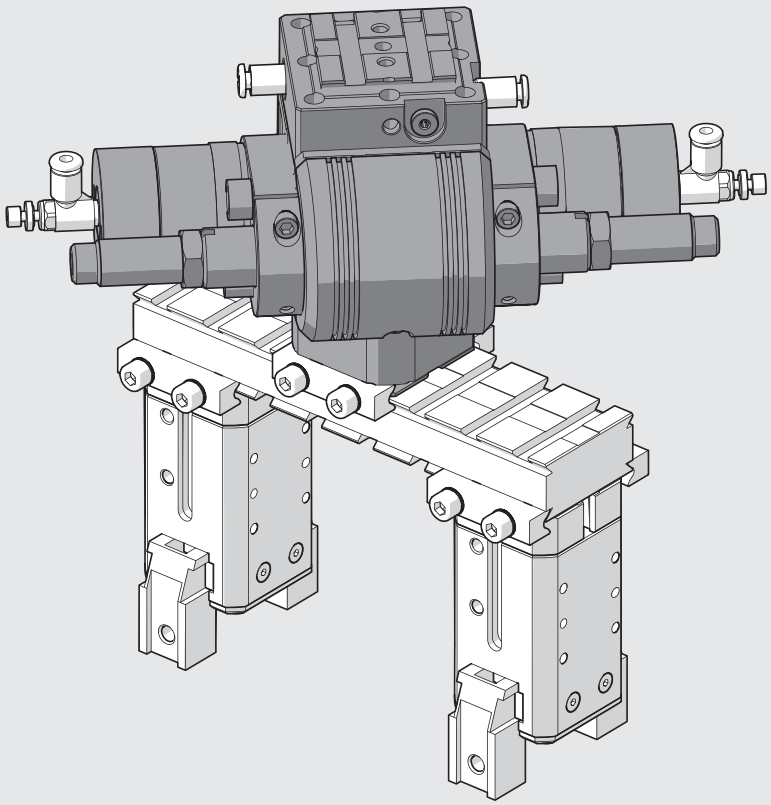
DAPK + DZAK

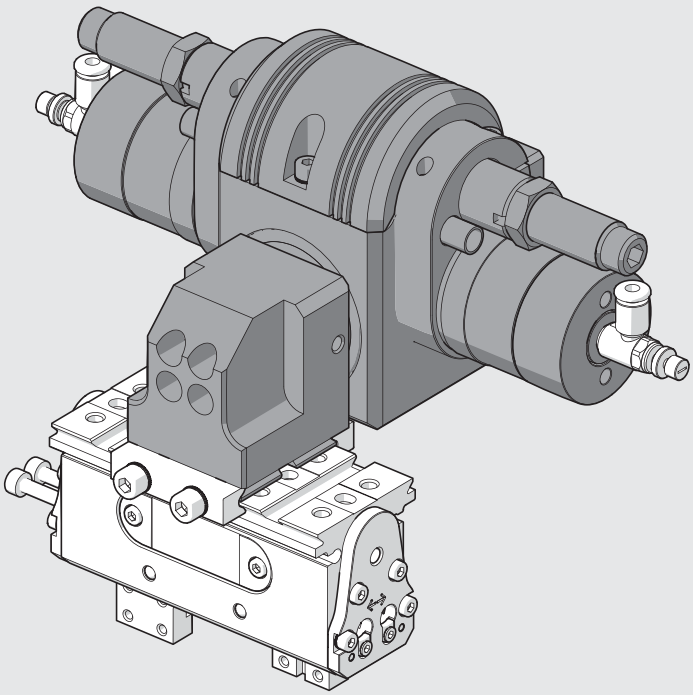


$M_B = p \cdot 1.26 \longrightarrow$ 7)

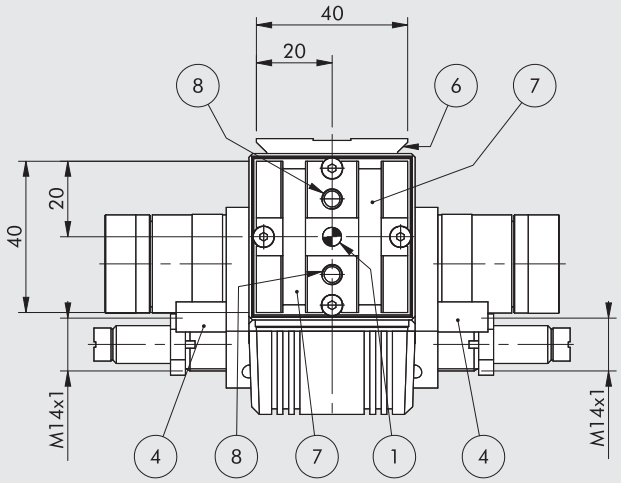
METAL WORK PNEUMATIC

EXAMPLES OF APPLICATION

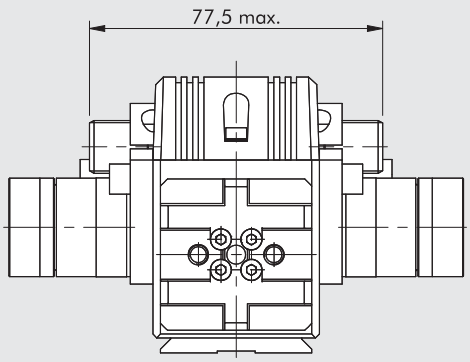




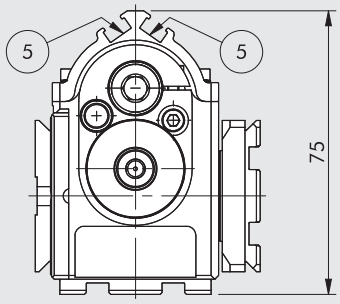
DIMENSIONS OF THE DAPK-1 ROTARY ACTUATOR

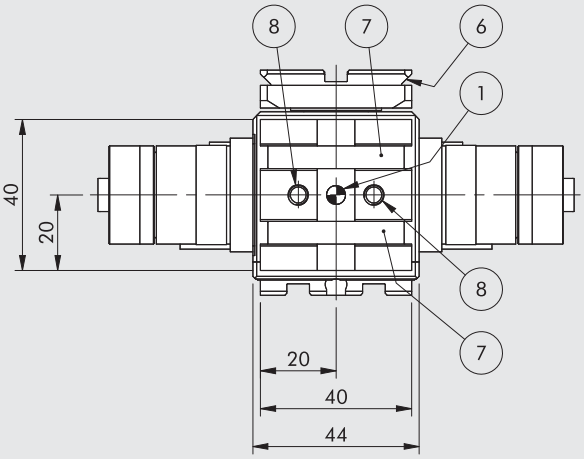


VERSION WITH ELASTIC MECHANICAL STOP

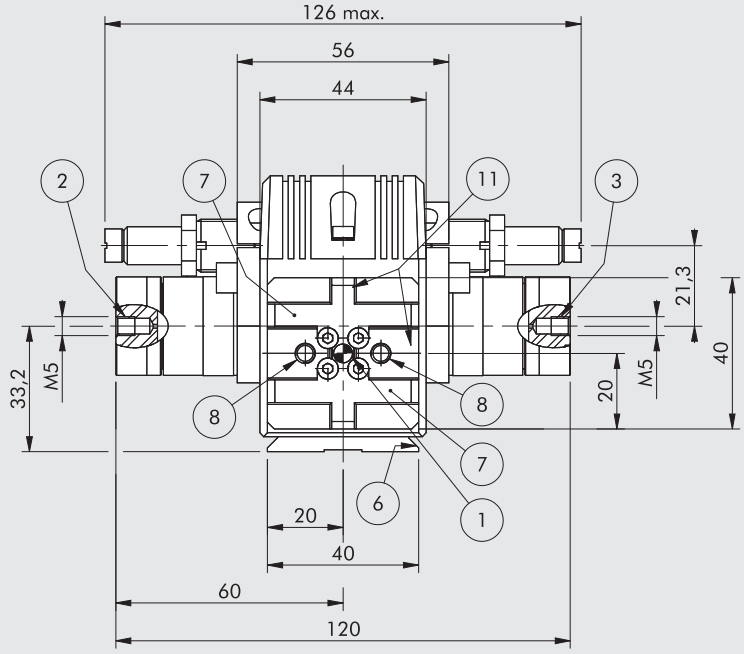


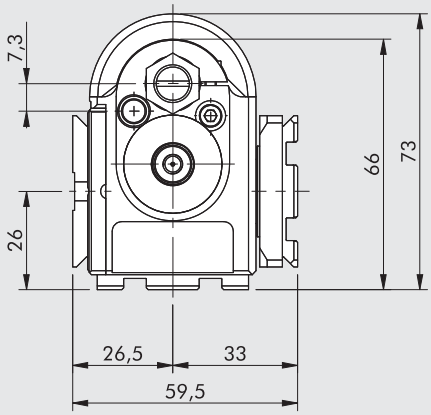
MAGNETIC VERSION





① Holes for centring pins
② Right-hand rotation supply
③ Left-hand rotation supply
④ Bushing for inductive sensors
⑤ Magnetic sensor or position sensor fixing slots
⑥ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑦ Slot for "V-Lock" precision key
⑧ Threaded holes for fixing

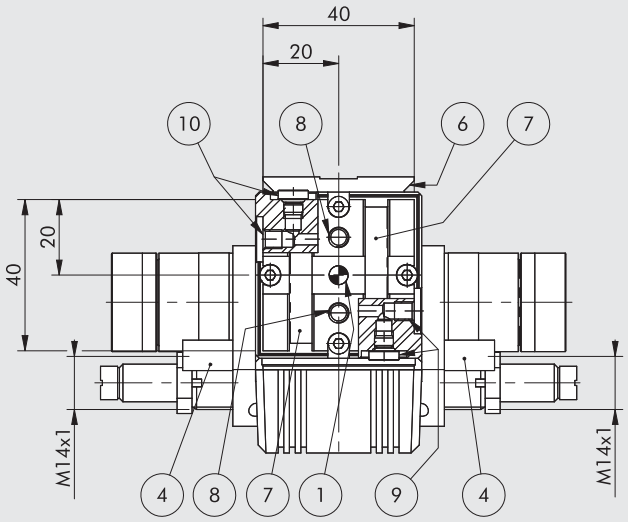


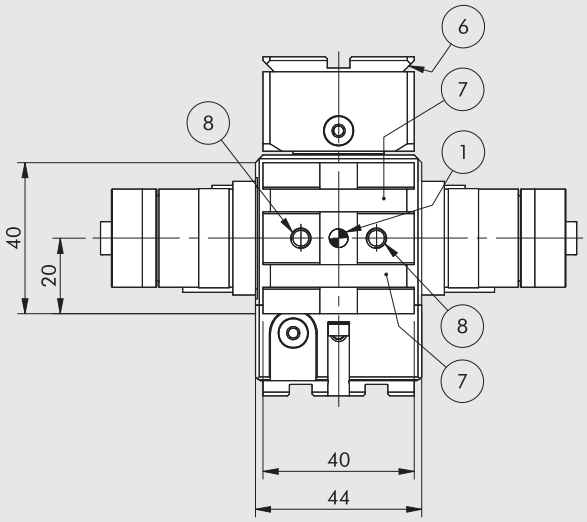


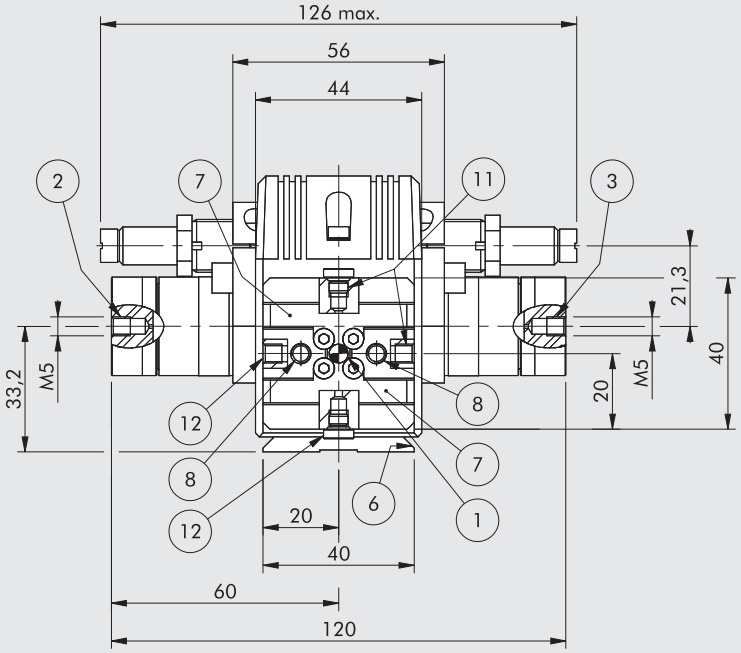
IMPORTANT: 1° of rotation corresponds to a linear movement of Δ = 0.126 mm

METAL WORK PNEUMATIC

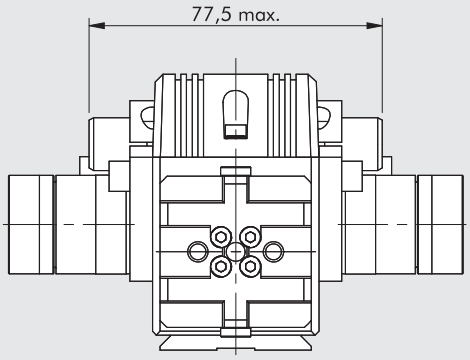
DAPIK-1 ROTARY ACTUATOR DIMENSIONS WITH INTERNAL AIR FLOWS



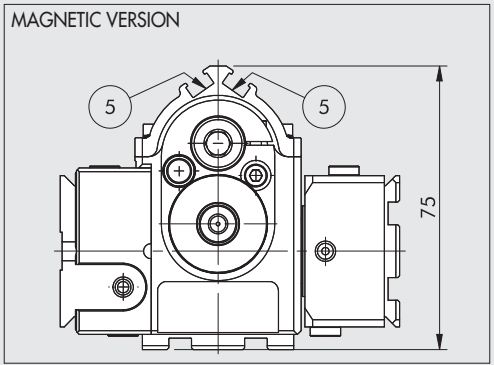




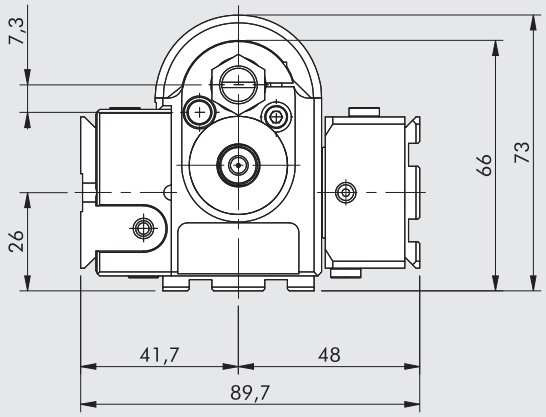
VERSION WITH ELASTIC MECHANICAL STOP



MAGNETIC VERSION

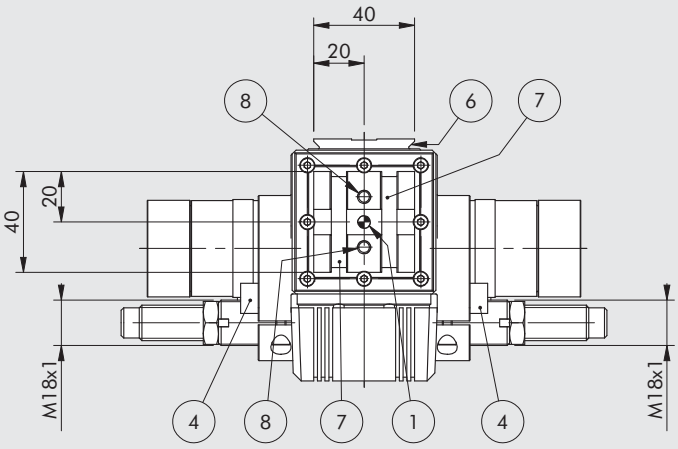


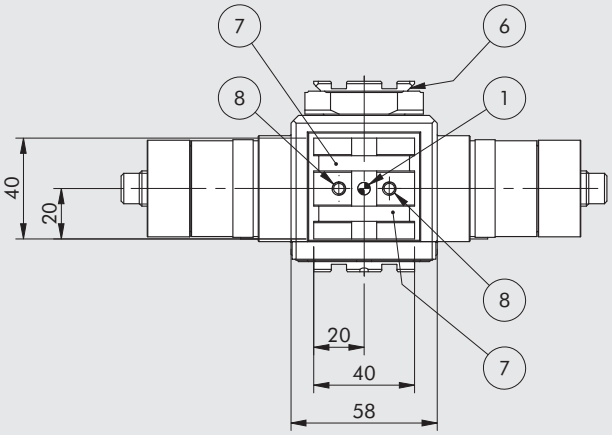
① Holes for centring pins
② Right-hand rotation supply
③ Left-hand rotation supply
④ Bushing for inductive sensors
⑤ Magnetic sensor or position sensor fixing slots
⑥ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑦ Slot for "V-Lock" precision key
⑧ Threaded holes for fixing
⑨ Air inlets on the right (M5 thread)
⑩ Air inlets on the left (M5 thread)
⑪ Air outlets on the right (M5 thread)
⑫ Air outlets on the left (M5 thread)

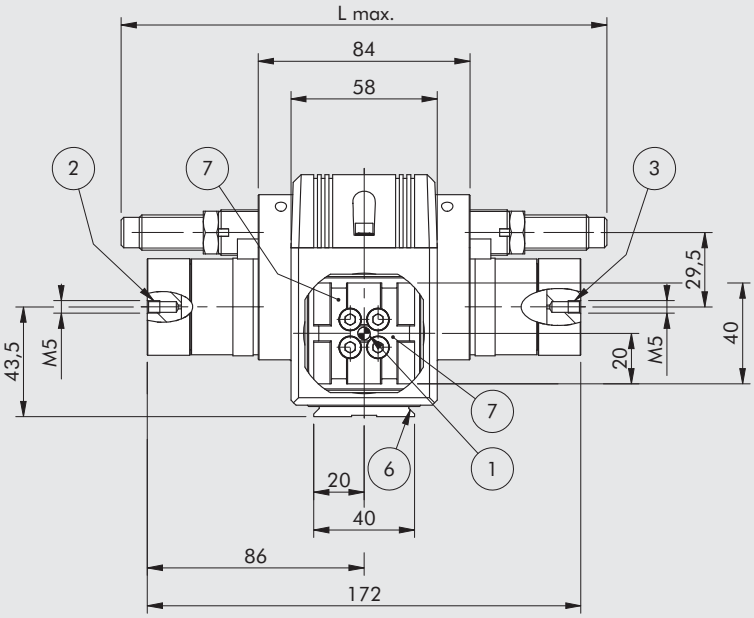


IMPORTANT: 1° of rotation corresponds to a linear movement of Δ = 0.126 mm

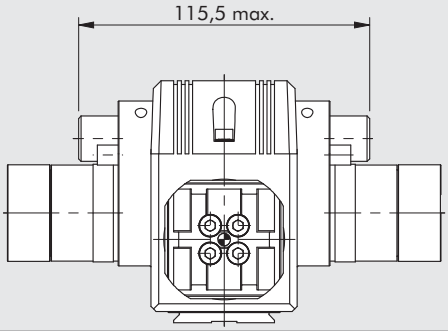
DIMENSIONS OF THE DAPK-2 ROTARY ACTUATOR



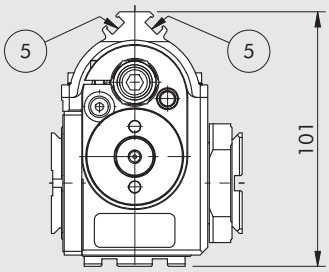




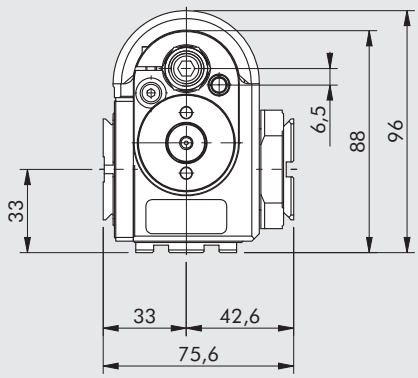
VERSION WITH ELASTIC MECHANICAL STOP



MAGNETIC VERSION



① Holes for centring pins
② Right-hand rotation supply
③ Left-hand rotation supply
④ Bushing for inductive sensors
⑤ Magnetic sensor or position sensor fixing slots
⑥ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑦ Slot for "V-Lock" precision key
⑧ Threaded holes for fixing

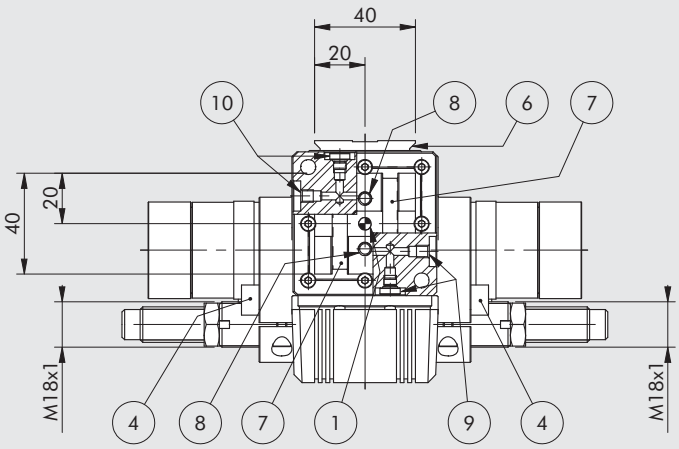


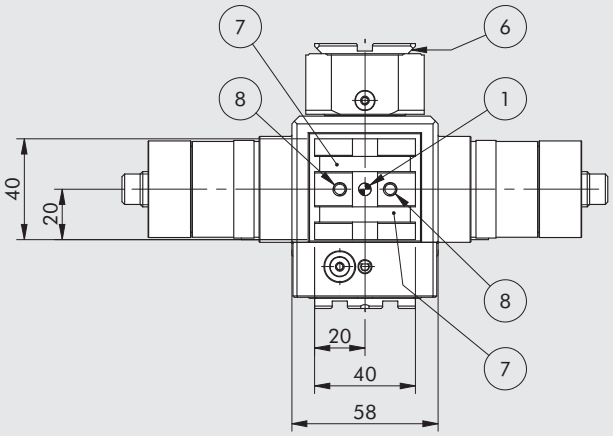
Shock-absorbers	L
Standard (H)	192.7 mm
Medium hardness (H2)	192.7 mm
Hard (M7)	209.5 mm

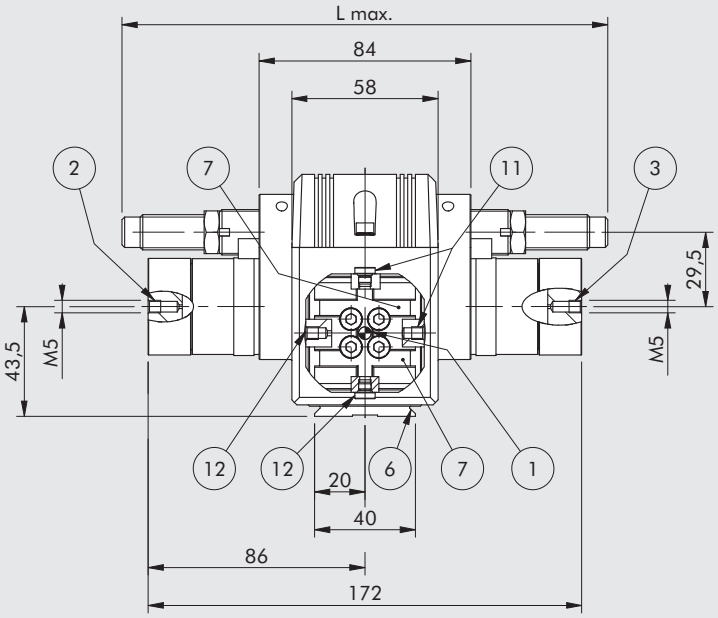
IMPORTANT: 1° of rotation corresponds to a linear movement of Δ = 0.183 mm

METAL WORK PNEUMATIC

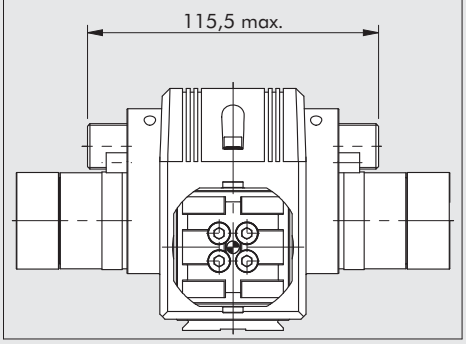
DAPIK-2 ROTARY ACTUATOR DIMENSIONS WITH INTERNAL AIR FLOWS



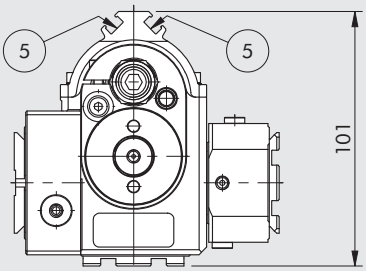




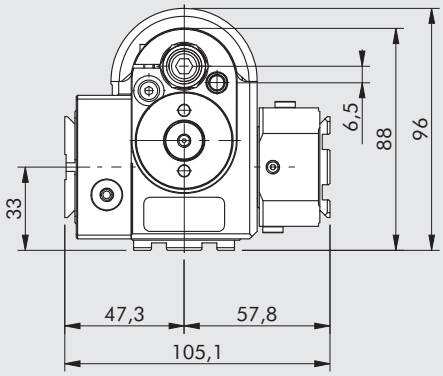
VERSION WITH ELASTIC MECHANICAL STOP



MAGNETIC VERSION



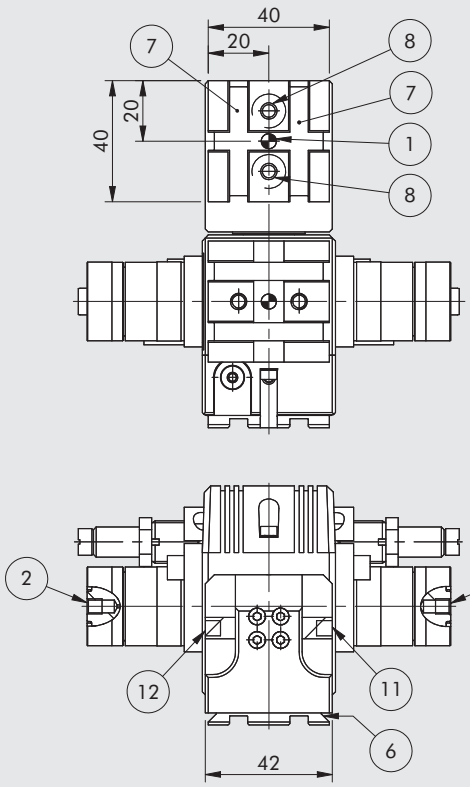
① Holes for centring pins
② Right-hand rotation supply
③ Left-hand rotation supply
④ Bushing for inductive sensors
⑤ Magnetic sensor or position sensor fixing slots
⑥ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑦ Slot for "V-Lock" precision key
⑧ Threaded holes for fixing
⑨ Air inlets on the right (M5 thread)
⑩ Air inlets on the left (M5 thread)
⑪ Air outlets on the right (M5 thread)
⑫ Air outlets on the left (M5 thread)

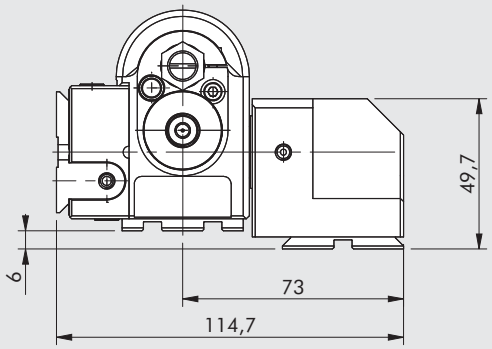


Shock-absorbers	L
Standard (H)	192.7 mm
Medium hardness (H2)	192.7 mm
Hard (M7)	209.5 mm

IMPORTANT: 1° of rotation corresponds to a linear movement of Δ = 0.183 mm

DIMENSIONS OF DAPIK-1 + WAK-1 ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN

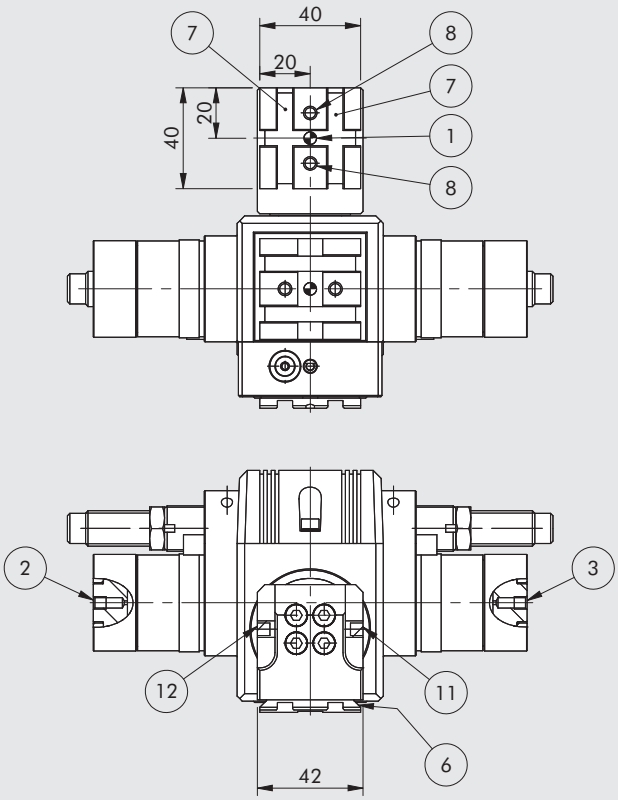


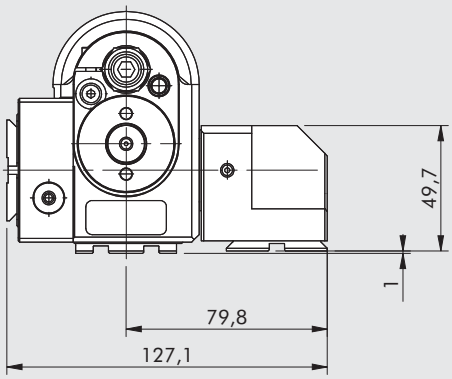


① Holes for centring pins
② Right-hand rotation supply
③ Left-hand rotation supply
⑥ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑦ Slot for "V-Lock" precision key
⑧ Threaded holes for fixing
⑪ Air outlets on the right (M5 thread)
⑫ Air outlets on the left (M5 thread)

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 rotary actuator on page **A3**.143

DIMENSIONS OF DAPIK-2 + WAK-2 ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN



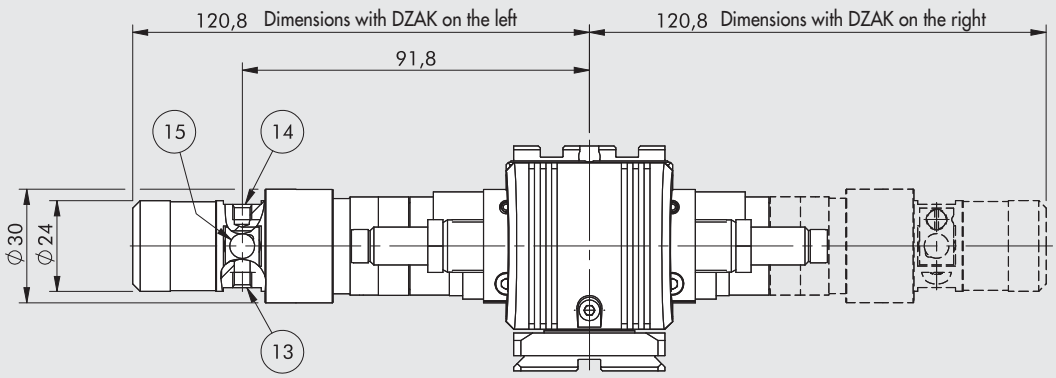


① Holes for centring pins
② Right-hand rotation supply
③ Left-hand rotation supply
⑥ Dovetail for "V-Lock" fixing.
For standard dimensions, see **chapter V-Lock adaptors**
⑦ Slot for "V-Lock" precision key
⑧ Threaded holes for fixing
⑪ Air outlets on the right (M5 thread)
⑫ Air outlets on the left (M5 thread)

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 rotary actuator on page **A3**.145

METAL WORK PNEUMATIC

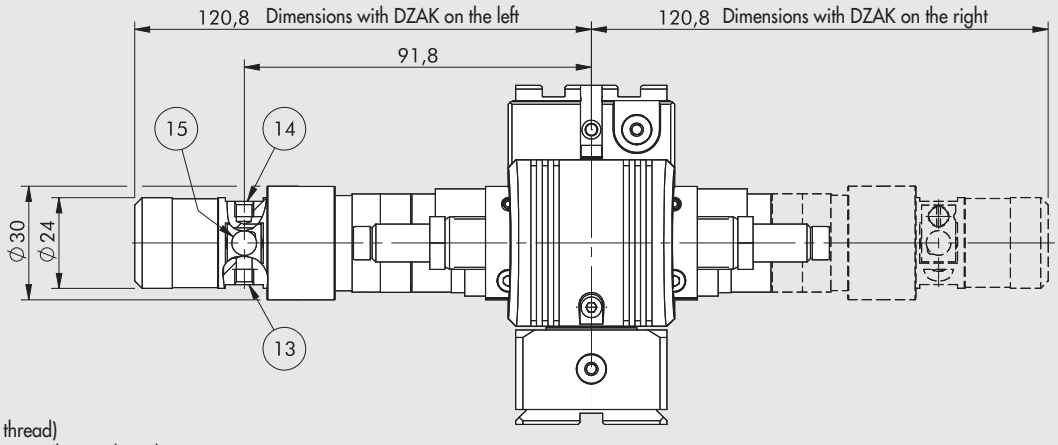
DIMENSIONS OF DAPK-1 + DZAK-1 THREE-POSITION ROTARY ACTUATOR (right or left)



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPK-1 rotary actuator on page **A3**.142

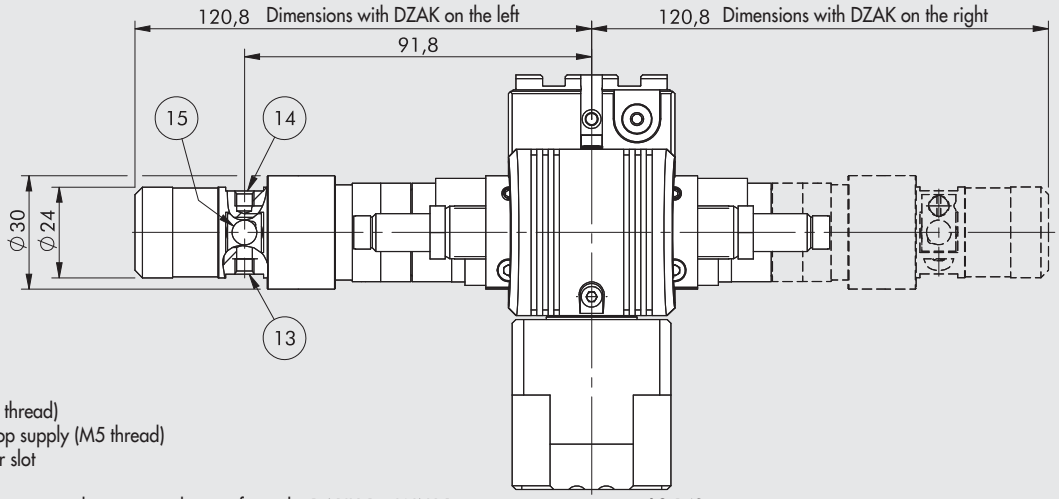
DIMENSIONS OF DAPIK-1 + DZAK-1 THREE-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS (right or left)



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 rotary actuator on page **A3**.143

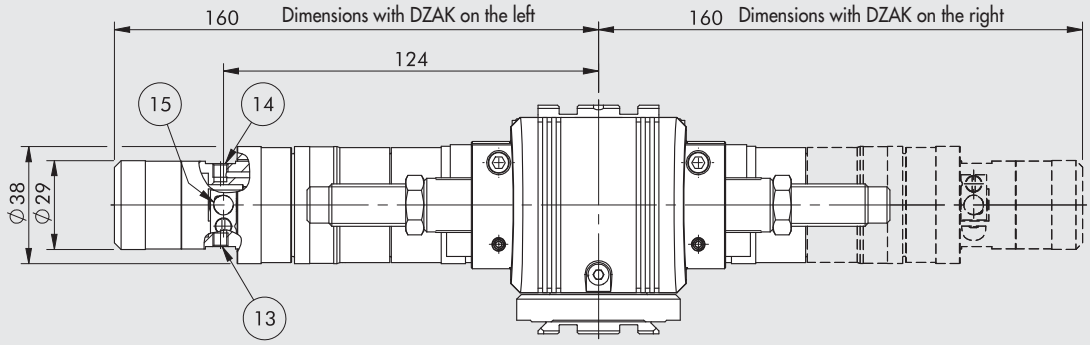
DIMENSIONS OF DAPIK-1 + WAK-1 + DZAK-1 THREE-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN (right or left)



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 + WAK-1 rotary actuator on page **A3**.142

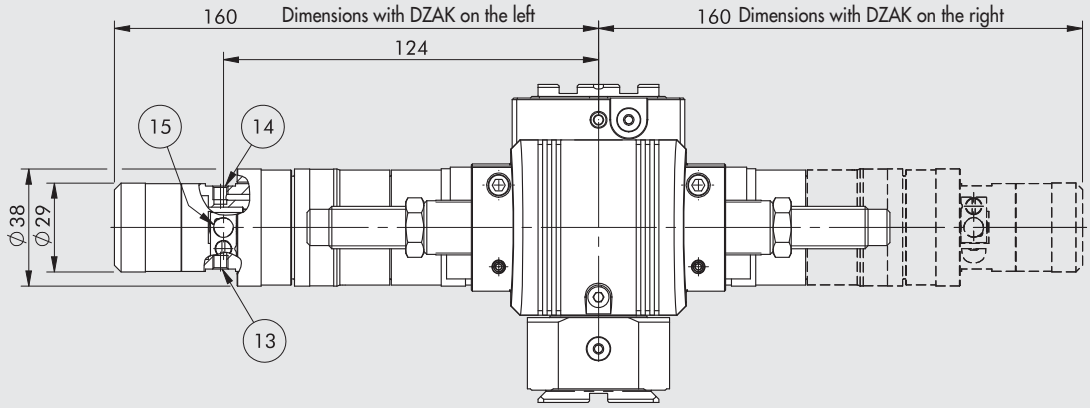
DIMENSIONS OF DAPK-2 + DZAK-2 THREE-POSITION ROTARY ACTUATOR (right or left)



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPK-2 rotary actuator on page **A3**.144

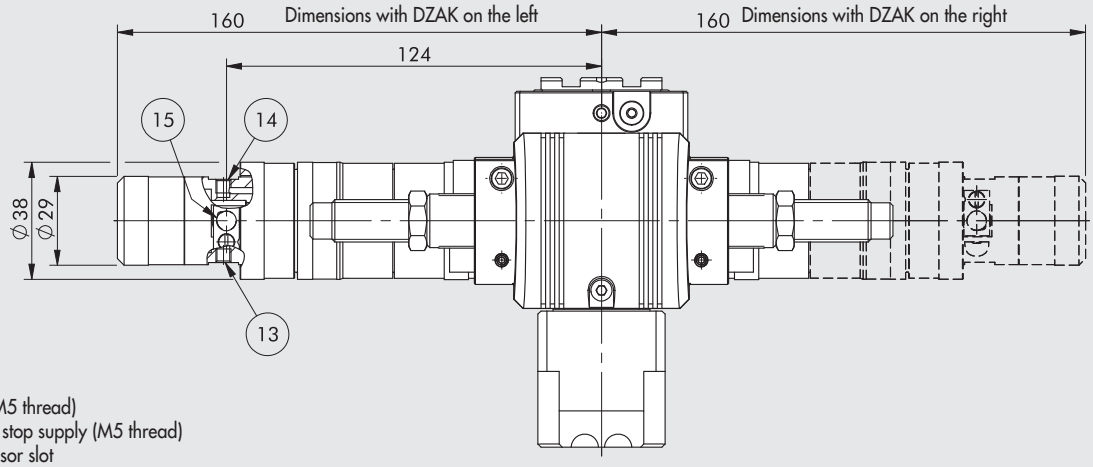
DIMENSIONS OF DAPIK-2 + DZAK-2 THREE-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS (right or left)



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 rotary actuator on page **A3**.145

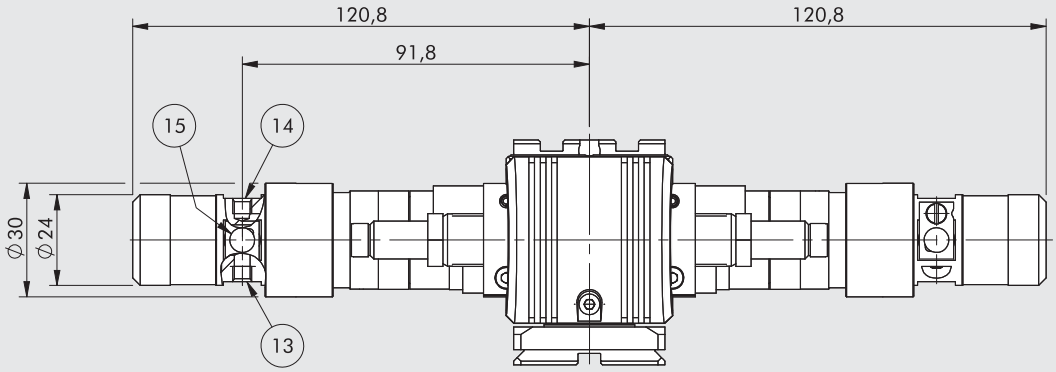
DIMENSIONS OF DAPIK-2 + WAK-2 + DZAK-2 THREE-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN (right or left)



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 + WAK-2 rotary actuator on page **A3.**146

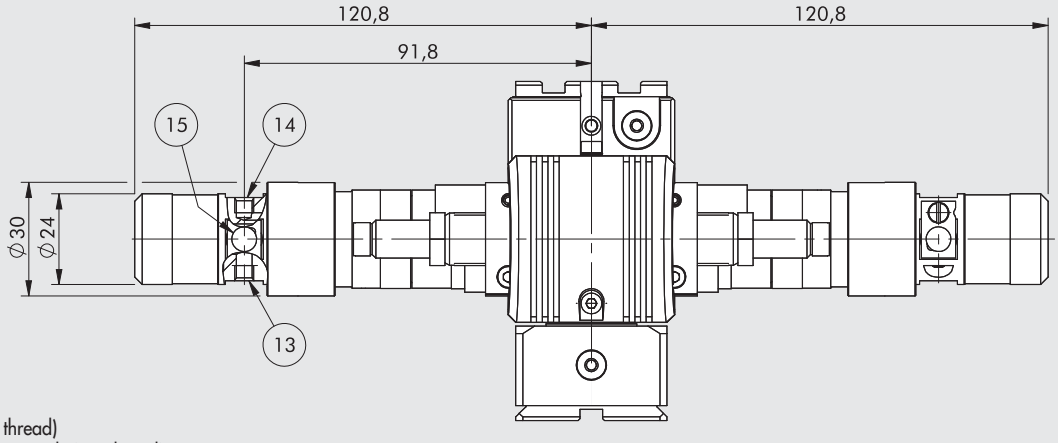
DIMENSIONS OF DAPK-1 + 2 DZAK-1 FOUR-POSITION ROTARY ACTUATOR



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPK-1 rotary actuator on page **A3**.142

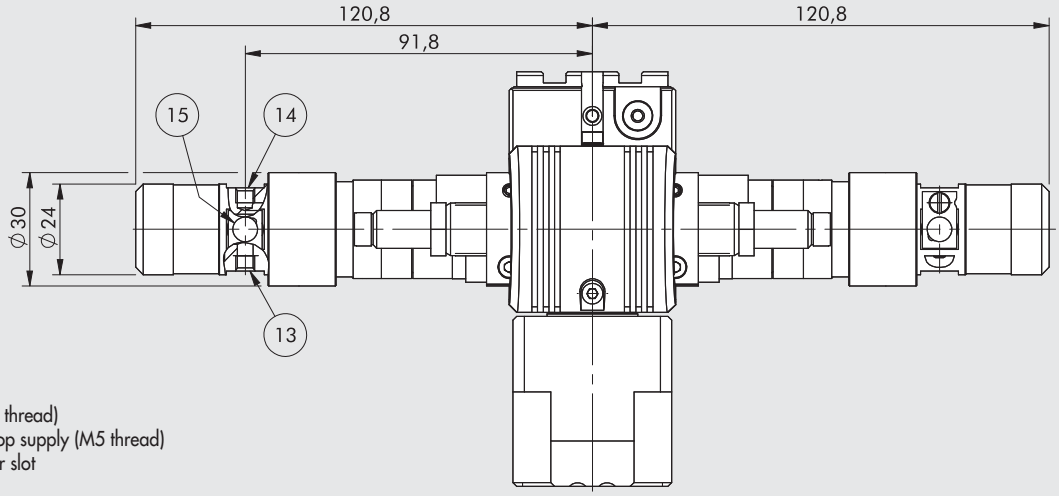
DIMENSIONS OF DAPIK-1 + 2 DZAK-1 FOUR-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 rotary actuator on page **A3**.143

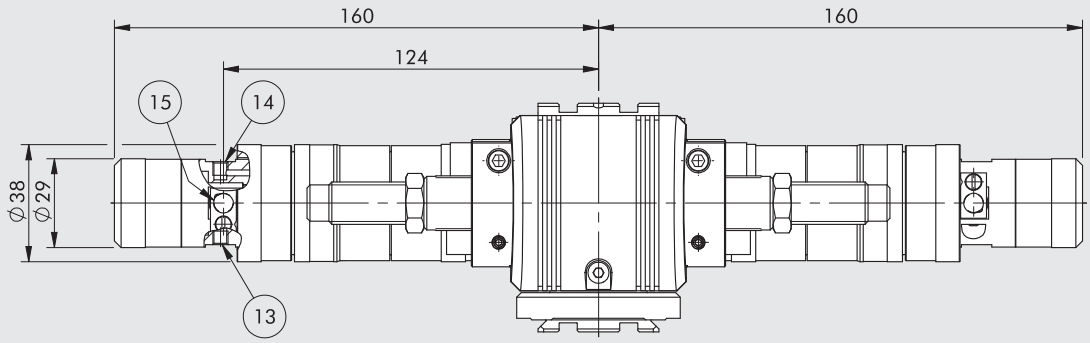
DIMENSIONS OF DAPIK-1 + WAK-1 + 2 DZAK-1 FOUR-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 + WAK-1 rotary actuator on page **A3**.142

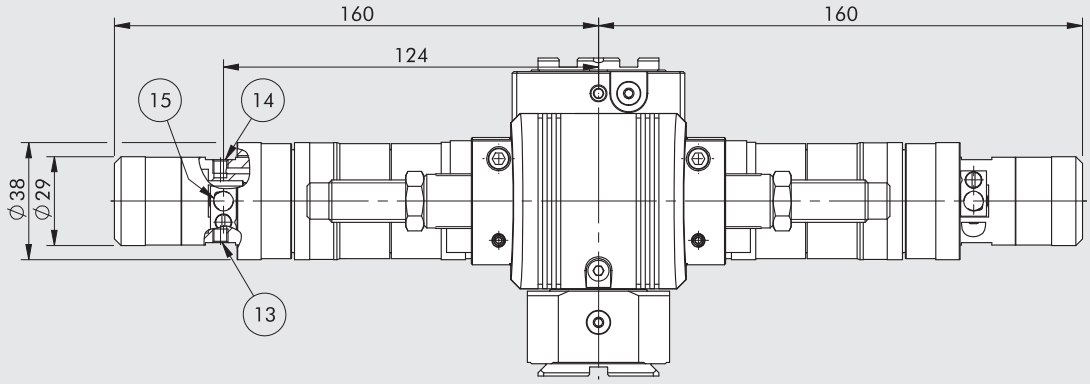
DIMENSIONS OF DAPK-2 + 2 DZAK-2 FOUR-POSITION ROTARY ACTUATOR



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPK-2 rotary actuator on page **A3**.144

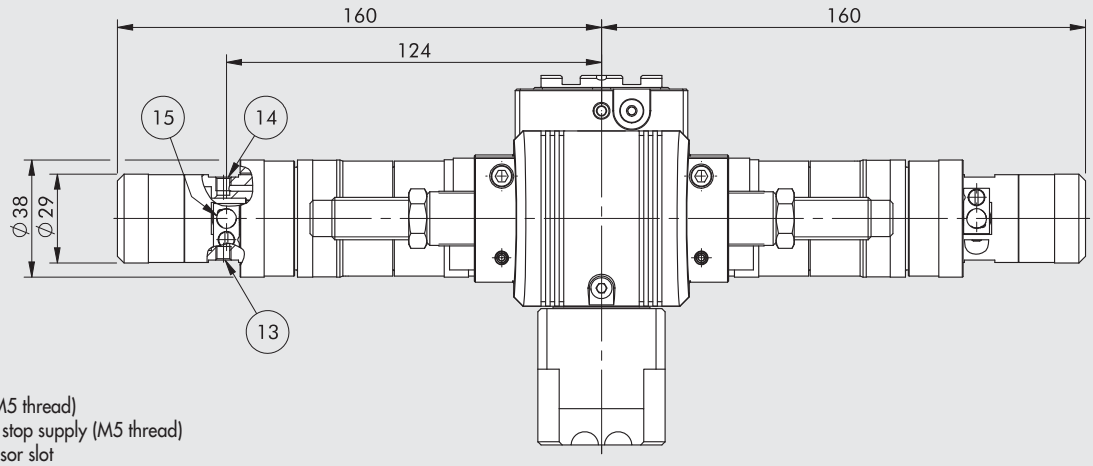
DIMENSIONS OF DAPK-2 + 2 DZAK-2 FOUR-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 rotary actuator on page **A3**.145

DIMENSIONS OF DAPIK-2 + WAK-2 + 2 DZAK-2 FOUR-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN



⑬ Air supply (M5 thread)
⑭ Intermediate stop supply (M5 thread)
⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 + WAK-2 rotary actuator on page **A3.**146

METAL WORK PNEUMATIC

KEY TO CODES

K20	1	02	0	3	0	00	K
	SIZE	POSITION		END POSITION			FAMILY
Rotary actuator series DAPK / DAPIK	**1** Size 1 **2** Size 2	**02** 2 position (DAPK) ▲ **S3** 3 position (DAPK + DZAK) ■ **D3** 3 position (DAPK + DZAK) **04** 4 position (DAPK + n.2 DZAK)	**0** Without internal air flow **1** With internal in-line air flow (DAPIK) **2** With 90° in-line air flow (DAPIK + WAK)	**3** With elastic mechanical stop **5** With standard shock absorbers (STD) **On request** ● **6** With medium hardness shock-absorbers (H2) ● **7** With hard shock-absorbers (M7)	**0** Magnetic **S** Non-magnetic		**K** V-Lock

▲ On the left viewed from the rotating plate. ■ On the right viewed from the rotating plate. ● Only for size 2.

ORDERING CODES

Code	Description
DAPK-1	
K2010203000K	DAPK-1 magnetic with elastic mechanical stop
K2010203S00K	DAPK-1 NON-magnetic with elastic mechanical stop
K2010205000K	DAPK-1 magnetic with shock absorbers
K2010205S00K	DAPK-1 NON-magnetic with shock absorbers
K2010213000K	DAPIK-1 magnetic with elastic mechanical stop
K2010213S00K	DAPIK-1 NON-magnetic with elastic mechanical stop
K2010215000K	DAPIK-1 magnetic with shock absorbers
K2010215S00K	DAPIK-1 NON-magnetic with shock absorbers
K201S303000K	DAPK-1 + DZAK-1 (SX) magnetic with elastic mechanical stop
K201S303S00K	DAPK-1 + DZAK-1 (SX) NON-magnetic with elastic mechanical stop
K201S305000K	DAPK-1 + DZAK-1 (SX) magnetic with shock absorbers
K201S305S00K	DAPK-1 + DZAK-1 (SX) NON-magnetic with shock absorbers
K201D303000K	DAPK-1 + DZAK-1 (DX) magnetic with elastic mechanical stop
K201D303S00K	DAPK-1 + DZAK-1 (DX) NON-magnetic with elastic mechanical stop
K201D305000K	DAPK-1 + DZAK-1 (DX) magnetic with shock absorbers
K201D305S00K	DAPK-1 + DZAK-1 (DX) NON-magnetic with shock absorbers
K2010403000K	DAPK-1 + n°2 DZAK-1 magnetic with elastic mechanical stop
K2010403S00K	DAPK-1 + n°2 DZAK-1 NON-magnetic with elastic mechanical stop
K2010405000K	DAPK-1 + n°2 DZAK-1 magnetic with shock absorbers
K2010405S00K	DAPK-1 + n°2 DZAK-1 NON-magnetic with shock absorbers
K201S313000K	DAPIK-1 + DZAK-1 (SX) magnetic with elastic mechanical stop
K201S313S00K	DAPIK-1 + DZAK-1 (SX) NON-magnetic with elastic mechanical stop
K201S315000K	DAPIK-1 + DZAK-1 (SX) magnetic with shock absorbers
K201S315S00K	DAPIK-1 + DZAK-1 (SX) NON-magnetic with shock absorbers
K201D313000K	DAPIK-1 + DZAK-1 (DX) magnetic with elastic mechanical stop
K201D313S00K	DAPIK-1 + DZAK-1 (DX) NON-magnetic with elastic mechanical stop
K201D315000K	DAPIK-1 + DZAK-1 (DX) magnetic with shock absorbers
K201D315S00K	DAPIK-1 + DZAK-1 (DX) NON-magnetic with shock absorbers
K2010413000K	DAPIK-1 + n°2 DZAK-1 magnetic with elastic mechanical stop
K2010413S00K	DAPIK-1 + n°2 DZAK-1 NON-magnetic with elastic mechanical stop
K2010415000K	DAPIK-1 + n°2 DZAK-1 magnetic with shock absorbers
K2010415S00K	DAPIK-1 + n°2 DZAK-1 NON-magnetic with shock absorbers
K2010223000K	DAPIK-1 + WAK-1 magnetic with elastic mechanical stop
K2010223S00K	DAPIK-1 + WAK-1 NON-magnetic with elastic mechanical stop
K2010225000K	DAPIK-1 + WAK-1 magnetic with shock absorbers
K2010225S00K	DAPIK-1 + WAK-1 NON-magnetic with shock absorbers
K201S323000K	DAPIK-1 + WAK-1 + DZAK-1 (SX) magnetic with elastic mechanical stop
K201S323S00K	DAPIK-1 + WAK-1 + DZAK-1 (SX) NON-magnetic with elastic mechanical stop
K201S325000K	DAPIK-1 + WAK-1 + DZAK-1 (SX) magnetic with shock absorbers
K201S325S00K	DAPIK-1 + WAK-1 + DZAK-1 (SX) NON-magnetic with shock absorbers
K201D323000K	DAPIK-1 + WAK-1 + DZAK-1 (DX) magnetic with elastic mechanical stop
K201D323S00K	DAPIK-1 + WAK-1 + DZAK-1 (DX) NON-magnetic with elastic mechanical stop
K201D325000K	DAPIK-1 + WAK-1 + DZAK-1 (DX) magnetic with shock absorbers
K201D325S00K	DAPIK-1 + WAK-1 + DZAK-1 (DX) NON-magnetic with shock absorbers
K2010423000K	DAPIK-1 + WAK-1 + n°2 DZAK-1 magnetic with elastic mechanical stop
K2010423S00K	DAPIK-1 + WAK-1 + n°2 DZAK-1 NON-magnetic with elastic mechanical stop
K2010425000K	DAPIK-1 + WAK-1 + n°2 DZAK-1 magnetic with shock absorbers
K2010425S00K	DAPIK-1 + WAK-1 + n°2 DZAK-1 NON-magnetic with shock absorbers

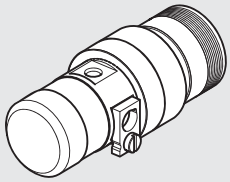
Code	Description
DAPK-2	
K2020203000K	DAPK-2 magnetic with elastic mechanical stop
K2020203S00K	DAPK-2 NON-magnetic with elastic mechanical stop
K2020205000K	DAPK-2 magnetic with STD shock absorbers
K2020205S00K	DAPK-2 NON-magnetic with STD shock absorbers
K2020213000K	DAPIK-2 magnetic with elastic mechanical stop
K2020213S00K	DAPIK-2 NON-magnetic with elastic mechanical stop
K2020215000K	DAPIK-2 magnetic with STD shock absorbers
K2020215S00K	DAPIK-2 NON-magnetic with STD shock absorbers
K202S303000K	DAPK-2 + DZAK-2 (SX) magnetic with elastic mechanical stop
K202S303S00K	DAPK-2 + DZAK-2 (SX) NON-magnetic with elastic mechanical stop
K202S305000K	DAPK-2 + DZAK-2 (SX) magnetic with STD shock absorbers
K202S305S00K	DAPK-2 + DZAK-2 (SX) NON-magnetic with STD shock absorbers
K202D303000K	DAPK-2 + DZAK-2 (DX) magnetic with elastic mechanical stop
K202D303S00K	DAPK-2 + DZAK-2 (DX) NON-magnetic with elastic mechanical stop
K202D305000K	DAPK-2 + DZAK-2 (DX) magnetic with STD shock absorbers
K202D305S00K	DAPK-2 + DZAK-2 (DX) NON-magnetic with STD shock absorbers
K2020403000K	DAPK-2 + n°2 DZAK-2 magnetic with elastic mechanical stop
K2020403S00K	DAPK-2 + n°2 DZAK-2 NON-magnetic with elastic mechanical stop
K2020405000K	DAPK-2 + n°2 DZAK-2 magnetic with STD shock absorbers
K2020405S00K	DAPK-2 + n°2 DZAK-2 NON-magnetic with STD shock absorbers
K202S313000K	DAPIK-2 + DZAK-2 (SX) magnetic with elastic mechanical stop
K202S313S00K	DAPIK-2 + DZAK-2 (SX) NON-magnetic with elastic mechanical stop
K202S315000K	DAPIK-2 + DZAK-2 (SX) magnetic with STD shock absorbers
K202S315S00K	DAPIK-2 + DZAK-2 (SX) NON-magnetic with STD shock absorbers
K202D313000K	DAPIK-2 + DZAK-2 (DX) magnetic with elastic mechanical stop
K202D313S00K	DAPIK-2 + DZAK-2 (DX) NON-magnetic with elastic mechanical stop
K202D315000K	DAPIK-2 + DZAK-2 (DX) magnetic with STD shock absorbers
K202D315S00K	DAPIK-2 + DZAK-2 (DX) NON-magnetic with STD shock absorbers
K2020413000K	DAPIK-2 + n°2 DZAK-2 magnetic with elastic mechanical stop
K2020413S00K	DAPIK-2 + n°2 DZAK-2 NON-magnetic with elastic mechanical stop
K2020415000K	DAPIK-2 + n°2 DZAK-2 magnetic with STD shock absorbers
K2020415S00K	DAPIK-2 + n°2 DZAK-2 NON-magnetic with STD shock absorbers
K2020223000K	DAPIK-2 + WAK-2 magnetic with elastic mechanical stop
K2020223S00K	DAPIK-2 + WAK-2 NON-magnetic with elastic mechanical stop
K2020225000K	DAPIK-2 + WAK-2 magnetic with STD shock absorbers
K2020225S00K	DAPIK-2 + WAK-2 NON-magnetic with STD shock absorbers
K202S323000K	DAPIK-2 + WAK-2 + DZAK-2 (SX) magnetic with elastic mechanical stop
K202S323S00K	DAPIK-2 + WAK-2 + DZAK-2 (SX) NON-magnetic with elastic mechanical stop
K202S325000K	DAPIK-2 + WAK-2 + DZAK-2 (SX) magnetic with STD shock absorbers
K202S325S00K	DAPIK-2 + WAK-2 + DZAK-2 (SX) NON-magnetic with STD shock absorbers
K202D323000K	DAPIK-2 + WAK-2 + DZAK-2 (DX) magnetic with elastic mechanical stop
K202D323S00K	DAPIK-2 + WAK-2 + DZAK-2 (DX) NON-magnetic with elastic mechanical stop
K202D325000K	DAPIK-2 + WAK-2 + DZAK-2 (DX) magnetic with STD shock absorbers
K202D325S00K	DAPIK-2 + WAK-2 + DZAK-2 (DX) NON-magnetic with STD shock absorbers
K2020423000K	DAPIK-2 + WAK-2 + n°2 DZAK-2 magnetic with elastic mechanical stop
K2020423S00K	DAPIK-2 + WAK-2 + n°2 DZAK-2 NON-magnetic with elastic mechanical stop
K2020425000K	DAPIK-2 + WAK-2 + n°2 DZAK-2 magnetic with STD shock absorbers
K2020425S00K	DAPIK-2 + WAK-2 + n°2 DZAK-2 NON-magnetic with STD shock absorbers

ACCESSORIES

V-Lock ACCESSORIES

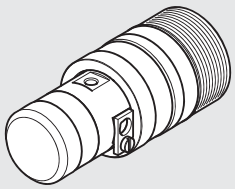
See page **A3**.36

DZAK-1 INTERMEDIATE STOP



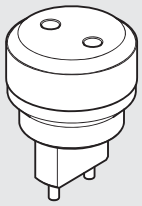
Code	Description	Weight [g]
095K2000100K	DZAK-1 intermediate stop	105

DZAK-2 INTERMEDIATE STOP



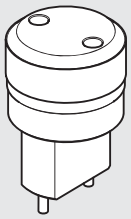
Code	Description	Weight [g]
095K2000110K	DZAK-2 intermediate stop	214

DZAK-1 ADJUSTING WRENCH



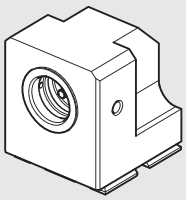
Code	Description	Weight [g]
095K2000250K	DZAK-1 adjusting wrench	25

DZAK-2 ADJUSTING WRENCH



Code	Description	Weight [g]
095K2000260K	DZAK-2 adjusting wrench	30

WAK-1

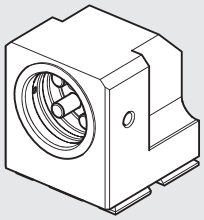


Code	Description	Weight [g]
095K2000150K	WAK-1 angle adaptor	190

Note: Individually packed with 4 screws, 4 washers

METAL WORK PNEUMATIC

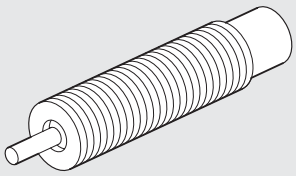
WAK-2



Code	Description	Weight [g]
095K2000160K	WAK-2 angle adaptor	175

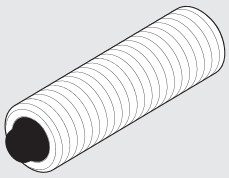
Note: Individually packed with 4 screws, 4 washers

SHOCK ABSORBERS



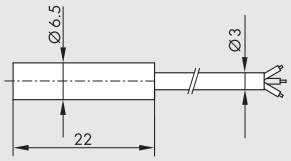
Code	Description	For
W0950005301	Shock absorbers - 2 M10 x 1	DAPK-1/DAPIK-1
0950004012	Shock absorbers standard MC150EUMH M14 x 1.5	DAPK-2/DAPIK-2
0950004013	Medium hardness shock absorber MC150EUMH2 M14 x 1.5	DAPK-2/DAPIK-2
0950004014	Hard shock absorber SC190EUM7 M14 x 1.5	DAPK-2/DAPIK-2

ELASTIC MECHANICAL STOP



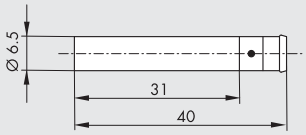
Code	Description	For
095K2000200K	Elastic mechanical stop M10 x 1	DAPK-1/DAPIK-1
095K2000210K	Elastic mechanical stop M14 x 1.5	DAPK-2/DAPIK-2

INDUCTION SENSOR Ø 6.5



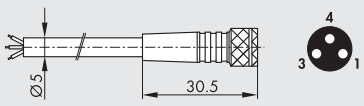
Code	Description
W095K030006	PNP Ø 6.5 PNP inductive sensor with LED 2 m
W095K031006	NPN Ø 6.5 NPN inductive sensor with LED 2 m

QUICK-FIT INDUCTIVE SENSOR Ø 6.5



Code	Description
W095K030009	PNP Ø 6.5 inductive sensor with push-in LED

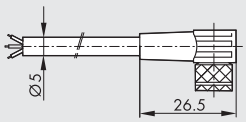
CABLE WITH STRAIGHT CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)



Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
W095K000005	Push-in cable female straight connector 5 m
W095K000010	Push-in cable female straight connector 10 m

CABLE WITH 90° CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)



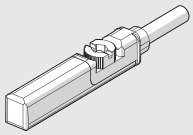
Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
W095K010005	Push-in cable female elbow connector 5 m
W095K010010	Push-in cable female elbow connector 10 m

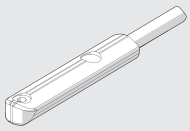
RETRACTING SENSOR

For codes and technical data, see **chapter A6**.

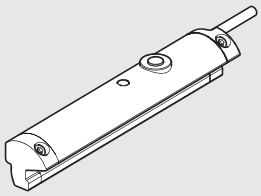
SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



POSITION SENSOR



Code	Description	For
W0950000470	LTS-032 position sensor with M8 4-PIN 0.3 m connector	DAPK-1/ DAPIK-1
W0950000471	LTS-064 position sensor with M8 4-PIN 0.3 m connector	DAPK-2/DAPIK-2

For technical data, see **chapter A6**.

OIL

Code	Description	Volume
9910490	PARALIQ P 460	80 ml

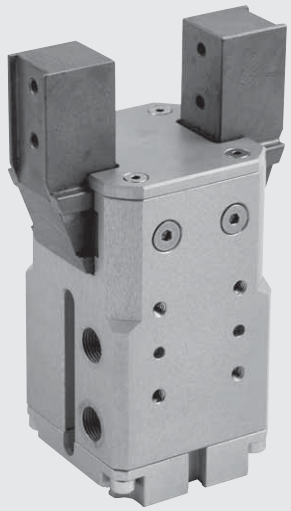
NOTES

METAL WORK PNEUMATIC

NOTES

GRIPPER WITH TWO PARALLEL JAWS SERIES P1K

Dual-acting grippers with parallel jaws and internal and external clamping.
The body is made of anodized aluminium alloy and the jaws are made of hardened steel. All sizes are equipped with a magnet and sensor grooves. The lower plate has a V-Lock profile and grooves.
A plate with a V-Lock coupling can also be mounted to the sides of the grippers.



TECHNICAL DATA		P1K-20	P1K-32
Operating pressure	bar	2 to 8	
	MPa	0.2 to 0.8	
	psi	29 to 116	
Temperature range	°C	5 to 70	
Fluid		20 µm filtered air, lubricated or unlubricated. If lubricated air is used, lubrication must be continuous	
Bore	mm	20	32
Clamping force of a single jaw	N	70	170
at 6.3 bar, 20 mm from the upper surface, on opening and closing			
Stroke of each jaw	mm	5	5
Max. frequency on continuous operation	Hz	> 5	> 5
Minimum opening/closing time	s	0.009 / 0.016	0.02 / 0.02
Repeatability	mm	> 0.02	> 0.02
Lubrication		Grease the sliding surfaces of the jaws every one million cycles. Use grease code 9910509	
Max. admissible static loads:			
- Fa	N	200	350
- Mx	Nm	6	10
- My	Nm	6	10
- Mz	Nm	8	12
Weight	kg	0.50	0.85

COMPONENTS

① BODY: anodised aluminium
② JAWS: nitrided steel
③ GUIDE: tempered steel
④ PISTON ROD: chromed steel
⑤ PISTON: aluminium
⑥ PISTON GASKET: NBR
⑦ GUIDE RING: PTFE
⑧ MAGNET: plastoferrite
⑨ GASKET: NBR
⑩ V-Lock REAR PLATE: anodised aluminium
⑪ GASKET: NBR
⑫ GUIDE BUSHING
⑬ PISTON ROD GASKET: polyurethane

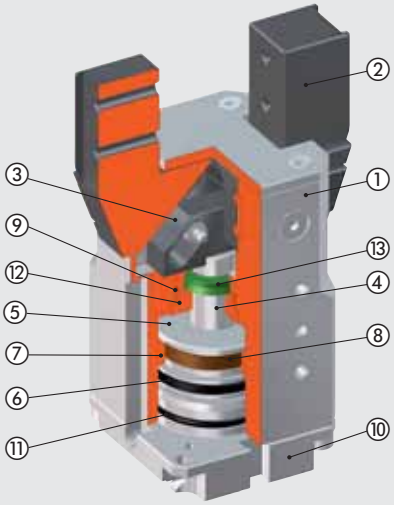
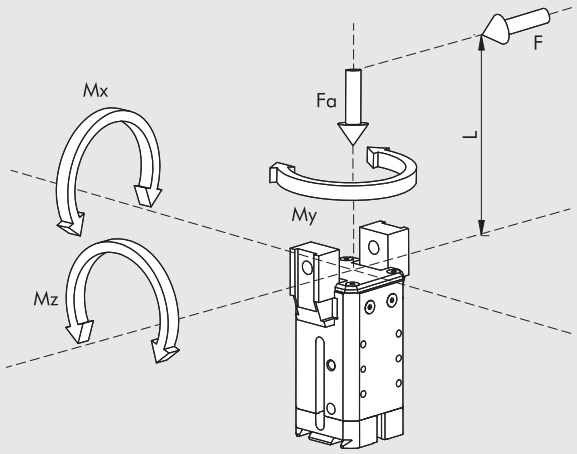
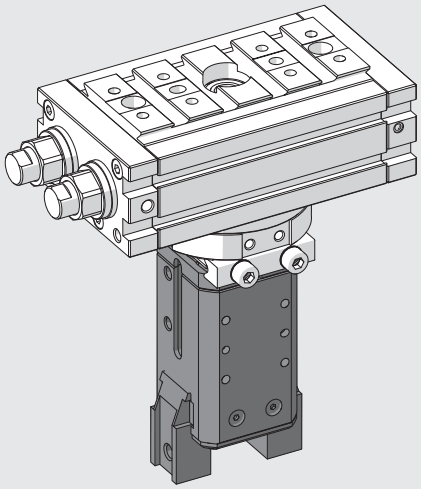


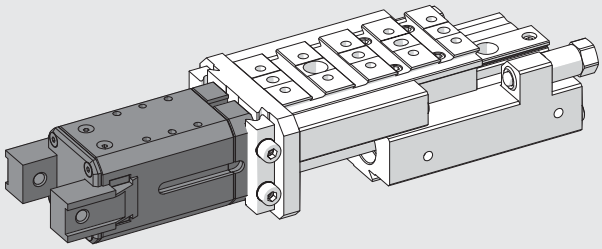
DIAGRAM OF FORCES AND MOMENTS



F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

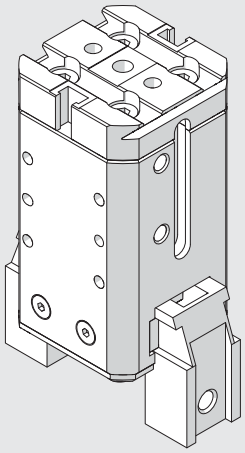
EXAMPLES OF APPLICATION



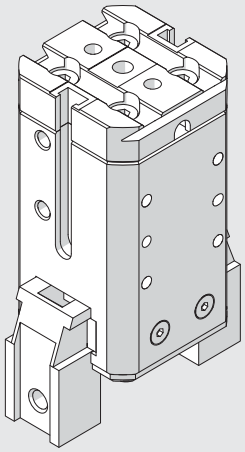


NOTES

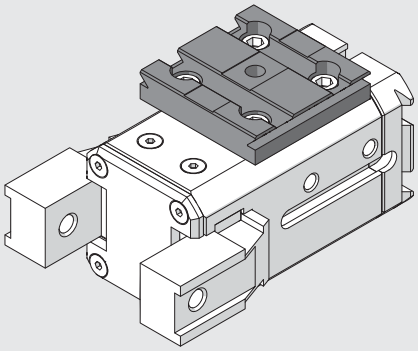
V-Lock MOUNTING OPTIONS



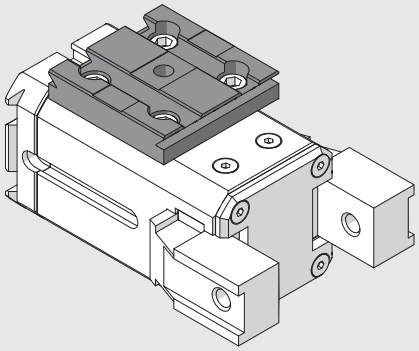
Gripper as supplied



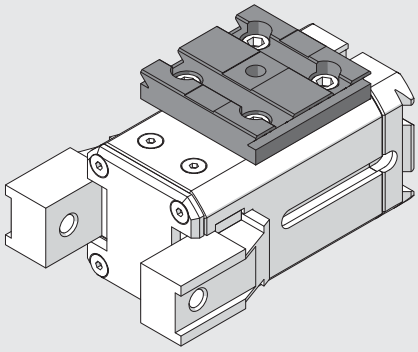
Unscrew the 4 screws at the back and rotate the rear flange by 90°



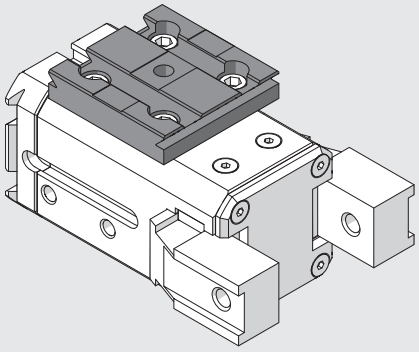
Fix the accessory "type 2 side adaptor" code 0950008004K to the right, lengthwise



Fix the accessory "type 2 side adaptor" code 0950008004K to the right, crosswise



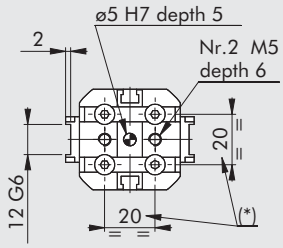
Fix the accessory "type 2 side adaptor" code 0950008004K to the left, lengthwise



Fix the accessory "type 2 side adaptor" code 0950008004K to the left, crosswise

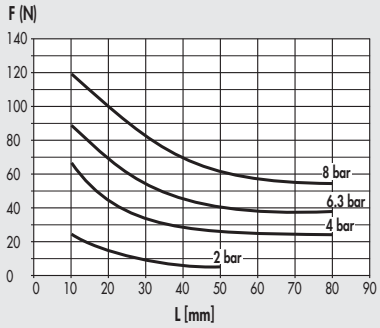
METAL WORK PNEUMATIC

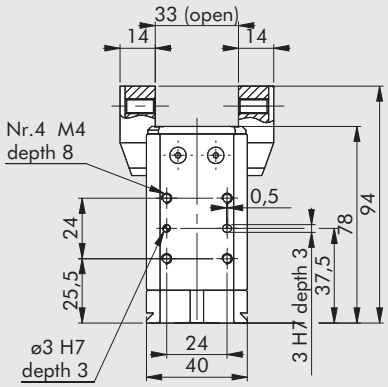
DIMENSIONS OF GRIPPER P1K-20

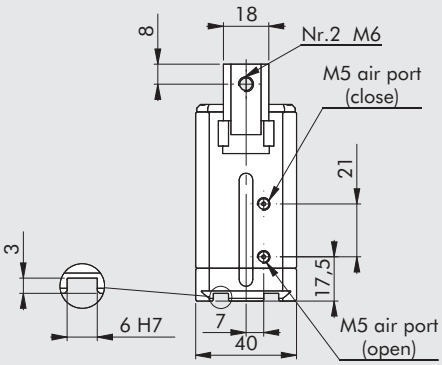


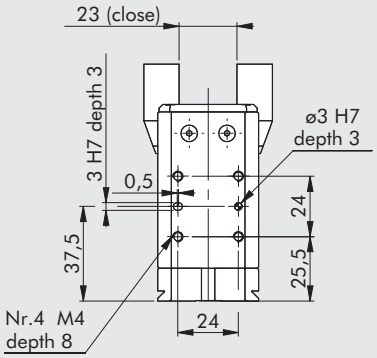
NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

(*): The screws can be untightened. Rotate the rear plate by 90° and tighten the screws.



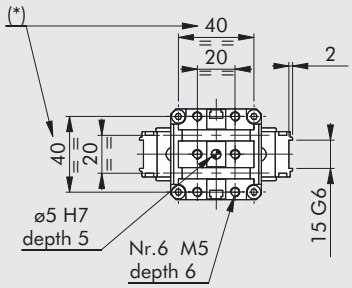






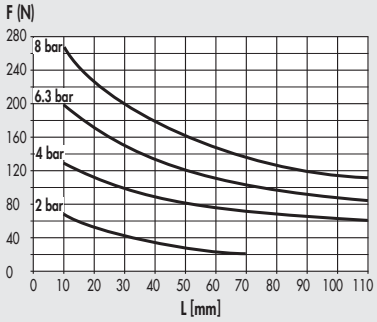
Code	Description
W1550200001K	Gripper with 2 parallel jaws P1K-20

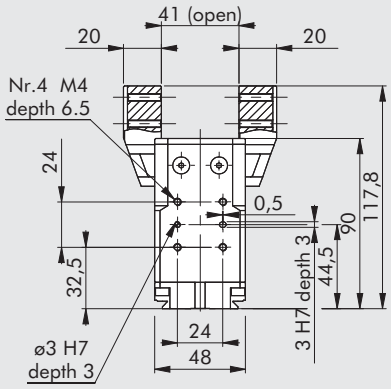
DIMENSIONS OF GRIPPER P1K-32

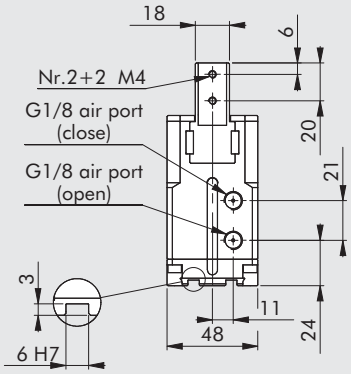


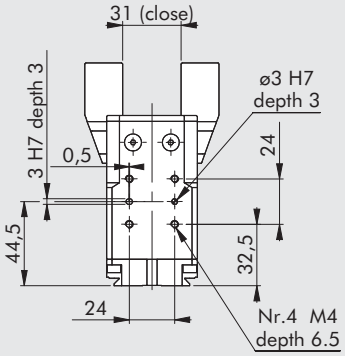
NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

(*): The screws can be untightened. Rotate the rear plate by 90° and tighten the screws.







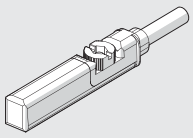


Code	Description
W1550320001K	Gripper with 2 parallel jaws P1K-32

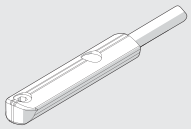
ACCESSORIES

RETRACTING SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



Per codici e dati tecnici vedere **capitolo A6**.

DIRECTION RECOMMENDED FOR FIXING THE SENSORS TO THE GRIPPER GROOVES

P1K-20

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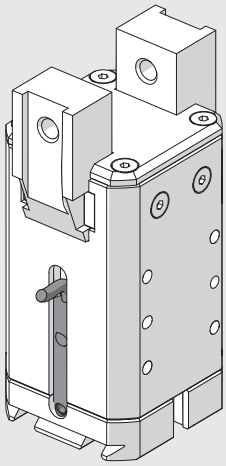

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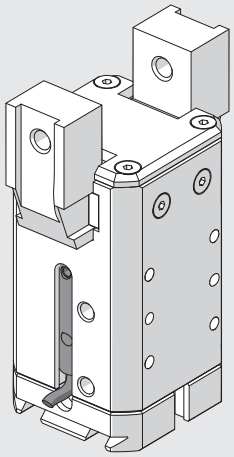

P1K-32

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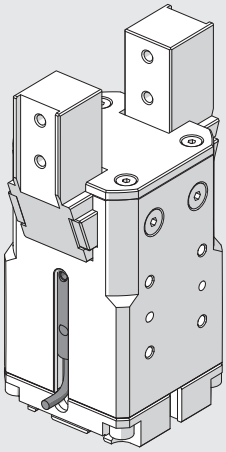
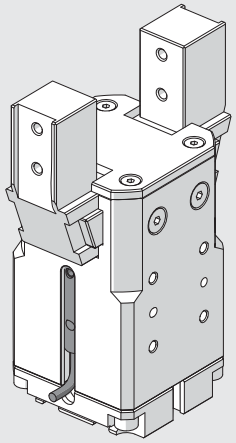
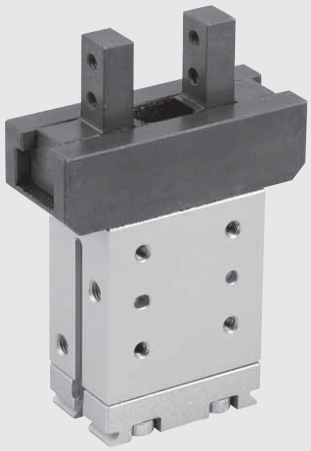


OPEN



GRIPPER WITH TWO PARALLEL JAWS SERIES P2K

Dual-acting grippers with parallel jaws and internal and external clamping.
The body is made of anodized aluminium alloy and the jaws are made of hardened steel. All sizes are equipped with a magnet and sensor grooves. The lower plate has a V-Lock profile and grooves.
A plate with a V-Lock coupling can also be mounted to the sides of the grippers.



TECHNICAL DATA		P2K-20
Operating pressure	bar	2 to 8
	MPa	0.2 to 0.8
	psi	29 to 116
Temperature range	°C	-10 to 80
Fluid		Fluid 20 µm filtered air, lubricated or unlubricated. If lubricated air is used, lubrication must be continuous
Bore	mm	20
Clamping force of a single jaw	N	100
at 6.3 bar, 20 mm from the upper surface, on opening and closing		
Stroke of each jaw	mm	5
Max. frequency on continuous operation	Hz	> 5
Minimum opening/closing time	s	0.012 / 0.02
Repeatability	mm	0.01
Lubrication		Grease the sliding surfaces of the jaws every one million cycles. Use grease code 9910509
Max. admissible static loads:		
- Fa	N	450
- Mx	Nm	12
- My	Nm	12
- Mz	Nm	16
Weight	kg	0.4

COMPONENTS

① BODY: anodised aluminium
② JAWS: nitrided steel
③ GUIDE: nitrided steel
④ PISTON ROD: nitrided steel
⑤ PISTON: aluminium
⑥ PISTON GASKET: NBR
⑧ MAGNET: plastoferrite
⑪ GASKET: polyurethane
⑨ V-Lock REAR PLATE: anodised aluminium
⑪ GASKET: NBR

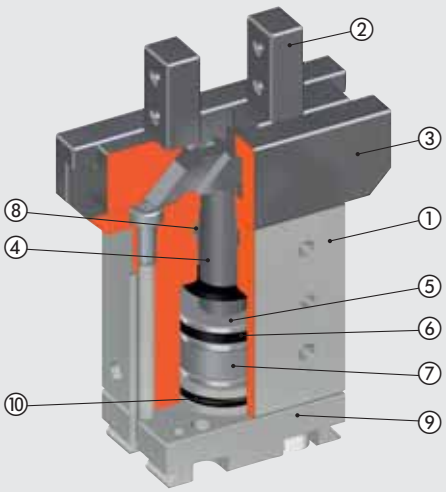
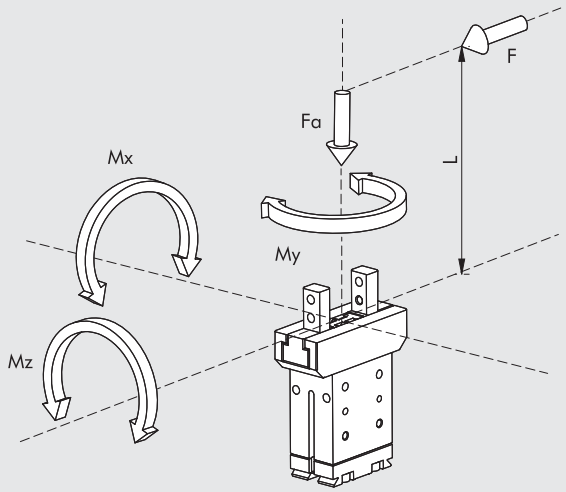
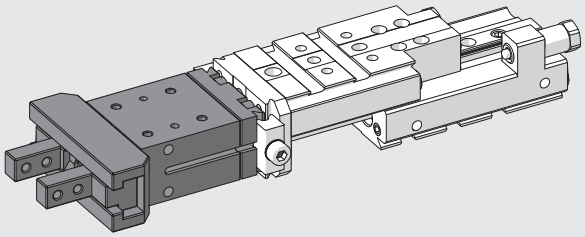


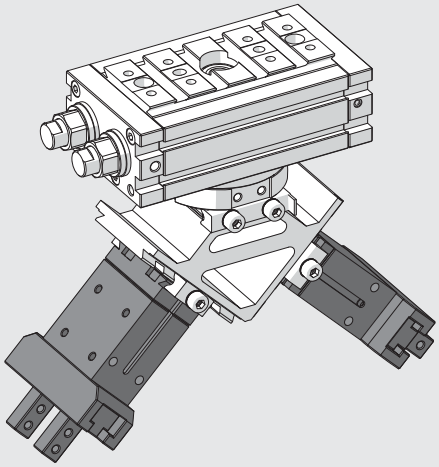
DIAGRAM OF FORCES AND MOMENTS



F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

EXAMPLES OF APPLICATION

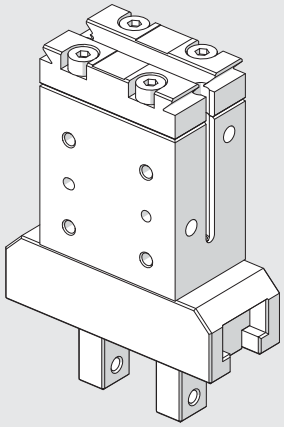




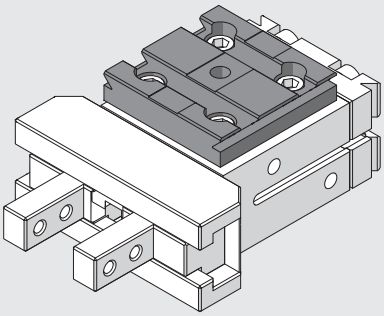
NOTES

METAL WORK PNEUMATIC

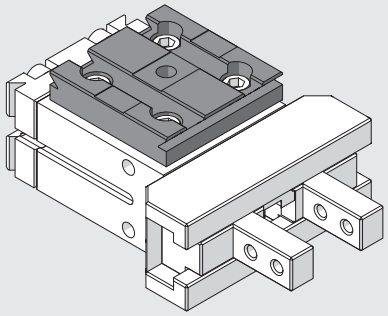
V-Lock MOUNTING OPTIONS



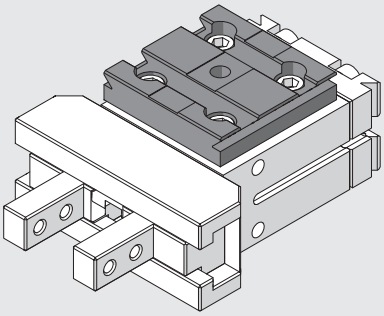
Gripper as supplied



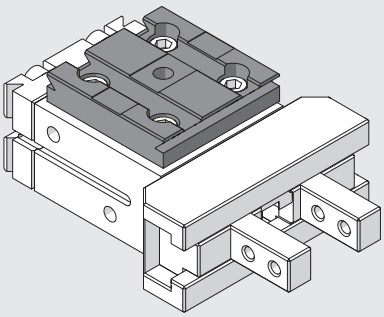
Fix the accessory "type 2 side adaptor" code 0950008004K to the right, lengthwise



Fix the accessory "type 2 side adaptor" code 0950008004K to the right, crosswise



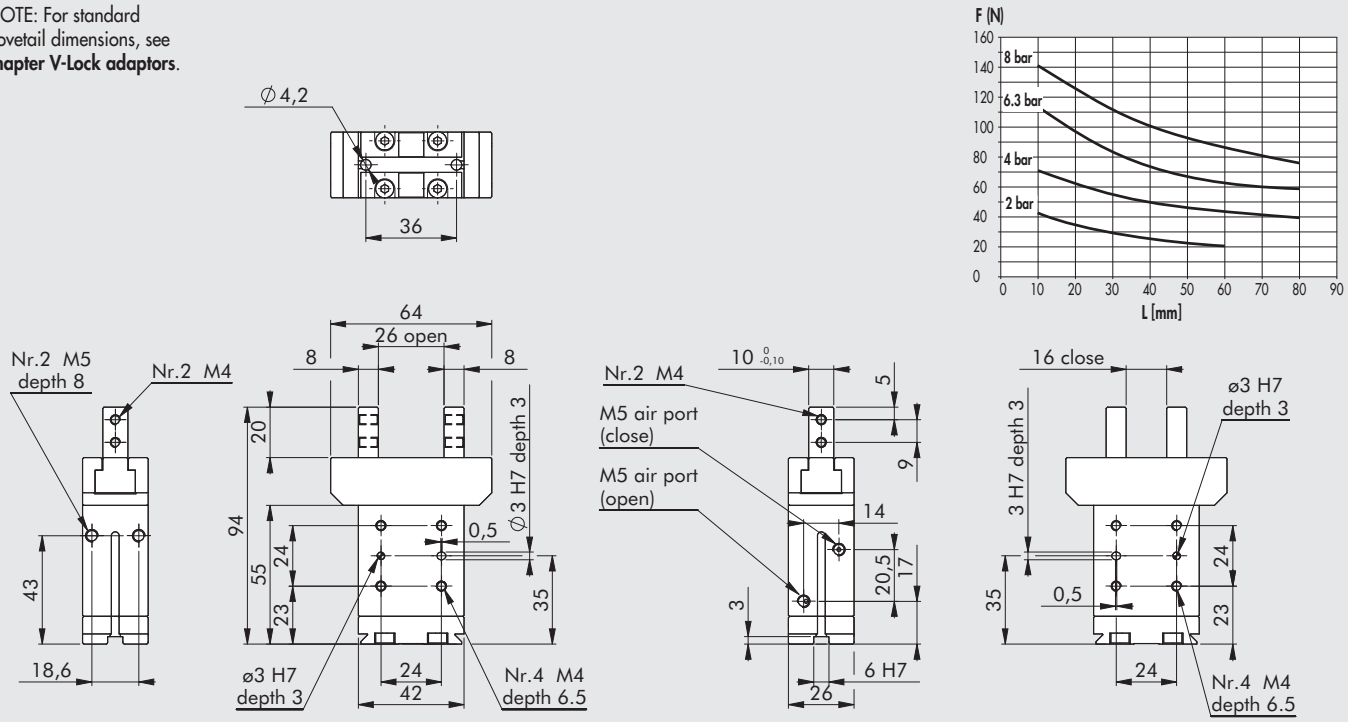
Fix the accessory "type 2 side adaptor" code 0950008004K to the left, lengthwise



Fix the accessory "type 2 side adaptor" code 0950008004K to the left, crosswise

DIMENSIONS OF GRIPPER P2K-20

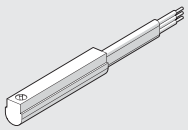
NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.



Code	Description
W1570200200K	Gripper with 2 parallel jaws P2K-20

ACCESSORIES

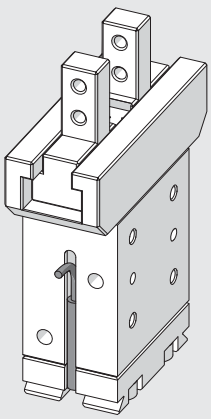
SENSOR Ø 4



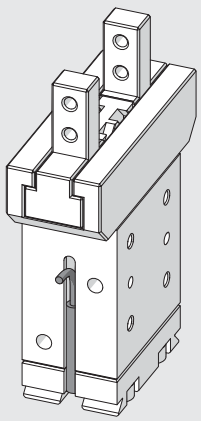
For codes and technical data, see **chapter A6**.

DIRECTION RECOMMENDED FOR FIXING THE SENSORS TO THE GRIPPER GROOVES

CLOSED

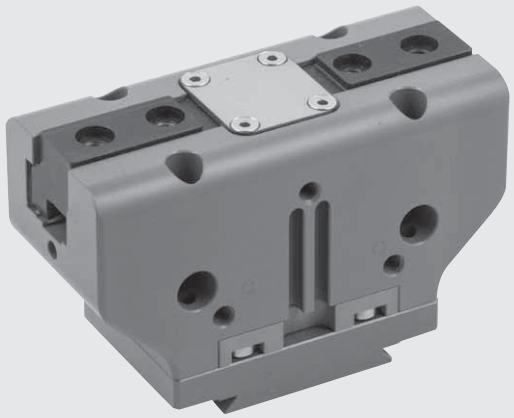


OPEN



GRIPPER WITH TWO PARALLEL JAWS SERIES P3K

Parallel double-acting two-jaw gripper, with either internal or external clamping.
Aluminum alloy body coated with surface hardening treatment; jaws made of wear-resistant coated steel.
The jaw-guiding system and precision in coupling with the body make the gripper extremely stable.
The ceramic-coated body reduces friction and wear, and enhances the movement of the jaws on the body.
All sizes are available in the version with standard stroke and clamping force, while only some in the version with reduced stroke but with higher clamping torque.
The gripper is equipped with a magnet and grooves for sensors.
A version designed to house inductive sensors is also available (**the inductive sensors are not supplied by Metal Work**).
Pneumatic supply is available on both sides. There are different mounting options, including that with V-Lock interfacing plates on the bottom or on the side.



TECHNICAL DATA		P3K-64	P3K-80		P3K-100	
			Standard	Increased force	Standard	Increased force
Operating pressure	bar	2 to 8				
	MPa	0.2 to 0.8				
	psi	29 to 116				
Temperature range	°C	-10 to 80				
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous				
Clamping force of a single jaw at 6.3 bar,	N	125	265	445	360	790
20 mm from the upper surface, on opening and closing						
Maximum movable weight	kg	1.3	2.5	5	3.5	7
Stroke of each jaw	mm	6	8	4	10	5
Minimum opening/closing time	s	0.05				
Repeatability	mm	0.01				
Moment of inertia as regards the piston axis	kg cm²	4	4.5		12	
Max. admissible static loads:						
- Fa	N	1100	1500		2000	
- Mx	Nm	40	90		80	
- My	Nm	60	55		115	
- Mz	Nm	40	55		70	
Weight	kg	0.4	0.6		1	

COMPONENTS

① BODY: hard-anodised aluminium
② JAWS: nitrided steel
③ PISTON ROD + GUIDE: nitrided steel
④ PISTON: hard-anodised aluminium
⑤ PISTON GASKET: NBR
⑥ PISTON ROD GASKET: NBR / polyurethane
⑦ BASE GASKET: reinforced SBR / NBR
⑧ MAGNET: neodymium

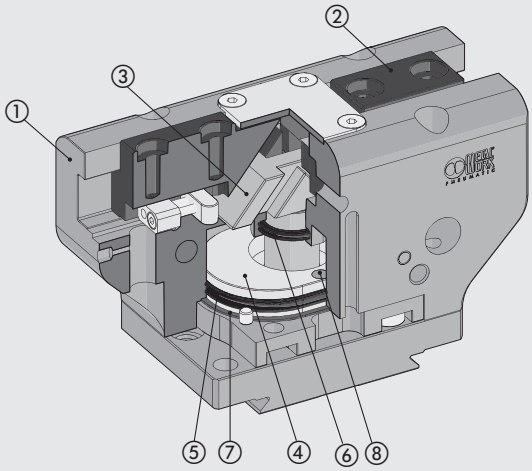
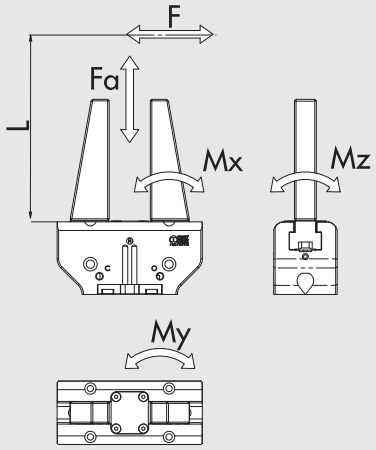
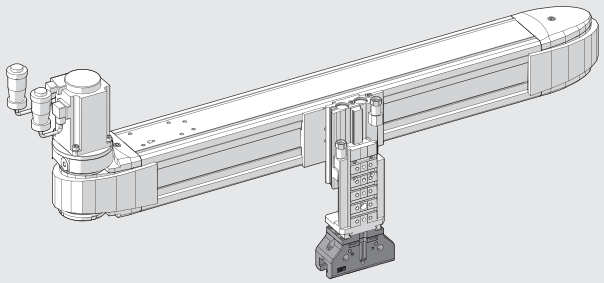


DIAGRAM OF FORCES AND MOMENTS



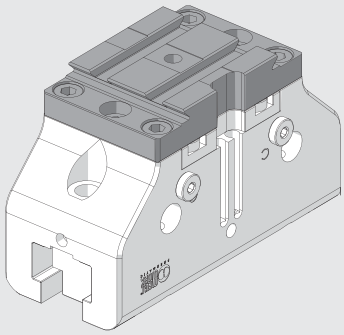
F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

EXAMPLES OF APPLICATION



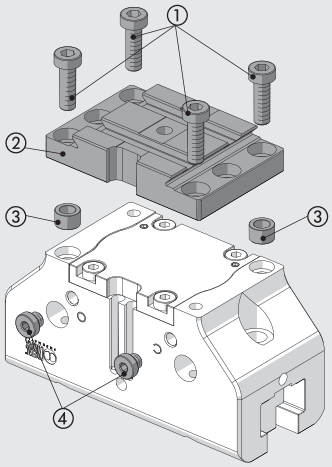
V-Lock MOUNTING OPTIONS

Standard

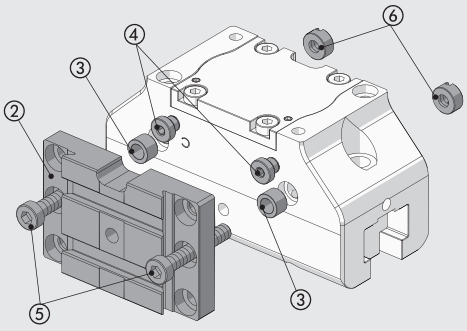


The gripper as supplied.

Lateral

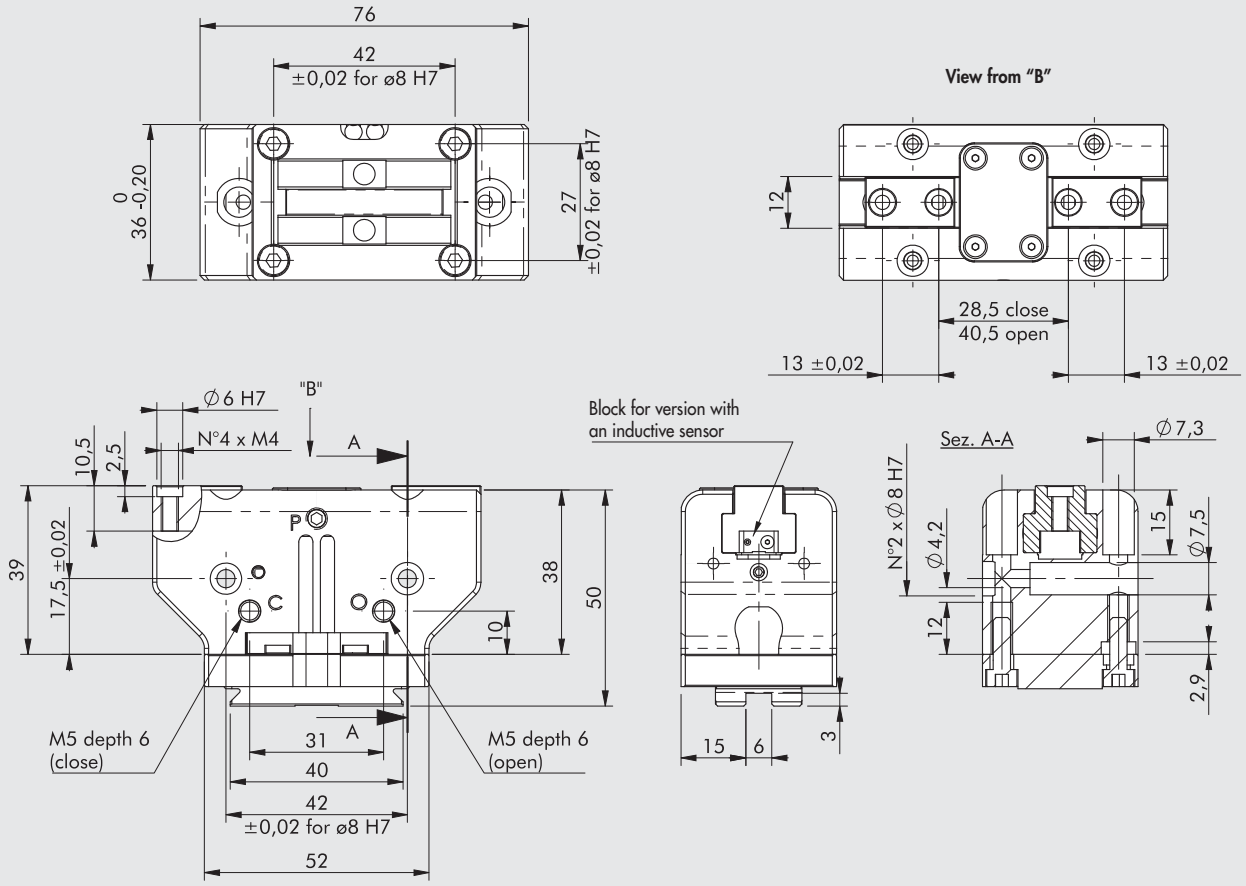


Unscrew the 4 screws ①, remove the plate ② and pull out the centring rings ③. Then unscrew the 2 plugs ④.

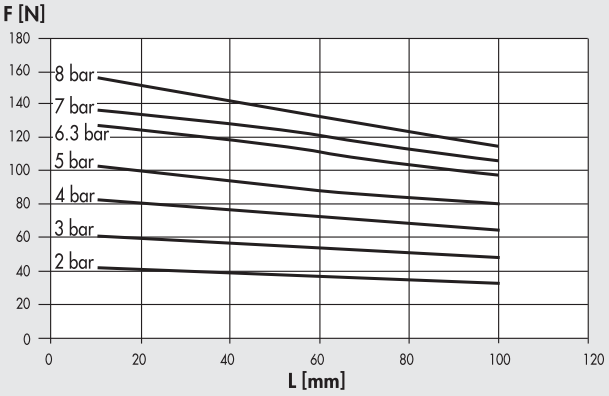


Replace the 2 plugs ④ on the opposite side of the gripper and insert the 2 centring rings ③.
Position the plate ② and the two long screws ⑤ (supplied with the gripper).
On the opposite side of the plate, insert the two nuts with a screwdriver slot ⑥ (supplied with the gripper) and tighten them against the screws ⑤.

DIMENSIONS OF GRIPPER P3K-64

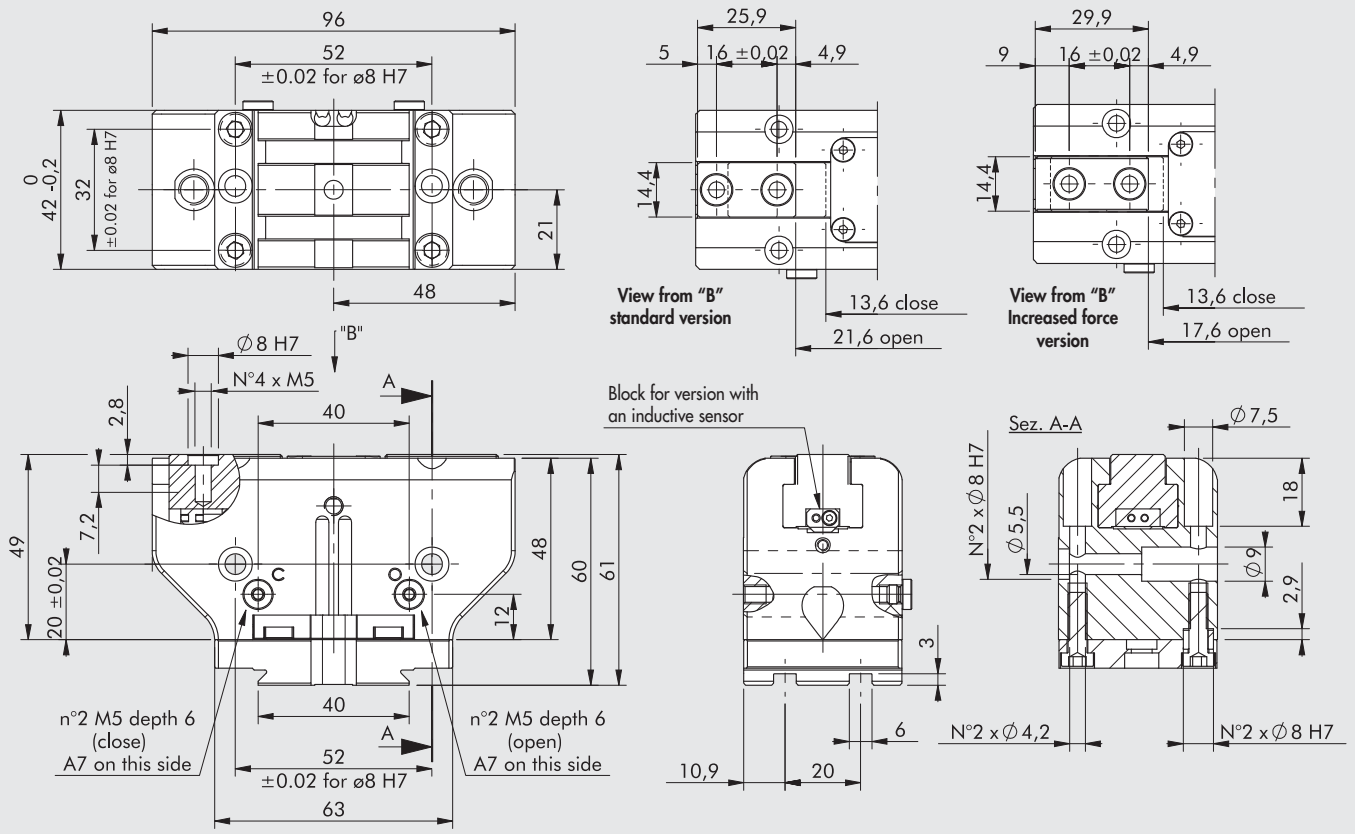


NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.



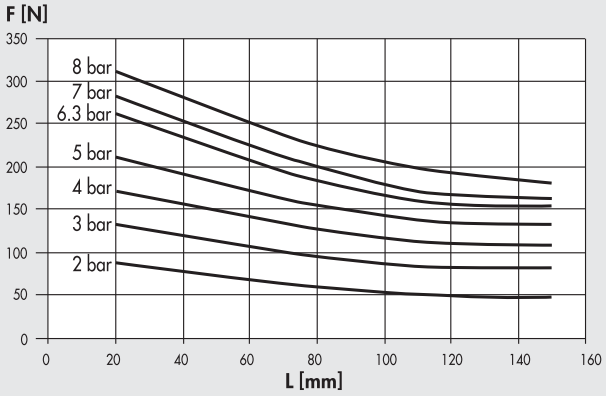
Code	Description
W1560640200K	Gripper with 2 parallel jaws P3K-64
W1560640201K	Gripper with 2 parallel jaws P3K-64 for inductive sensors

DIMENSIONS OF GRIPPER P3K-80

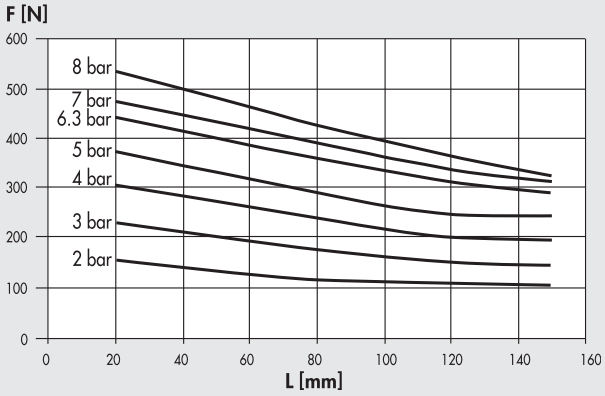


NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

Standard version



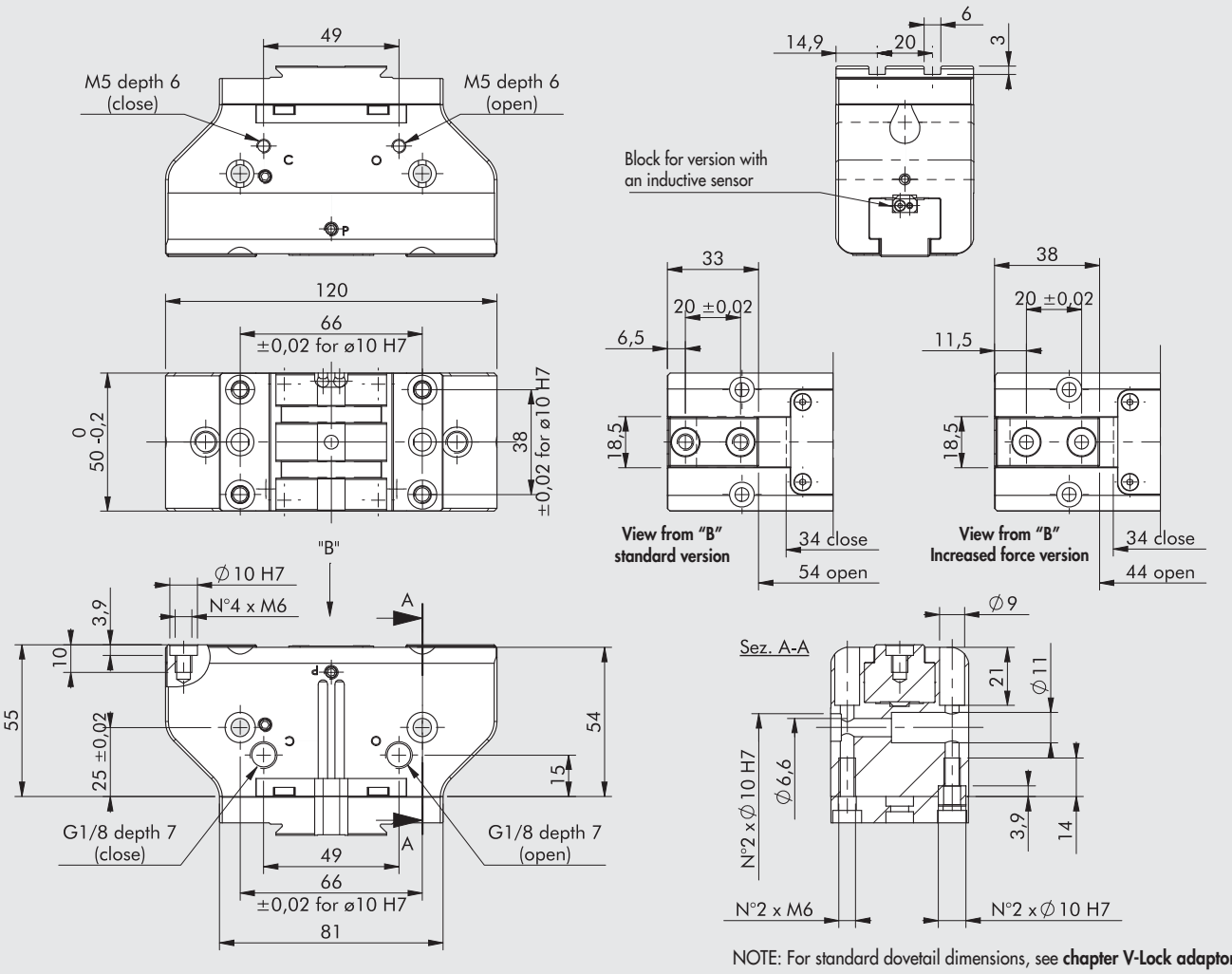
Increased force version



Code	Description
W1560800200K	Gripper with 2 parallel jaws P3K-80
W1560800201K	Gripper with 2 parallel jaws P3K-80 for inductive sensors
W1560800220K	Gripper with 2 parallel jaws P3K-80 increased force
W1560800221K	Gripper with 2 parallel jaws P3K-80 increased force for inductive sensors

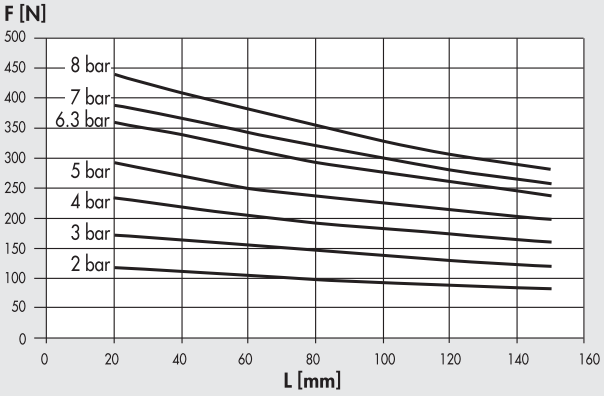
METAL WORK PNEUMATIC

DIMENSIONS OF GRIPPER P3K-100

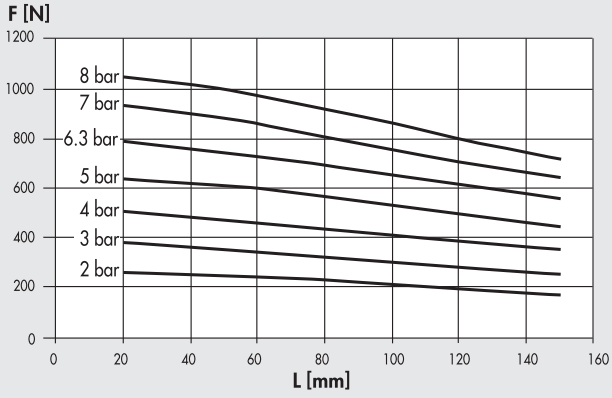


NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

Standard version



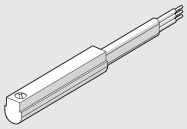
Increased force version



Code	Description
W1561000200K	Gripper with 2 parallel jaws P3K-100
W1561000201K	Gripper with 2 parallel jaws P3K-100 for inductive sensors
W1561000220K	Gripper with 2 parallel jaws P3K-100 increased force
W1561000221K	Gripper with 2 parallel jaws P3K-100 increased force for inductive sensors

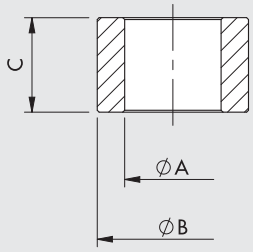
ACCESSORIES

SENSOR Ø 4



For codes and technical data, see **chapter A6**.

CENTRING RING



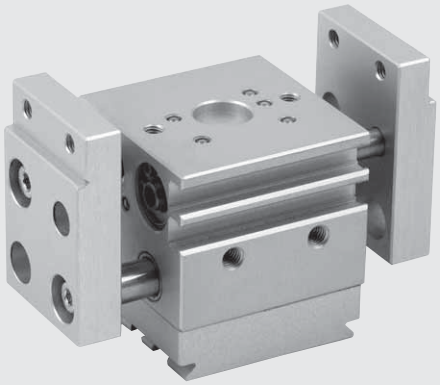
Code	Size	ØA	ØB f7	C
W1560649201	**64**	$4.5^{0}_{-0.1}$	6	$5^{0}_{-0.1}$
W1560809201	**80**	$5.1^{0}_{-0.1}$	8	$5^{0}_{-0.05}$
W1561009201	**100**	$6.2^{\pm 0.1}$	10	$6.9^{0}_{-0.1}$

Note: 2-pieces pack

NOTES

GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES P4K

Dual-acting grippers with parallel jaws and internal and external clamping.
Specifically designed for clamping particularly bulky items.
They come with a magnet and sensor grooves.
The lower plate has a V-Lock profile and grooves.
A plate with a V-Lock coupling can also be mounted to the sides of the grippers.



TECHNICAL DATA		P4K-12
Operating pressure	bar	3 to 8
	MPa	0.3 to 0.8
	psi	43 to 116
Temperature range	°C	-10 to 80
Fluid		20 µm filtered air, lubricated or unlubricated. If lubricated air is used, lubrication must be continuous
Bore	mm	2 x 12
Clamping force of a single jaw	N	45
at 6.3 bar, 20 mm from the upper surface, on opening and closing		
Stroke of each jaw	mm	10
Max. frequency on continuous operation	Hz	> 4
Minimum opening/closing time	s	0.008 / 0.008
Repeatability	mm	< 0.04
Max. admissible static loads:		
- Fa	N	200
- Mx	Nm	6
- My	Nm	6
- Mz	Nm	8
Weight	kg	0.35

COMPONENTS

① BODY: anodised aluminium
② JAWS anodised aluminium
③ GUIDE BUSHING: steel strip with bronze insert
④ PISTON ROD: nitrided steel
⑤ DRIVE ROD: steel
⑥ PISTON GASKET: NBR
⑦ BUFFER: polyurethane
⑧ GASKET: NBR
⑨ PISTON ROD GASKET: polyurethane
⑩ END CAP: bronze
⑪ MAGNET: plastoneodymium
⑫ V-Lock REAR PLATE: anodised aluminium

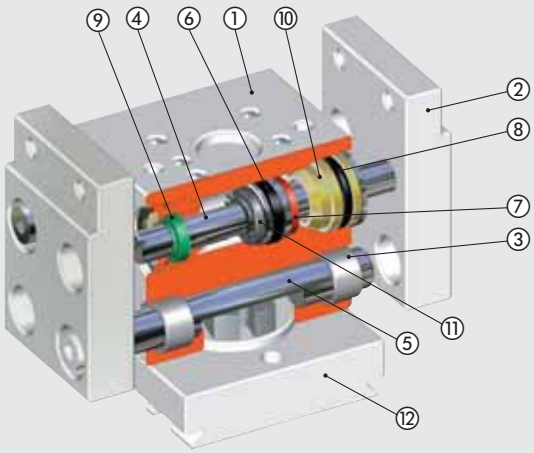
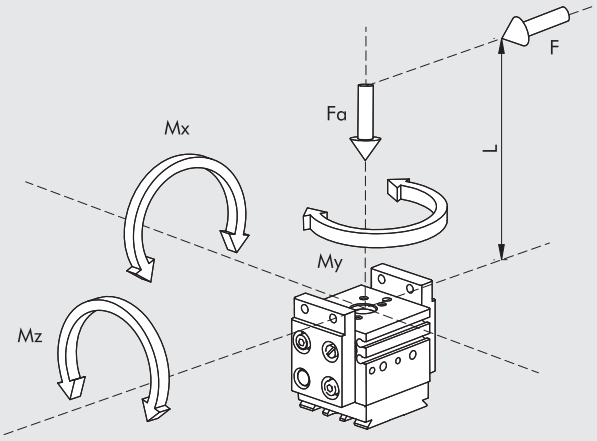
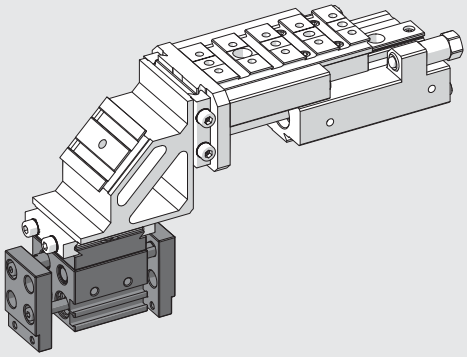


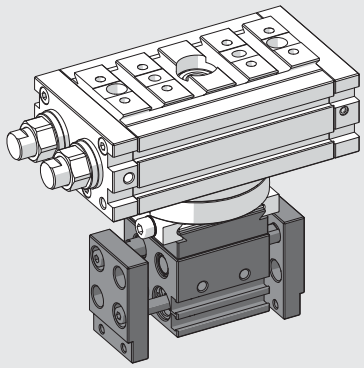
DIAGRAM OF FORCES AND MOMENTS



F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

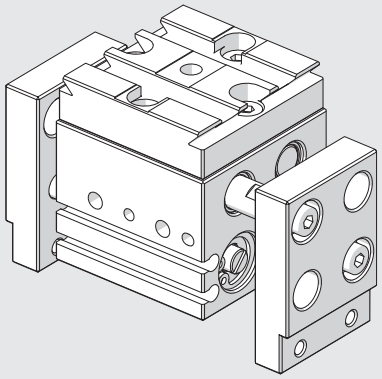
EXAMPLES OF APPLICATION



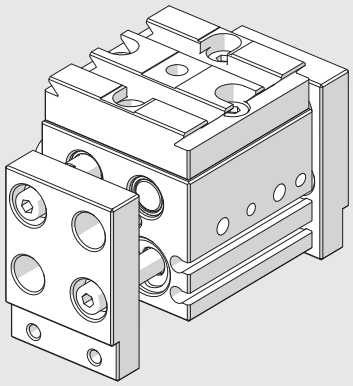


NOTES

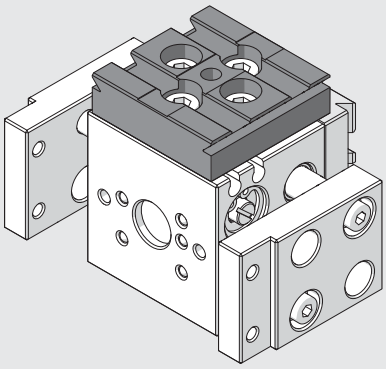
V-Lock MOUNTING OPTIONS



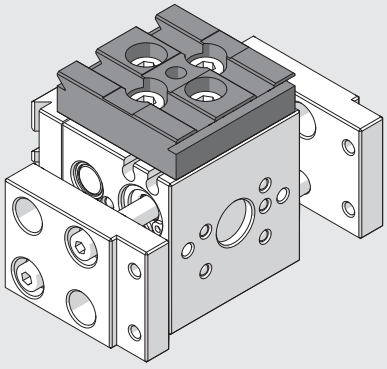
Gripper as supplied



Unscrew the 4 screws at the back and rotate the rear flange by 90°



Fix the accessory "type 1 side adaptor" code 0950008003K to the right, lengthwise



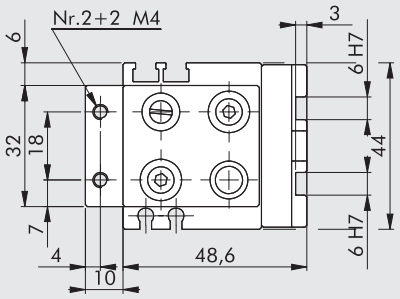
Fix the accessory "type 1 side adaptor" code 0950008003K to the right, crosswise

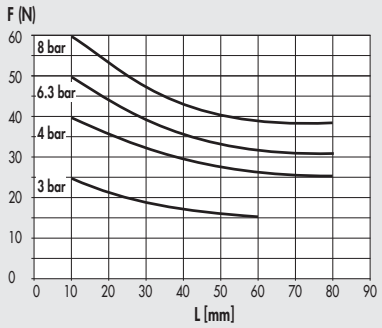
NOTES

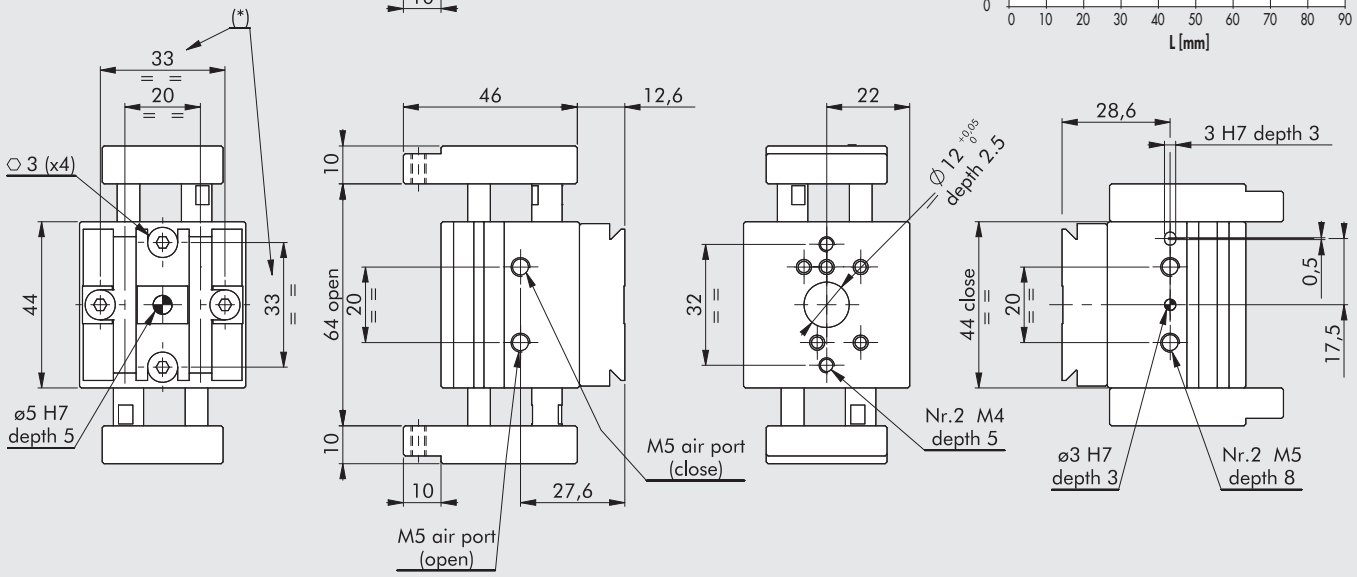
DIMENSIONS OF GRIPPER P4K-12

NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

(*): The screws can be untightened. Rotate the rear plate by 90° and tighten the screws.





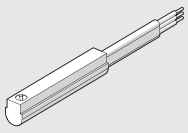


Code	Description
W1580120200K	Gripper with 2 parallel long-stroke jaws P4K-12

ACCESSORIES

SENSOR Ø 4

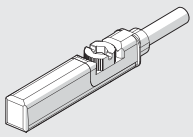
For codes and technical data, see **chapter A6**.



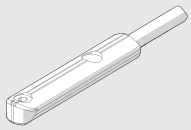
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation, secure fixing

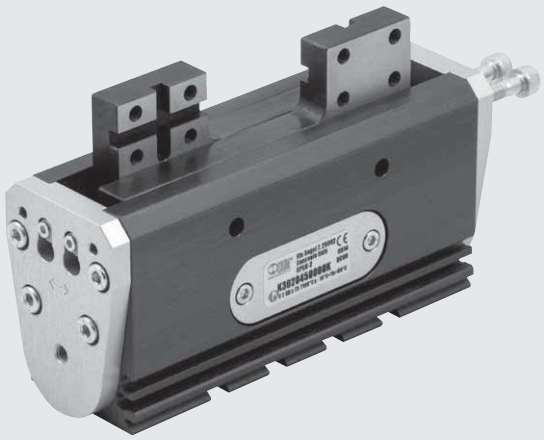


SENSOR, OVAL TYPE
Traditional



GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES GPLK

Dual-acting parallel grippers with either internal or external clamping.
The long stroke make them ideal for clamping parts of different sizes or when the clamping fingers are specifically shaped to hold the part.
The jaw guide is particularly sturdy and is designed to reduce friction and backlash to a minimum, which is a guarantee of long life.
The body is made of hard-anodised aluminium.
The jaws are made of high-tensile hardened and ground steel.
The pistons are housed in a stainless steel jacket.
The end-of-stroke position both on opening and closing can be adjusted using the screws positioned on one side. The grippers come with magnetic or inductive sensors to read the end-of-stroke position.
The magnetic sensors are housed in grooves on the side of the body.
Inductive sensors are inserted into holes on one side.
The side of the body opposite the jaws has a V-Lock profile and grooves.
It is advisable to use flow regulators to control the opening and closing speed and prevent end-of-stroke impacts.



TECHNICAL DATA		GPLK-1-30	GPLK-1-40	GPLK-2-45	GPLK-2-60	GPLK-2-75
Operating pressure	bar	2 to 8				
	MPa	0.2 to 0.8				
	psi	29 to 116				
Temperature range	°C	-10 to 80				
Fluid		20 µm filtered air, lubricated or unlubricated. If lubricated air is used, lubrication must be continuous				
Clamping force of a single jaw	N	42		116		
at 6.3 bar, 20 mm from the upper surface, on opening and closing						
Single jaw stroke, adjustable	mm	1 to 15	6 to 20	5.5 to 22.5	13 to 30	20 to 37.5
Maximum overall stroke	mm	30	40	45	60	75
Minimum opening/closing time						
measured at maximum stroke:						
at 3 bar	s	0.18	0.22	0.44	0.60	0.76
at 6 bar	s	0.10	0.12	0.28	0.32	0.36
Repeatability (on 100 strokes at constant conditions)	mm	< 0.03			< 0.04	
Moment of inertia around the y axis	kg.cm²	3.5	4.4	16.4	21.5	29.1
Weight	kg	0.44	0.46	1.04	1.12	1.26
Max. admissible static loads						
Ft	N	7.5			15	
Fa	N	70			120	
Mx	Nm	9			37	
My	Nm	4			23	
Mz	Nm	7			22	

COMPONENTS

① BODY: hard-anodised aluminium
② ROLLER: tempered steel
③ BLANKING PLATE: blank anodised aluminium
④ STOP PLATE: blank anodised aluminium
⑤ INTERNAL BODY: steel
⑥ PINION: nitrided steel
⑦ MAGNET: neoplast
⑧ PISTON: technopolymer
⑨ GASKET: NBR
⑩ RACK: burnished steel
⑪ JAW: tempered steel

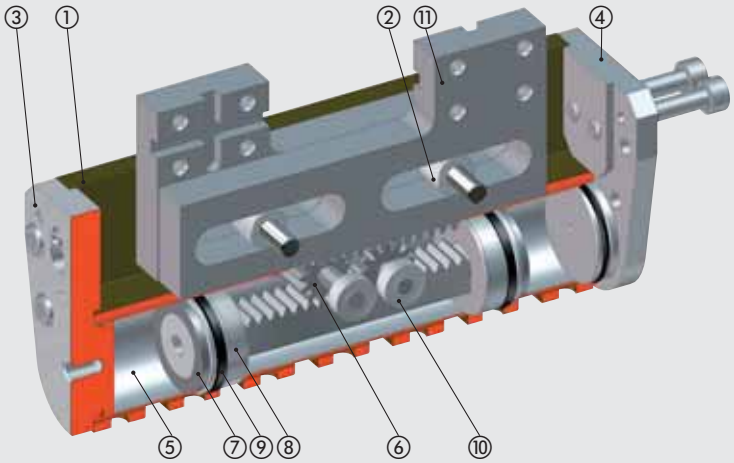
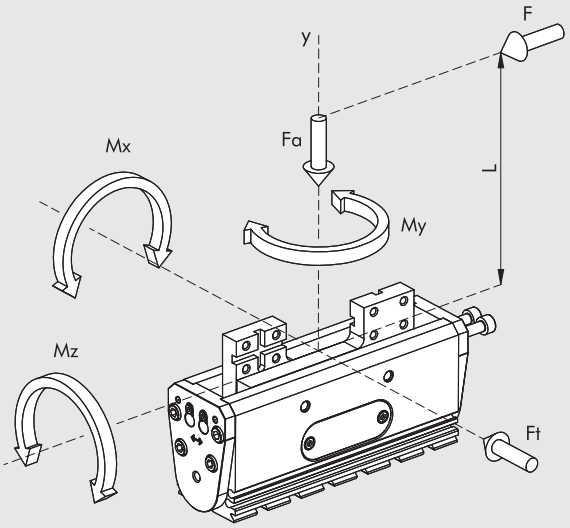
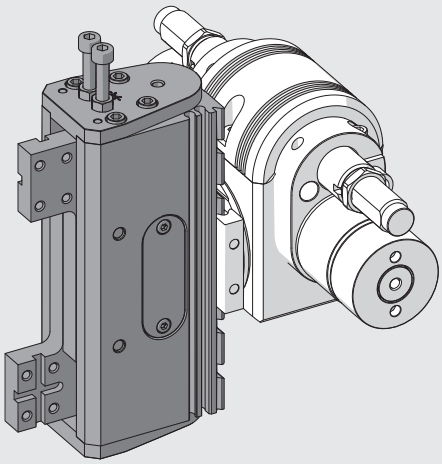


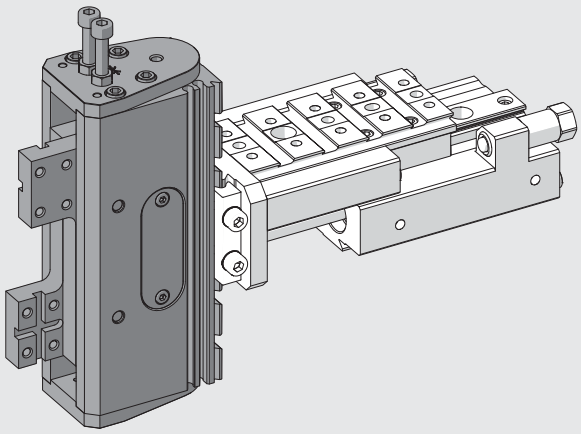
DIAGRAM OF FORCES AND MOMENTS



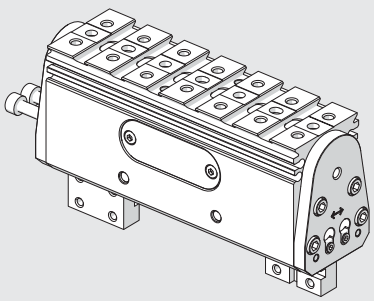
F	Clamping force
Ft	Maximum static traverse force
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

EXAMPLES OF APPLICATION

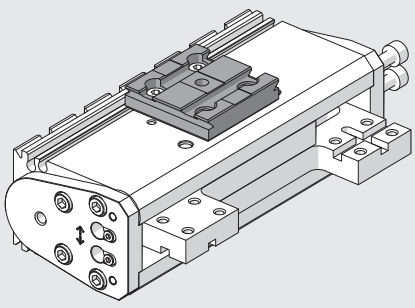




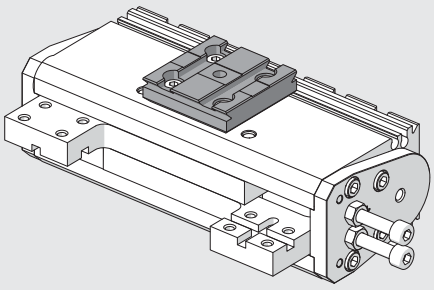
V-Lock MOUNTING OPTIONS



Gripper as supplied



Fix the accessory "type 2 side adaptor" code 0950008004K, lengthwise

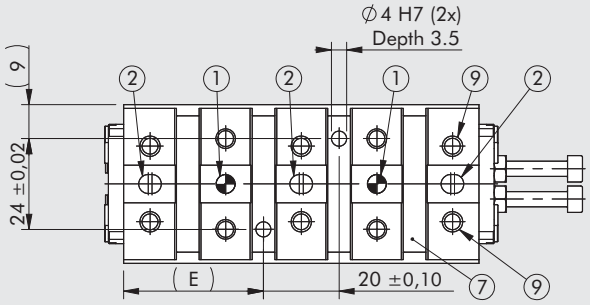


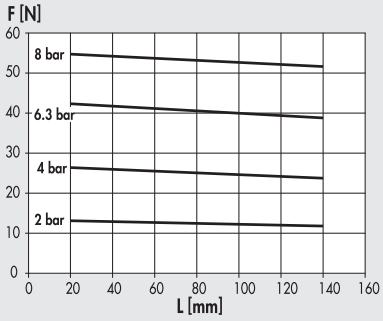
Fix the accessory "type 2 side adaptor" code 0950008004K, crosswise

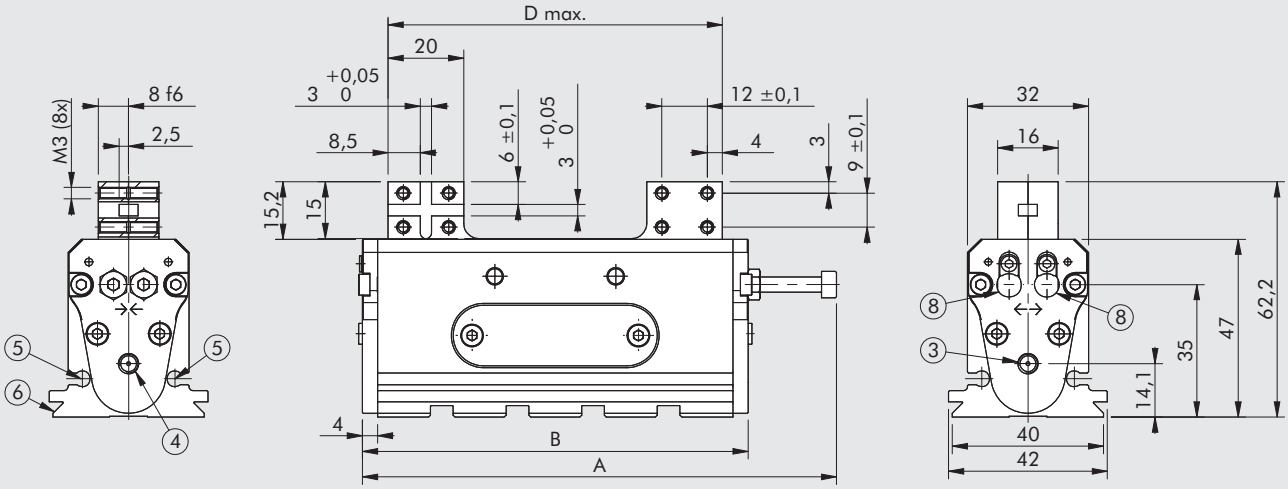
METAL WORK PNEUMATIC

DIMENSIONS OF GRIPPER GPLK-1

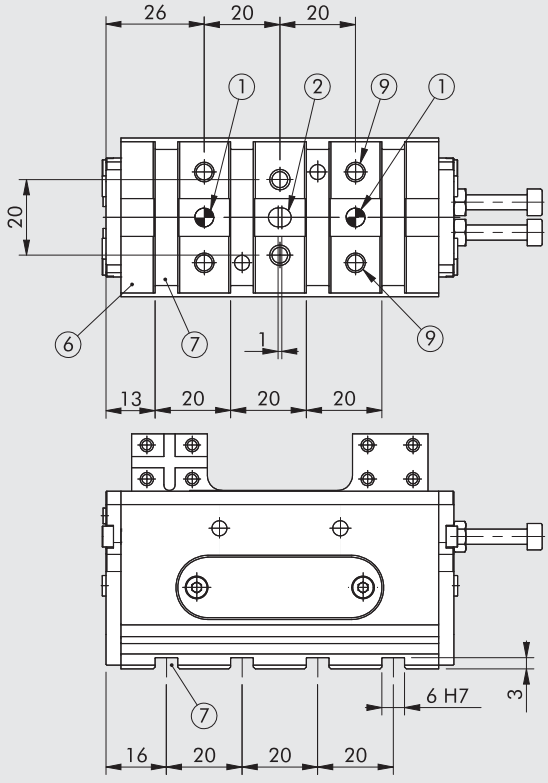
① Holes for centring pins
② Centring slot
③ Gripper opening power
④ Gripper closing power
⑤ Magnetic sensor fixing slots
⑥ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑦ Slot for "V-Lock" precision key
⑧ Inductive induction sensor slot
⑨ Threaded holes for fixing



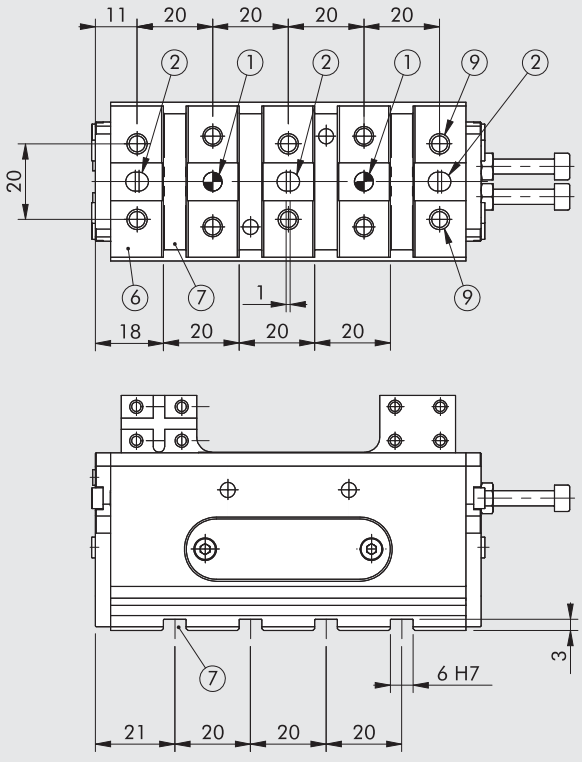




GPLK-1-30



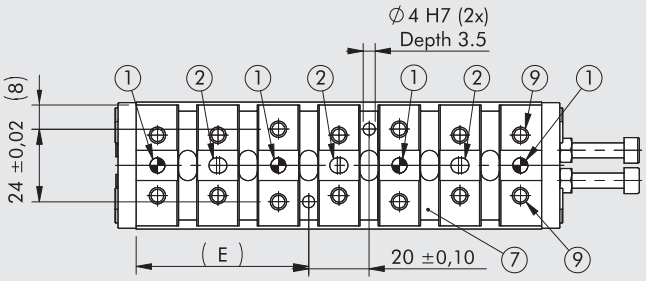
GPLK-1-40

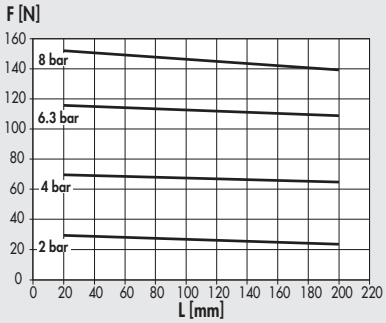


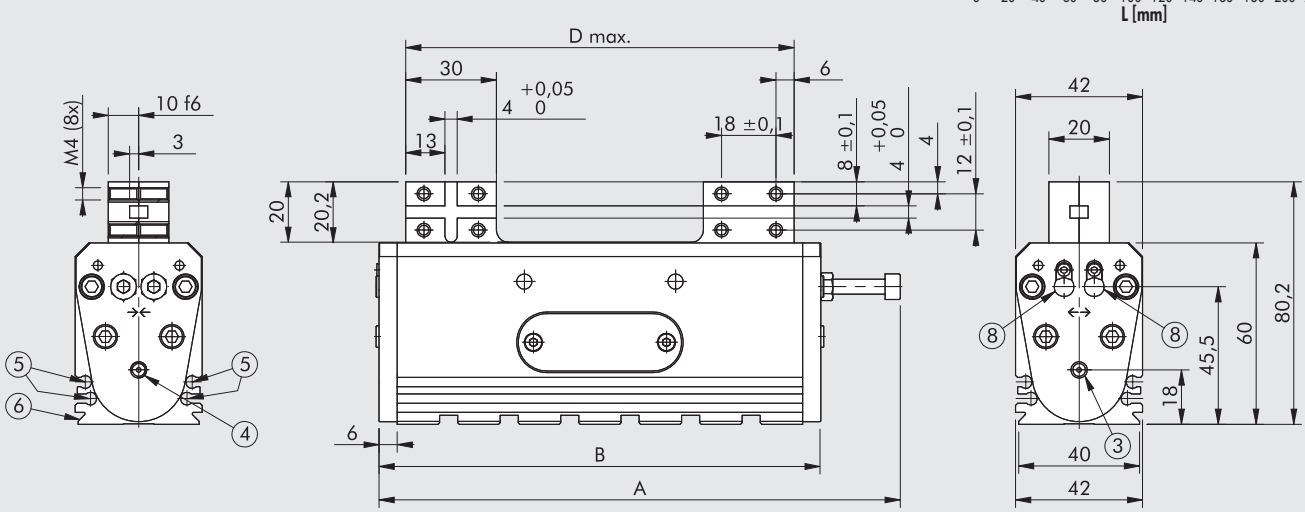
Code	Description	Overal Stroke	A	B	D max	E
K3010300000K	GPLK-1-30	30	114	92	78	32
K3010400000K	GPLK-1-40	40	124	102	88	37

DIMENSIONS OF GRIPPER GPLK-2

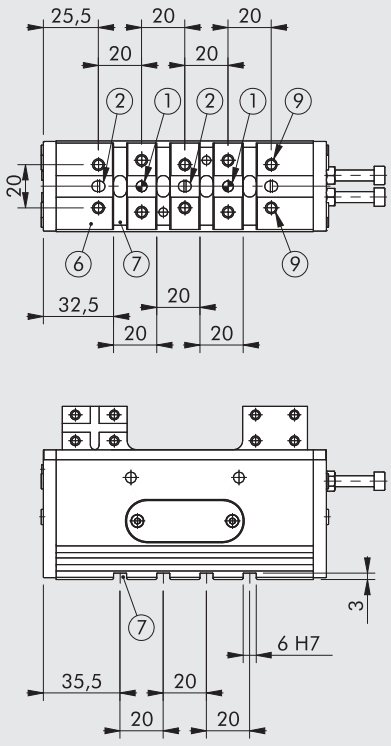
① Holes for centring pins
② Centring slot
③ Gripper opening power
④ Gripper closing power
⑤ Magnetic sensor fixing slots
⑥ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑦ Slot for "V-Lock" precision key
⑧ Inductive induction sensor slot
⑨ Threaded holes for fixing



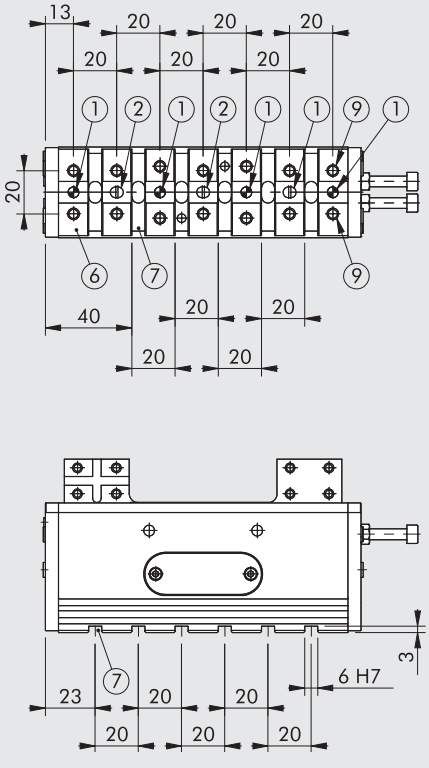




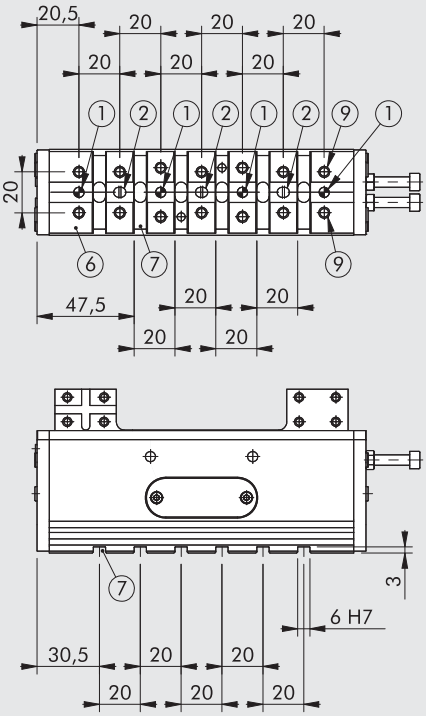
GPLK-2-45



GPLK-2-60



GPLK-2-75



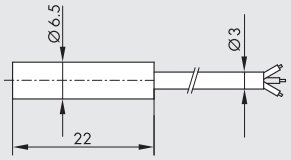
Code	Description	Overal Stroke	A	B	D max	E
K3020450000K	GPLK-2-45	45	157	131	113	49.5
K3020600000K	GPLK-2-60	60	172	146	128	57
K3020750000K	GPLK-2-75	75	187	161	143	64.5

ACCESSORIES

V-Lock ACCESSORIES

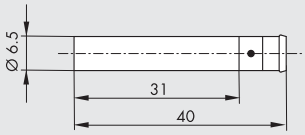
See page **A3**.36

INDUCTION SENSOR Ø 6.5



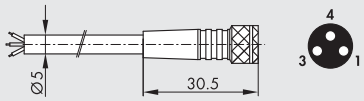
Code	Description
W095K030006	PNP Ø 6.5 PNP inductive sensor with LED 2 m
W095K031006	NPN Ø 6.5 NPN inductive sensor with LED 2 m

QUICK-FIT INDUCTIVE SENSOR Ø 6.5



Code	Description
W095K030009	PNP Ø 6.5 inductive sensor with push-in LED

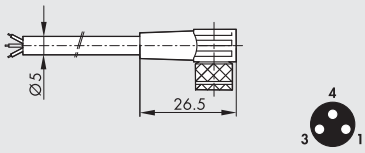
CABLE WITH STRAIGHT CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)



Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
W095K000005	Push-in cable female straight connector 5 m
W095K000010	Push-in cable female straight connector 10 m

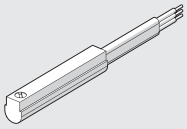
CABLE WITH 90° CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)



Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
W095K010005	Push-in cable female elbow connector 5 m
W095K010010	Push-in cable female elbow connector 10 m

SENSOR Ø 4



For codes and technical data, see **chapter A6**.

OIL

Code	Description	Volume
9910490	PARALIQ P 460	80 ml

GRIPPER WITH TWO HINGED JAWS SERIES P7K

The body is made of anodized aluminium alloy and the jaws are made of hardened steel. They come with a magnet and sensor grooves.
The lower plate has a V-Lock profile and grooves.
A plate with a V-Lock coupling can also be mounted to the sides of the grippers.

TECHNICAL DATA		P7K-20	P7K-32
Operating pressure	bar	2 to 10	
	MPa	0.2 to 1.0	
	psi	29 to 145	
Temperature range	°C	-10 to 80	
Fluid		20 µm filtered air, lubricated or unlubricated. If lubricated air is used, lubrication must be continuous	
Bore	mm	20	32
Maximum opening angle for single jaw		16° 30′	16°
Clamping force of a single jaw at 6.3 bar, 20 mm from the upper surface, on opening and closing	N	50	120
Max. frequency on continuous operation	Hz	> 5	> 5
Minimum opening/closing time	s	0.042 / 0.016	0.017 / 0.010
Repeatability	mm	0.01	0.01
Lubrication		Grease the sliding surfaces of the jaws every one million cycles. Use grease code 9910509	
Max. admissible static loads:			
- Fa	N	200	350
- Mx	Nm	6	10
- My	Nm	6	10
- Mz	Nm	8	12
Weight	kg	0.22	0.54

COMPONENTS

① BODY: anodised aluminium
② JAWS: nitrided steel
③ PISTON ROD: nitrided steel
④ PISTON: aluminium
⑤ PISTON GASKET: NBR
⑥ GUIDE RING: PTFE (only for Ø 32)
⑧ MAGNET: plastoferrite
⑧ GASKET: polyurethane
⑨ GASKET: NBR
⑩ V-Lock REAR PLATE: anodised aluminium

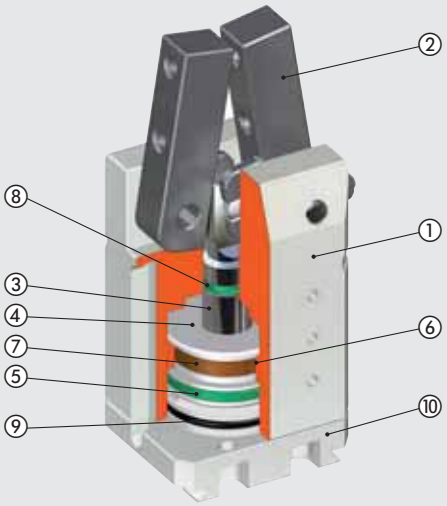
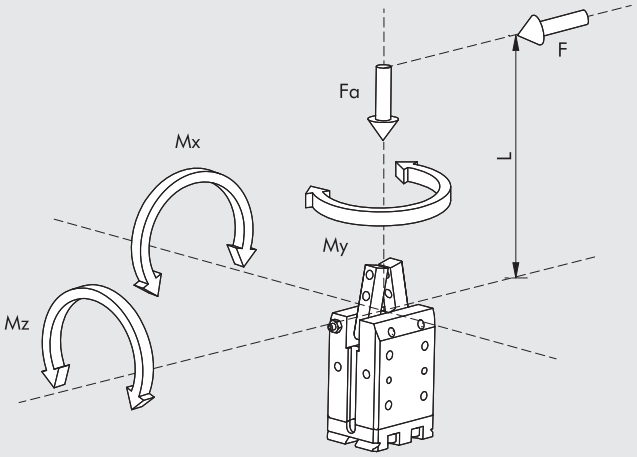
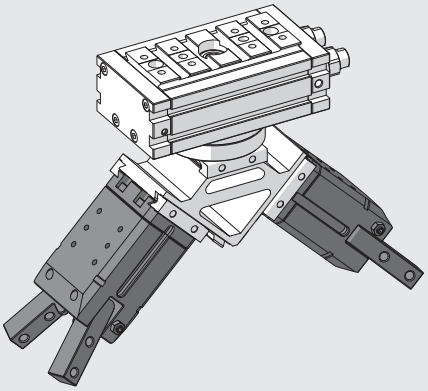


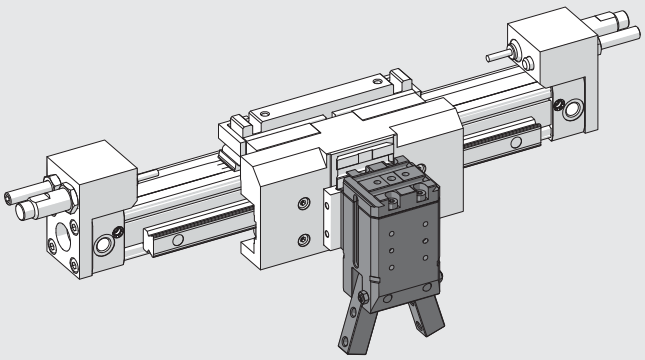
DIAGRAM OF FORCES AND MOMENTS



F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

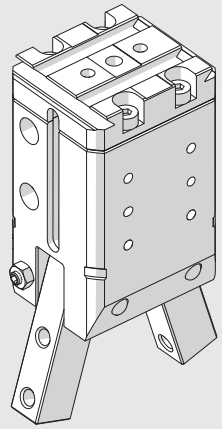
EXAMPLES OF APPLICATION



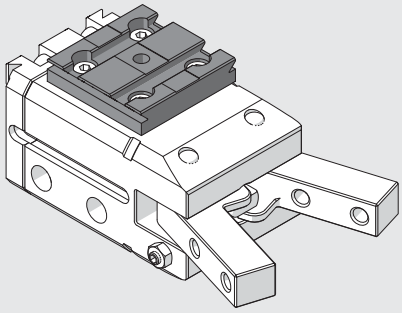


NOTES

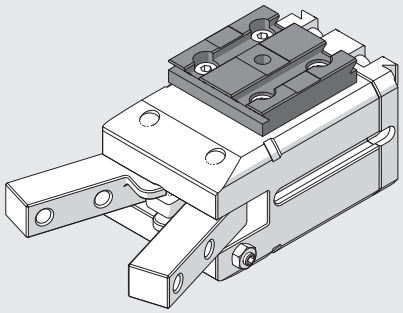
V-Lock MOUNTING OPTIONS



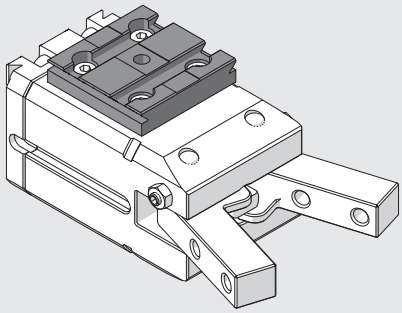
Gripper as supplied



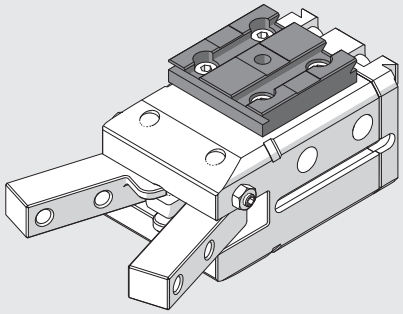
Fix the accessory "type 2 side adaptor" code 0950008004K to the right, lengthwise



Fix the accessory "type 2 side adaptor" code 0950008004K to the right, crosswise



Fix the accessory "type 2 side adaptor" code 0950008004K to the left, lengthwise

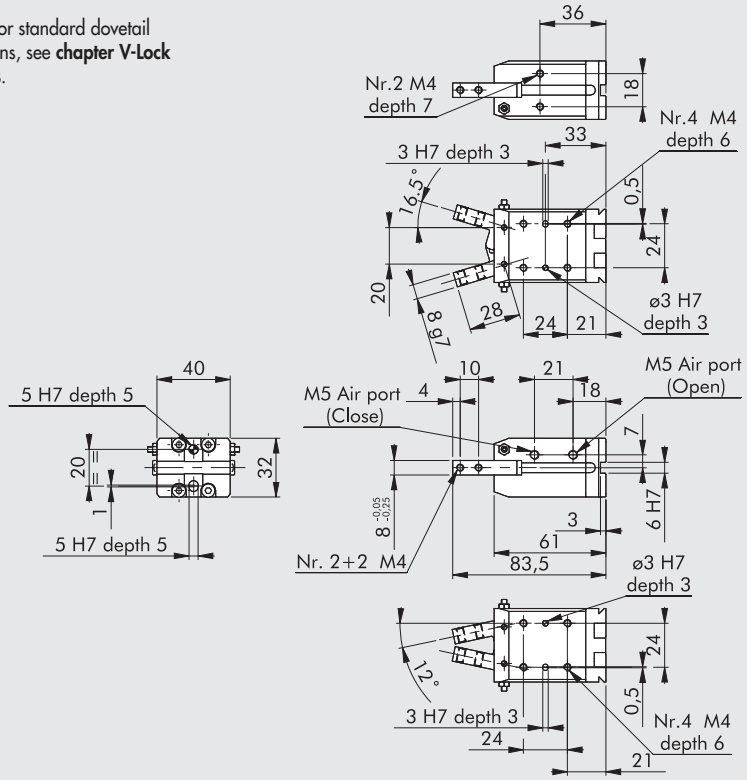


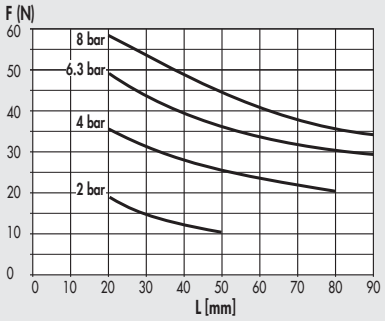
Fix the accessory "type 2 side adaptor" code 0950008004K to the left, crosswise

METAL WORK PNEUMATIC

DIMENSIONS OF GRIPPER P7K-20

NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

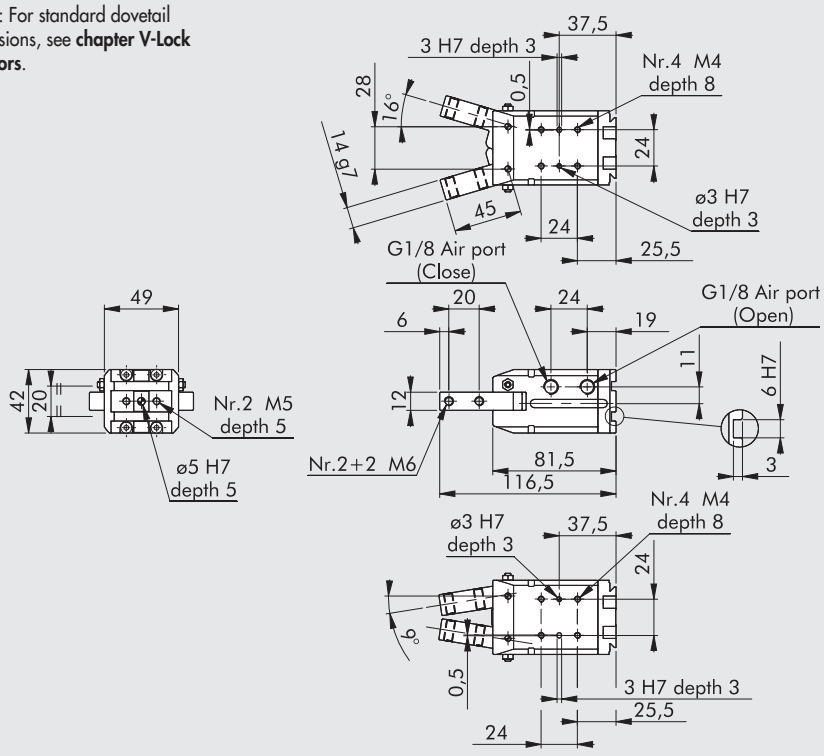


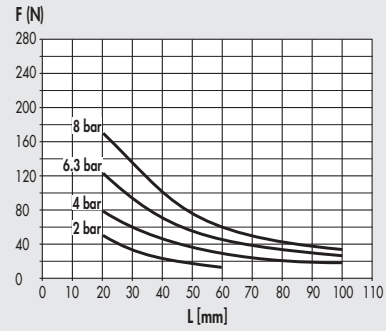


Code	Description
W1590200200K	Gripper with 2 hinged jaws P7K-20

DIMENSIONS OF GRIPPER P7K-32

NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.



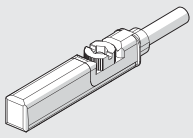


Code	Description
W1590320200K	Gripper with 2 hinged jaws P7K-32

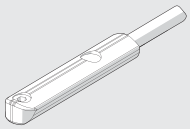
ACCESSORIES

RETRACTING SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional

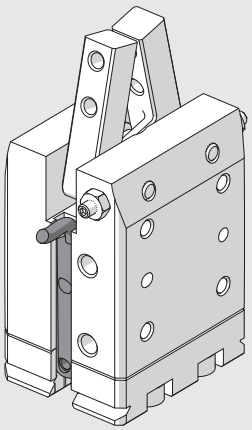


For codes and technical data, see **chapter A6**.

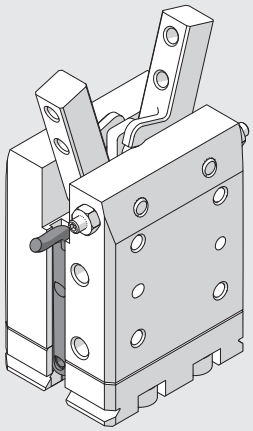
DIRECTION RECOMMENDED FOR FIXING THE SENSORS TO THE GRIPPER GROOVES

P7K-20

CLOSED

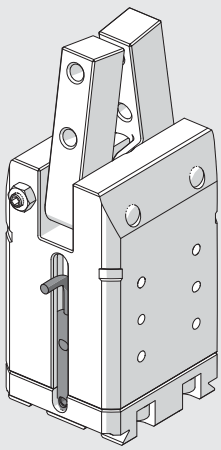


OPEN



P7K-32

CLOSED



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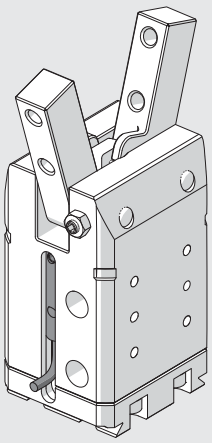


GRIPPER 180° WITH TWO HINGED JAWS SERIES P9K

METAL WORK PNEUMATIC

Hinged toggle grippers with an adjustable opening angle.
High clamping forces.
The body is made of hard anodized aluminium alloy and the jaws and moving parts are made of hardened steel.
They come with a magnet and sensor grooves.
The lower plate has a V-Lock profile and grooves.
A plate with a V-Lock coupling can also be mounted to the sides of the grippers.

TECHNICAL DATA		P9K-32	P9K-40
Operating pressure	bar	2 to 8	
	MPa	0.2 to 0.8	
	psi	29 to 116	
Temperature range	°C	-10 to 80	
Fluid		20 µm filtered air, lubricated or unlubricated. If lubricated air is used, lubrication must be continuous	
Bore	mm	32	40
Clamping force of a single jaw at 6.3 bar, 40 mm from the upper surface, on opening and closing	N	160	260
Max. frequency on continuous operation	Hz	> 5	> 5
Minimum opening/closing time	s	0.034 / 0.041	0.052 / 0.061
Repeatability	mm	< 0.02	< 0.02
Lubrication		Grease the sliding surfaces of the jaws every one million cycles. Use grease code 9910509	
Max. admissible static loads:			
- Fa	N	350	500
- Mx	Nm	12	20
- My	Nm	12	20
- Mz	Nm	16	24
Weight	kg	0.76	1.6

COMPONENTS

① BODY: anodised aluminium
② JAWS: nitrided steel
③ LEVERAGE SYSTEM: nitrided steel
④ PISTON ROD: stainless steel
⑤ PISTON: aluminium
⑥ PISTON GASKET: NBR
⑦ GUIDE RING: PTFE
⑧ MAGNET: plastoferrite
⑨ GASKET: NBR
⑩ GUIDE BUSHING: bronze
⑪ GASKET: NBR
⑫ V-Lock REAR PLATE: anodised aluminium
⑬ PISTON ROD GASKET: polyurethane

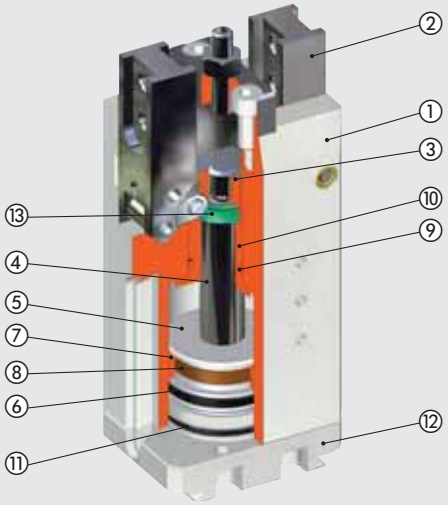
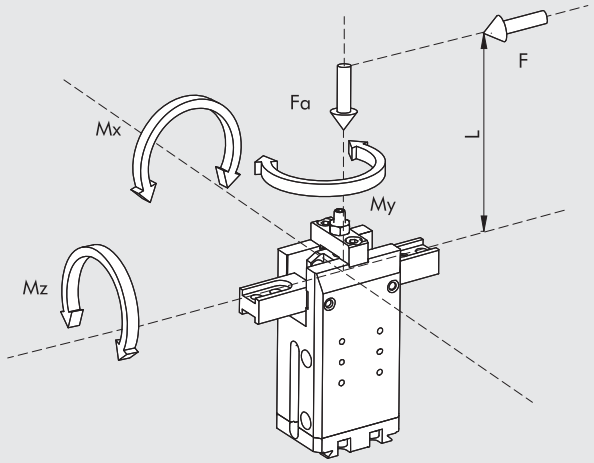
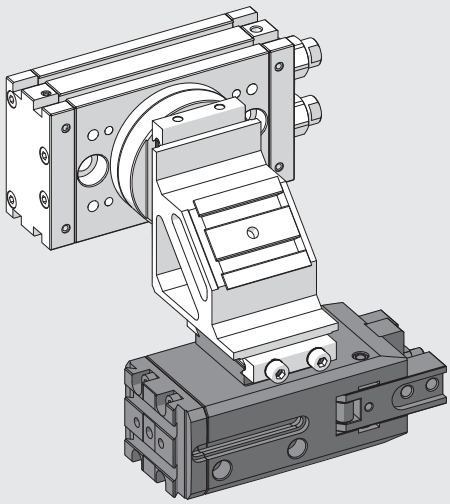


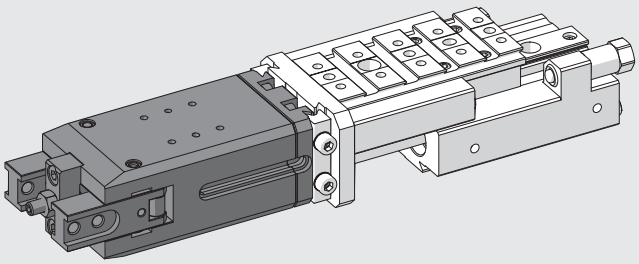
DIAGRAM OF FORCES AND MOMENTS



F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

EXAMPLES OF APPLICATION

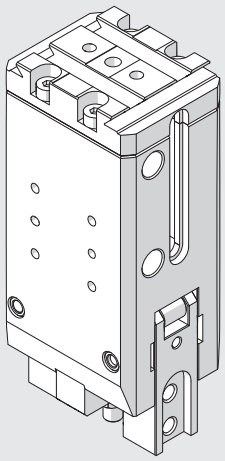




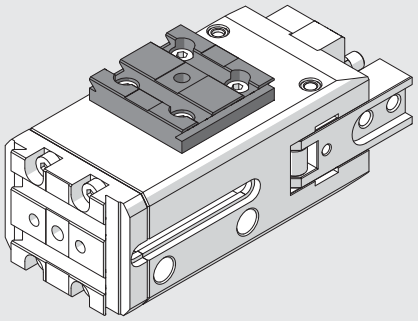
NOTES

METAL WORK PNEUMATIC

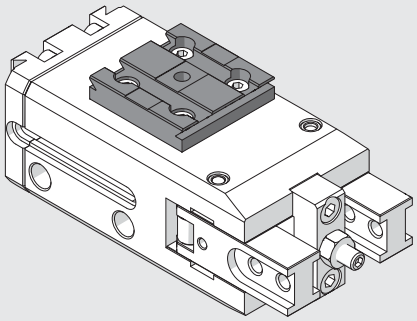
V-Lock MOUNTING OPTIONS



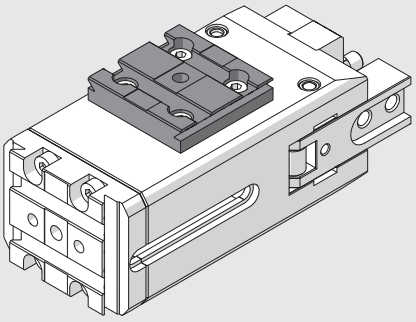
Gripper as supplied



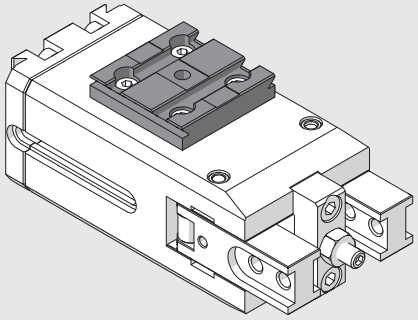
Fix the accessory "type 2 side adaptor" code 0950008004K (for Ø 32) or "type 3 side adaptor" code 0950008005K (for Ø 40) to the right, lengthwise



Fix the accessory "type 2 side adaptor" code 0950008004K (for Ø 32) or "type 3 side adaptor" code 0950008005K (for Ø 40) to the right, crosswise



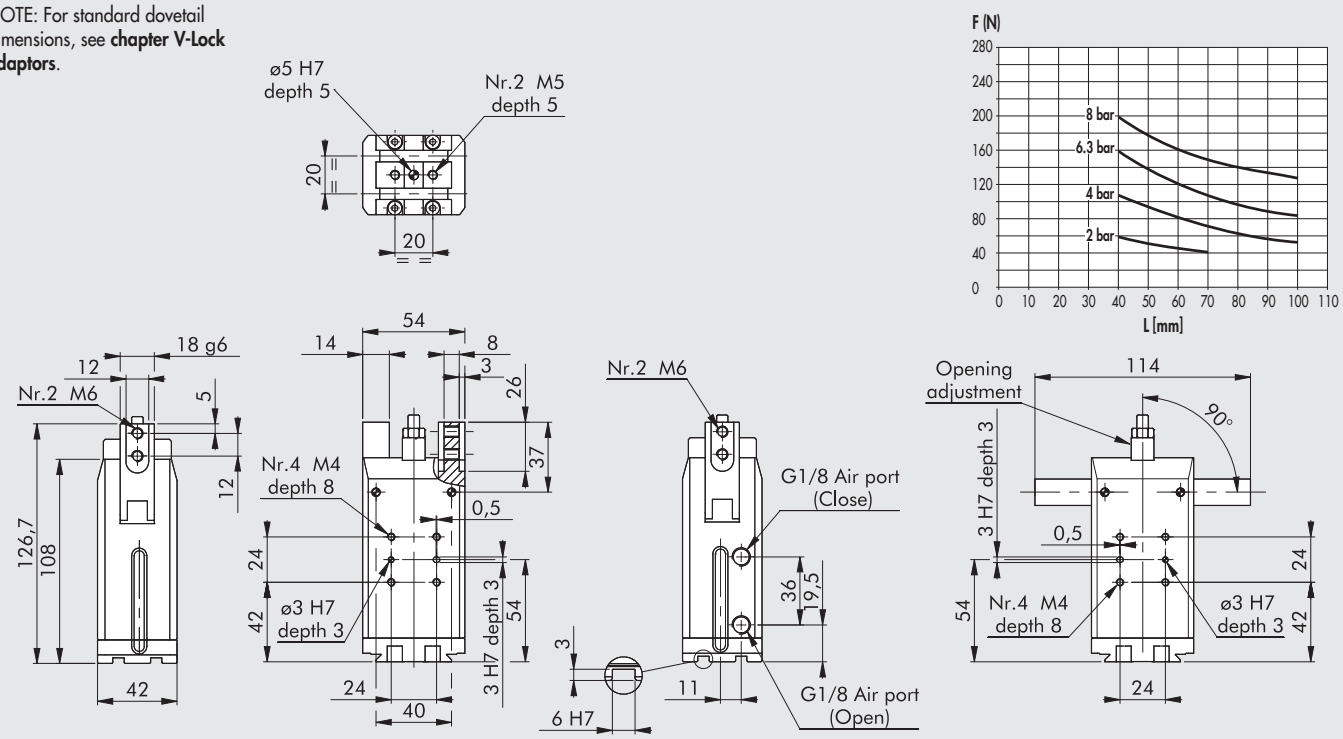
Fix the accessory "type 2 side adaptor" code 0950008004K (for Ø 32) or "type 3 side adaptor" code 0950008005K (for Ø 40) to the left, lengthwise



Fix the accessory "type 2 side adaptor" code 0950008004K (for Ø 32) or "type 3 side adaptor" code 0950008005K (for Ø 40) to the left, crosswise

DIMENSIONS OF GRIPPER P9K-32

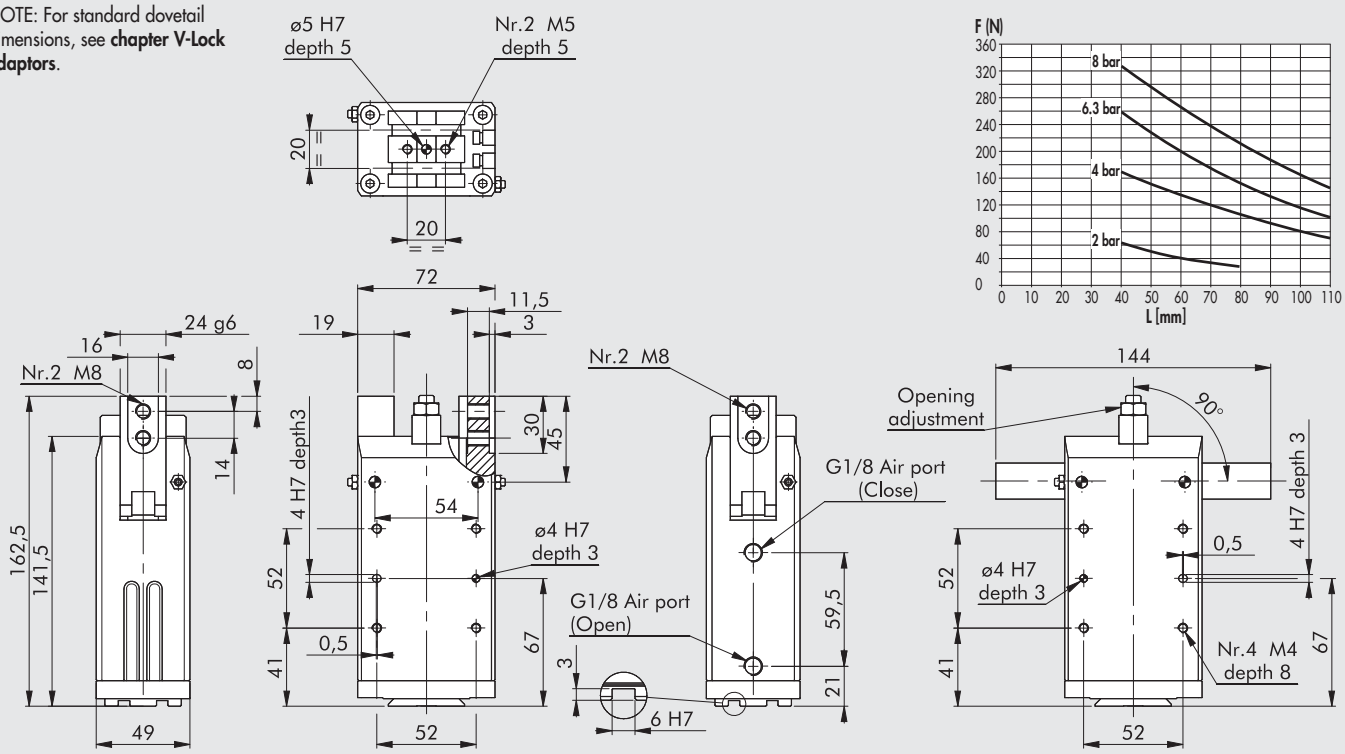
NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.



Code	Description
W1530320180K	Hinged gripper P9K-32

DIMENSIONS OF GRIPPER P9K-40

NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.



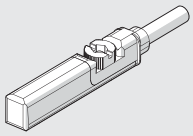
Code	Description
W1530400180K	Hinged gripper P9K-40

ACCESSORIES

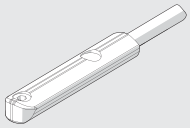
RETRACTING SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



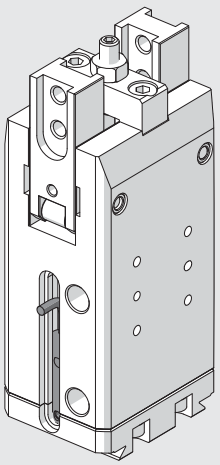
SENSOR, OVAL TYPE
Traditional



DIRECTION RECOMMENDED FOR FIXING THE SENSORS TO THE GRIPPER GROOVES

P9K-32

CLOSED



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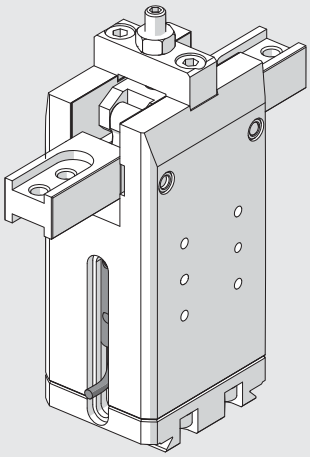
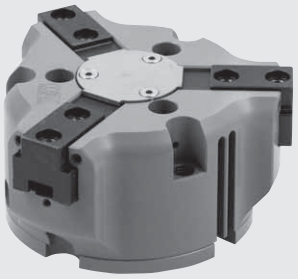
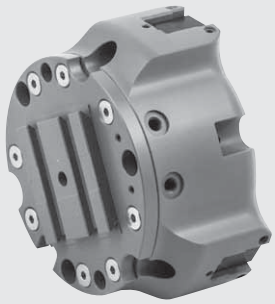


NOTES

GRIPPER WITH THREE PARALLEL JAWS SERIES P12K

Parallel double-acting three-jaw gripper, with either internal or external clamping.
Aluminum alloy body coated with surface hardening treatment; jaws made of wear-resistant coated steel.
The jaw-guiding system and precision in coupling with the body make the gripper extremely stable.
The ceramic-coated body reduces friction and wear, and enhances the movement of the jaws on the body.
All sizes are available in the version with standard stroke and clamping force, while only some in the version with reduced stroke but with higher clamping torque.The gripper is equipped with a magnet and grooves for sensors.
A version designed to house inductive sensors is also available (**the inductive sensors are not supplied by Metal Work**).





TECHNICAL DATA		P12K-64	P12K-80		P12K-100	
			Standard	Increased force	Standard	Increased force
Operating pressure	bar	2 to 8				
	MPa	0.2 to 0.8				
	psi	29 to 116				
Temperature range	°C	-10 to 80				
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous				
Clamping force of a single jaw at 6.3 bar, 20 mm from the upper surface, on opening and closing	N	310	435	860	840	1450
Maximum movable weight	kg	2.9	4.5	9	9	20
Stroke of each jaw	mm	6	8	4	10	5
Minimum opening/closing time	s	0.05				
Repeatability	mm	0.01				
Moment of inertia as regards the piston axis	kg cm²	6	6.5		19	
Max. admissible static loads:						
- Fa	N	1100	1500		2000	
- Mx	Nm	40	90		80	
- My	Nm	60	55		115	
- Mz	Nm	40	55		70	
Weight	kg	0.75	0.8		1.5	

COMPONENTS

① BODY: hard-anodised aluminium
② JAWS: nitrided steel
③ PISTON ROD + GUIDE: nitrided steel
④ PISTON: hard-anodised aluminium
⑤ PISTON GASKET: NBR
⑥ PISTON ROD GASKET: NBR / polyurethane
⑦ BASE GASKET: reinforced SBR / NBR
⑧ MAGNET: neodymium

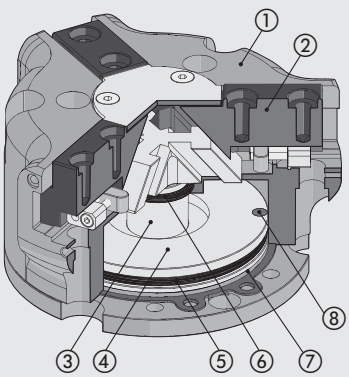
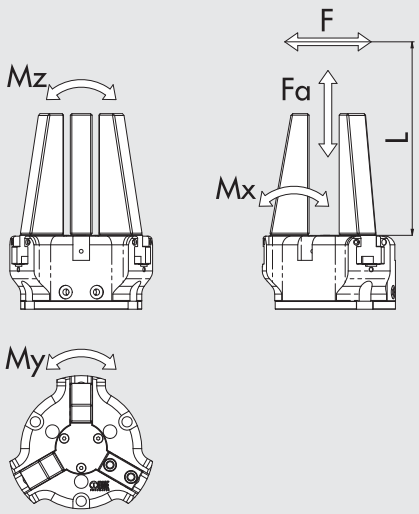
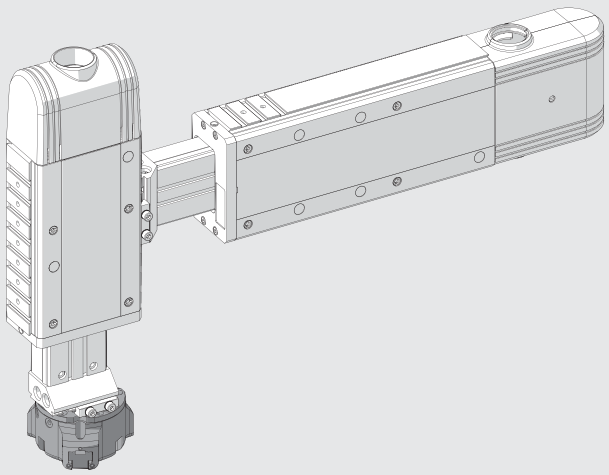


DIAGRAM OF FORCES AND MOMENTS



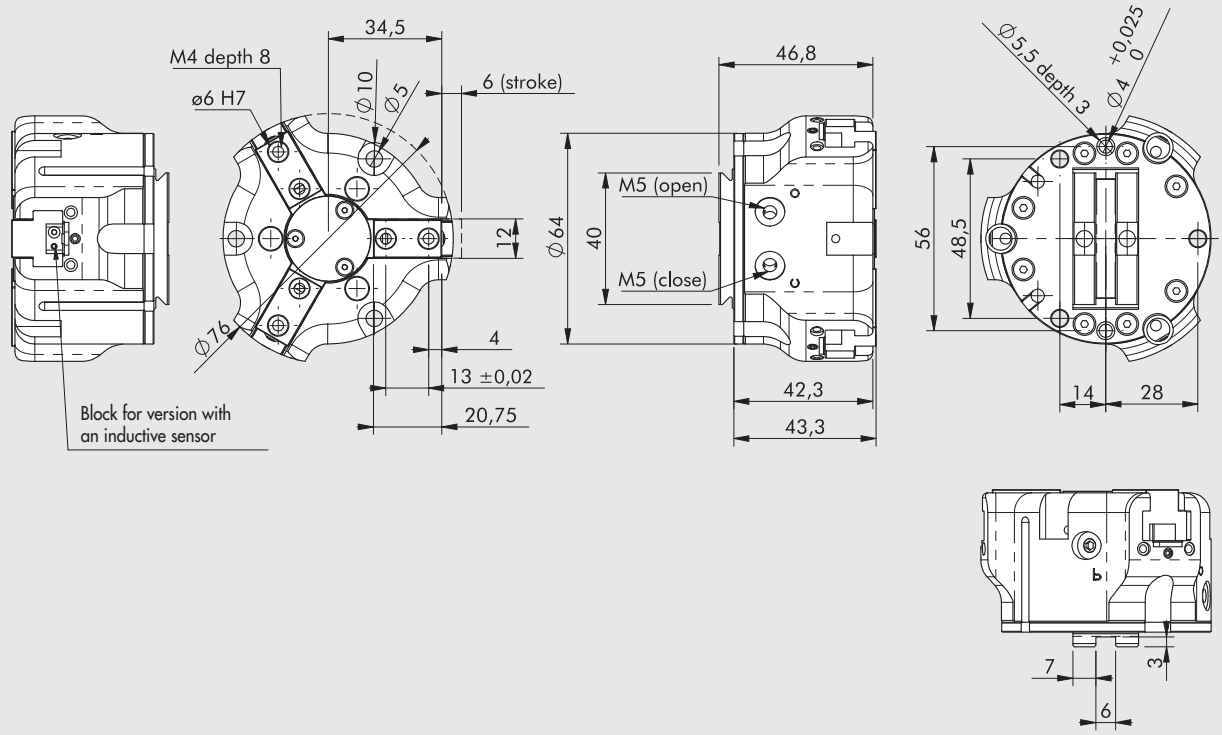
F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

EXAMPLES OF APPLICATION

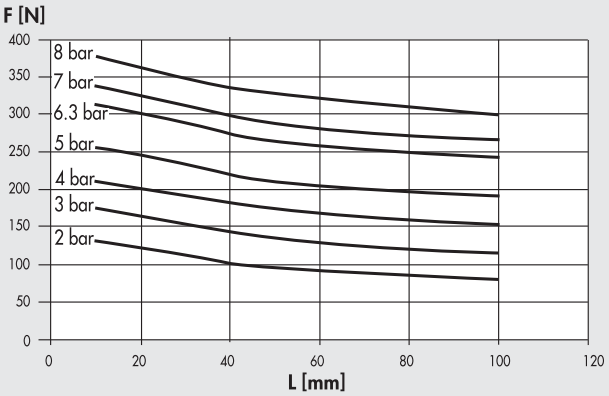


NOTES

DIMENSIONS OF GRIPPER P12K-64



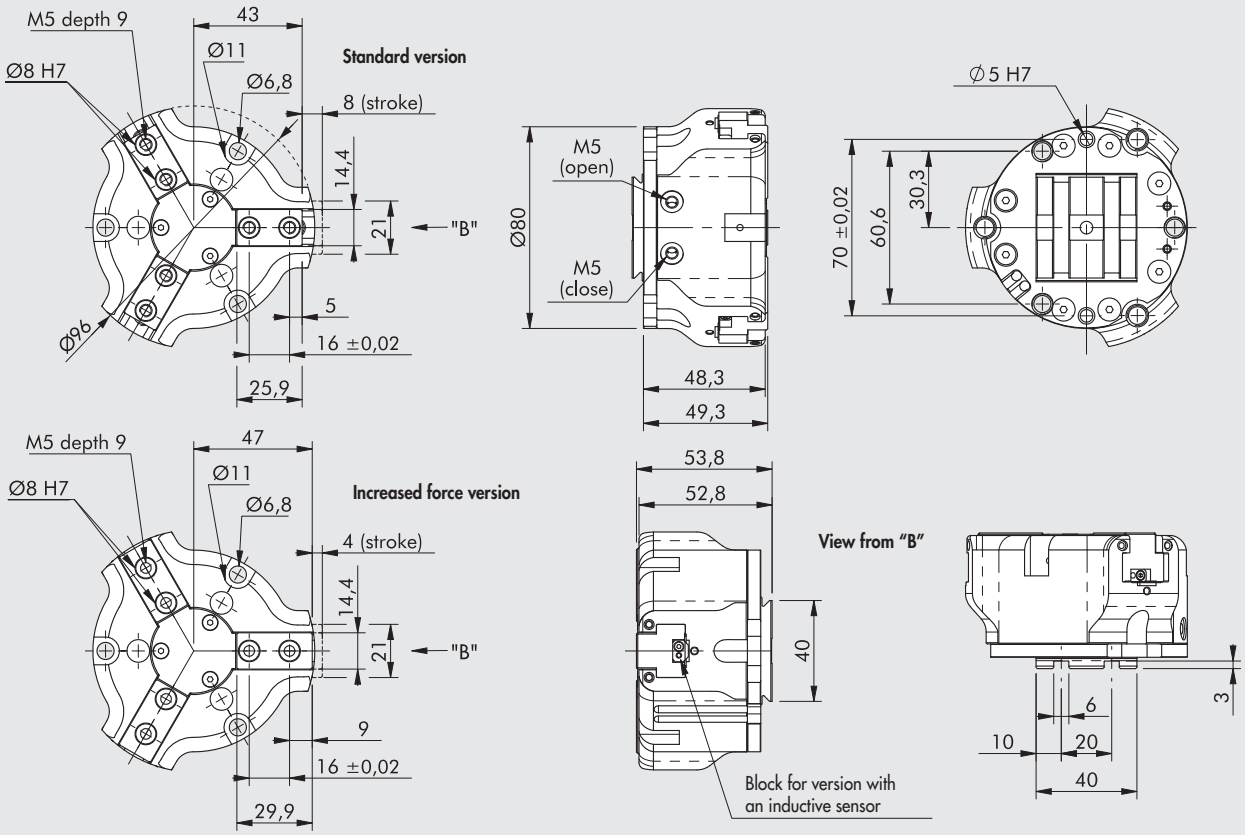
NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.



Code	Description
W1560640300K	Gripper with 3 parallel jaws P12K-64
W1560640301K	Gripper with 3 parallel jaws P12K-64 for inductive sensors

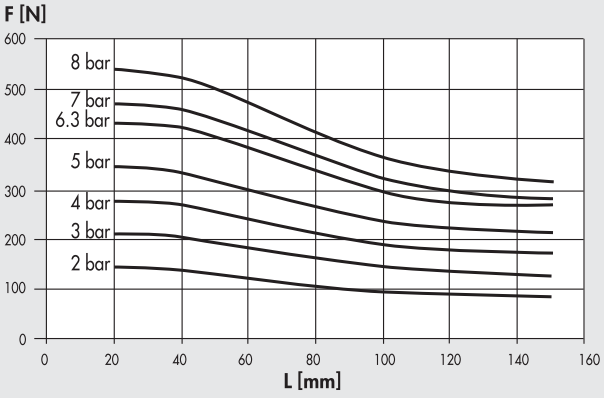
METAL WORK PNEUMATIC

DIMENSIONS OF GRIPPER P12K-80

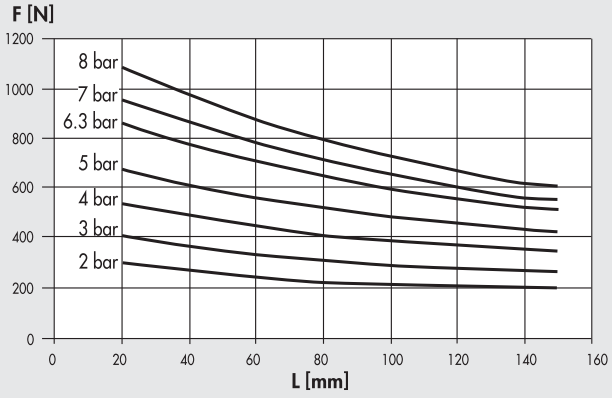


NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

Standard version

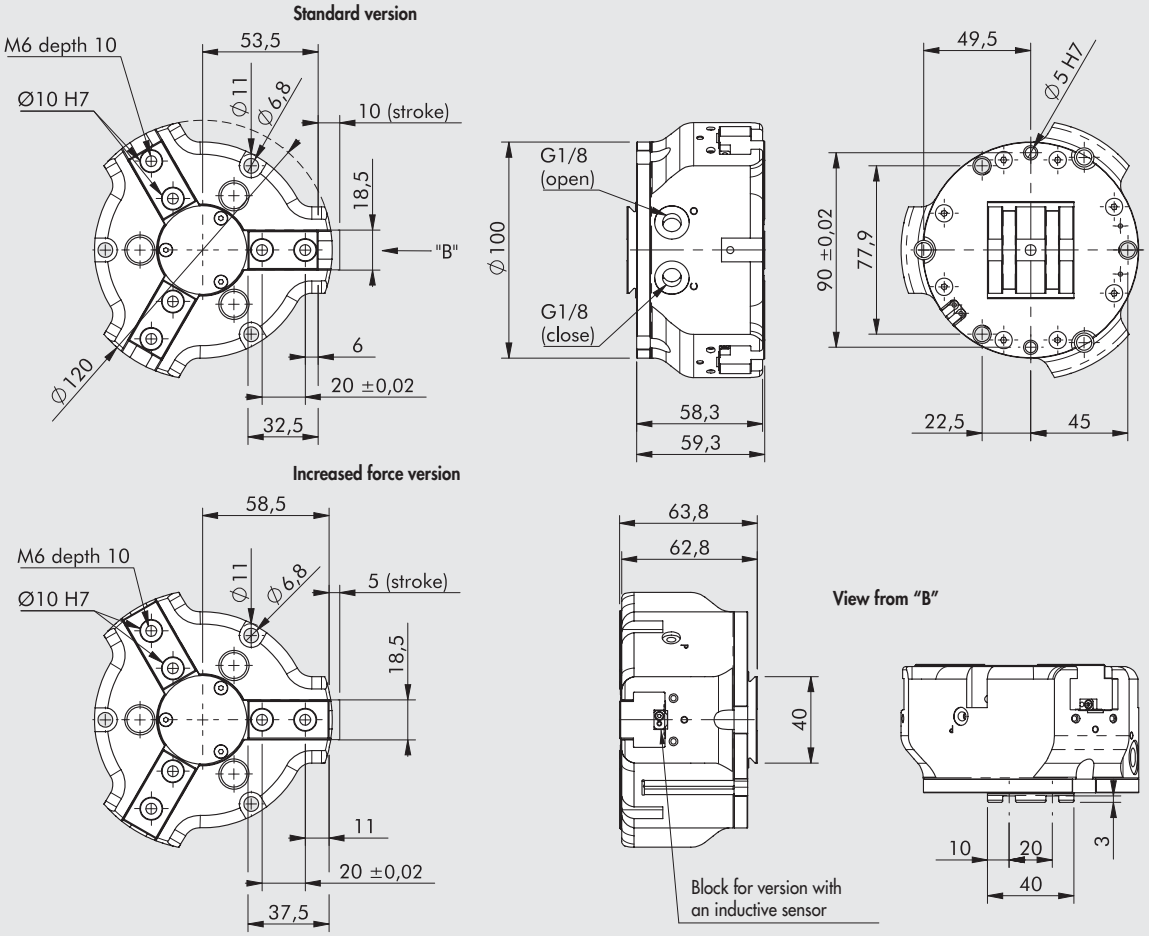


Increased force version



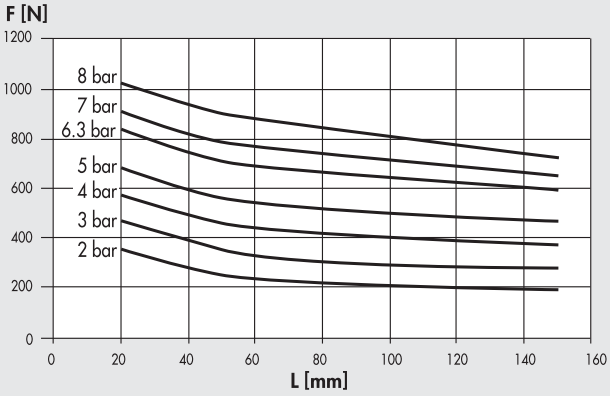
Code	Description
W1560800300K	Gripper with 3 parallel jaws P12K-80
W1560800301K	Gripper with 3 parallel jaws P12K-80 for inductive sensors
W1560800320K	Gripper with 3 parallel jaws P12K-80 increased force
W1560800321K	Gripper with 3 parallel jaws P12K-80 increased force for inductive sensors

DIMENSIONS OF GRIPPER P12K-100

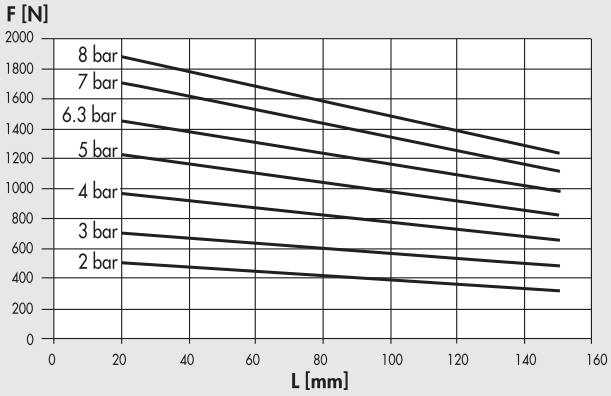


NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

Standard version



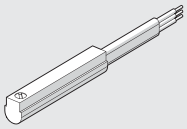
Increased force version



Code	Description
W1561000300K	Gripper with 3 parallel jaws P12K-100
W1561000301K	Gripper with 3 parallel jaws P12K-100 for inductive sensors
W1561000320K	Gripper with 3 parallel jaws P12K-100 increased force
W1561000321K	Gripper with 3 parallel jaws P12K-100 increased force for inductive sensors

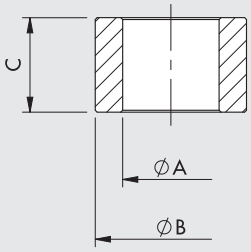
ACCESSORIES

SENSOR Ø 4



For codes and technical data, see **chapter A6**.

CENTRING RING



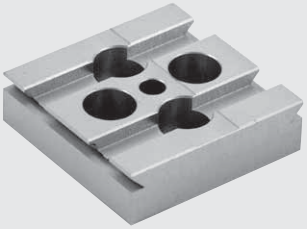
Code	Size	ØA	ØB f7	C
W1560649201	64	$4.5^{0}_{-0.1}$	6	$5^{0}_{-0.1}$
W1560809201	80	$5.1^{0}_{-0.1}$	8	$5^{0}_{-0.05}$
W1561009201	100	$6.2^{\pm 0.1}$	10	$6.9^{0}_{-0.1}$

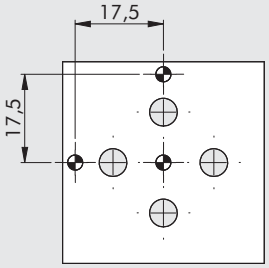
Note: 2-pieces pack

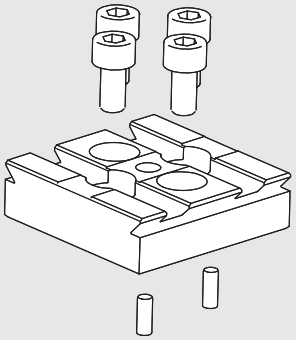
NOTES

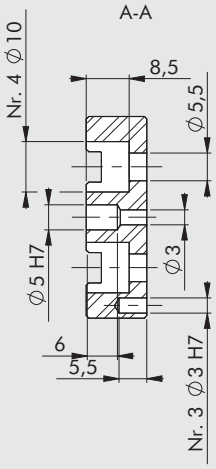
V-Lock GRIPPER ACCESSORIES

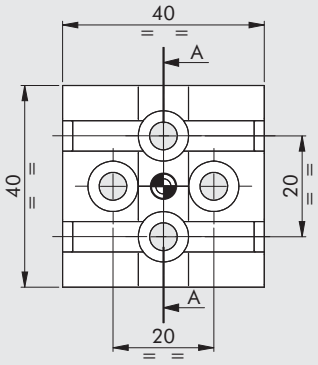
SIDE ADAPTOR KIT TYPE 1 CODE 0950008003K

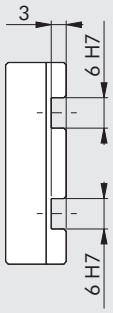












NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

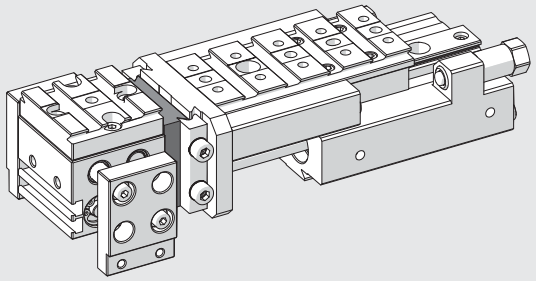
Adaptor for fixing to other V-Lock or Quick-set components. For lateral fixing to the grippers.
W1580120200K Gripper with 2 jaws, long stroke, P4K-12

The 4 screws and 2 pins can be used to fix the plate to the grippers in two orthogonal directions.

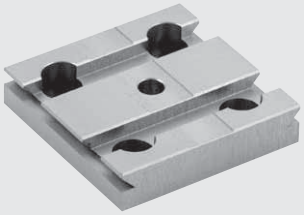
Kit contents:

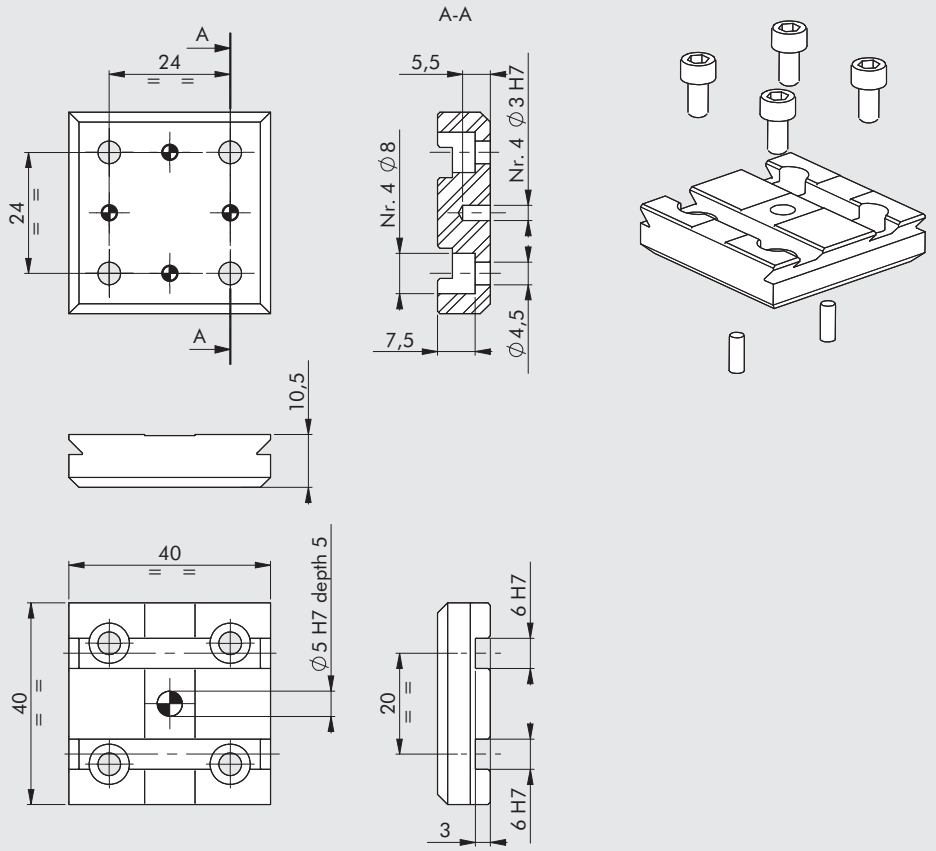
1 side cylinder head P4K-12:	Material	Anodized aluminium
	Weight	0.041 kg
2 cylindrical pins Ø 3 x 8		
4 screws M5 x 10 galvanised		

EXAMPLES OF APPLICATION



SIDE ADAPTOR KIT TYPE 2 CODE 0950008004K





NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

Adaptor for fixing to other V-Lock or Quick-set components. For lateral fixing to the grippers.

W1550200001K	Gripper with 2 parallel jaws P1K-20
W1550320001K	Gripper with 2 parallel jaws P1K-32
W1570200200K	Gripper with 2 parallel jaws P2K-20
W1590200200K	Gripper with 2 hinged jaws P7K-20
W1590320200K	Gripper with 2 hinged jaws P7K-32
W1530320180K	Gripper 180° with 2 hinged jaws P9K-32

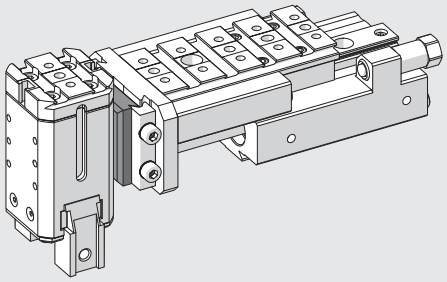
K3010300000K	Gripper with 2 parallel jaws, long stroke GPLK-1-30
K3010400000K	Gripper with 2 parallel jaws, long stroke GPLK-1-40
K3020450000K	Gripper with 2 parallel jaws, long stroke GPLK-2-45
K3020600000K	Gripper with 2 parallel jaws, long stroke GPLK-2-60
K3020750000K	Gripper with 2 parallel jaws, long stroke GPLK-2-75

The 4 screws and 2 pins can be used to fix the plate to the grippers in two orthogonal directions.

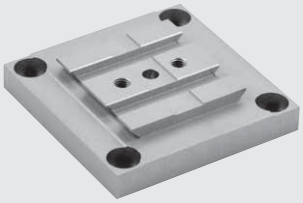
Kit contents:

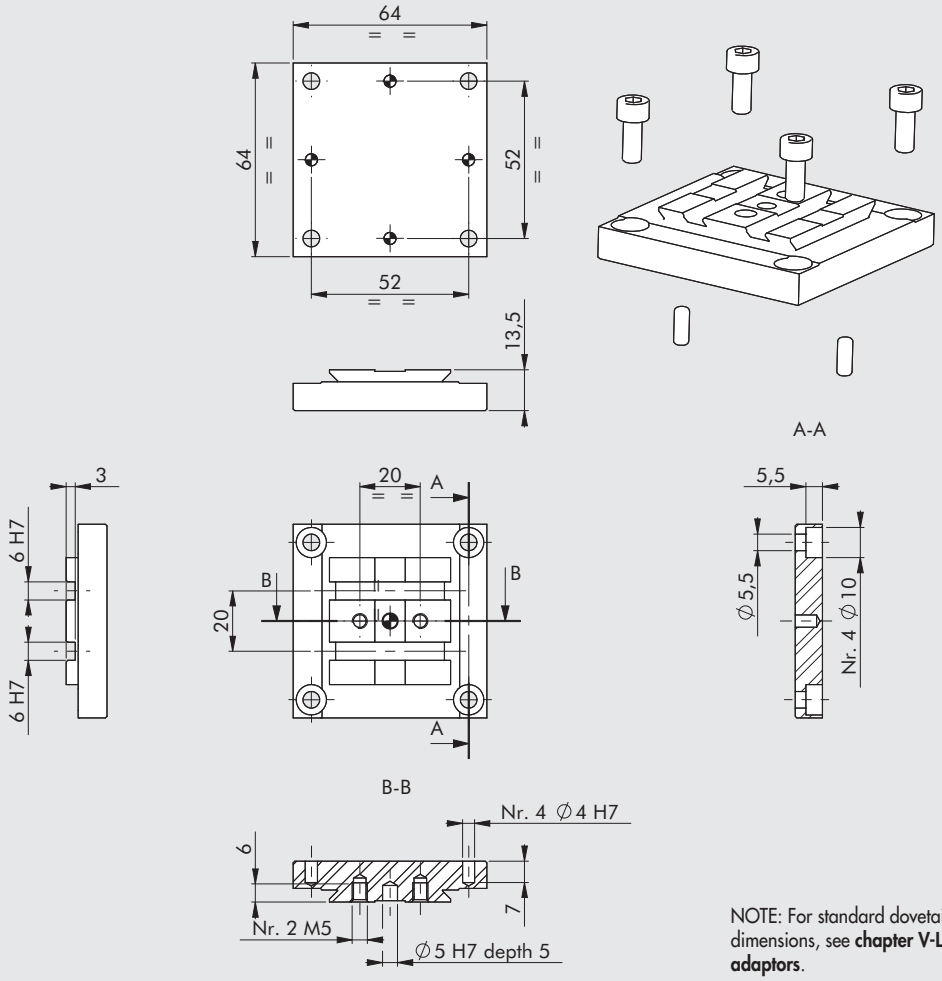
1 side cylinder head P1K-20:	Material	Anodized aluminium
	Weight	0.037 kg
2 cylindrical pins Ø 3 x 8		
4 screws M4 x 8 galvanised		

EXAMPLES OF APPLICATION



SIDE ADAPTOR KIT TYPE 3 CODE 0950008005K





NOTE: For standard dovetail dimensions, see **chapter V-Lock adaptors**.

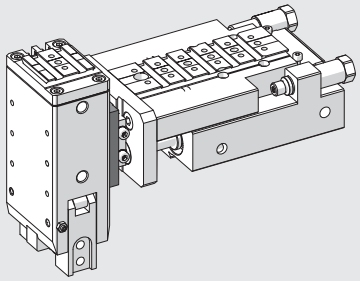
Adaptor for fixing to other V-Lock or Quick-set components. For lateral fixing to the grippers.
W1530400180K Gripper 180° with 2 hinged jaws P9K-40

The 4 screws and 2 pins can be used to fix the plate to the grippers in two orthogonal directions.

Kit contents:

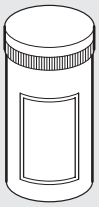
1 side cylinder head P9K-40:	Material	Anodized aluminium
	Weight	0.115 kg
2 cylindrical pins Ø 4 x 10		
4 screws M5 x 12, galvanised		

EXAMPLES OF APPLICATION



METAL WORK PNEUMATIC

GREASE

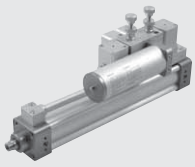


Code	Description	Weight [g]
9910509	Grease pipe NYOGEL 774 H	500

NOTES

NOTES

SUMMARY HYDRAULIC-PNEUMATIC



● **HYDRAULIC BRAKE SERIES BRK** A4.2

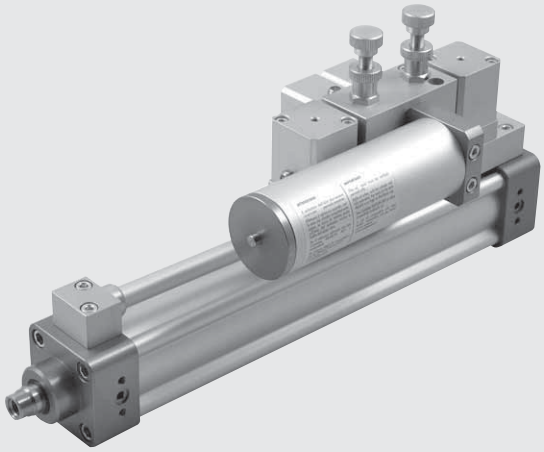
● **INTEGRATED HYDRAULIC BRAKE** A4.16

BRK HYDRAULIC BRAKE

This is a closed-loop hydraulic brake without its own power source.
It is normally associated with an ISO 15552 pneumatic cylinder.
It consists of an oil-filled cylinder, one or more regulation valves and a tank compensating for oil leaks.
It is available in two sizes, the Ø40 and Ø63, and in different versions:

- with regulation in piston rod extension, in retraction or both
- SKIP valve (slow/fast) or STOP valve or both, with NC or NO control

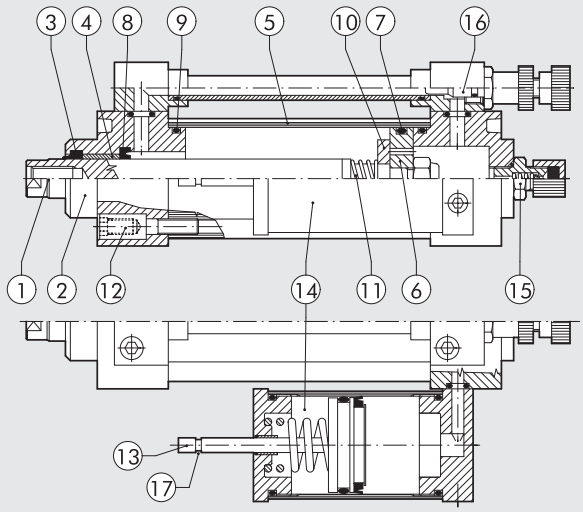
After a certain operating time, the brake compensation tank needs to be topped up. Refer to the minimum mark on the dipstick. With the piston rod fully extended, the dipstick must project at least 15 mm from the tank cap. Use only DEXRON ATF hydraulic oil. During the first few work cycles, excess oil is ejected through a hole in the tank.



TECHNICAL DATA		Ø40	Ø63
Operating temperature	°C	From –10 to +70	
Fluid		Oil, brake fluid provided	
Maximum applicable load	N	7000	25000
Speed	mm/min	see attached diagram	
Standard strokes	mm	50, 100, 150, 200, 250, 300, 350, 400, 450, 500 special strokes up to 1000 on request.	
Versions		Regulation in piston rod extension and/or retraction. SKIP valves. STOP valves. NC or NO Tank in-line or on the side	
Cylinder fixing		using flange kit	-
ISO 15552 cylinders connected	mm	from Ø 40 to Ø 100	from Ø 100 to Ø 200

COMPONENTS

① PISTON ROD: thick chromed steel
② HEADS: anodised aluminium alloy
③ PISTON ROD GASKET: NBR rubber
④ PISTON ROD GUIDE BUSHING: steel strip with bronze and PTFE insert
⑤ JACKET: drawn anodised aluminium alloy
⑥ PISTON: aluminium alloy
⑦ PISTON GASKET: NBR rubber
⑧ OIL SEAL GASKET: polyurethane
⑨ Static O-rings: NBR rubber
⑩ SEALING DISK: plastic
⑪ SPRINGS: zinc-plated steel
⑫ SECURING/ASSEMBLY SCREW: self-threading screw (Tap Tite)
⑬ OIL LEVEL STICK: zinc-plated steel
⑭ OIL RECOVERY TANK
⑮ VALVE for OIL FILLING
⑯ FLOW REGULATION NEEDLE
⑰ MINIMUM LEVEL

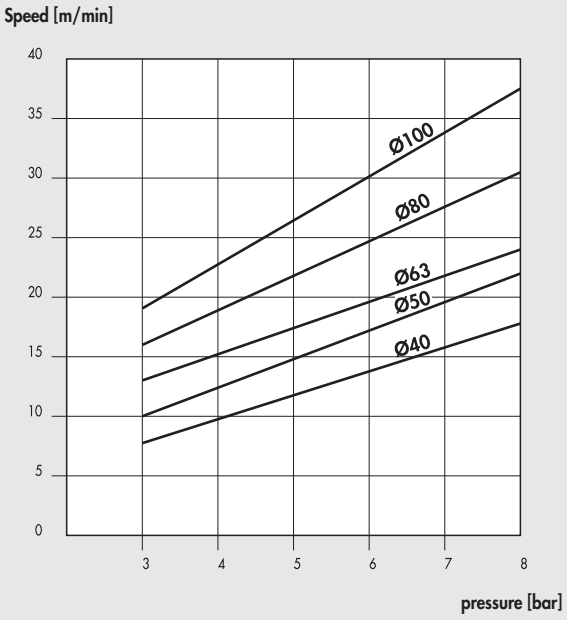


METAL WORK PNEUMATIC

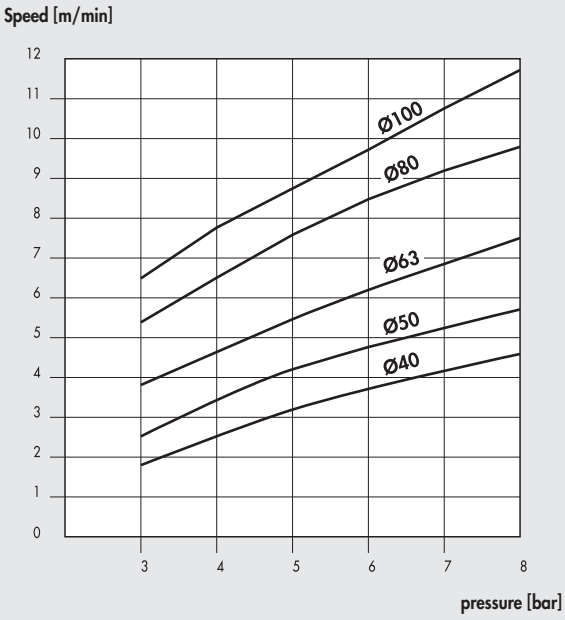
SPEED

The speed can be reached by coupling the BRK brake to a pneumatic cylinder. The diagrams show the indicative speed, which depends on the bore and feed pressure for the pneumatic cylinder. Average values for temperature of 20°C. The maximum speed increases with oil temperature, and vice versa.

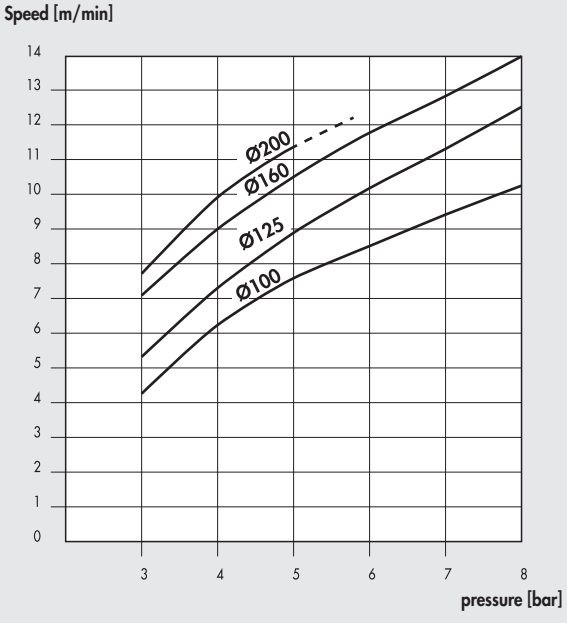
Ø40 BRK BRAKE WITH REGULATION, SKIP OR REGULATION + SKIP VALVE(S)



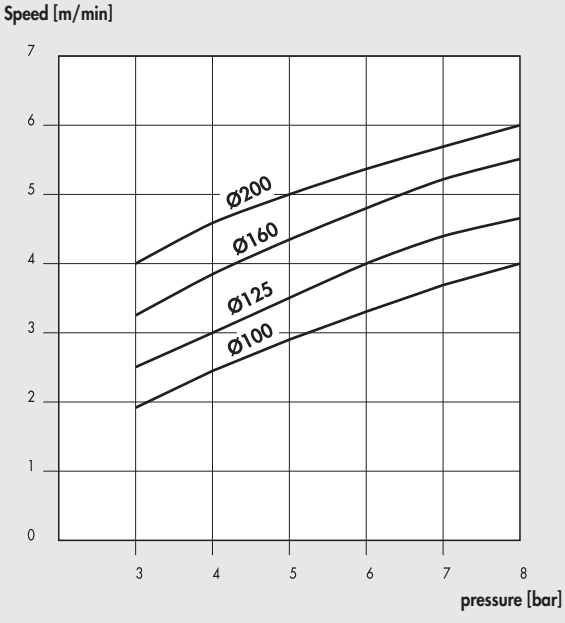
Ø40 BRK BRAKE WITH STOP OR REGULATION + STOP VALVE(S)



Ø63 BRK BRAKE WITH REGULATION, SKIP OR REGULATION + SKIP VALVE(S)

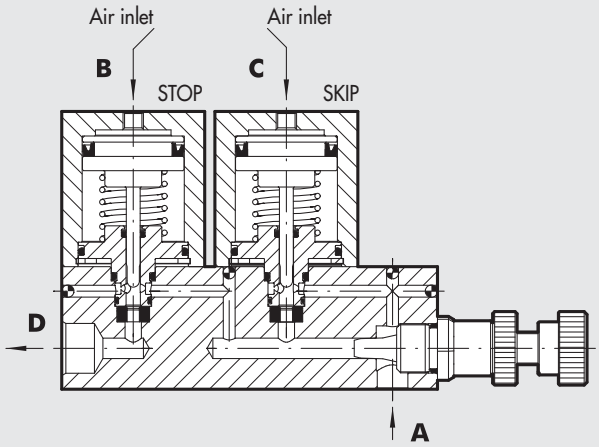


Ø63 BRK BRAKE WITH STOP OR REGULATION + STOP VALVE(S)

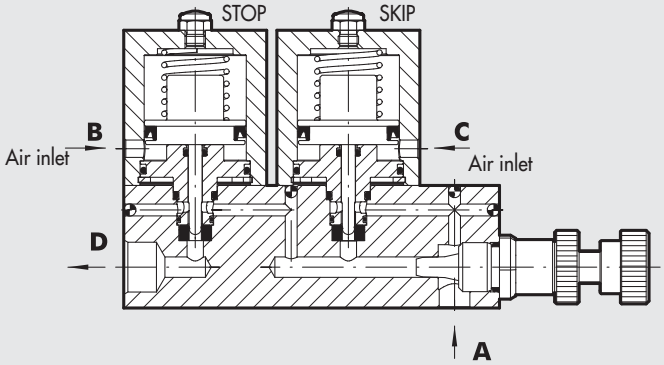


SKIP-STOP APPLICATION WITH VALVES

NO



NC



In normally-open (NO) valves, flow moves freely from A to D. When port C is supplied, this operates the SKIP valve and the fluid is forced through the bottleneck generated by the adjusting pin. When port B is supplied, this operates the STOP valve and interrupts the flow of fluid.
In normally-closed NC valves, flow is normally inhibited. When port B is supplied, the fluid flows through but it is forced through the bottleneck generated by the adjusting pin. When port C is supplied, flow moves freely from A to D.

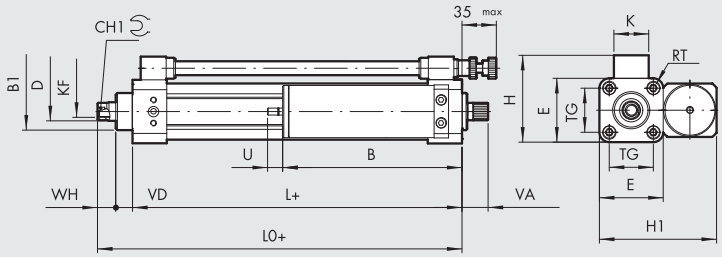
DIMENSIONS AND ORDERING CODES

HYDRAULIC BRAKE WITH REGULATION IN PISTON ROD EXTENSION

Symbol	Code	Ø
	W170001____	40
	W170001____63	63

____ = Enter the stroke

Weight [g]
Ø40: For stroke 0 mm = 1340 g / Each mm = 4.2 g
Ø63: For stroke 0 mm = 2340 g / Each mm = 8.7 g



+ = ADD THE STROKE

Ø	B1	CH1	D	E	H	H1	K	KF	L	L0	RT	TG	VA	VD	WH
40	32	13	16	55	75	101	30	M10	84	114	M6	38	22.5	14.5	15.5
63	45	19	22	75	100	131	35	M16	96	126.5	M8	56.5	22.5	15	15.5

Stroke	B		U max	
	Ø40	Ø63	Ø40	Ø63
1 - 50	109	133	23	28
51 - 150	129	158	39	47
151 - 250	154	178	55	67
251 - 350	174	228	71	86
351 - 450	204	248	87	105
451 - 500	229	273	95	124

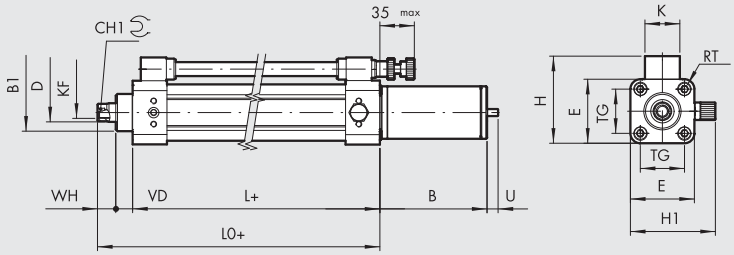
METAL WORK PNEUMATIC

HYDRAULIC BRAKE WITH REGULATION IN PISTON ROD EXTENSION, IN-LINE TANK

Symbol	Code	Ø
	W170001____L	40
	W170001____63L	63

____ = Enter the stroke

Weight [g]
Ø40: For stroke 0 mm = 1300 g / Each mm = 4.2 g
Ø63: For stroke 0 mm = 2300 g / Each mm = 8.7 g

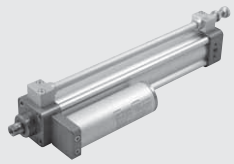


+ = ADD THE STROKE

Ø	B1	CH1	D	E	H	H1	K	KF	L	L0	RT	TG	VD	WH
40	32	13	16	55	75	73	30	M10	84	114	M6	38	14.5	15.5
63	45	19	22	75	100	93	35	M16	96	126.5	M8	56.5	15	15.5

Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	92	112	23	28
51 - 150	112	137	39	47
151 - 250	137	157	55	67
251 - 350	157	187	71	86
351 - 450	187	212	87	105
451 - 500	212	252	95	124

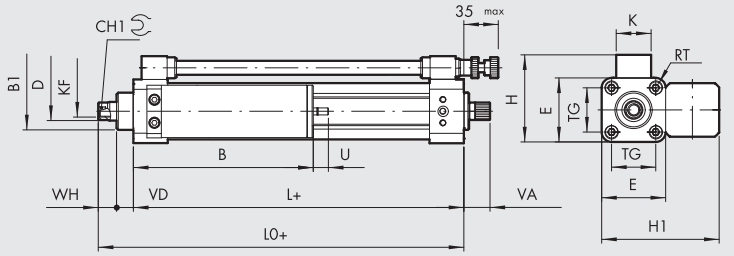
HYDRAULIC BRAKE WITH REGULATION IN PISTON ROD RETRACTION



Symbol	Code	Ø
	W170011____	40
	W170011____63	63

____ = Enter the stroke

Weight [g]
Ø40: For stroke 0 mm = 1340 g / Each mm = 4.2 g
Ø63: For stroke 0 mm = 2340 g / Each mm = 8.7 g

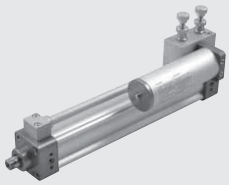


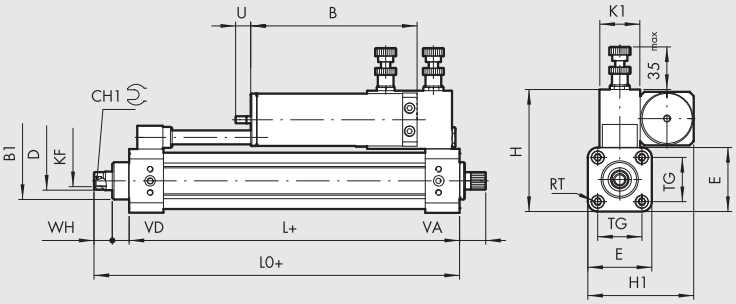
+ = ADD THE STROKE

Ø	B1	CH1	D	E	H	H1	K	KF	L	L0	RT	TG	VA	VD	WH
40	32	13	16	55	75	101	30	M10	84	114	M6	38	22.5	14.5	15.5
63	45	19	22	75	100	131	35	M16	96	126.5	M8	56.5	22.5	15	15.5

Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	109	133	23	28
51 - 150	129	158	39	47
151 - 250	154	178	55	67
251 - 350	174	228	71	86
351 - 450	204	248	87	105
451 - 500	229	273	95	124

HYDRAULIC BRAKE WITH REGULATION IN PISTON ROD EXTENSION/RETRACTION





+ = ADD THE STROKE

Symbol	Code	Ø
	W170021____	40
	W170021____63	63

____ = Enter the stroke

Weight [g]

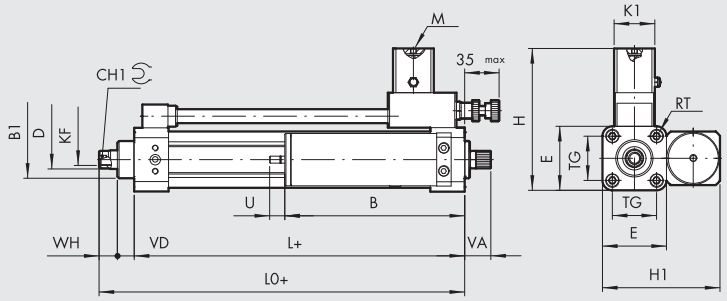
Ø40: For stroke 0 mm = 1710 g / Each mm = 4.2 g

Ø63: For stroke 0 mm = 2760 g / Each mm = 8.7 g

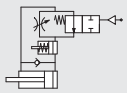
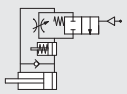
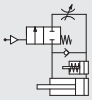
Ø	B1	CH1	D	E	H	H1	K1	KF	L	L0	RT	TG	VA	VD	WH
40	32	13	16	55	105	91	35	M10	84	114	M6	38	22.5	14.5	15.5
63	45	19	22	75	135	111	35	M16	96	126.5	M8	56.5	22.5	15	15.5

Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	98	122	23	28
51 - 150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + SKIP VALVE
HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + STOP VALVE



+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170101____	40	SKIP NO
	W170101____63	63	SKIP NO
	W170201____	40	STOP NO
	W170201____63	63	STOP NO
	W170102____	40	SKIP NC
	W170102____63	63	SKIP NC
	W170202____	40	STOP NC
	W170202____63	63	STOP NC

____ = Enter the stroke

Weight [g]

Ø40: For stroke 0 mm = 1555 g / Each mm = 4.2 g

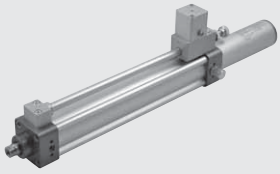
Ø63: For stroke 0 mm = 2620 g / Each mm = 8.7 g

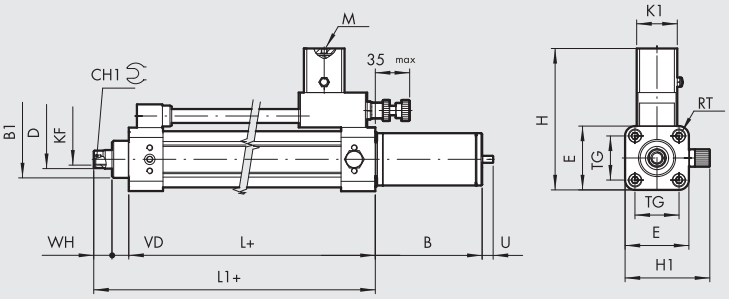
Ø	B1	CH1	D	E	H	H1	K1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	123	101	35	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	143	131	35	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	109	133	23	28
51 - 150	129	158	39	47
151 - 250	154	178	55	67
251 - 350	174	228	71	86
351 - 450	204	248	87	105
451 - 500	229	273	95	124

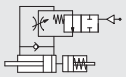
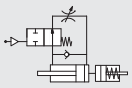
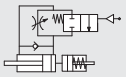
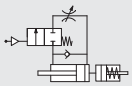
METAL WORK PNEUMATIC

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + SKIP VALVE, IN-LINE TANK
HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + STOP VALVE, IN-LINE TANK





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170101____L	40	SKIP NO
	W170101____63L	63	SKIP NO
	W170201____L	40	STOP NO
	W170201____63L	63	STOP NO
	W170102____L	40	SKIP NC
	W170102____63L	63	SKIP NC
	W170202____L	40	STOP NC
	W170202____63L	63	STOP NC

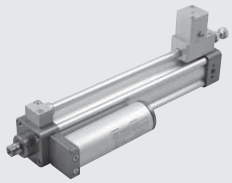
____ = Enter the stroke

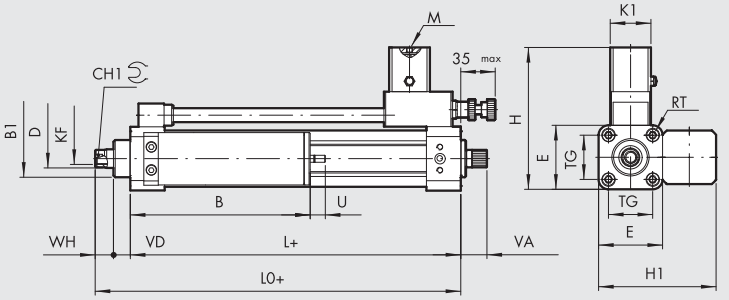
Weight [g]
Ø40: For stroke 0 mm = 1510 g / Each mm = 4.2 g
Ø63: For stroke 0 mm = 2600 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	K1	KF	L	L0	M	RT	TG	VD	WH
40	32	13	16	55	123	73	35	M10	84	114	M5	M6	38	14.5	15.5
63	45	19	22	75	143	93	35	M16	96	126.5	M5	M8	56.5	15	15.5

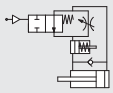
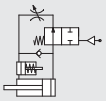
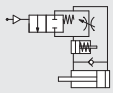
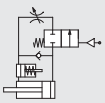
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	92	112	23	28
51 - 150	112	137	39	47
151 - 250	137	157	55	67
251 - 350	157	187	71	86
351 - 450	187	212	87	105
451 - 500	212	252	95	124

HYDRAULIC BRAKE WITH REGULATION IN RETRACTION + SKIP VALVE
HYDRAULIC BRAKE WITH REGULATION IN RETRACTION + STOP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170111____	40	SKIP NO
	W170111____63	63	SKIP NO
	W170211____	40	STOP NO
	W170211____63	63	STOP NO
	W170112____	40	SKIP NC
	W170112____63	63	SKIP NC
	W170212____	40	STOP NC
	W170212____63	63	STOP NC

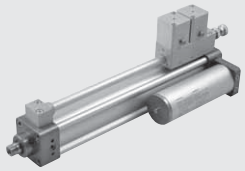
____ = Enter the stroke

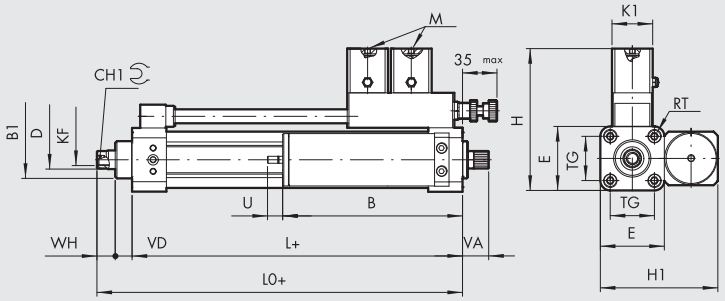
Weight [g]
Ø40: For stroke 0 mm = 1555 g / Each mm = 4.2 g
Ø63: For stroke 0 mm = 2620 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	K1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	123	101	35	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	143	131	35	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

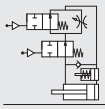
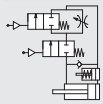
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	109	133	23	28
51 - 150	129	158	39	47
151 - 250	154	178	55	67
251 - 350	174	228	71	86
351 - 450	204	248	87	105
451 - 500	229	273	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + SKIP/STOP VALVES





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170301____	40	SKIP/STOP NO
	W170301____63	63	SKIP/STOP NO
	W170302____	40	SKIP/STOP NC
	W170302____63	63	SKIP/STOP NC

____ = Enter the stroke

Weight [g]

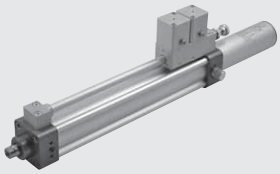
Ø40: For stroke 0 mm = 1730 g / Each mm = 4.2 g

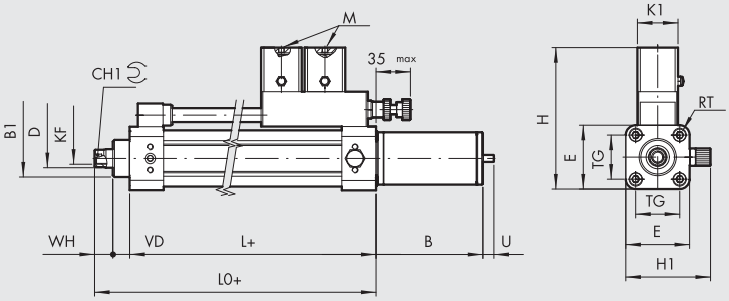
Ø63: For stroke 0 mm = 2850 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	K1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	123	101	35	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	143	131	35	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

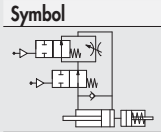
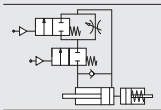
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	109	133	23	28
51 - 150	129	158	39	47
151 - 250	154	178	55	67
251 - 350	174	228	71	86
351 - 450	204	248	87	105
451 - 500	229	273	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION + SKIP/STOP VALVES, IN-LINE TANK





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170301____L	40	SKIP/STOP NO
	W170301____63L	63	SKIP/STOP NO
	W170302____L	40	SKIP/STOP NC
	W170302____63L	63	SKIP/STOP NC

____ = Enter the stroke

Weight [g]

Ø40: For stroke 0 mm = 1690 g / Each mm = 4.2 g

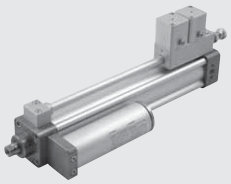
Ø63: For stroke 0 mm = 2800 g / Each mm = 8.7 g

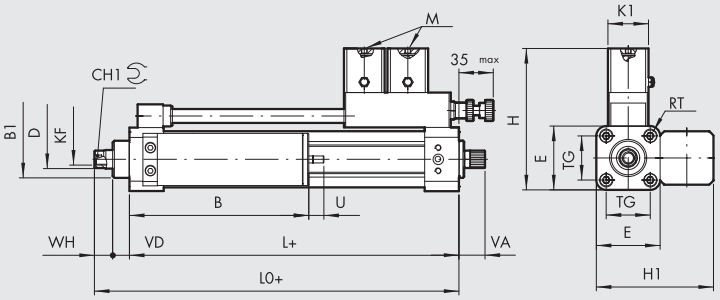
Ø	B1	CH1	D	E	H	H1	K1	KF	L	L0	M	RT	TG	VD	WH
40	32	13	16	55	123	73	35	M10	84	114	M5	M6	38	14.5	15.5
63	45	19	22	75	143	93	35	M16	96	126.5	M5	M8	56.5	15	15.5

Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	92	112	23	28
51 - 150	112	137	39	47
151 - 250	137	157	55	67
251 - 350	157	187	71	86
351 - 450	187	212	87	105
451 - 500	212	252	95	124

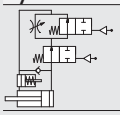
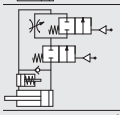
METAL WORK PNEUMATIC

HYDRAULIC BRAKE WITH REGULATION IN RETRACTION + SKIP/STOP VALVES





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170311____	40	SKIP/STOP NO
	W170311____63	63	SKIP/STOP NO
	W170312____	40	SKIP/STOP NC
	W170312____63	63	SKIP/STOP NC

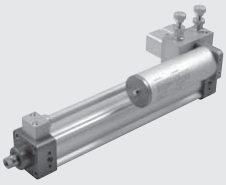
____ = Enter the stroke

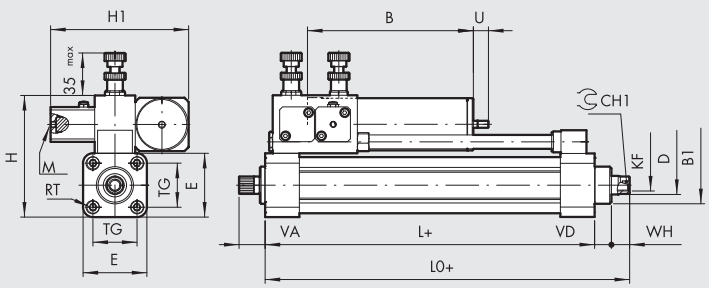
Weight [g]
Ø40: For stroke 0 mm = 1730 g / Each mm = 4.2 g
Ø63: For stroke 0 mm = 2850 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	K1	KF	L	LO	M	RT	TG	VA	VD	WH
40	32	13	16	55	123	101	35	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	143	131	35	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

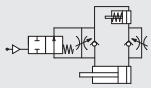
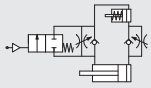
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	109	133	23	28
51 - 150	129	158	39	47
151 - 250	154	178	55	67
251 - 350	174	228	71	86
351 - 450	204	248	87	105
451 - 500	229	273	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + EXTENSION SKIP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W17002A____	40	SKIP NO
	W17002A____63	63	SKIP NO
	W17002B____	40	SKIP NC
	W17002B____63	63	SKIP NC

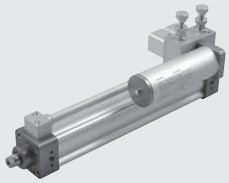
____ = Enter the stroke

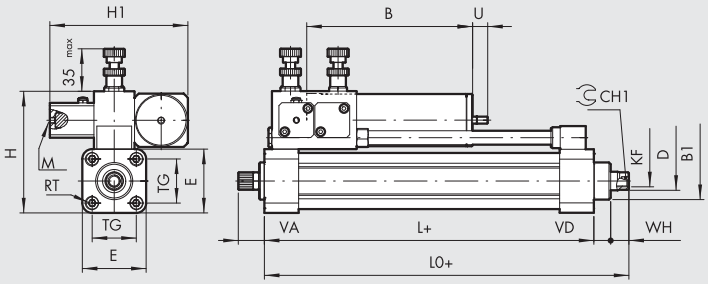
Weight [g]
Ø40: For stroke 0 mm = 1850 g / Each mm = 4.2 g
Ø63: For stroke 0 mm = 2910 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	KF	L	LO	M	RT	TG	VA	VD	WH
40	32	13	16	55	105	119	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	135	129	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

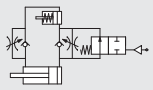
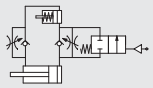
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	98	122	23	28
51 - 150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + RETRACTION SKIP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	**W17002C____**	**40**	SKIP NO
	W17002C____63	**63**	SKIP NO
	**W17002D____**	**40**	SKIP NC
	W17002D____63	**63**	SKIP NC

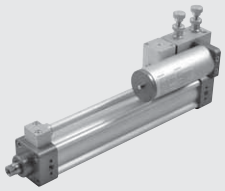
____ = Enter the stroke

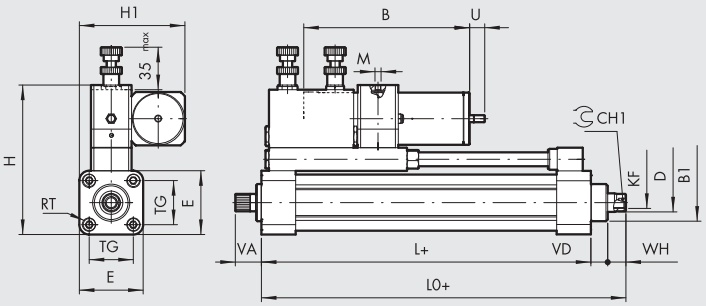
Weight [g]
Ø40: For stroke 0 mm = 1850 g / Each mm = 4.2 g
Ø63: For stroke 0 mm = 2910 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	105	119	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	135	129	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

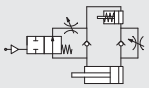
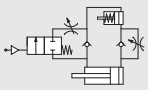
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	98	122	23	28
51 - 150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + EXTENSION STOP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	**W170023____**	**40**	STOP NO
	W170023____63	**63**	STOP NO
	**W170024____**	**40**	STOP NC
	W170024____63	**63**	STOP NC

____ = Enter the stroke
Note: Minimum stroke 100 mm

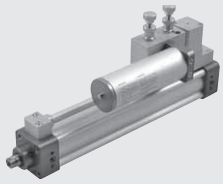
Weight [g]
Ø40: For stroke 0 mm = 1990 g / Each mm = 4.2 g
Ø63: For stroke 0 mm = 3230 g / Each mm = 8.7 g

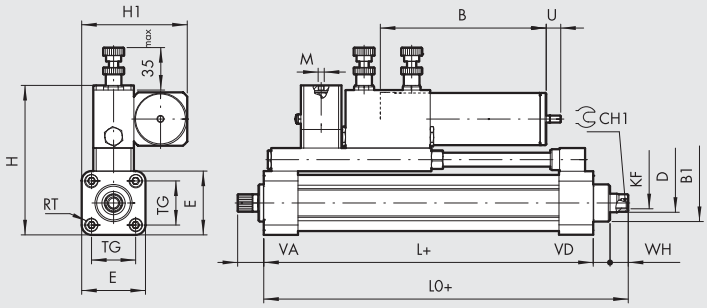
Ø	B1	CH1	D	E	H	H1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	129	91	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	160	111	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
100 - 150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

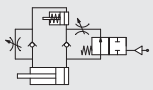
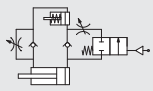
METAL WORK PNEUMATIC

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + RETRACTION STOP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170025____	40	STOP NO
	W170025____63	63	STOP NO
	W170026____	40	STOP NC
	W170026____63	63	STOP NC

____ = Enter the stroke

Note: Minimum stroke 100 mm

Weight [g]

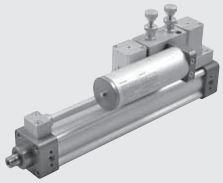
Ø40: For stroke 0 mm = 2080 g / Each mm = 4.2 g

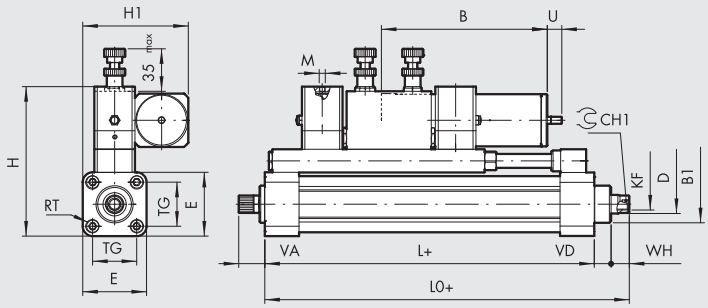
Ø63: For stroke 0 mm = 3230 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	129	91	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	160	111	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

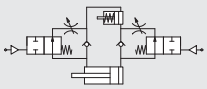
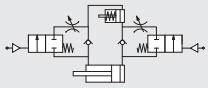
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
100 - 150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL STOP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170221____	40	STOP NO
	W170221____63	63	STOP NO
	W170222____	40	STOP NC
	W170222____63	63	STOP NC

____ = Enter the stroke

Note: Minimum stroke 150 mm

Weight [g]

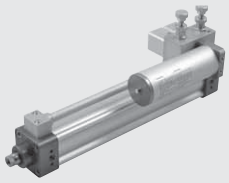
Ø40: For stroke 0 mm = 2260 g / Each mm = 4.2 g

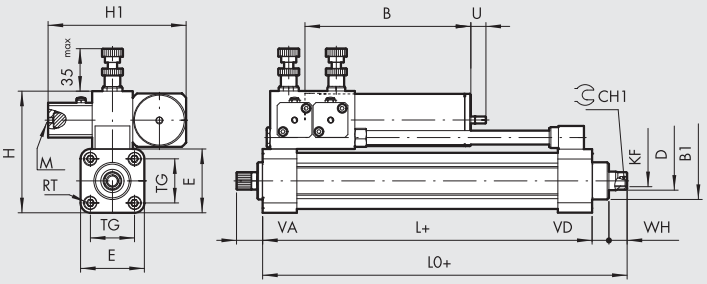
Ø63: For stroke 0 mm = 3560 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	129	91	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	160	111	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

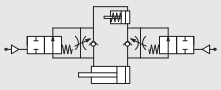
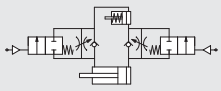
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL SKIP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170121____	40	SKIP NO
	W170121____63	63	SKIP NO
	W170122____	40	SKIP NC
	W170122____63	63	SKIP NC

____ = Enter the stroke

Weight [g]

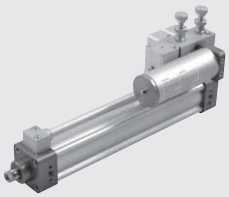
Ø40: For stroke 0 mm = 1850 g / Each mm = 4.2 g

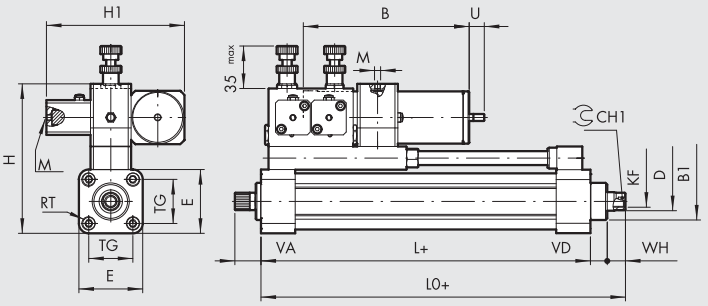
Ø63: For stroke 0 mm = 3050 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	105	119	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	135	129	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

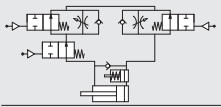
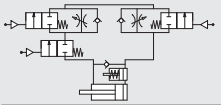
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
1 - 50	98	122	23	28
51 - 150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL SKIP VALVE + PISTON ROD EXTENSION STOP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170123____	40	SKIP + STOP NO
	W170123____63	63	SKIP + STOP NO
	W170124____	40	SKIP + STOP NC
	W170124____63	63	SKIP + STOP NC

____ = Enter the stroke

Note: Minimum stroke 100 mm

Weight [g]

Ø40: For stroke 0 mm = 2110 g / Each mm = 4.2 g

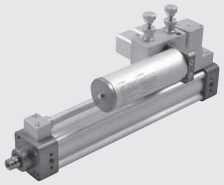
Ø63: For stroke 0 mm = 3490 g / Each mm = 8.7 g

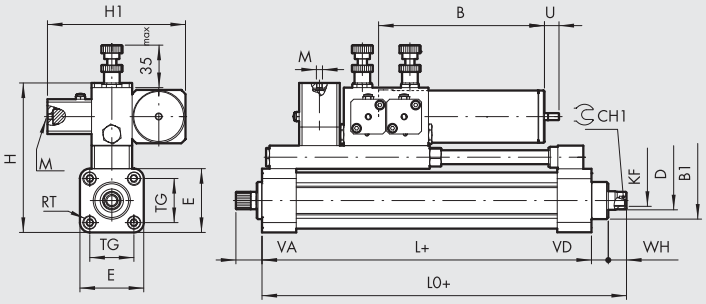
Ø	B1	CH1	D	E	H	H1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	129	119	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	160	129	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
100 - 150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

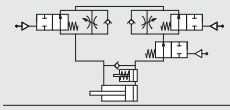
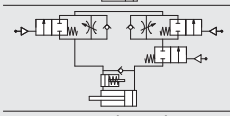
METAL WORK PNEUMATIC

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL SKIP VALVE + PISTON ROD RETRACTION STOP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170125____	40	SKIP + STOP NO
	W170125____63	63	SKIP + STOP NO
	W170126____	40	SKIP + STOP NC
	W170126____63	63	SKIP + STOP NC

____ = Enter the stroke

Note: Minimum stroke 100 mm

Weight [g]

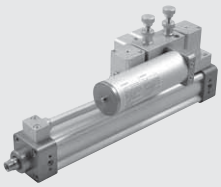
Ø40: For stroke 0 mm = 2210 g / Each mm = 4.2 g

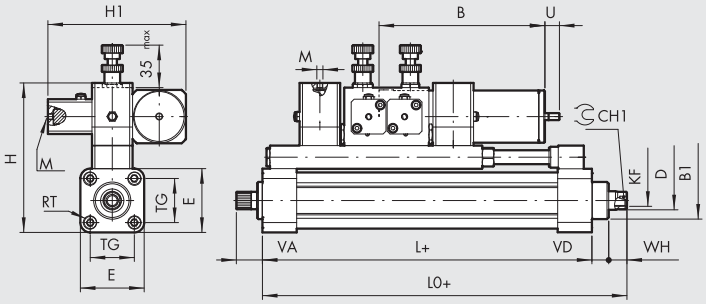
Ø63: For stroke 0 mm = 3490 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	129	119	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	160	129	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

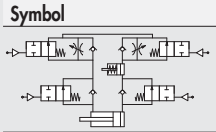
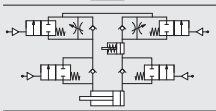
Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
100 - 150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

HYDRAULIC BRAKE WITH REGULATION IN EXTENSION/RETRACTION + DUAL SKIP VALVE + DUAL STOP VALVE





+ = ADD THE STROKE

Symbol	Code	Ø	Valve
	W170321____	40	SKIP + STOP NO
	W170321____63	63	SKIP + STOP NO
	W170322____	40	SKIP + STOP NC
	W170322____63	63	SKIP + STOP NC

____ = Enter the stroke

Note: Minimum stroke 150 mm

Weight [g]

Ø40: For stroke 0 mm = 2415 g / Each mm = 4.2 g

Ø63: For stroke 0 mm = 3820 g / Each mm = 8.7 g

Ø	B1	CH1	D	E	H	H1	KF	L	L0	M	RT	TG	VA	VD	WH
40	32	13	16	55	129	119	M10	84	114	M5	M6	38	22.5	14.5	15.5
63	45	19	22	75	160	129	M16	96	126.5	M5	M8	56.5	22.5	15	15.5

Stroke	B Ø40	B Ø63	U max Ø40	U max Ø63
150	118	147	39	47
151 - 250	143	167	55	67
251 - 350	163	217	71	86
351 - 450	193	237	87	105
451 - 500	218	262	95	124

KEY TO CODES

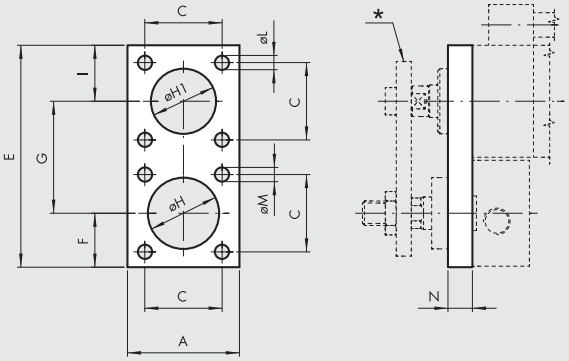
W 1 7 0	1	0	1	0300	L
				STROKE	
W170 BRK hydraulic brake	**0** Regulation **1** Regulation + SKIP **2** Regulation + STOP **3** Regulation + SKIP + STOP	**0** Extension **1** Retraction **2** Extension and retraction	**1** No valve or NO **2** NC ***3** + STOP NO in extension ***4** + STOP NC in extension ***5** + STOP NO in retraction ***6** + STOP NC in retraction **▲A** + SKIP NO in extension **▲B** + SKIP NC in extension **▲C** + SKIP NO in retraction **▲D** + SKIP NC in retraction	Enter the desired stroke in four digits (e.g. 0500 for stroke 500)	**_** Ø 40 **● L** Ø 40 In-line tank **63** Ø 63 **● 63L** Ø 63 In-line tank

● Only for versions with piston rod regulation in extension
* In combination with regulation in extension/retraction or regulation + SKIP in extension/retraction
▲ In combination with regulation in extension/retraction

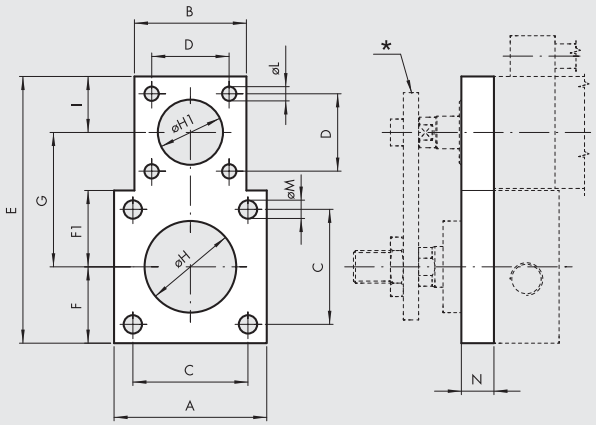
NOTES

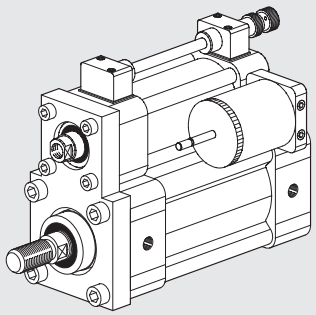
FLANGE FOR MOUNTING HYDRAULIC BRAKE Ø 40 WITH ISO 15552 CYLINDER

Ø 40



Ø 50-63-80-100





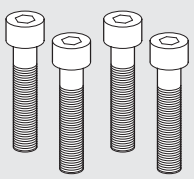
* Piston rod connection plate.

Depending on the cylinder size and operating pressure, it may be necessary for the plate connecting the two piston rods to be guided externally in order to withstand the bending moment due to braking.
The table shows the minimum pressure "p", above which it is advisable to guide the plate.

Code	Ø	A	B	C	D	E	F	F1	G	ØH	ØH1	I	ØL	ØM	N	Weight [g]	p min [bar]
W0950402012	**40**	55	-	38	38	109	26.5	-	55	35	32	27.5	7	7	12	418	10
W0950502012	**50**	65	55	46.5	38	121	32.5	32.5	61	40	32	27.5	7	9	12	540	10
W0950632012	**63**	75	55	56.5	38	131	37.5	37.5	66	45	32	27.5	7	9	15	792	6
W0950802012	**80**	95	55	72	38	151	47.5	47.5	76	45	32	27.5	7	11	15	1216	3
W0951002012	**100**	112	55	89	38	168	56	56	84.5	55	32	27.5	7	11	15	1535	2

Note: 1 pc. per pack complete with 4+4 screws

FLANGE SCREW KIT FOR HYDRAULIC BRAKE Ø 40

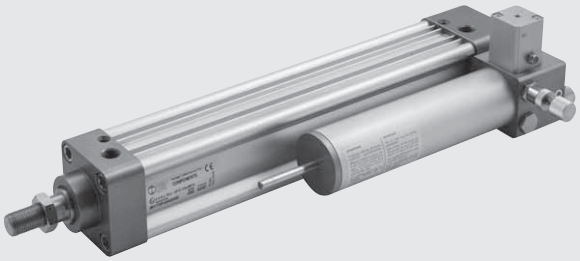


Code	Description	Weight [g]
W0950402111	Kit BRK-P/C-040	58
W0950502111	Kit BRK-P/C-050	93
W0950632111	Kit BRK-P/C-063	97
W0950802111	Kit BRK-P/C-080-100	151

Note: code corresponds to 4 + 4 screws

INTEGRATED HYDRAULIC BRAKE

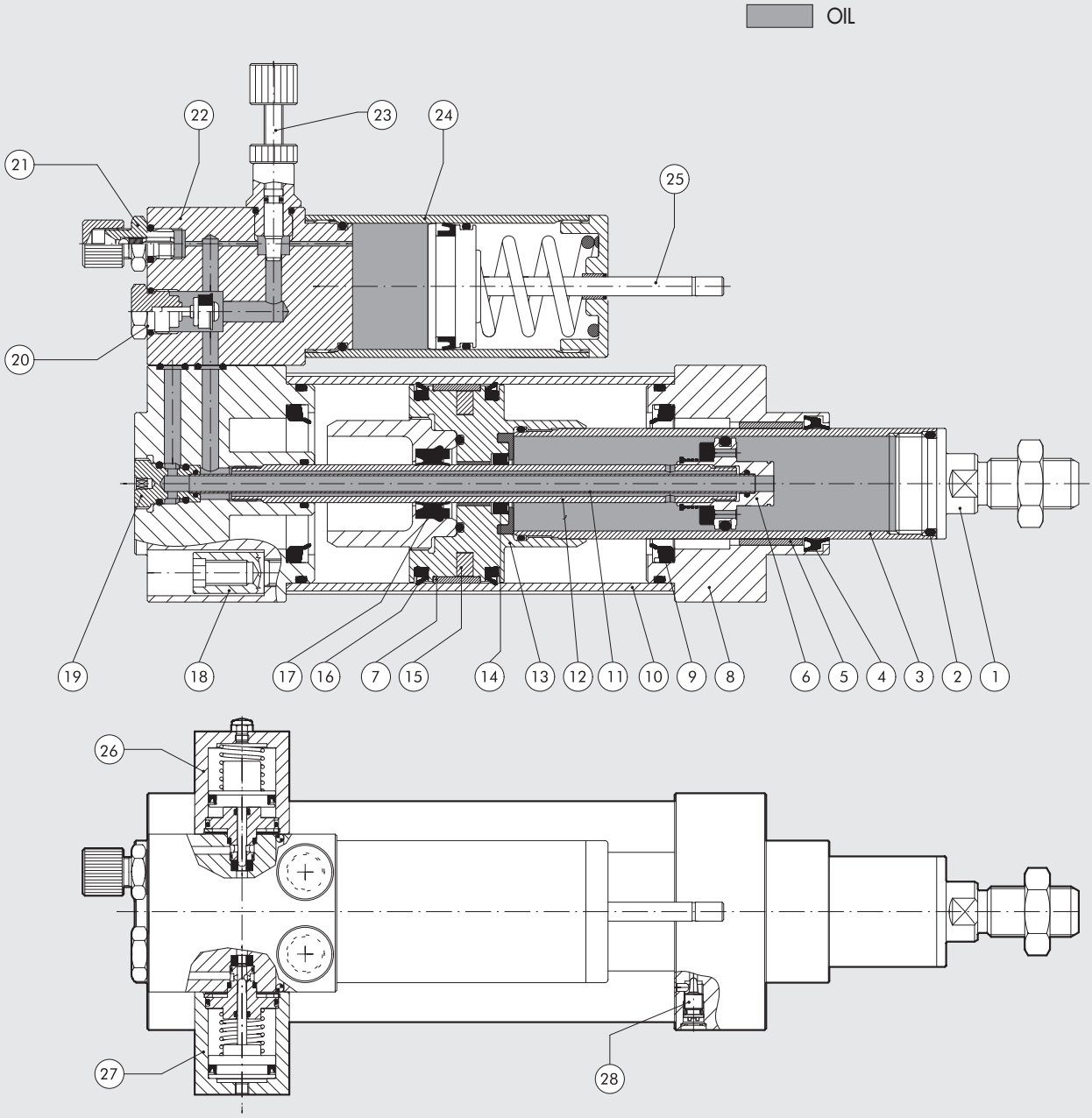
The integrated hydraulic brake is comprised of a pneumatic cylinder that acts as an actuator and an oleo-dynamic circuit that acts as a brake.
The dimensions of the pneumatic cylinder comply with ISO 15552.
The hydraulic circuit is comprised of a brake fluid tank and one or two flow regulation pins. It can mount one or more (slow-fast) SKIP or STOP valves that are normally open (NO) or normally closed (NC), for the piston rod extension and retraction.
The basic feature of this device is that the driving force and the braking force are coaxial, so they do not generate undesired bending moments on the piston rod and the external structures connected to it. Due to its conception, this brake is particularly compact and has reduced dimensions compared to BRK external hydraulic brakes.
After a certain operating time, the brake fluid tank must be topped up with oil. This needs doing when the oil level reaches the minimum mark on the rod. With the piston rod right out, the minimum level mark must not project less than 8-10 mm from the cap.
Always use DEXRON ATF hydraulic oil or another compatible product.
During the first operating cycles, excess oil is expelled through a hole in the tank.



TECHNICAL DATA		Ø50	Ø63	Ø80
Operating pressure	bar	From 1 to 8		
	MPa	From 0.1 to 0.8		
	psi	From 14.5 to 116		
NC valve actuation pressure	bar	From 3 to 8		
	MPa	From 0.3 to 0.8		
	psi	From 43.5 to 116		
Operating temperature range	°C	From-10 to +70		
	°F	From 14 to 156		
Pneumatic circuit fluid		Lubricated or unlubricated filtered air.		
Hydraulic circuit fluid		DEXRON ATF - the list of compatible oils is available on the web site www.metalwork.it		
Thrust force generated at 6 bar	N	1109	1801	2946
Pull force generated at 6 bar	N	600	1292	2437
Maximum load which can be applied from outside while the rod is lock	N			
• Version without valves and with closed pins:				
Thrust Load on the rod		6000		
Traction Load on the rod		5000		
• Version with STOP NC valves not operated:				
Thrust Load on the rod		6000		
Traction Load on the rod		5000		
• Version with STOP NO valves operated at 6 bar:				
Thrust Load on the rod		6000		
Traction Load on the rod		5000		
• Version with STOP NO valves operated at 8 bar:				
Thrust Load on the rod		6000		
Traction Load on the rod		5000		
Speeds at 6 bar and 20°C		see charts on the following pages		
Standard strokes	mm	50, 100, 150, 200, 250, 300, 350, 400, 450, 500.		
		Other special strokes up to 500 available on request.		
Valve combinations		Piston-out, piston-in and dual regulation.		
		The following combinations of valves can be mounted on each regulated section:		
		STOP NO, STOP NC, SKIP NO, SKIP NC, DOUBLE STOP NO, DOUBLE STOP NC,		
		DOUBLE SKIP NO, DOUBLE SKIP NC, STOP NO+STOP NC, SKIP NO+SKIP NC,		
		STOP NO+SKIP NO, STOP NC+SKIP NC, STOP NO+SKIP NC, STOP NC+SKIP NO		
Sensor magnet		All versions are provided with a magnet		

METAL WORK PNEUMATIC

COMPONENTS

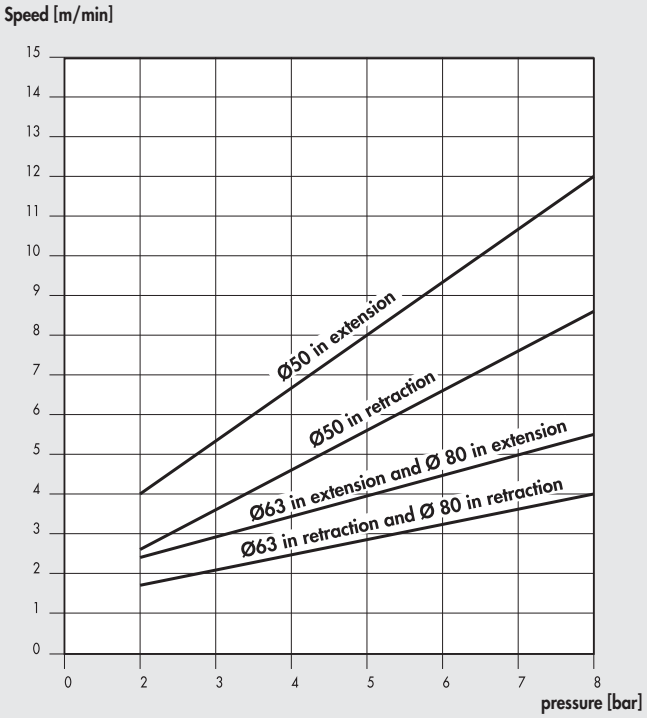


① GUIDE HOLD: AISI 303 stainless steel
② O-RING: NBR
③ PISTON ROD: thickly chromed steel
④ PISTON ROD GASKET: polyurethane
⑤ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑥ INSIDE PISTON: brass
⑦ GUIDE RING: PTFE
⑧ HEAD: anodized aluminium
⑨ CUSHIONING GASKET: NBR
⑩ JACKET: anodised and calibrated aluminium section
⑪ INTERNAL PIPE: brass
⑫ INTERMEDIATE PIPE: steel
⑬ PISTON: aluminium
⑭ PISTON ROD GASKET: polyurethane
⑮ MAGNET: plastoferrite
⑯ PISTON GASKET: NBR
⑰ PISTON ROD GASKET: polyurethane
⑱ SECURING/ASSEMBLY SCREW: self-tapping
⑲ BUSH: nickel-plated brass
⑳ CHECK VALVE
㉑ OIL FILLING VALVE
㉒ REGULATION UNIT: anodised aluminium
㉓ REGULATION PIN
㉔ OIL RECOVERY TANK
㉕ OIL LEVEL ROD: galvanised steel
㉖ NC VALVE
㉗ NO VALVE
㉘ CUSHIONING PIN

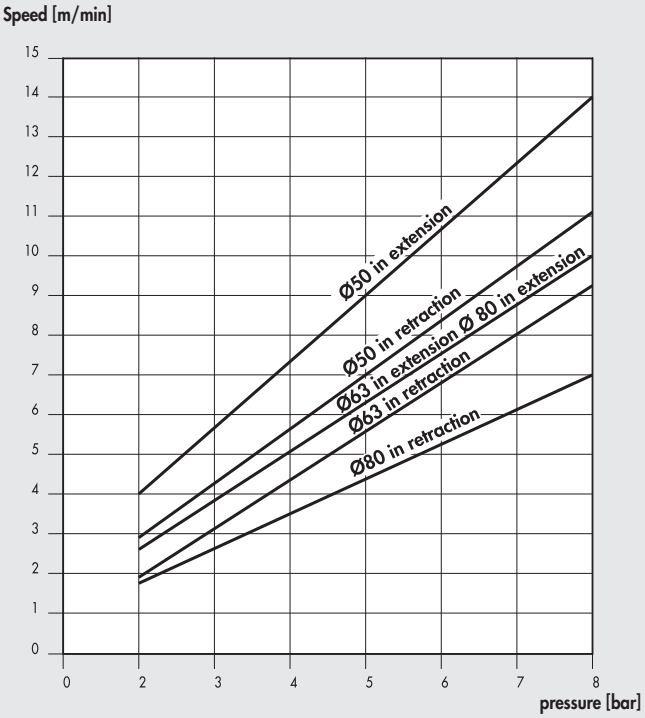
SPEED

Maximum speed reached. The diagrams show the indicative speed, which depends on the bore and feed pressure.
Average values for temperature of 20°C. The maximum speed increases with oil temperature, and vice versa.

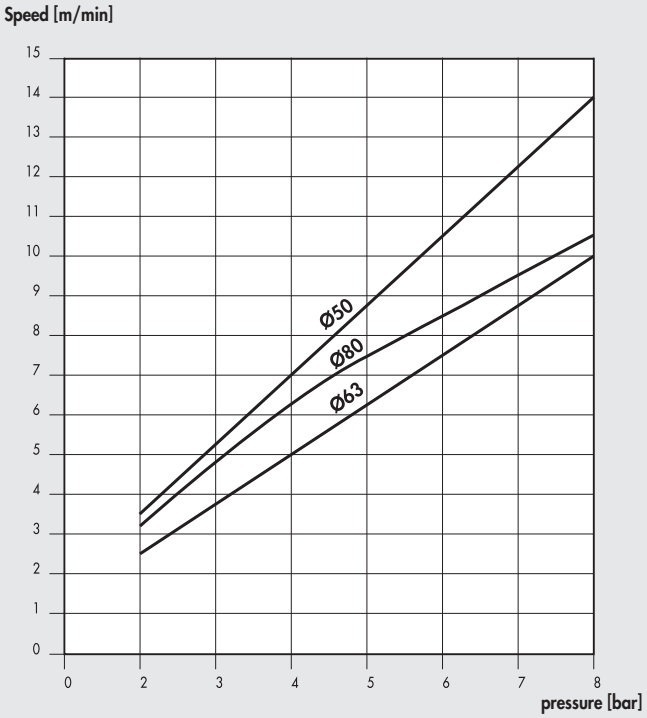
INTEGRATED HYDRAULIC BRAKE WITH VALVES STOP AND WITH VALVES SKIP AND STOP



INTEGRATED HYDRAULIC BRAKE WITH VALVES STOP



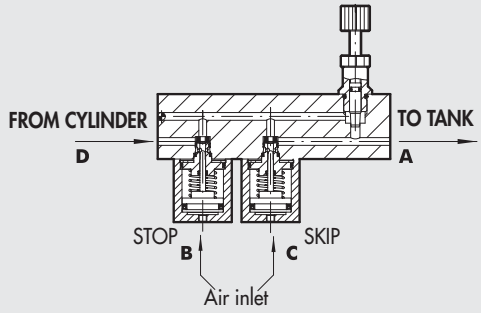
INTEGRATED HYDRAULIC BRAKE WITH REGULATION IN EXTENSION, IN RETRACTION OR DUAL



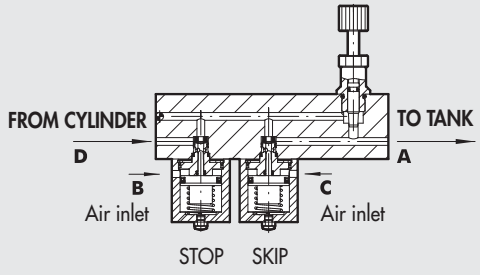
METAL WORK PNEUMATIC

SKIP-STOP APPLICATION WITH VALVES

NO



NC

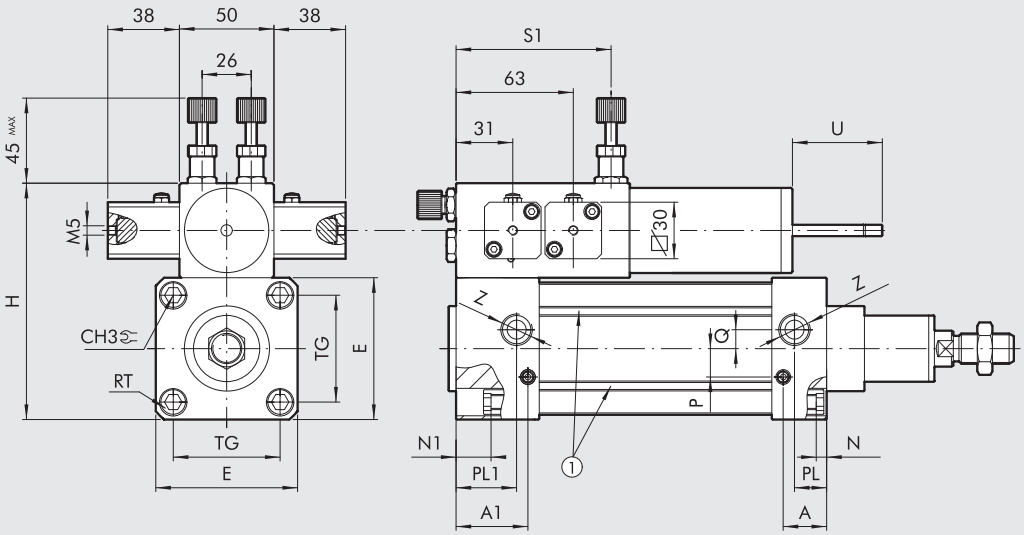


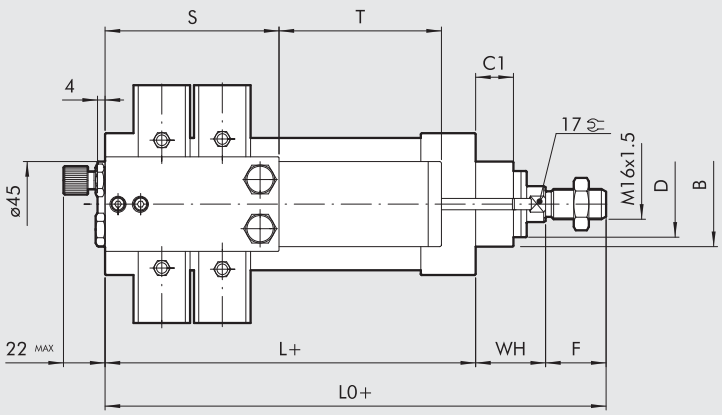
In normally-open (NO) valves, flow moves freely from A to D. When port C is supplied, this operates the SKIP valve and the fluid is forced through the bottleneck generated by the adjusting pin. When port B is supplied, this operates the STOP valve and interrupts the flow of fluid.
In normally-closed NC valves, flow is normally inhibited. When port B is supplied, the fluid flows through but it is forced through the bottleneck generated by the adjusting pin. When port C is supplied, flow moves freely from A to D.

OVERALL DIMENSIONS OF THE VARIOUS VERSIONS

Stroke	T	U max
50	106	25
100	131	30
150	131	35
200	131	40
250	171	45
300	171	50
350	216	55
400	216	60
450	301	65
500	301	70

Type	S	S1
Regulation only	50	40
1 valve for side	50	40
2 valve for side	82	72





+ = ADD THE STROKE

① SLOTS FOR SLIM SENSOR
(ONLY ON THE UTILITY PORTS SIDE)

Ø	A	A1	B	C1	CH3	D	E	F	H	L	L0	N	N1	P	PL	PL1	Q	RT	TG	WH	Z
50	28	38	40	15	8	25	65	32	115	128	192	5.5	19	11	22	32	8	M8	46.5	32	G1/4
63	23	38	45	20	8	35	75	32	125	121	190	5.5	19	15	17	32	10	M8	56.5	37	G3/8
80	25	36	45	16	10	35	95	32	145	125	190	6	15	15	21	32	10	M10	72	33	G3/8

KEY TO CODES

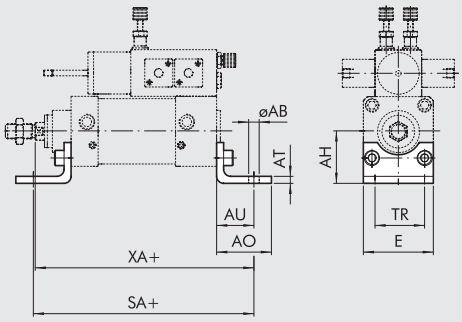
W 1 7 3	2	3	1	0	0 5 0 0
INTEGRATED BRAKE	REGULATION	PISTON ROD EXTENSION CONTROL VALVES	PISTON ROD RETRACTION CONTROL VALVES	BORE	STROKE
W173 Integrated brake	**0** Out **1** In **2** Dual	**0** Without valves **1** Stop NO **2** Stop NC **3** Skip NO **4** Skip NC **5** Stop NO Skip NO **6** Stop NO Skip NC **7** Stop NC Skip NO **8** Stop NC Skip NC	**0** Without valves **1** Stop NO **2** Stop NC **3** Skip NO **4** Skip NC **5** Stop NO Skip NO **6** Stop NO Skip NC **7** Stop NC Skip NO **8** Stop NC Skip NC	**A** Ø 50 **0** Ø 63 **1** Ø 80	Specify the desired stroke in 4 digits (e.g. 0500 for stroke 500)

N.B. With at least one extension control valve and one retraction control valve, type W1732_ _ _ is required.

ACCESSORIES: FIXINGS

FOOT - MODEL A

+ = ADD THE STROKE



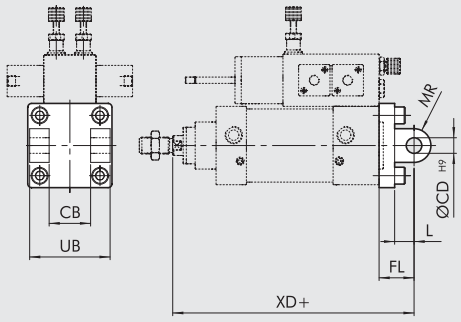
Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	XA	SA	Weight [g]
W0950502001	50	9	45	15	4	32	45	65	192	192	162
W0950632001	63	9	50	15	6	32	50	75	190	185	266
W0950802001	80	12	63	20	6	41	63	95	199	207	456

Note: Individually packed with 2 screws.

N.B.: for fixing the rear head is necessary to use:
- Ø50-63 n. 4 screws M8x40 UNI 5931 (see kit 0950636092)
- Ø80 n. 4 screws M10x40 UNI 5931

FEMALE HINGE - MODEL B

+ = ADD THE STROKE



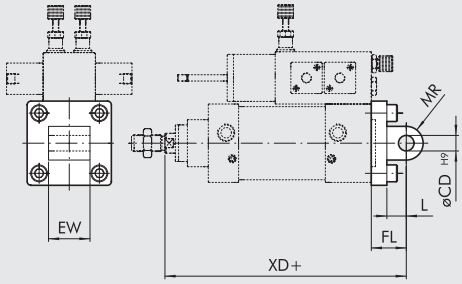
Code	Ø	UB	CB	FL	øCD	XD	MR	L	Weight [g]
W0950502003	50	60	32	27	12	187	12	15	252
W0950632003	63	70	40	32	16	190	16	20	394
W0950802003	80	90	50	36	16	194	16	20	670

Note: Supplied with 4 screws, 4 washers, 2 snap rings and 1 pin.

N.B.: for fixing the rear head is necessary to use:
- Ø50-63 n. 4 screws M8x40 UNI 5931 (see kit 0950636092)
- Ø80 n. 4 screws M10x40 UNI 5931

MALE HINGE - MODEL BA

+ = ADD THE STROKE



Code	Ø	EW	FL	MR	øCD	L	XD	Weight [g]
W0950502004	50	32	27	13	12	15	187	220
W0950632004	63	40	32	17	16	20	190	316
W0950802004	80	50	36	17	16	20	194	578

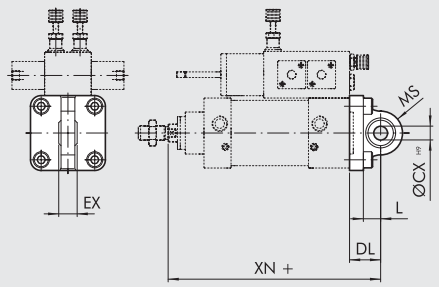
Note: Supplied with 4 screws.

N.B.: for fixing the rear head is necessary to use:
- Ø50-63 n. 4 screws M8x40 UNI 5931 (see kit 0950636092)
- Ø80 n. 4 screws M10x40 UNI 5931

METAL WORK PNEUMATIC

ARTICULATED MALE HINGE - MODEL BAS

+ = ADD THE STROKE

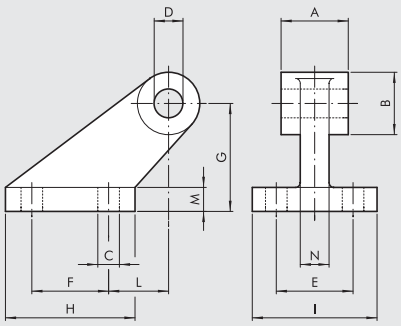


Code	Ø	DL	MS	L	XN	øCX	EX	Weight [g]
W0950502006	50	27	21	15	187	12	16	236
W0950632006	63	32	23	20	190	16	21	336
W0950802006	80	36	28	20	194	16	21	572

Note: Supplied with 4 screws, 4 washers.

N.B.: for fixing the rear head is necessary to use:
- Ø50-63 n. 4 screws M8x40 UNI 5931 (see kit 0950636092)
- Ø80 n. 4 screws M10x40 UNI 5931

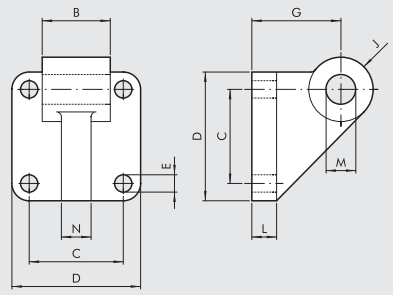
CETOP HINGE FOR MODEL B - MODEL GL



Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440
W0950802008	80	50	33	11	16	40	50	63	75	63	32	12	15	464

Note: Supplied with 4 screws, 4 washers.

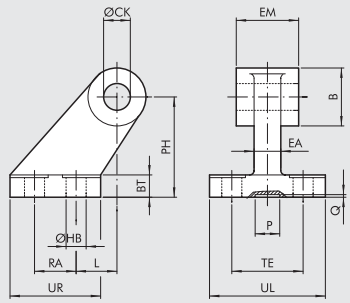
ISO HINGE FOR MODEL B - MODEL GS



Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]
W0950502108	50	31.5	46.5	65	9	45	13	12	12	12	252
W0950632108	63	39.5	56.5	75	9	50	17	12	16	15	350
W0950802108	80	49.5	72	95	11	63	17	16	16	15	655

Note: Supplied with 4 screws, 4 washers.

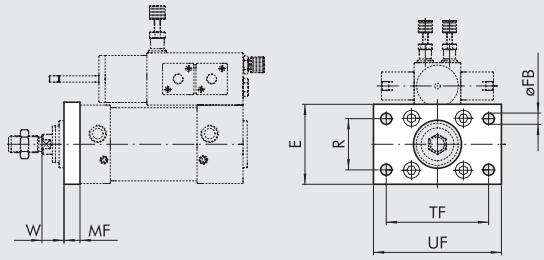
ISO 15552 HINGE FOR MODEL B - MODEL AB7



Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]
W0950502017	50	32	26	9	12	50	30	45	45	65	3	12	16	21	3	162
W0950632017	63	40	30	9	16	52	35	50	50	67	2	14*	16	21	3	191
W0950802017	80	50	30	11	16	66	40	63	60	86	7	14	20	21	3	332

* Dimensions not to ISO 15552

FRONT FLANGE - MODEL C

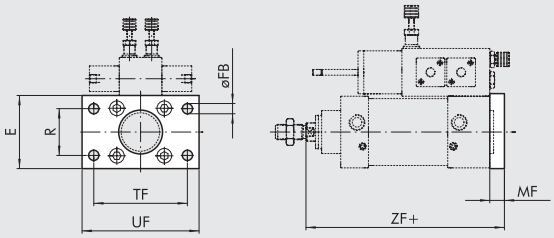


Code	Ø	TF	UF	E	MF	R	øFB	W	Weight [g]
W0950502002	50	90	110	65	12	45	9	20	522
W0950632002	63	100	120	75	12	50	9	25	670
W0950802002	80	126	153	95	16	63	12	17	1420

Note: Supplied with 4 screws.

REAR FLANGE - MODEL C

+ = ADD THE STROKE

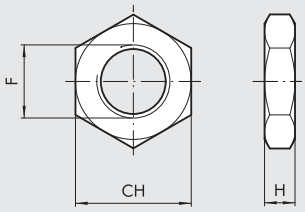


Code	Ø	TF	UF	E	MF	R	øFB	ZF	Weight [g]
W0950502002	50	90	110	65	12	45	9	170	522
W0950632002	63	100	120	75	12	50	9	170	670
W0950802002	80	126	153	95	16	63	12	176	1420

Note: Supplied with 4 screws.

N.B.: for fixing the rear head is necessary to use:
- Ø50-63 n. 4 screws M8x40 UNI 5931 (see kit 0950636092)
- Ø80 n. 4 screws M10x40 UNI 5931

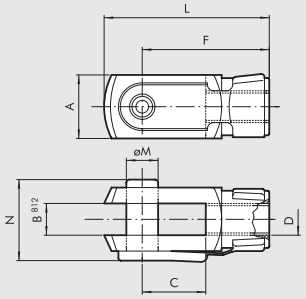
ROD NUT - MODEL S



Code	Ø	F	H	CH	Weight [g]
0950502010	50 - 80	M16x1.5	8	24	20

Note: Individually packed.

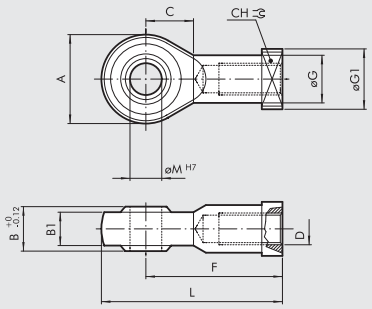
FORK MODEL GK-M



Code	Ø	Ø M	C	B	A	L	F	D	N	Weight [g]
W0950502020	50 - 80	16	32	16	32	83	64	M16x1.5	40	340

Note: Individually packed.

ROD EYE - MODEL GA-M

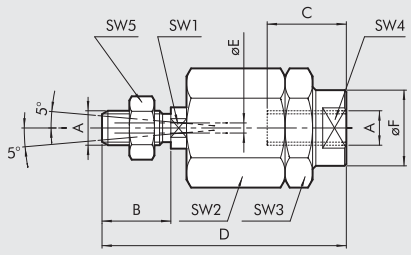


Code	Ø	Ø M	C	B1	B	A	L	F	D	Ø G	CH	Ø G1	Weight [g]
W0950502025	50 - 80	16	22	15	21	42	85	64	M16x1.5	22	22	22	226

Note: Individually packed.

METAL WORK PNEUMATIC

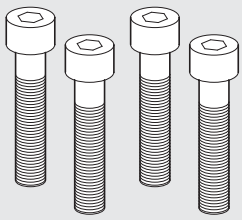
SELF ALIGNING ROD COUPLER - MODEL GA-K



Code	Ø	A	B	C	D	ØF	ØE	SW_1	SW_2	SW_3	SW_4	SW_5	Weight [g]
W0950502030	50 - 80	M16x1.5	32	32	103	32	4	20	41	41	30	24	620

Note: Individually packed.

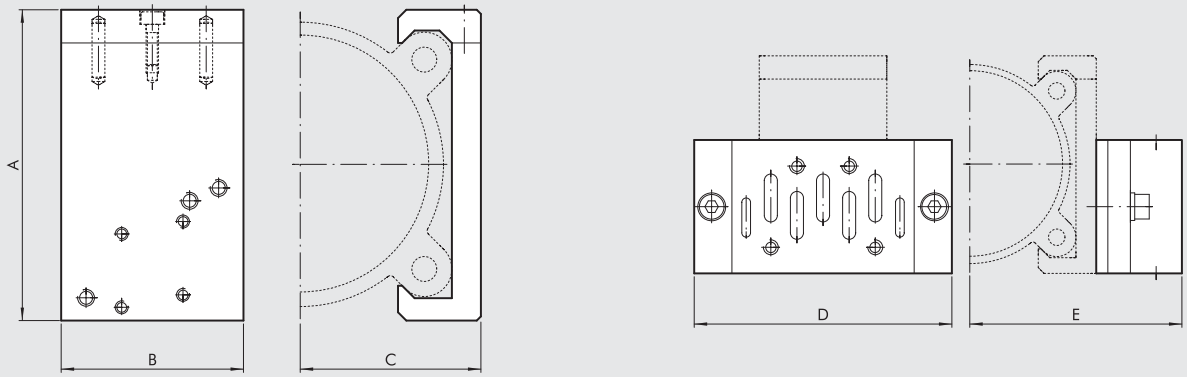
KIT OF REAR HEAD SCREWS Ø50-63



Code	Ø	Description
0950636092	50-63	Kit of M8x40 UNI 5931 rear head fixing screws

Note: 4 items per pack.

CYLINDER BRACKET - VALVE SERIES KCV



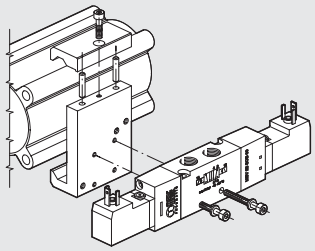
					ISO 1		ISO 2			
Code	**Ø**	**A**	**B**	**C**	**D**	**E**	**D**	**E**	**Applicable valves**	**Weight [g]**
0950502090	**50**	71.5	40	37	110	72	124	78	MACH 16 Serie 70 1/8-1/4 ISO 1 - ISO 2	93
0950632090	**63**	81.5	40	42	110	77	124	83	MACH 16 Serie 70 1/8-1/4 ISO 1 - ISO 2	101
0950802090	**80**	99	60	53.5	110	88.5	124	94.5	Serie 70 1/8-1/4-1/2 ISO 1 - ISO 2	222

KIT FOR FIXING VALVES TO BRACKETS

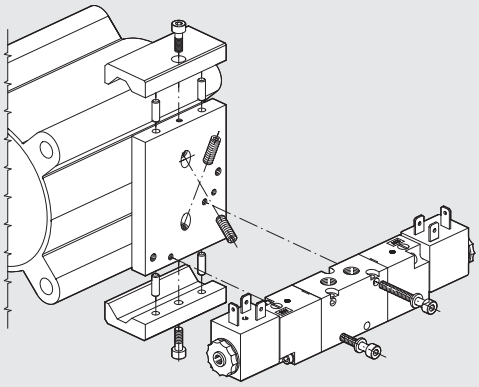
Code	Valve KIT	Composition	Weight [g]
0950002003	MACH 16	2 hex. screws M3x25 with washer	4
0950002004	Series 70 1/8-1/4	2 hex. screws M4x30 with washer	8
0950002001	ISO 1	Adaptor + ISO 1 BASE SIDE + screws + washers (Fig.B)	230
0950002002	ISO 2	Adaptor + ISO 2 BASE SIDE + screws + washers (Fig.B)	350

VALVE ASSEMBLY ON HYDRAULIC BRAKE

FOR Ø 50-63

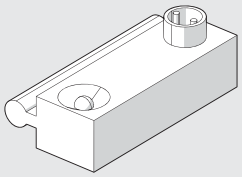


FOR Ø 80



ACCESSORIES: MAGNETIC SENSORS

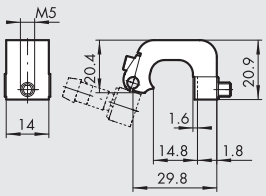
SENSOR SERIES DSM



For codes and technical data, see **chapter A6**.

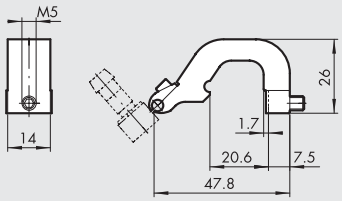
SENSOR SUPPORT BRACKETS FOR SENSORS DSM

Ø 50 to 63



Code	Description
W0950000712	Bracket D.50-63 DST 81

Ø 80

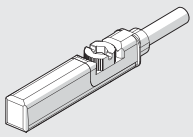


Code	Description
W0950000713	Bracket D.80-100-125 DST 82

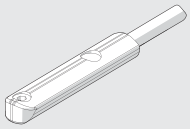
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



METAL WORK PNEUMATIC

NOTES

NOTES

SUMMARY ELECTRIC CYLINDER

METAL WORK PNEUMATIC

ELECTRIC CYLINDER

- ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552 — A5.2

- ELECTRIC CYLINDER SERIES ELEKTRO ROUND DC — A5.39

- ELECTRIC AXIS SERIES ELEKTRO SHAK — A5.46

- ELECTRIC AXIS SERIES ELEKTRO SHAK GANTRY — A5.60

- ELECTRIC AXIS SERIES ELEKTRO SVAK — A5.70

- ELECTRIC AXIS - RODLESS SERIES ELEKTRO SK — A5.77

- ELECTRIC AXIS BELT-DRIVEN RODLESS, SERIES ELEKTRO BK — A5.90

MOTORS AND DRIVES

- ELECTRIC MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO — A5.104

- PROGRAMMABLE UNIT - E.MOTION — A5.124

- PROGRAMMABLE STEPPING MOTOR DRIVE - E.DRIVE — A5.127

- DRIVES FOR STEPPING MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO — A5.130

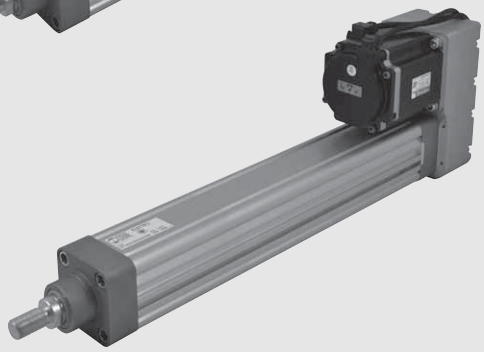
- DRIVES FOR BRUSHLESS MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO — A5.135

ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552

An electric cylinder with a connection interface in accordance with ISO 15552.
The piston rod extension is controlled by a system with a hardened screw and recirculating ball screw nut. The piston has a guide strip calibrated to reduce to a minimum play with the barrel and hence vibration during ball screw rotation.
The cylinder can be equipped with a built-in non-rotating system featuring two opposing slides that run in separate longitudinal slots in the barrel. The piston comes with magnets and the barrel has longitudinal slots for housing sensors. The piston rod has increased outside diameter and thickness to make it extra rigid and more resistant to radial and peak loads.
A system for greasing the screws is included. Numerous standard accessories for pneumatic cylinders, can be used for mounting the cylinder. Accessories made of aluminium, or made of steel for heavy-duty operations, can be used.
The motor can be selected from an optimised range, which encompasses both STEPPING and BRUSHLESS motors.
There is a version with a brake mounted on the motor.
Stepping motors are also available with a brake and encoder (all BRUSHLESS motors come with an encoder). It is important to remember that the brake is static type, so the motor must be stopped before the brake is engaged.
There is a version for in-line assembly, where the drive shaft is jointed directly onto the screw. There is also a geared motor version, where transmission is provided by pulleys and a cog belt with a transmission ratio of 1:1.
A planetary gearbox, in the case of a Ø 100 in-line cylinder, and pulleys with a non-unitary gear ratio, in the case of a Ø 80 and Ø 100 cylinder, can be used to increase the torque. Suitable motor drives are provided.
Special adaptor flanges and joints can be provided if the customer wishes to use a particular brand of motor.

in-line version

geared version



N.B.: A piston rod anti-rotation system must be used. If the piston rod is not fixed firmly to an element, a flange or to any other device preventing it from rotating, a cylinder in the anti-rotation version must be used.

TECHNICAL DATA		Ø 32	Ø 50	Ø 63 - 63 HD	Ø 80	Ø 100
Piston rod thread		M10x1.25	M16x1.5	M16x1.5	M20x1.5	
Environmental temperature range for STEPPING motors	°C	from -10 to +50				
BRUSHLESS motors	°C	from 0 to +40				
Electrical protection rating with STEPPING motors		IP20/IP40 or IP55 (see key to codes on page **A5**.30)			IP55	
BRUSHLESS motors		IP40 or IP65 (see key to codes on page **A5**.30)			IP65	
Maximum relative humidity of the air for IP55 STEPPING motor		90% with 40°C; 57% with 50°C (no condensate)				
IP65 BRUSHLESS motor		90% (no condensate)				
Minimum stroke for version with non-rotating		Twice the screw pitch (to guarantee ball lubrication)				
Minimum stroke for version without non-rotating	mm	80 (in order to re-grease the screw)			125 (in order to re-grease the screw)	
Maximum stroke	mm	1370	1500			
Positioning repeatability	mm	± 0.02				
Positioning accuracy	mm	± 0.2 **				
Overall radial oscillation of the piston rod (without load) for 100 mm of stroke	mm	0.4				
Versions		With or without piston rod non-rotating			With or without piston rod non-rotating; in line or geared motor; wth or without planetary gearbox	
Uncontrolled impact at the end of stroke		NOT ALLOWED (it provides an extra-stroke minimum 5 mm)				
Sensor magnet		YES				
Maximum angle of twist of the piston rod for non-rotating version		1°30′	1°	0°45′	0°35′	0°30′
Work position		Any				

** indicative average data that gets influenced by various factors such as the stroke, the type of motor, the cylinder version, etc ...

METAL WORK PNEUMATIC

MECHANICAL FEATURES		Ø 32		Ø 50			Ø 63			Ø 63 HD		Ø 80			Ø 100	
Screw pitch (p)	mm	4	12	5	10	16	5	10	20	5	10	5	10	32	10	40
Screw diameter	mm	12	12	16	16	16	20	20	20	20	20	32	32	32	50	40
Static axial load (F_o)*	N	3300		4300			7500			12800		27150			36080	
Dynamic axial load (F)	N	5200	5600	10500	6670	4330	10010	12800	4880	17600	18980	30000	43000	26000	73000	43000
		Calculate mean axial load and the calculate life (see graphs on page **A5**.8)														
Maximum number of revs	1/min	4000		3000			2500			2500		2000			2200	
Maximum speed (V_{max})	mm/s	267	800	250	500	800	208	417	833	208	417	165	310	1100	500	1500

* **N.B.:** Static loads bearable without damage. Useful loads are shown in the diagrams on page **A5**.10 onwards.

WEIGHTS (ONLY CYLINDER)		Ø 32		Ø 50			Ø 63 - 63 HD			Ø 80			Ø 100	
Screw pitch (p)	mm	4	12	5	10	16	5	10	20	5	10	32	10	40
Weight at stroke 0	g	896	973	1990	2043	2086	2942	3209	3056	8658	8629	8650	15049	13719
Additional weight each mm of stroke	g	3.98	3.96	6.64	6.62	6.55	6.25	6.32	6.32	15.6	15.3	16	35.5	26
Weight of the in-line transmission (without motor)	g	300		900			1100			1700			2900	
Weight of the geared transmission (without motor)	g	1100		2000			3000			6300			8700	
Moving mass at stroke 0 (non-rotating version) Mx	g	270	353	586	629	703	956	1215	1067	3709	3730	3667	6630	6171
Additional moving mass each mm of stroke	g	1.25		1.84			1.98			4.9			15	9.6

N.B.: You get the total weight of a complete cylinder by adding: weight stroke 0 + stroke [mm] x weight for each mm of stroke + weight of the transmission + weight of the motor.

MASS MOMENTS OF INERTIA

		Ø 32		Ø 50			Ø 63 - 63 HD		
Screw pitch	mm	4	12	5	10	16	5	10	20 (only Ø63)
Transmission ratio (τ)		1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
J0 at stroke 0	kgmm²	1.2407	2.4309	5.3455	6.1360	9.1113	12.4043	14.8767	23.5427
J1 each metre of stroke	kgmm²/m	12.2592	17.8468	35.2305	38.5264	49.1936	86.2990	96.6652	116.3671
J2 each kg of load	kgmm²/kg	0.4053	4.0858	0.6333	2.5332	6.4849	0.6333	2.5332	10.1327
J3 in-line transmission	kgmm²	5.2		5.2			36.2		
J3 geared transmission	kgmm²	53.2		126.5			237.7		

		Ø 80								
Screw pitch	mm	5		10			32			
Transmission ratio (τ)		1:1	1:1.25	1:1	1:1.25	1:1.5	1:1	1:1.5		
J0 at stroke 0	kgmm²	430		420.3			438.8			
J1 each metre of stroke	kgmm²/m	688		608			753			
J2 each kg of load	kgmm²/kg	0.6333		2.5330			25.9382			
J3 in-line transmission	kgmm²	148.2	-	148.2	-	-	148.2	-		
J3 geared transmission	kgmm²	1041.7	388.3	1041.7	388.3	1071.6	1041.7	1071.6		

		Ø 100					
Screw pitch	mm	10			40		
Transmission ratio (τ)		1:1	1:2	1:3 ●	1:1	1:2	1:3 ●
J0 at stroke 0	kgmm²	1357			1042.4		
J1 each metre of stroke	kgmm²/m	3984			1869.3		
J2 each kg of load	kgmm²/kg	2.5330			40.5284		
J3 in-line transmission	kgmm²	327.8	-	594.8	327.8	-	549.8
J3 geared transmission	kgmm²	1041.7	1161.1	-	1041.7	1161.1	-

● in line with gearbox

The total mass moment of inertia (Jtot) reduced for the motor is: Jtot = [J1 · corsa [m] + J2 · (Carico [kg] + Mx [kg]) + J0] · τ^2 + J3
Mx is defined in the weight table.

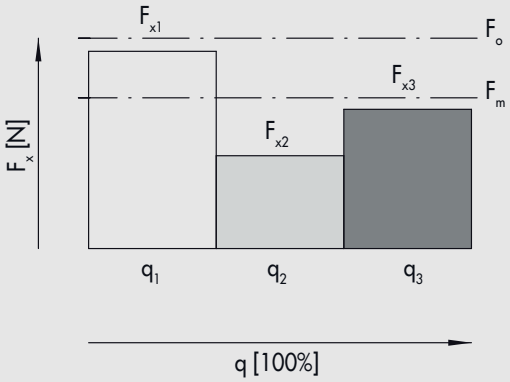
CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

Peak axial load in a work cycle must not exceed the static axial load F_o. The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

Mean axial load F_m

$$F_m = \sqrt[3]{\sum F_x^3 \times \frac{V_x}{V_m} \times \frac{q}{100}} =$$

$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{x1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{x2}}{V_m} + \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{x3}}{V_m} \times \frac{q_3}{100} + \ldots}$$

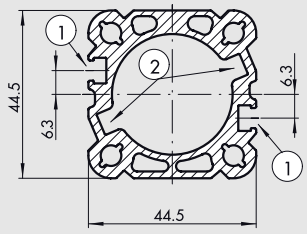


F_x = Axial load at stage x
F_m = Mean axial load during extension
F_o = Static axial load
q = Time segment
V_x = Speed in the phase x
V_m = Average speed

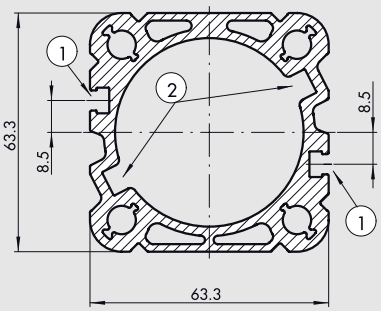
The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
The graphs on page **A5**.8 show screw life as a function of F_m

BARREL CROSS SECTION

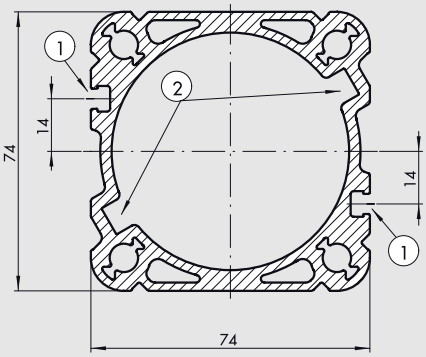
Ø 32



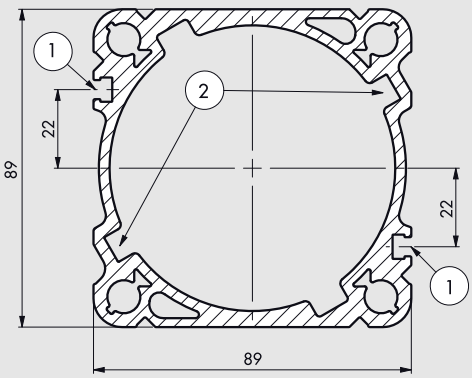
Ø 50



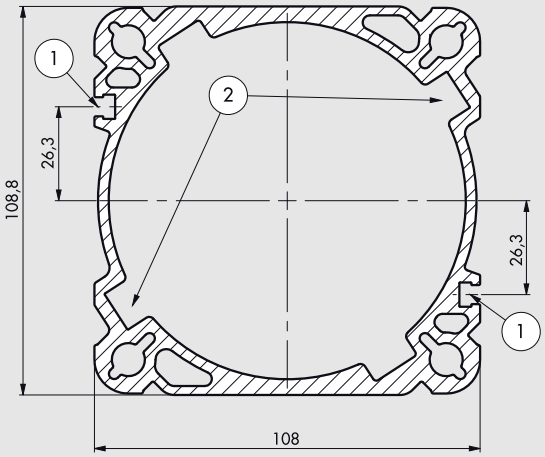
Ø 63



Ø 80



Ø 100

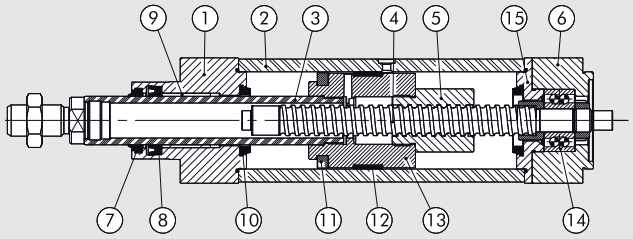


① Slots for sensors
② Slots for anti-rotation

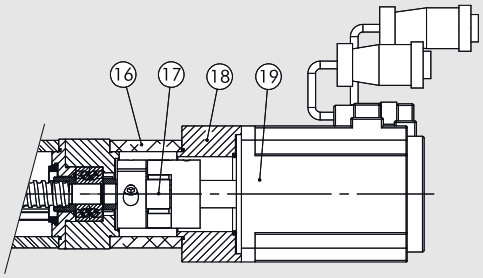
METAL WORK PNEUMATIC

COMPONENTS

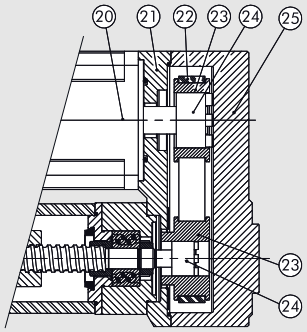
CYLINDER



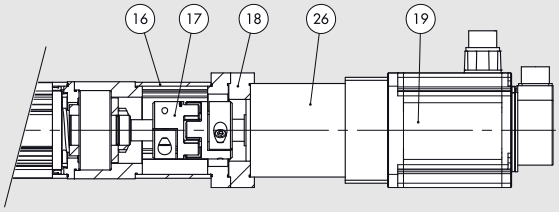
CYLINDER WITH IN-LINE MOTOR



CYLINDER WITH GEARED MOTOR



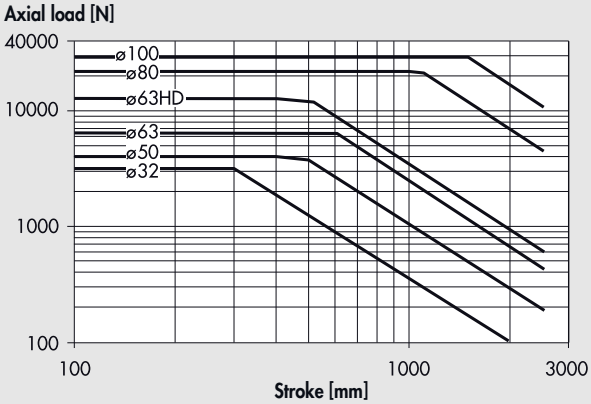
CYLINDER WITH MOTOR AND GEARBOX



① FRONT CYLINDER HEAD: anodised aluminium
② BARREL: extruded and anodised aluminium alloy
③ PISTON ROD: grinded chrome steel
④ WORM SCREW: hardened steel
⑤ BALL SCREW NUT: steel
⑥ REAR CYLINDER HEAD: anodised aluminium
⑦ WIPER RING: polyurethane
⑧ PISTON ROD GASKET: NBR (IP55/ IP65 version only)
⑨ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑩ BUFFER: technopolymer
⑪ MAGNET: plastoferrite
⑫ GUIDE STRIP: self-lubricated calibrated technopolymer
⑬ PISTON: aluminium
⑭ BEARING: oblique with two ball rings
⑮ BEARING LOCKING RING: anodised aluminium
⑯ BELL: extruded and anodised aluminium alloy
⑰ COUPLING
⑱ ADAPTOR PLATE: anodised aluminium
⑲ ELECTRIC MOTOR
⑳ ELECTRIC MOTOR
㉑ TRANSMISSION PLATE: anodised aluminium
㉒ DRIVE BELT
㉓ PULLEY: steel
㉔ SHRINK DISC
㉕ COVER: anodised aluminium
㉖ PLANETARY GEARBOX

PEAK LOADS

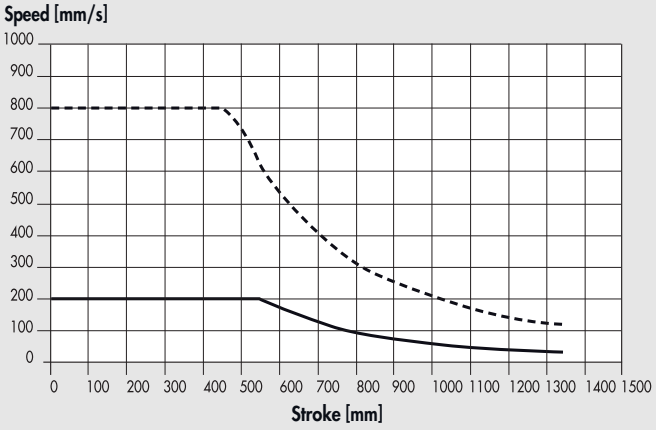
With vertical installations, the following load conditions applied to the piston rod must be met.



CRITICAL VELOCITY

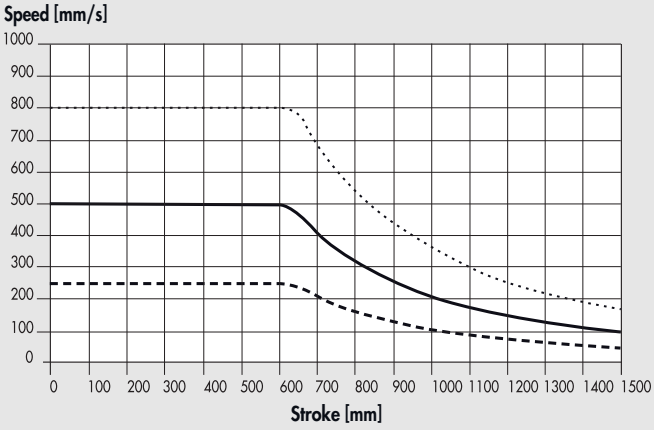
The two variables (stroke and linear speed) must meet the conditions in the graph below, otherwise resonance could be generated and affect the system.

Ø 32



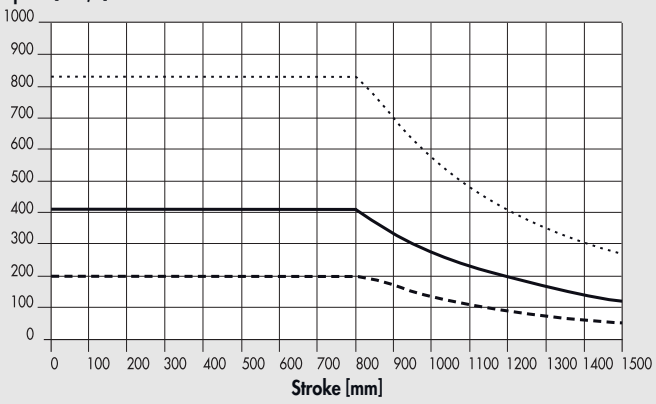
screw pitch 4
screw pitch 12

Ø 50



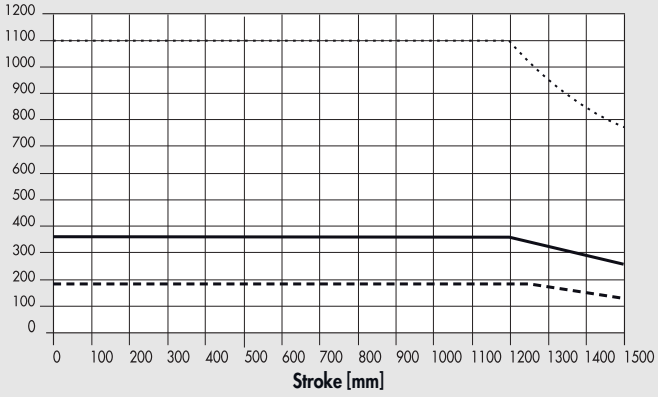
screw pitch 5
screw pitch 10
screw pitch 16

Ø 63 - Ø 63 HD



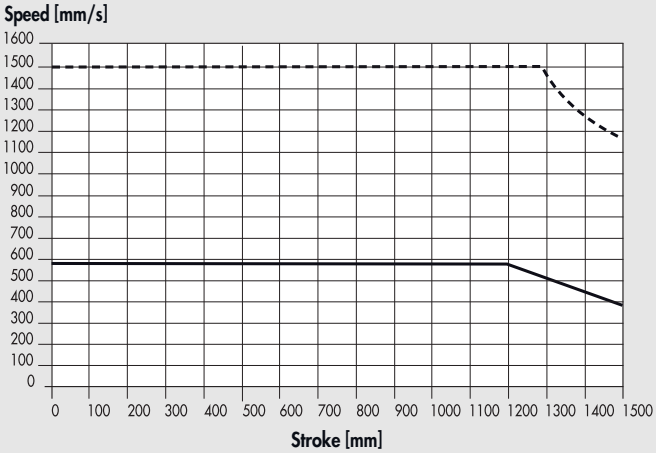
screw pitch 5
screw pitch 10
screw pitch 20 (only Ø 63)

Ø 80



screw pitch 5
screw pitch 10
screw pitch 32

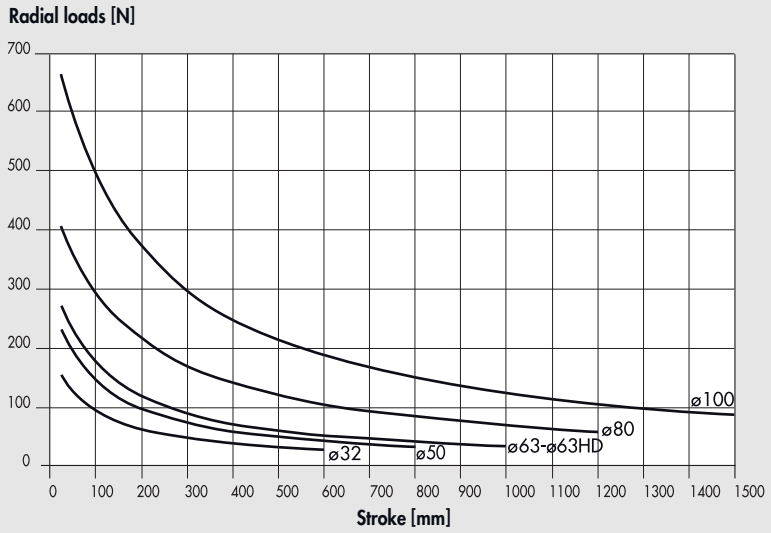
Ø 100



screw pitch 10
screw pitch 40

METAL WORK PNEUMATIC

MAXIMUM RADIAL LOADS ON PISTON ROD



Radial loads can be applied to the piston rod.
They must not exceed the values in the adjacent chart, otherwise the guides on the rod and piston will be subjected to excessive wear.

PISTON ROD SPEED DEPENDING ON THE NUMBER OF SCREW TURNS

SCREW PITCH	TRANSMISSION RATIO	K (n/V)
4	1:1	15
5	1:1	12
	1:1.25	15
10	1:1	6
	1:1.25	7.5
	1:1.5	9
	1:2	12
	1:3	18
12	1:1	5
16	1:1	3.75
20	1:1	3
32	1:1	1.87
	1:1.5	2.81
40	1:1	1.5
	1:2	3
	1:3	4.5

The table shows the direct correspondence between the number of turns (1/min) and the translation speed of the stem (mm/s).
In any case all the other conditions and limitations of each specific cylinder will have to be complied.

Example:
V = 100 mm/s
pitch = 10
transmission ratio = 1:1.5
K = 9
n = V x K = 900 rpm

DRIVE TORQUE AS A FUNCTION OF THE AXIAL LOAD APPLIED TO THE PISTON ROD

SCREW PITCH	TRANSMISSION RATIO	h (C/F)
4	1:1	0.0008
5	1:1	0.0010
	1:1.25	0.0008
10	1:1	0.0020
	1:1.25	0.0016
	1:1.5	0.0013
	1:2	0.0010
	1:3	0.0007
12	1:1	0.0024
16	1:1	0.0032
20	1:1	0.0040
32	1:1	0.0064
	1:1.5	0.0043
40	1:1	0.0080
	1:2	0.0040
	1:3	0.0027

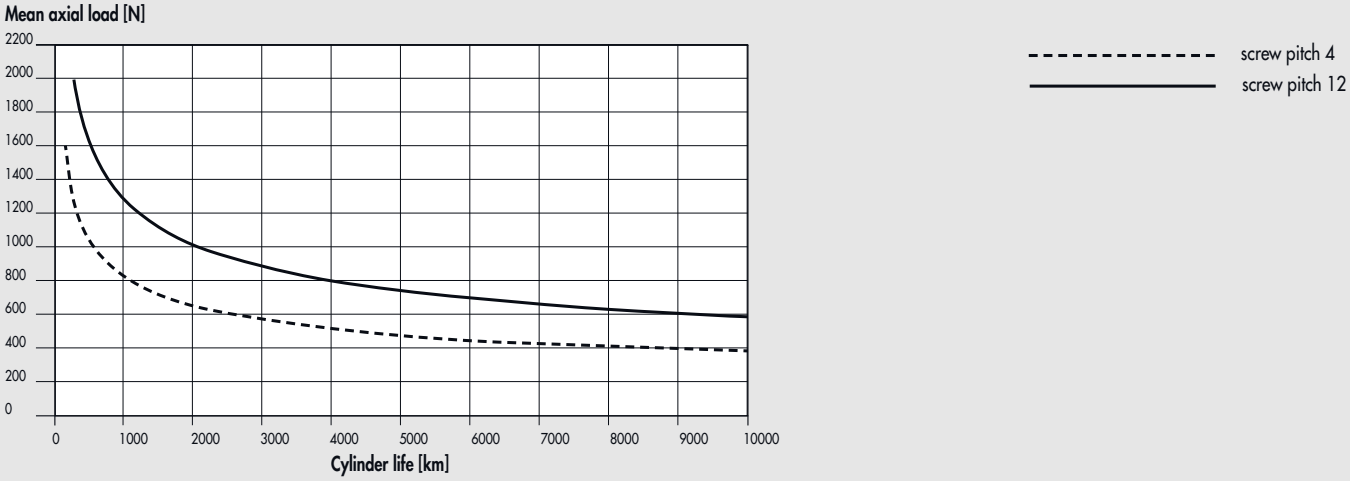
The friction generated in the mechanical system is taken into account.

Example:
F = 1000 N
pitch = 10
transmission ratio = 1:1.5
h = 0.0013
C = F x h = 1.3 Nm

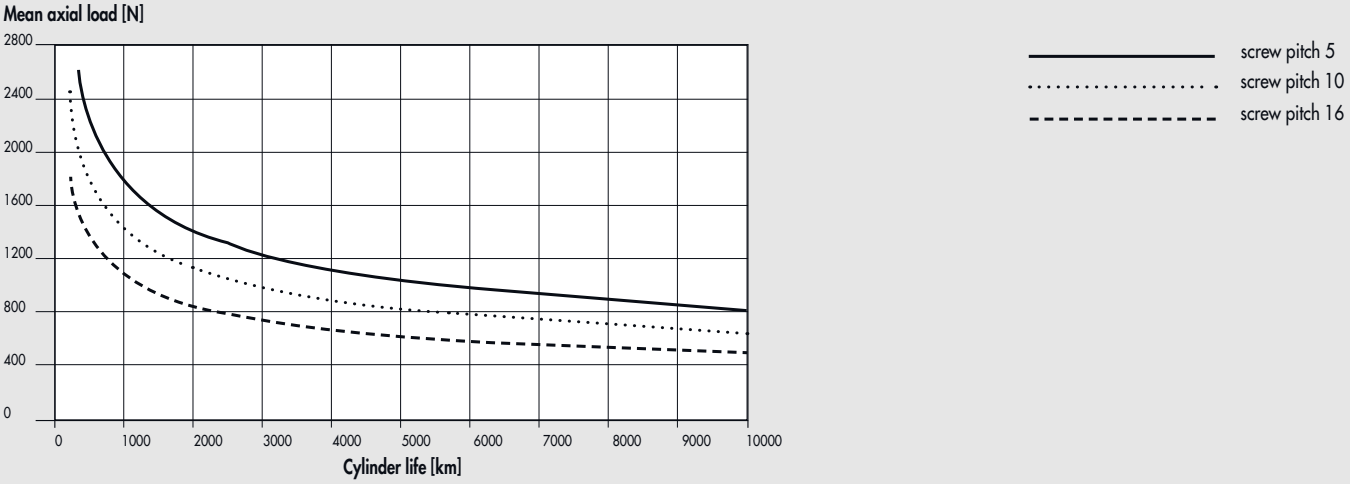
LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD

Life characteristics can vary considerably from those indicated in the graphs due to different operating conditions (radial loads, temperature, lubrication status, etc.).

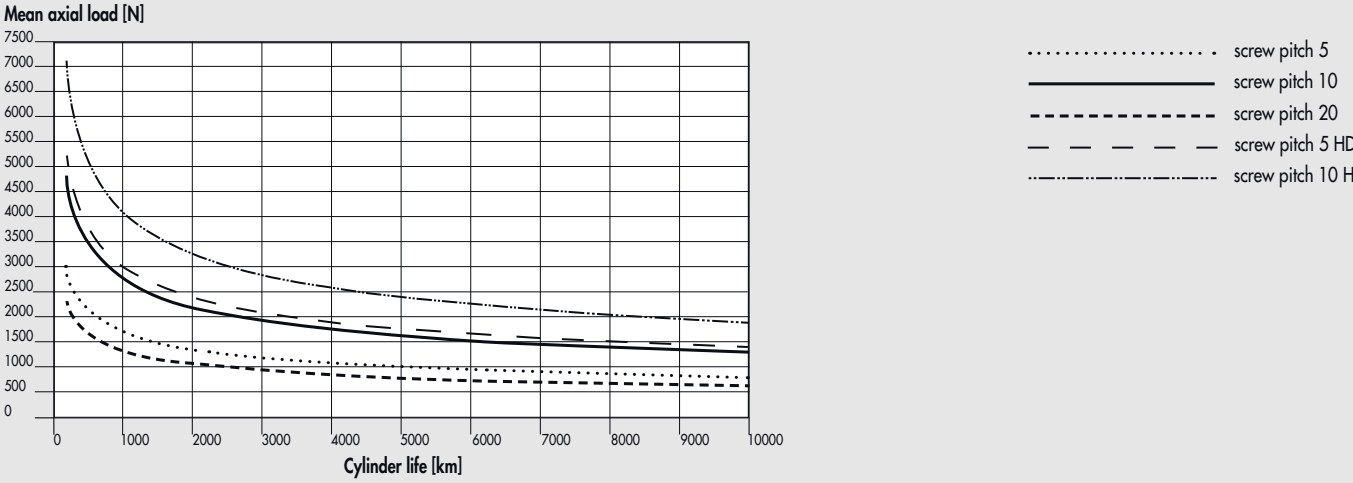
Ø 32



Ø 50

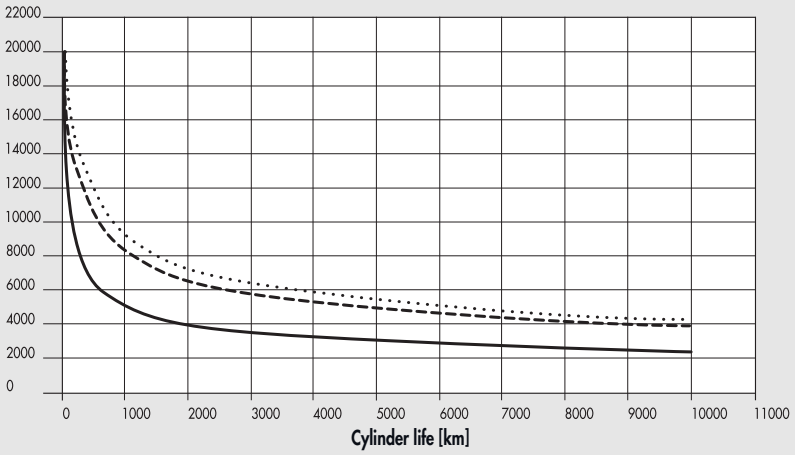


Ø 63 - Ø 63 HD



Ø 80

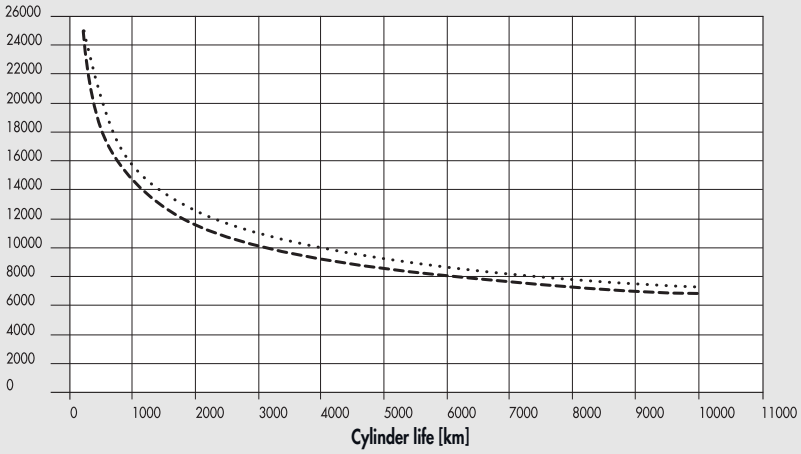
Mean axial load [N]



screw pitch 5
screw pitch 10
screw pitch 32

Ø 100

Mean axial load [N]



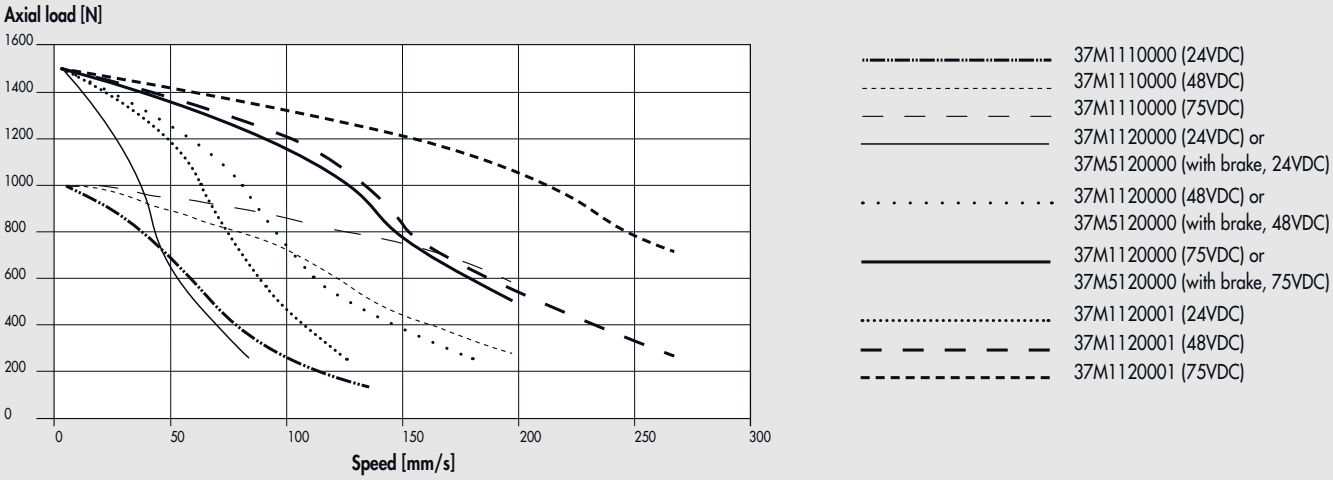
screw pitch 10
screw pitch 40

NOTES

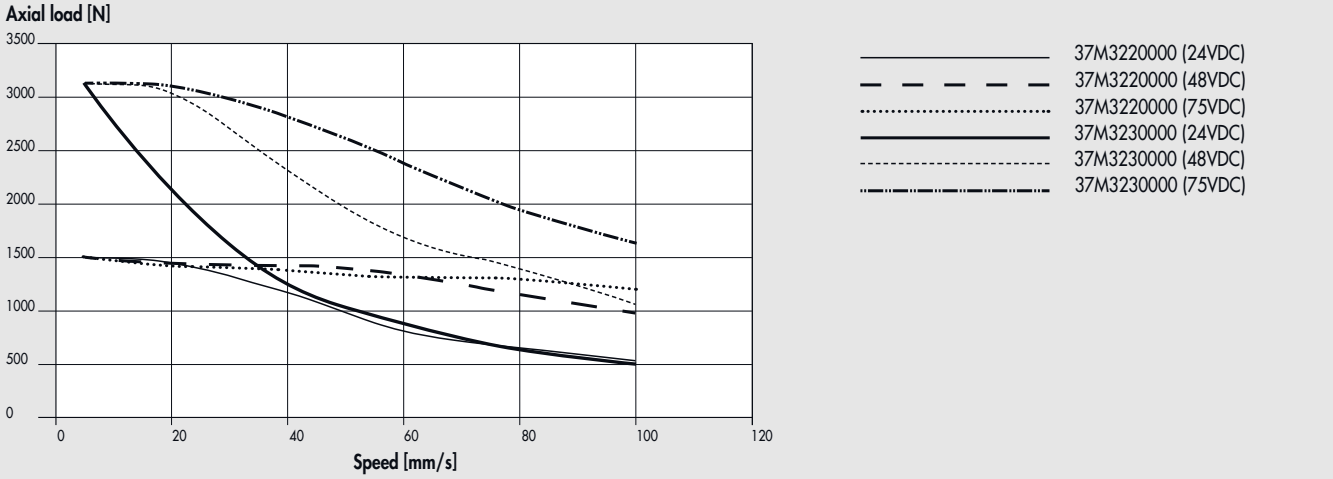
AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPELTE WITH MOTOR AND DRIVE)

N.B.: The obtainable load values already take the efficiency of the system into account. For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available axial load with the motor stopped is also reduced by 50%.

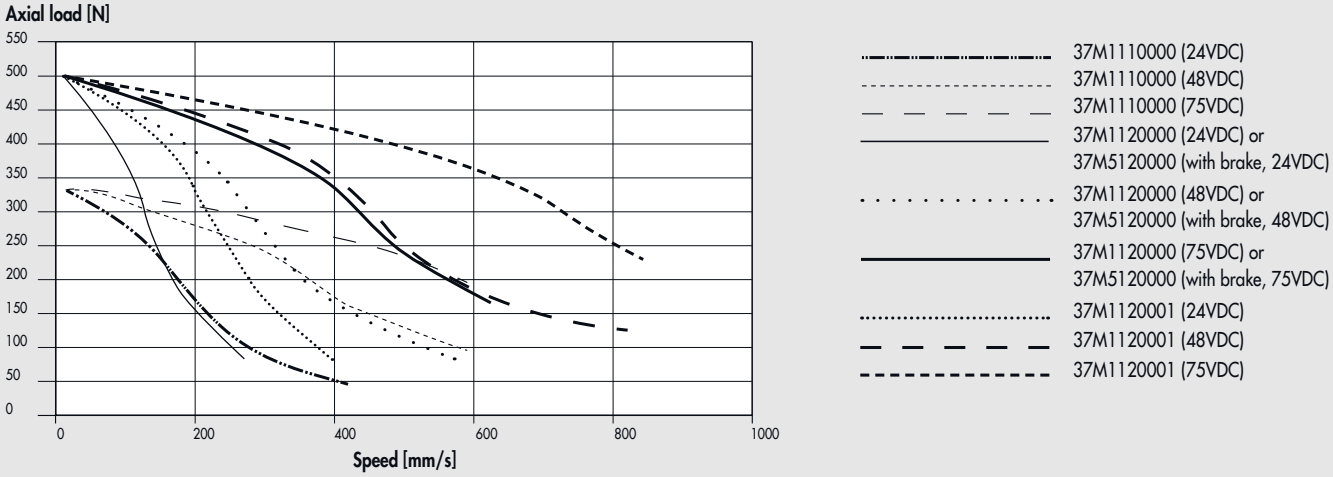
Ø 32 with pitch 4 screw, STEPPING motors and motor 1 STEPPING with BRAKE



Ø 32 with pitch 4 screw, STEPPING motors with BRAKE + ENCODER

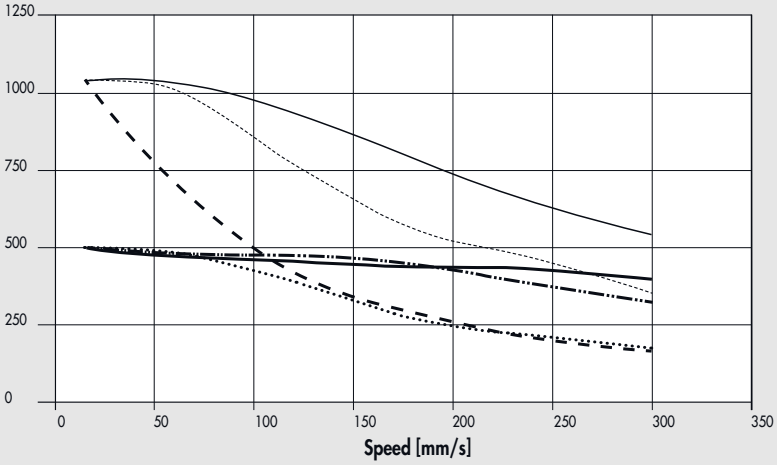


Ø 32 with pitch 12 screw, STEPPING motors and motor 1 STEPPING with BRAKE



Ø 32 with pitch 12 screw, STEPPING motors with BRAKE + ENCODER

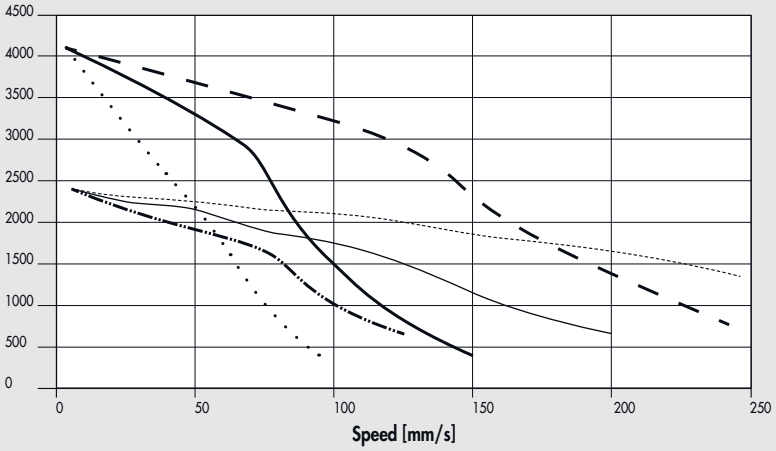
Axial load [N]



37M3220000 (24VDC)
37M3220000 (48VDC)
37M3220000 (75VDC)
37M3230000 (24VDC)
37M3230000 (48VDC)
37M3230000 (75VDC)

Ø 50 with pitch 5 screw, STEPPING motors

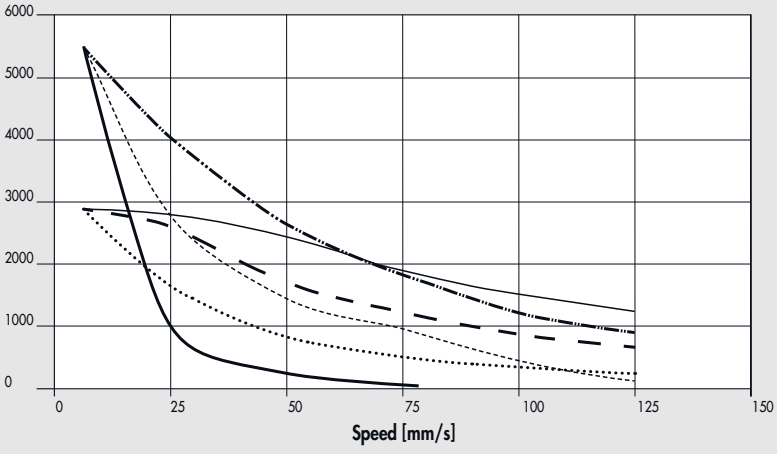
Axial load [N]



37M1430000 (48VDC)
37M1430000 (75VDC)
37M1430000 (140VDC)
37M1440000 (48VDC)
37M1440000 (75VDC)
37M1440000 (140VDC)

Ø 50 with pitch 5 screw, STEPPING motors with BRAKE + ENCODER

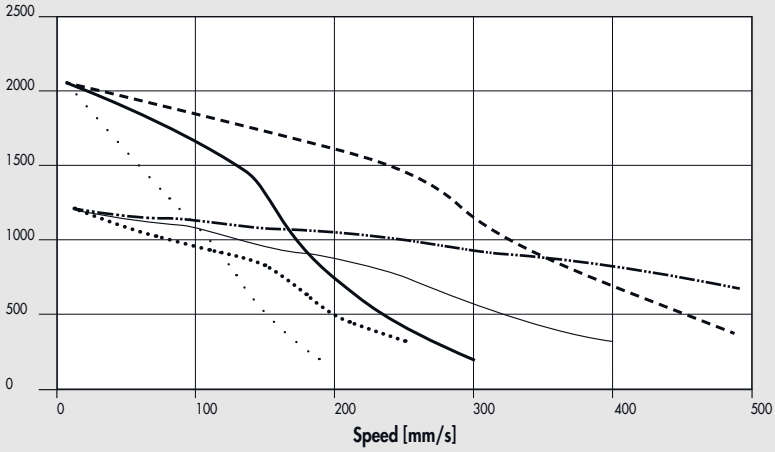
Axial load [N]



37M3430000 (24VDC)
37M3430000 (48VDC)
37M3430000 (75VDC)
37M3460000 (24VDC)
37M3460000 (48VDC)
37M3460000 (75VDC)

Ø 50 with pitch 10 screw, STEPPING motors

Axial load [N]



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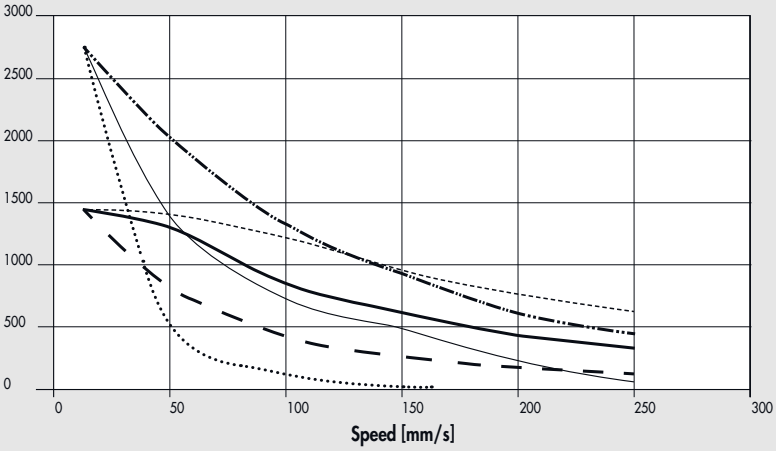
37M1430000 (75VDC)
37M1430000 (140VDC)
37M1440000 (48VDC)
37M1440000 (75VDC)
37M1440000 (140VDC)

Ø 50 with pitch 10 screw, STEPPING motors with BRAKE + ENCODER

Axial load [N]



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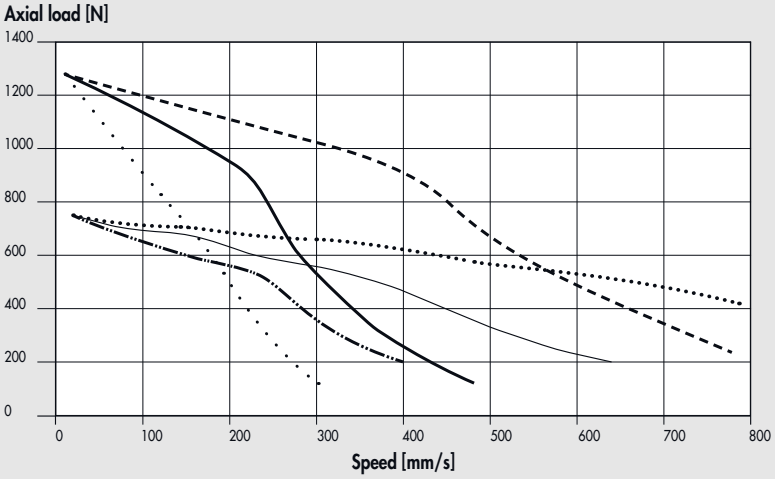
37M3430000 (48VDC)
37M3430000 (75VDC)
37M3460000 (24VDC)
37M3460000 (48VDC)
37M3460000 (75VDC)

Ø 50 with pitch 16 screw, STEPPING motors

Axial load [N]



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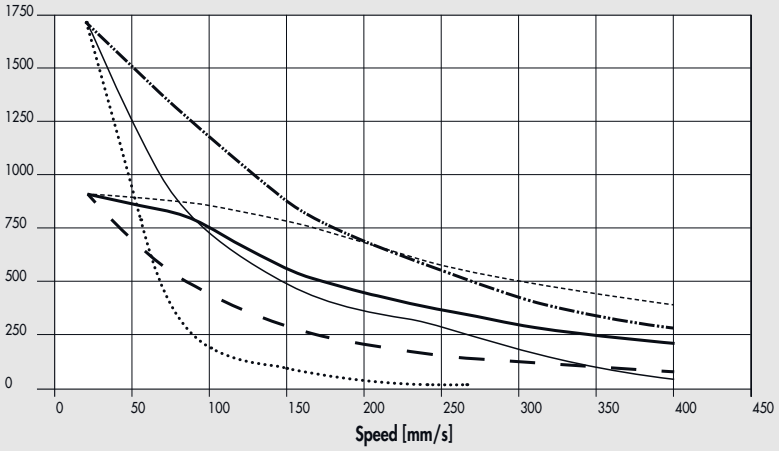
37M1430000 (75VDC)
37M1430000 (140VDC)
37M1440000 (48VDC)
37M1440000 (75VDC)
37M1440000 (140VDC)

Ø 50 with pitch 16 screw, STEPPING motors with BRAKE + ENCODER

Axial load [N]



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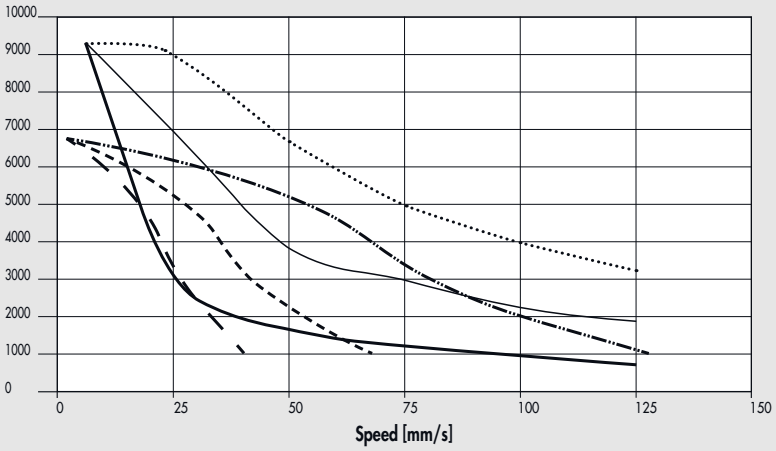
37M3430000 (48VDC)
37M3430000 (75VDC)
37M3460000 (24VDC)
37M3460000 (48VDC)
37M3460000 (75VDC)

Ø 63 with pitch 5 screw, STEPPING motors

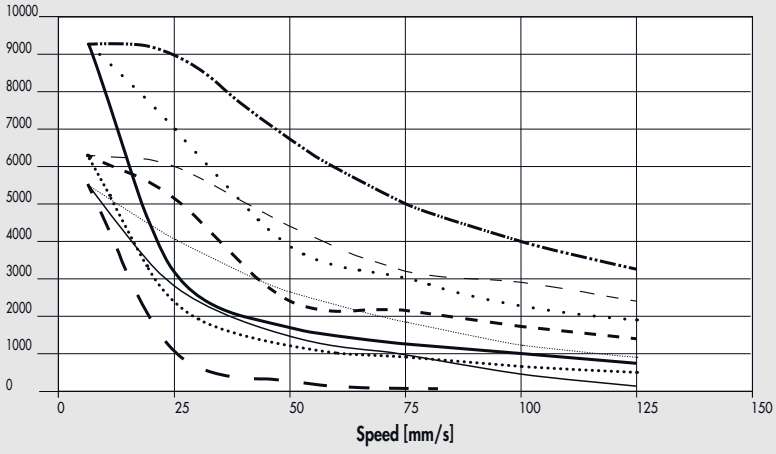
Axial load [N]



37M1450000 (48VDC)
37M1450000 (75VDC)
37M1450000 (140VDC)
37M1470000 (24VDC)
37M1470000 (48VDC)
37M1470000 (75VDC)

Ø 63 with pitch 5 screw, STEPPING motors with BRAKE + ENCODER

Axial load [N]



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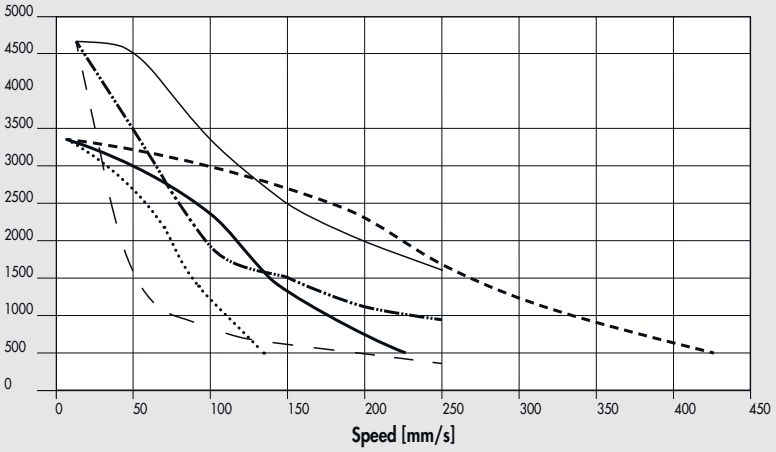
37M3460000 (24VDC)
37M3460000 (48VDC)
37M3460000 (75VDC)
37M3470000 (24VDC)
37M3470000 (48VDC)
37M3470000 (75VDC)

Ø 63 with pitch 10 screw, STEPPING motors

Axial load [N]



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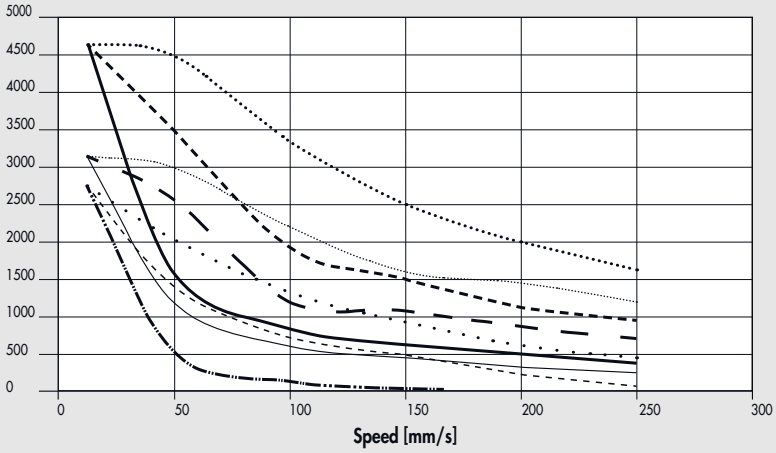
37M1450000 (75VDC)
37M1450000 (140VDC)
37M1470000 (24VDC)
37M1470000 (48VDC)
37M1470000 (75VDC)

Ø 63 with pitch 10 screw, STEPPING motors with BRAKE + ENCODER

Axial load [N]



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37M3450000 (75VDC)
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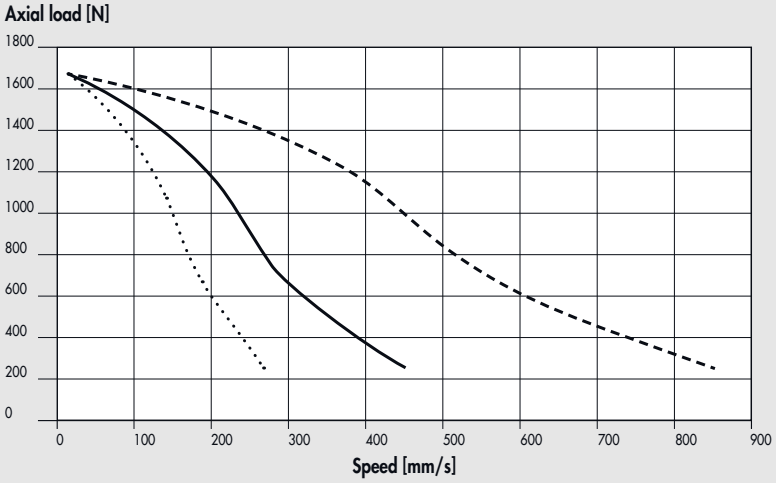
37M3460000 (48VDC)
37M3460000 (75VDC)
37M3470000 (24VDC)
37M3470000 (48VDC)
37M3470000 (75VDC)

Ø 63 with pitch 20 screw, STEPPING motors

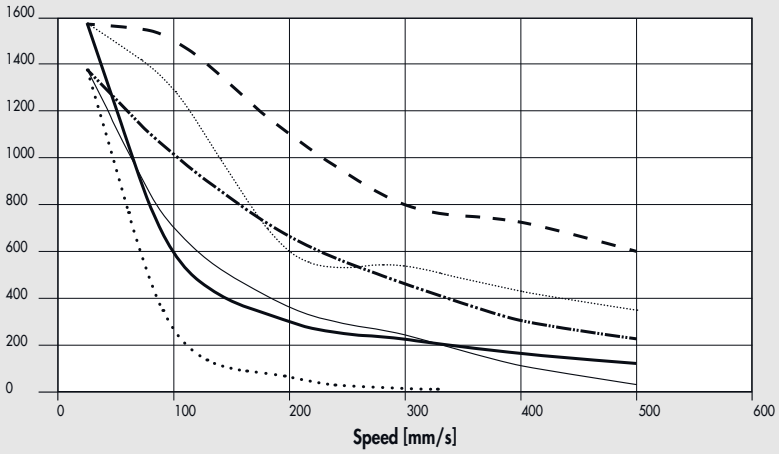
Axial load [N]



37M1450000 (48VDC)
37M1450000 (75VDC)
37M1450000 (140VDC)

Ø 63 with pitch 20 screw, STEPPING motors with BRAKE + ENCODER

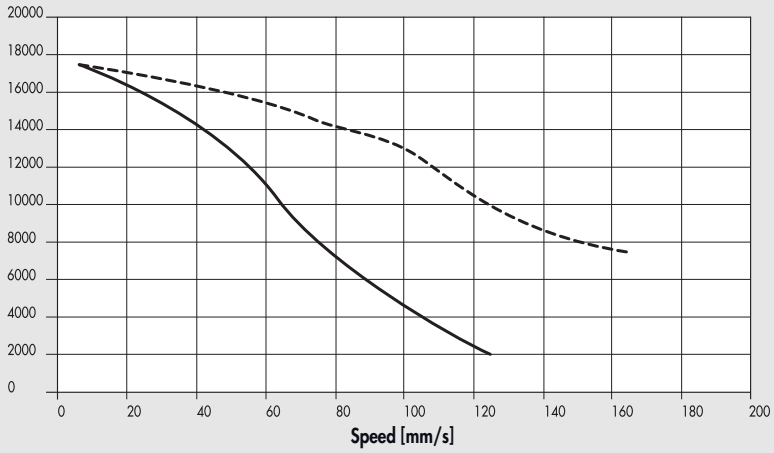
Axial load [N]



37M3450000 (24VDC)
37M3450000 (48VDC)
37M3450000 (75VDC)
37M3460000 (24VDC)
37M3460000 (48VDC)
37M3460000 (75VDC)

Ø 80 with pitch 5 screw, STEPPING motors

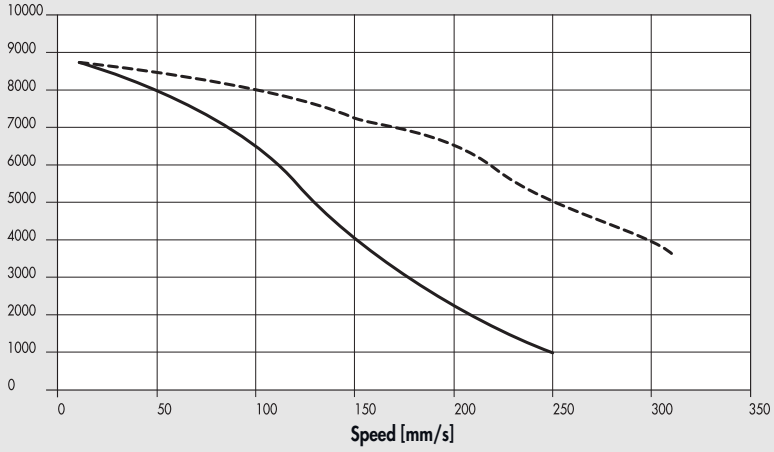
Axial load [N]



37M1890000 + 37D1362001 (230VAC)
37M1890000 + 37D1362001 (115VAC)

Ø 80 with pitch 10 screw, STEPPING motors

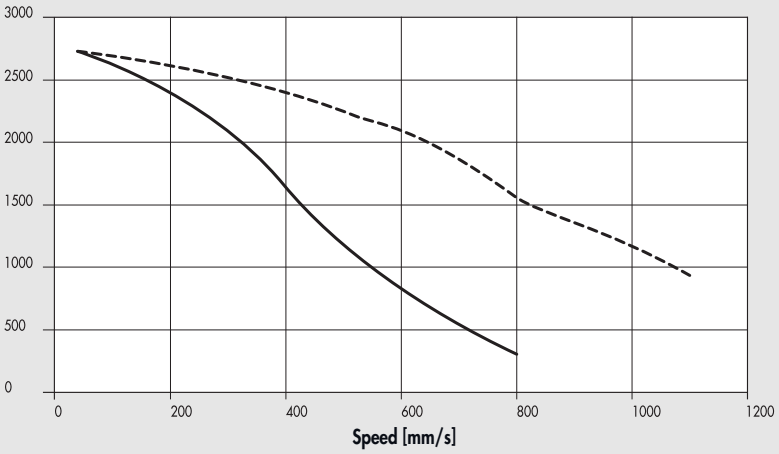
Axial load [N]



37M1890000 + 37D1362001 (230VAC)
37M1890000 + 37D1362001 (115VAC)

Ø 80 with pitch 32 screw, STEPPING motors

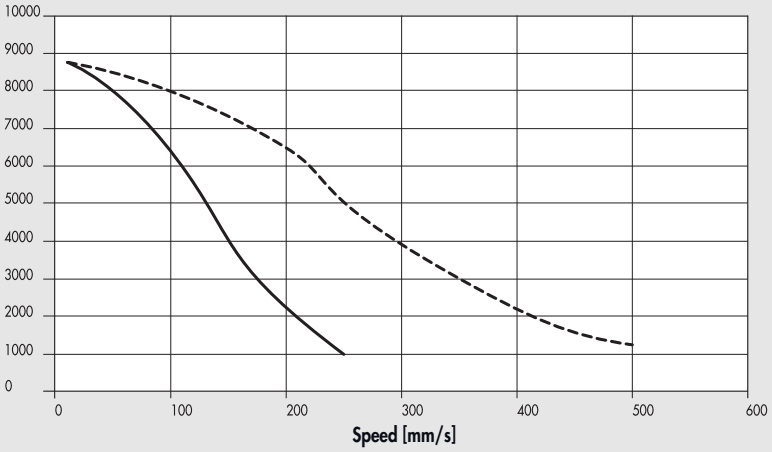
Axial load [N]



37M1890000 + 37D1362001 (230VAC)
37M1890000 + 37D1362001 (115VAC)

Ø 100 with pitch 10 screw, STEPPING motors

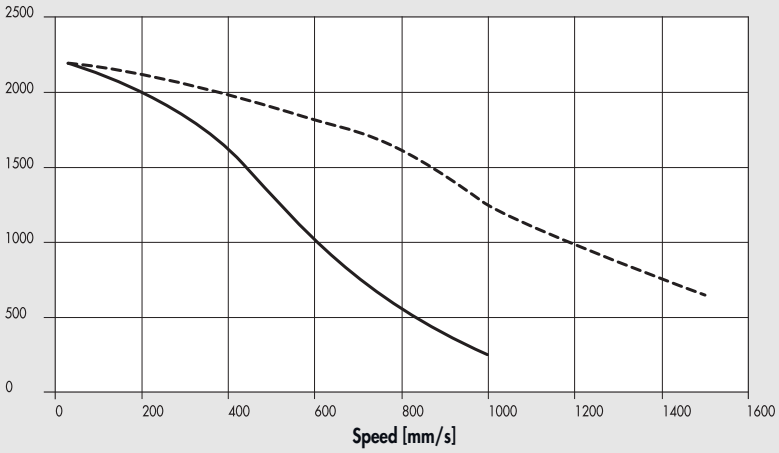
Axial load [N]



37M1890000 + 37D1362001 (230VAC)
37M1890000 + 37D1362001 (115VAC)

Ø 100 with pitch 40 screw, STEPPING motors

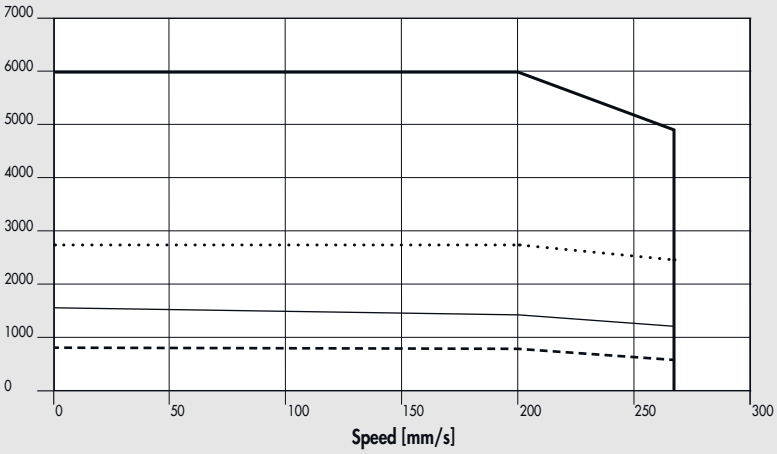
Axial load [N]



37M1890000 + 37D1362001 (230VAC)
37M1890000 + 37D1362001 (115VAC)

Ø 32 with pitch 4 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE

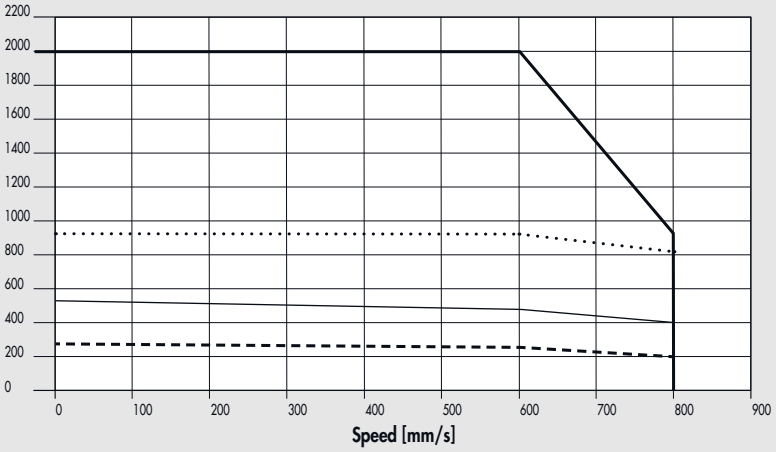
Axial load [N]



- Nominal torque 37M2200000 or 37M4200000 (with brake) + 37D2200000 (200W)
- Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Max torque 37M2200000 or 37M4200000 (with brake) + 37D2200000 (200W)
- Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)

Ø 32 with pitch 12 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE

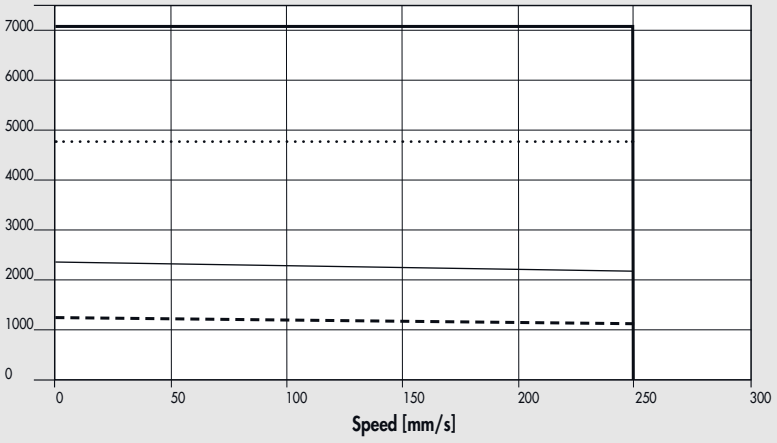
Axial load [N]



- Nominal torque 37M2200000 or 37M4200000 (with brake) + 37D2200000 (200W)
- Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Max torque 37M2200000 or 37M4200000 (with brake) + 37D2200000 (200W)
- Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)

Ø 50 with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE

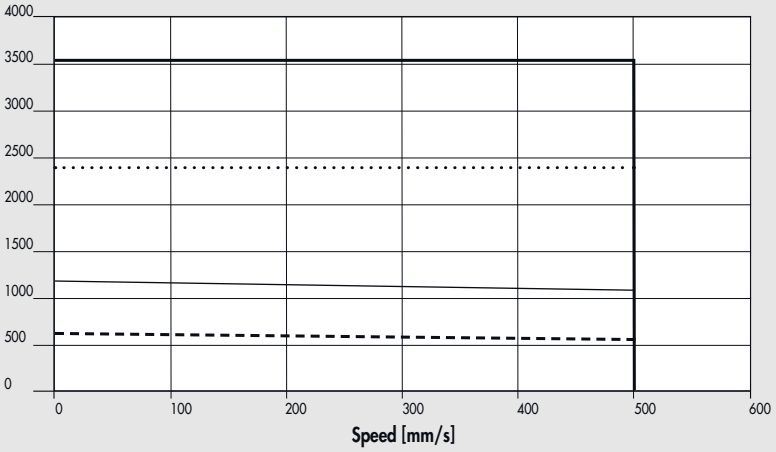
Axial load [N]



- Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Nominal torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)
- Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Max torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

Ø 50 with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE

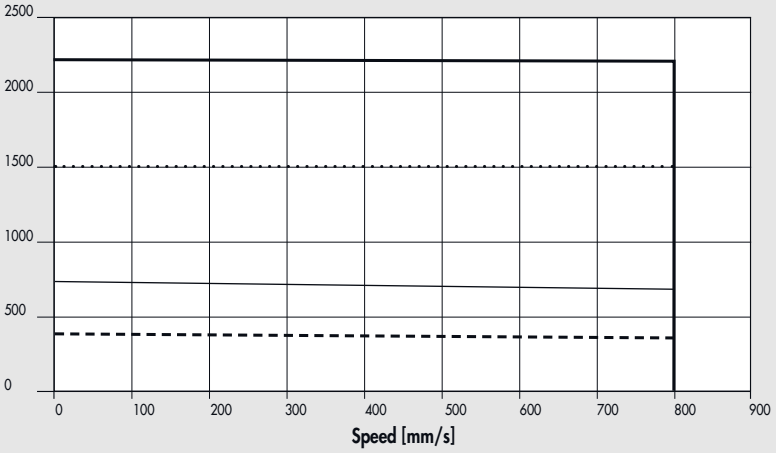
Axial load [N]



- Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Nominal torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)
- Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Max torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

Ø 50 with pitch 16 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE

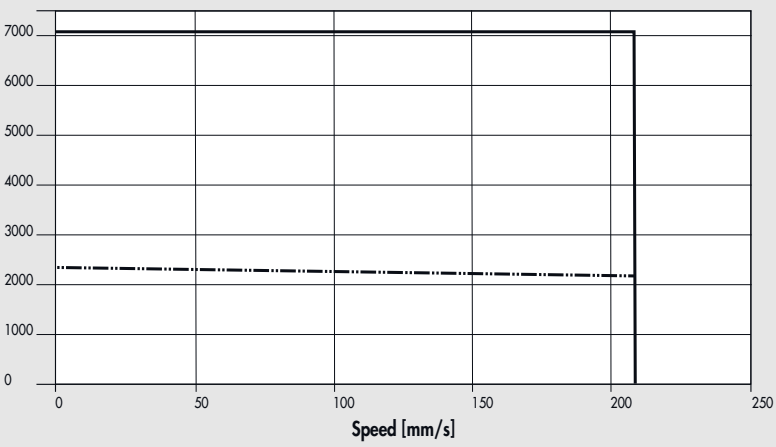
Axial load [N]



- Nominal torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Nominal torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)
- Max torque 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)
- Max torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

Ø 63 - Ø 63 HD with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (750 W)

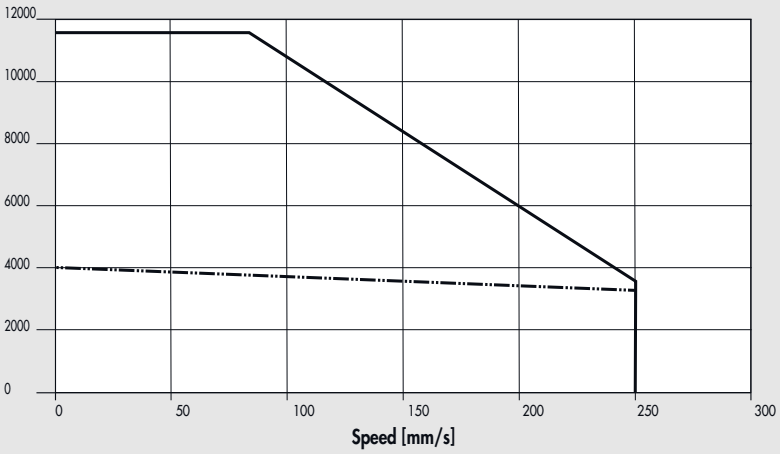
Axial load [N]



- Nominal torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)
- Max torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

Ø 63 HD with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (1000 W)

Axial load [N]

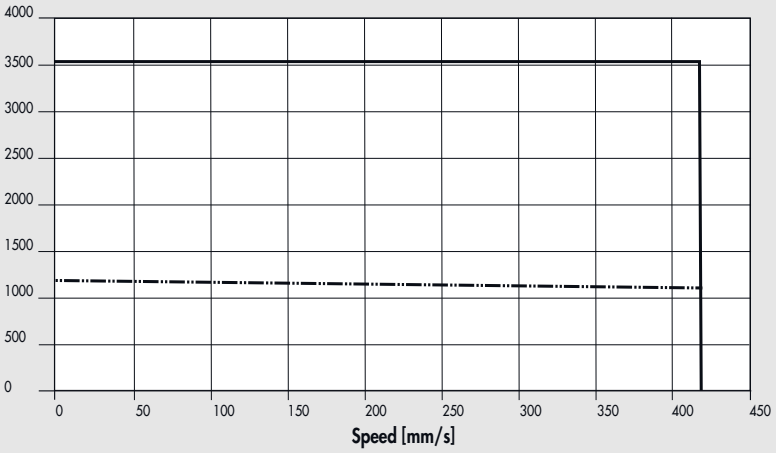


Nominal torque 37M2540000 or 37M4540000 (with brake) + 37D2400000 (1000W)

Max torque 37M2540000 or 37M4540000 (with brake) + 37D2400000 (1000W)

Ø 63 - Ø 63 HD with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (750 W)

Axial load [N]

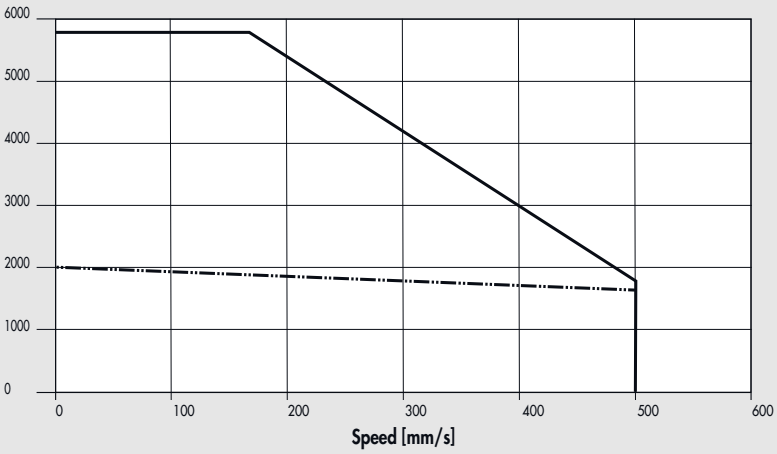


Nominal torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

Max torque 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

Ø 63 HD with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (1000 W)

Axial load [N]

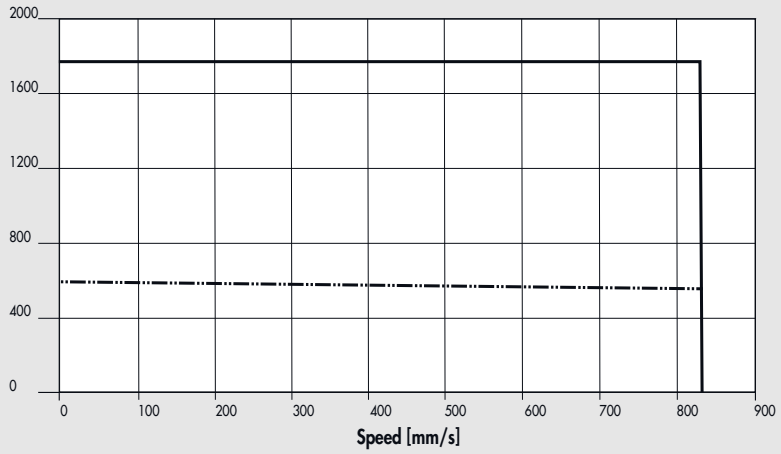


Nominal torque 37M2540000 or 37M4540000 (with brake) + 37D2400000 (1000W)

Max torque 37M2540000 or 37M4540000 (with brake) + 37D2400000 (1000W)

Ø 63 with pitch 20 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE

Axial load [N]

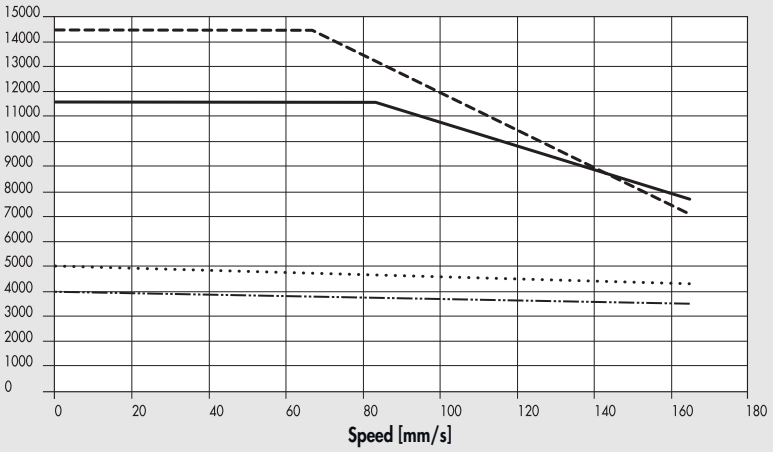


Nominal torque 37M2330000
or 37M4330000 (with brake)
+ 37D2400000 (750W)

Max torque 37M2330000
or 37M4330000 (with brake)
+ 37D2400000 (750W)

Ø 80 with pitch 5 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (1000W)

Axial load [N]



Max torque 37M2540000
or 37M4540000 (with brake)
+ 37D2400000 (1000W) in-line version (1:1)

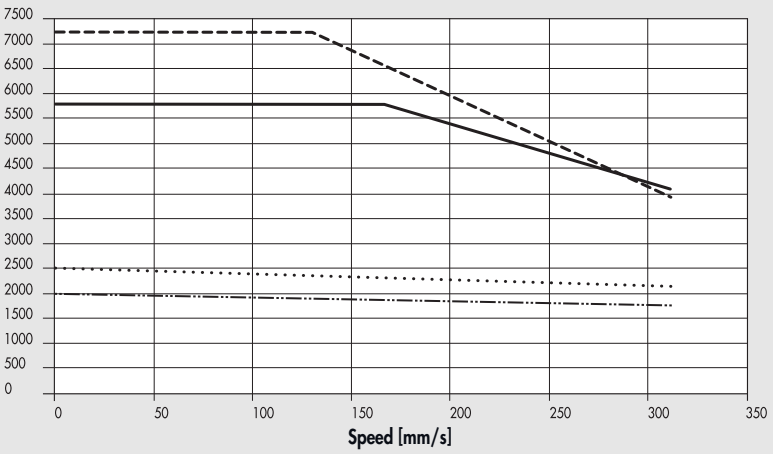
Nominal torque 37M2540000
or 37M4540000 (with brake)
+ 37D2400000 (1000W) in-line version (1:1)

Max torque 37M2540000
or 37M4540000 (with brake)
+ 37D2400000 (1000W) geared version (1:1.25)

Nominal torque 37M2540000
or 37M4540000 (with brake)
+ 37D2400000 (1000W) geared version (1:1.25)

Ø 80 with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (1000W)

Axial load [N]



Max torque 37M2540000
or 37M4540000 (with brake)
+ 37D2400000 (1000W) in-line version (1:1)

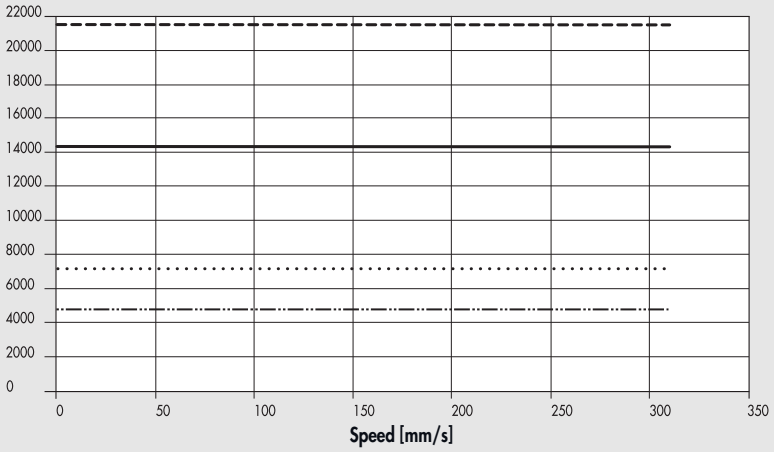
Nominal torque 37M2540000
or 37M4540000 (with brake)
+ 37D2400000 (1000W) in-line version (1:1)

Max torque 37M2540000
or 37M4540000 (with brake)
+ 37D2400000 (1000W) geared version (1:1.25)

Nominal torque 37M2540000
or 37M4540000 (with brake)
+ 37D2400000 (1000W) geared version (1:1.25)

Ø 80 with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (3000W)

Axial load [N]



Max torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) in-line version (1:1)

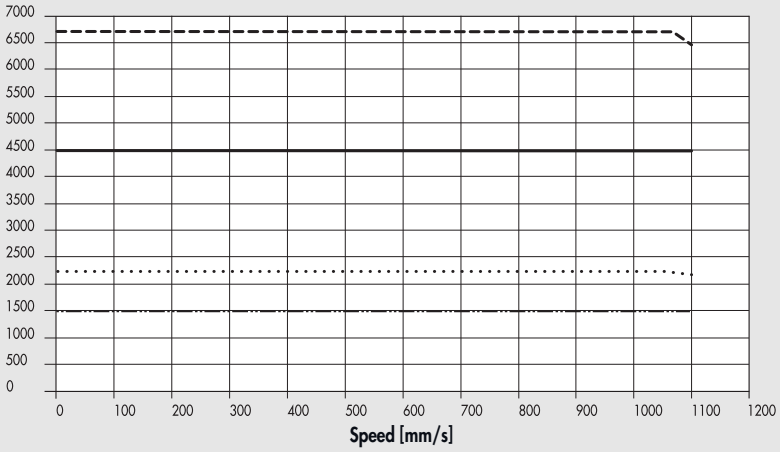
Nominal torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) in-line version (1:1)

Max torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) geared version (1:1.5)

Nominal torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) geared version (1:1.5)

Ø 80 with pitch 32 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (3000W)

Axial load [N]



Max torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) in-line version (1:1)

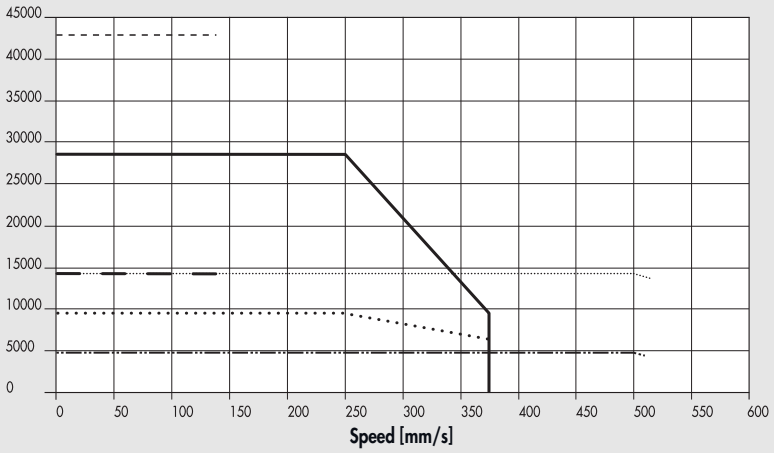
Nominal torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) in-line version (1:1)

Max torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) geared version (1:1.5)

Nominal torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) geared version (1:1.5)

Ø 100 with pitch 10 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (3000W)

Axial load [N]



Max torque 37M2770000
or 37M4770000 (with brake) + 37D2600001
(3000W) in-line version with gearbox (1:3)

Nominal torque 37M2770000
or 37M4770000 (with brake) + 37D2600001
(3000W) in-line version with gearbox (1:3)

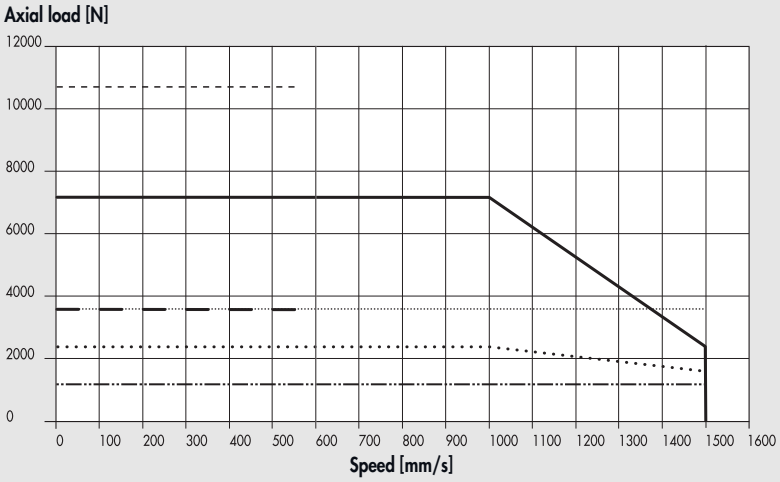
Max torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) geared version (1:2)

Nominal torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) geared version (1:2)

Max torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) in-line version (1:1)

Nominal torque 37M2770000
or 37M4770000 (with brake)
+ 37D2600001 (3000W) in-line version (1:1)

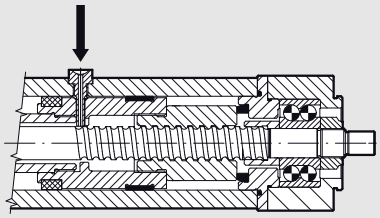
Ø 100 with pitch 40 screw, BRUSHLESS motors and BRUSHLESS motors with BRAKE (3000W)



- Max torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version with gearbox (1:3)
- Nominal torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version with gearbox (1:3)
- Max torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:2)
- Nominal torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) geared version (1:2)
- Max torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)
- Nominal torque 37M2770000 or 37M4770000 (with brake) + 37D2600001 (3000W) in-line version (1:1)

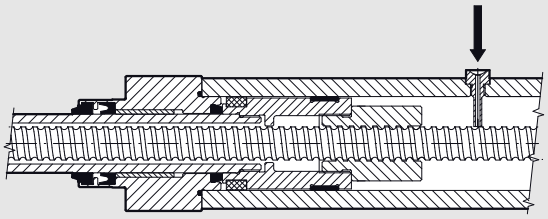
LUBRICATION DIAGRAMS

LUBRICATION OF VERSION WITH NON-ROTATING PISTON ROD



- Retract the piston rod towards the rear head. The piston rod/piston ball screw/system must rest against the buffer of the rear head.
- Unscrew the cap on the lubricator port (see note 1 in the drawing on **next page**).
- Screw the lubricating pin (see accessory on page **A5**.35) into the thread. Make sure you enter the corresponding hole in the piston below.
- Pump grease (code 9910506) using the suitable lubricator according to the quantity in table.
- Unscrew the lubricating pin and make the piston rod perform four complete strokes. The piston rod should end up in the initial (retracted) position.
- Repeat the last two operations.
- The operation of re-greasing will have to be repeated every 200 km, approximately, at least once a year.

LUBRICATION OF VERSION WITHOUT NON-ROTATING PISTON ROD



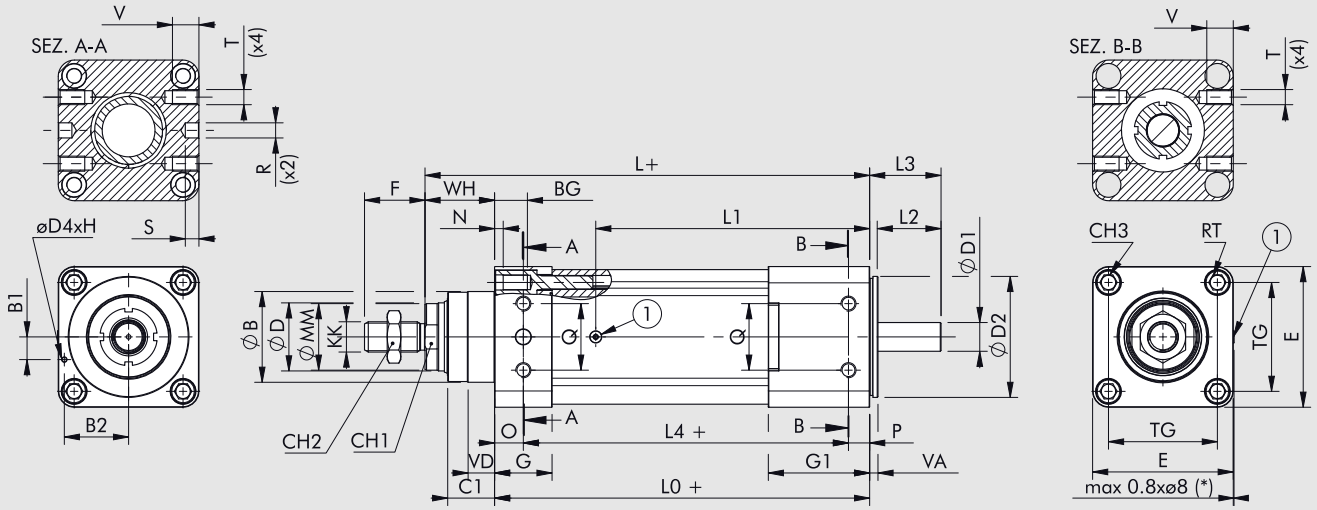
- Extend the piston rod completely. The piston rod/piston/ball screw system must rest against the buffer of the front head.
- Unscrew the cap on the lubricator port (see note 1 in the drawing on **next page**).
- Screw the lubricating pin (see accessory on page **A5**.35) into the thread. Make sure you enter the corresponding hole in the piston below.
- Pump grease (code 9910506) using the suitable lubricator according to the quantity in table.
- Unscrew the lubricating pin and make the piston rod perform four complete strokes. The piston rod should end up in the initial (extended) position.
- Repeat the last two operations.
- The operation of re-greasing will have to be repeated every 200 km, approximately, at least once a year.

		Ø 32		Ø 50			Ø 63			Ø 63 HD		Ø 80			Ø 100	
Screw pitch (p)	mm	4	12	5	10	16	5	10	20	5	10	5	10	32	10	40
Relube grease quantity	g	0.3	0.6	0.9	1.5	2.1	1.5	1.8	3	1.5	1.8	2.1	3.3	4.8	7.2	12.9
	cc	0.26	0.52	0.77	1.30	1.81	1.30	1.55	2.60	1.30	1.55	1.81	2.84	4.13	6.20	11.10

N.B.: These are indicative values that can change as a function of the stroke

DIMENSIONS

CYLINDER DIMENSIONS (WITHOUT MOTOR)



① = lubricator port
(*) = only for Ø 63 - Ø 80 - Ø 100
+ = add the stroke

Ø	ØB (d11)	B1	B2	BG	C1	CH1	CH2	CH3	ØD (f7)	ØD1 (h7)	ØD2	ØD4 (h7)	E	F	G	G1	H	KK	L	L0
32	30	7	19.5	14.5	16	17	17	6	20	6.35	32	3	46	22	26	26	9	M10x1.25	160	134
50	40	7	28	17.5	25	21	24	8	25	10	50	3	64.5	32	30	30	9	M16x1.5	194	157
63	45	9	34.5	17.5	25	26	24	8	30	12	63	3	75.5	32	32	32	9	M16x1.5	210	173
63 HD	45	9	34.5	17.5	25	26	24	8	30	12	63	3	75.5	32	32	46	9	M16x1.5	230	193
80	60	15	42.5	21	31	41	30	10	45	19	80	3	93	40	38	67	9	M20x1.5	294	248
100	90	25	21	21	34	65	30	10	70	24	100	5	110	40	38	77	9	M20x1.5	321.5	270.5

Ø	L1	L2	L3	L4	ØMM	N	O	P	Q	R (h7)	S	T	V	RT	TG	VA	VD	WH
32	86.3	23	27	-	19	4.5	-	-	-	-	-	-	-	M6	32.5	3	4.5	26
50	100.8	24	28.4	-	24	5.5	-	-	-	-	-	-	-	M8	46.5	5.5	5.5	37
63	112.3	34	39.5	-	29	5.5	-	-	-	-	-	-	-	M8	56.5	5.5	6.5	37
63 HD	132.3	34	39.5	-	29.5	5.5	-	-	-	-	-	-	-	M8	56.5	5.5	6.5	37
80	181.1	41.7	47.2	215	42	5	19	14	44	10	9	M10	17.5	M10	72	5.5	17.5	46
100	200.6	46.9	54.9	232.5	69	5	19	19	58	12	9	M12	20	M10	89	8	20	51

NOTES

MOTOR-DRIVE COUPLINGS FOR VARIOUS CYLINDER BORES

MOTOR CODES		DRIVES CODES				
	Metal Work	37D1222000 *	37D1332000 *	37D1442000	37D1552000	37D1362001
	Manufacturer	RTA CSD 94	RTA NDC 96	RTA PLUS A4	RTA PLUS B7	X-MIND B6
Metal Work	Manufacturer	(4.4A 24 - 48VDC)	(6A 24 - 75VDC)	(6A 77 - 140VDC)	(10A 28 - 62VAC) ●	(6A 110 - 230VAC) ●
STEPPING						
37M1110000	Motor SANYO DENKI 103-H7123-1749 (4A 75V max)	Ø32	Ø32 ◆	-	Ø32 ■	-
37M1120000	Motor SANYO DENKI 103-H7126-1740 (4A 75V max)	Ø32	Ø32 ◆	-	Ø32 ■	-
37M1120001	Motor SANYO DENKI 103-H7126-6640 (5.6A 75V max)	-	Ø32	-	Ø32 ■	-
37M1430000	Motor SANYO DENKI 103-H8221-6241 (6A 140V max)	-	Ø50	Ø 50	Ø50 ◆	Ø50 ▲
37M1440000	Motor SANYO DENKI 103-H8222-6340 (6A 140V max)	-	Ø50	Ø 50	Ø50 ◆	Ø50 ▲
37M1450000	Motor SANYO DENKI SM-2863-5255 (6A 140V max)	-	Ø63 - Ø63 HD	Ø63 - Ø63 HD	Ø63 - Ø63 HD ◆	Ø63 - Ø63 HD ▲
37M1470000	Motor B&R 80MPH6.101S000-01 (10A 80V max)	-	-	-	Ø63 HD	-
37M1890000	Motor SANYO DENKI 103-H89223-6341 (6A 230V max)	-	-	-	-	Ø80 - Ø100
STEPPING WITH BRAKE						
37M5120000	Motore SANYO DENKI 103-H7126-1710B (4A 75V max)	Ø32	Ø32 ◆	-	Ø32 ■	-
STEPPING WITH BRAKE + ENCODER						
37M3220000	Motor B&R 80MPF3.500D114-01 (5A 80V max)	-	Ø32 ◆	Ø32 ■	Ø32 ■	
37M3230000	Motor B&R 80MPF5.500D114-01 (5A 80V max)	-	Ø32 ◆	Ø32 ■	Ø32 ■	
37M3430000	Motor B&R 80MPH1.600D114-01 (6A 80V max)	-	Ø50	Ø50 ▲	Ø50 ◆	
37M3460000	Motor B&R 80MPH3.600D114-01 (6A 80V max)	-	Ø50 - Ø63 - Ø63 HD	Ø50 - Ø63 - Ø63 HD ▲	Ø50 - Ø63 - Ø63 HD ◆	
37M3450000	Motor B&R 80MPH4.101D114-01 (10A 80V max)	-	-	-	Ø63 - Ø63 HD	
37M3470000	Motor B&R 80MPH6.101D114-01 (10A 80V max)	-	-	-	Ø63 HD	

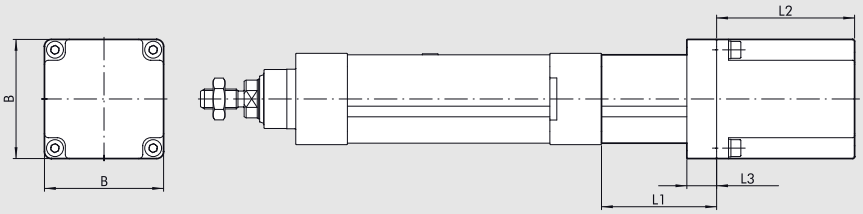
✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive **e**.drive, code 37D1332002, can be used.
◆ **Important!** Limit current
■ **Important!** Limit current and voltage
▲ **Important!** Limit voltage
● **Important!** AC drive to continuous voltage VDC = VAC · $\sqrt{2}$

MOTOR CODES		DRIVES CODES		
	Metal Work	37D2200000	37D2400000	37D2600001
	Manufacturer	SANYO DENKI RS1A01	SANYO DENKI RS1A03	DELTA ASD-A2-3043-M
Metal Work	Manufacturer	(15A 200W)	(30A 400 - 750 - 1000 W)	(3000W)
BRUSHLESS				
37M2200000	Motor SANYO DENKI R2AA06020FXH11M (200W)	Ø32	-	-
37M2220000	Motor SANYO DENKI R2AA06040FXH11M (400W)	-	Ø32 - Ø50	-
37M2330000	Motor SANYO DENKI R2AA08075FXH11M (750W)	-	Ø50 - Ø63 - Ø63 HD	-
37M2540000	Motor SANYO DENKI R2AAB8100HXH29M (1000W)	-	Ø63 HD - Ø80	-
37M2770000	Motor DELTA ECMA-J11330R4 (3000W)	-	-	Ø80 - Ø100
BRUSHLESS WITH BRAKE				
37M4200000	Motor SANYO DENKI R2AA06020FCH11M (200W)	Ø32	-	-
37M4220000	Motor SANYO DENKI R2AA06040FCH11M (400W)	-	Ø32 - Ø50	-
37M4330000	Motor SANYO DENKI R2AA08075FCH11M (750W)	-	Ø50 - Ø63 - Ø63 HD	-
37M4540000	Motor SANYO DENKI R2AAB8100HCH29M (1000W)	-	Ø63 HD - Ø80	-
37M4770000	Motor DELTA ECMA-J11330S4 (3000W)	-	-	Ø80 - Ø100

NOTE

METAL WORK PNEUMATIC

DIMENSIONS OF CYLINDERS WITH IN-LINE MOTOR



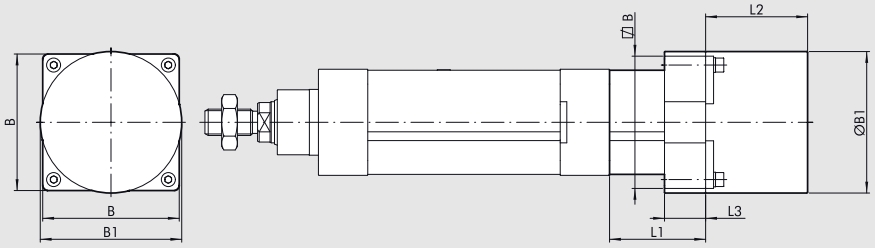
For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	L1	L2	L3
32	BRUSHLESS	371032_ _ _ _ _2200	37M2200000	0.64	60	60	62	69.5	15
		371032_ _ _ _ _2220	37M2220000	1.27	60	60	62	95.5	15
	STEPPING	371032_ _ _ _ _1110	37M1110000	0.8	NEMA 23	56	45	53.8	12
		371032_ _ _ _ _1120	37M1120000	1.2	NEMA 23	56	45	75.8	12
		371032_ _ _ _ _1121	37M1120001	1.2	NEMA 23	56	45	75.8	12
50	BRUSHLESS	371050_ _ _ _ _2330	37M2330000	2.39	80	80	77.4	107.3	35
63	STEPPING	371063_ _ _ _ _1450	37M1450000	6.7	NEMA 34	85.5	63.5	127	16
63 HD	STEPPING	371H63_ _ _ _ _1450	37M1450000	6.7	NEMA 34	85.5	63.5	127	16
		371H63_ _ _ _ _1470	37M1470000	9.3	NEMA 34	86.6	63.5	130	16
80	BRUSHLESS	371080_ _ _ _ _2770	37M2770000	9.5	130	130	120	187.5	26
100	BRUSHLESS	371100_ _ _ _ _2770	37M2770000	9.5	130	130	126	187.5	40

VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	L1	L2	L3
32	BRUSHLESS	371032_ _ _ _ _4200	37M4200000	0.64	60	60	62	97.5	15
		371032_ _ _ _ _4220	37M4220000	1.27	60	60	62	123.5	15
	STEPPING	371032_ _ _ _ _3220	37M3220000	1.2	60	60	45	151.8	7
		371032_ _ _ _ _3230	37M3230000	2.5	60	60	45	184.5	7
		371032_ _ _ _ _5120	37M5120000	1.2	NEMA 23	56	45	112	12
50	BRUSHLESS	371050_ _ _ _ _4330	37M4330000	2.39	80	80	77.4	143	35
	STEPPING	371050_ _ _ _ _3430	37M3430000	2.9	NEMA 34	86.6	63.4	156.5	9.9
		371050_ _ _ _ _3460	37M3460000	5.5	NEMA 34	86.6	63.4	188.5	9.9
63	STEPPING	371063_ _ _ _ _3460	37M3460000	5.5	NEMA 34	86.6	63.5	188.5	9.9
		371063_ _ _ _ _3450	37M3450000	6.3	NEMA 34	86.6	63.5	188.5	9.9
63 HD	STEPPING	371H63_ _ _ _ _3450	37M3450000	6.3	NEMA 34	86.6	63.5	188.5	16
		371H63_ _ _ _ _3460	37M3460000	5.5	NEMA 34	86.6	63.5	188.5	16
		371H63_ _ _ _ _3470	37M3470000	9.3	NEMA 34	86.6	63.5	220.5	16
80	BRUSHLESS	371080_ _ _ _ _4770	37M4770000	9.5	130	130	120	216	26
100	BRUSHLESS	371100_ _ _ _ _4770	37M4770000	9.5	130	130	126	216	40

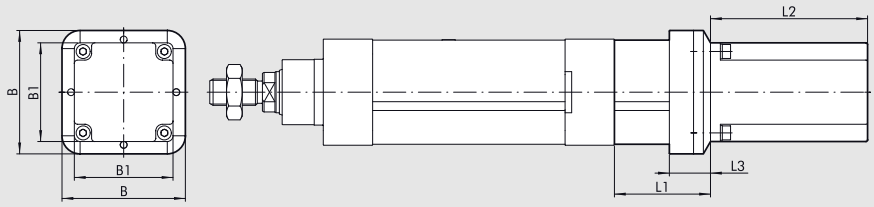


For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	Ø B1	L1	L2	L3
50	STEPPING	371050_ _ _ _ _1430	37M1430000	2.4	NEMA 34	83	86	61.4	62	25
		371050_ _ _ _ _1440	37M1440000	4.2	NEMA 34	83	86	61.4	92.2	25
80	STEPPING	371080_ _ _ _ _1890	37M1890000	17.5	NEMA 42	106.4	106.4	102	221	35
100	STEPPING	371100_ _ _ _ _1890	37M1890000	17.5	NEMA 42	110	106.4	109	221	35

DIMENSIONS OF CYLINDERS WITH IN-LINE MOTOR



For any missing dimensions, please refer to page **A5**.23

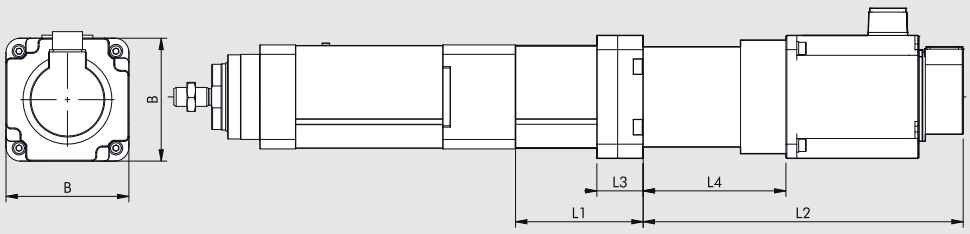
VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	B1	L1	L2	L3
50	BRUSHLESS	371050_ _ _ _ _ _2220	37M2220000	1.27	60	74.5	60	61.4	95.5	25
63	BRUSHLESS	371063_ _ _ _ _ _2330	37M2330000	2.39	80	94	80	78.5	107.3	25
63 HD	BRUSHLESS	371H63_ _ _ _ _ _2330	37M2330000	2.39	80	94	80	78.5	107.3	25
		371H63_ _ _ _ _ _2540	37M2540000	3.18	86	94	84.4	78.5	137.1	25
80	BRUSHLESS	371080_ _ _ _ _ _2540	37M2540000	3.18	86	93	84.4	102	137.1	35

VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	B1	L1	L2	L3
50	BRUSHLESS	371050_ _ _ _ _ _4220	37M4220000	1.27	60	74.5	60	61.4	123.5	25
63	BRUSHLESS	371063_ _ _ _ _ _4330	37M4330000	2.39	80	94	80	78.5	143	25
63 HD	BRUSHLESS	371H63_ _ _ _ _ _4330	37M4330000	2.39	80	94	80	78.5	143	25
		371H63_ _ _ _ _ _4540	37M4540000	3.18	86	94	84.4	78.5	163	25
80	BRUSHLESS	371080_ _ _ _ _ _4540	37M4540000	3.18	86	93	84.4	102	163	35

DIMENSIONS OF CYLINDERS WITH IN-LINE MOTOR AND GEARBOX



For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR

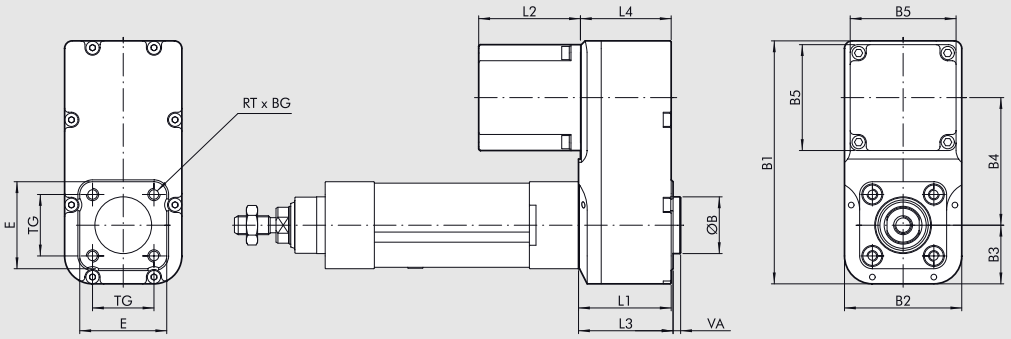
Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Code for gear mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	L1	L2	L3	L4
100	BRUSHLESS	371100_ _ _ _ _ _6770	37M2770000	37R0364000	9.5	130	130	135	338.5	49	151

VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Code for gear mounted on the cylinder	Motor torque [Nm]	Coupling flange	B	L1	L2	L3	L4
100	BRUSHLESS	371100_ _ _ _ _ _7770	37M4770000	37R0364000	9.5	130	130	135	367	49	151

METAL WORK PNEUMATIC

DIMENSIONS OF CYLINDERS WITH GEARED MOTOR



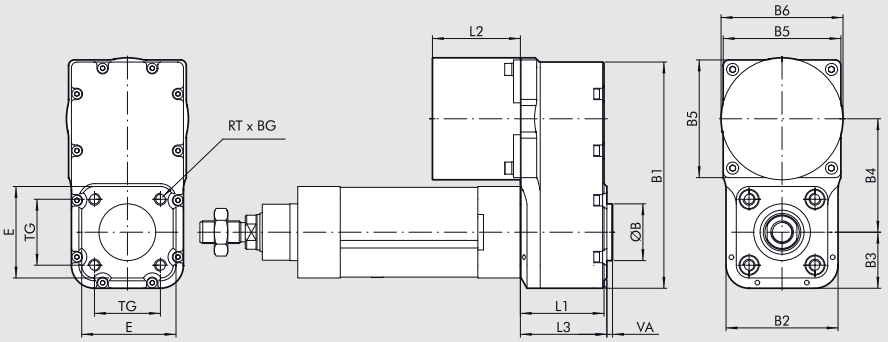
For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	STEPPING	371032_ _ _ _ _ _1110	37M1110000	0.8	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	53.8	50	48	32.5	M6	4
		371032_ _ _ _ _ _1120	37M1120000	1.2	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	75.8	50	48	32.5	M6	4
		371032_ _ _ _ _ _1121	37M1120001	1.2	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	75.8	50	48	32.5	M6	4
63	STEPPING	371063_ _ _ _ _ _1450	37M1450000	6.7	NEMA 34	45	179.5	92	46	87.5	84.5	17	75.5	70	127	72	68	56.5	M8	4
63 HD	STEPPING	371H63_ _ _ _ _ _1450	37M1450000	6.7	NEMA 34	45	179.5	92	46	87.5	85.5	17	75.5	70	127	72	68	56.5	M8	4
80	BRUSHLESS	371080_ _ _ _ _ _2540	37M2540000	3.18	86	45	204.5	115	57	97.5	86	21	-	80.5	137.1	-	-	72	M10	4

VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	STEPPING	371032_ _ _ _ _ _3220	37M3220000	1.2	60	30	128.5	62	31	67.5	60	15	46	49	151.8	50	48	32.5	M6	4
		371032_ _ _ _ _ _3230	37M3230000	2.5	60	30	128.5	62	31	67.5	60	15	46	49	184.5	50	48	32.5	M6	4
		371032_ _ _ _ _ _5120	37M5120000	1.2	NEMA 23	30	128.5	62	31	67.5	56	15	46	49	112	50	48	32.5	M6	4
80	BRUSHLESS	371080_ _ _ _ _ _4540	37M4540000	3.18	86	45	204.5	115	57	97.5	86	21	-	80.5	163	-	-	72	M10	4

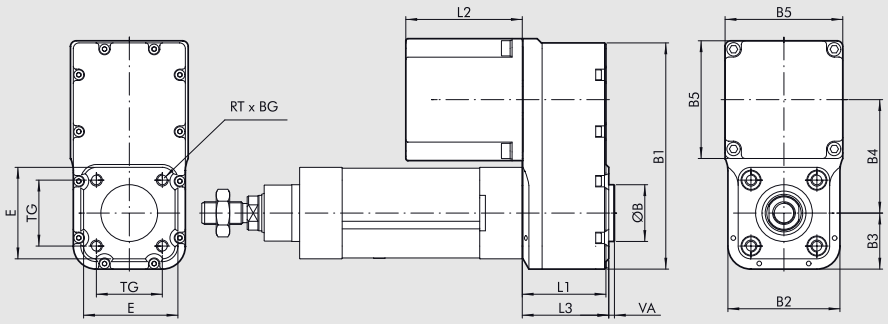


For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	ØB6	BG	E	L1	L2	L3	TG	RT	VA
50	STEPPING	371050_ _ _ _ _ _1430	37M1430000	2.4	NEMA 34	40	159.5	79	39.5	80	80	86	17	64.5	59	62	61	46.5	M8	4
		371050_ _ _ _ _ _1440	37M1440000	4.2	NEMA 34	40	159.5	79	39.5	80	83	86	17	64.5	59	92.2	61	46.5	M8	4

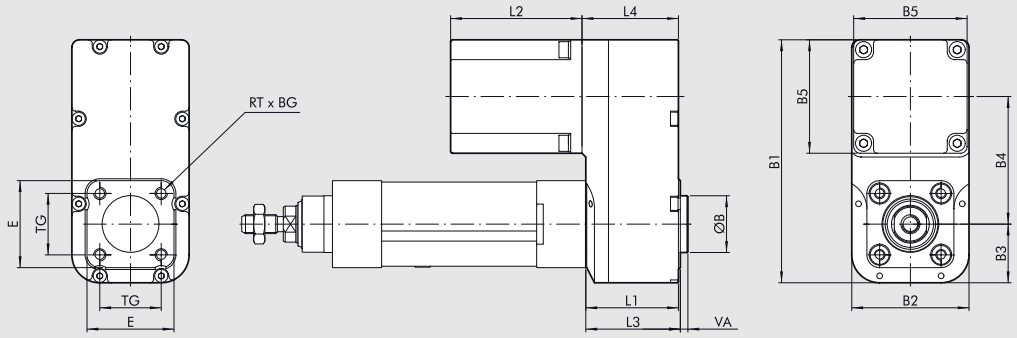
DIMENSIONS OF CYLINDERS WITH GEARED MOTOR



For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR AND BRAKE

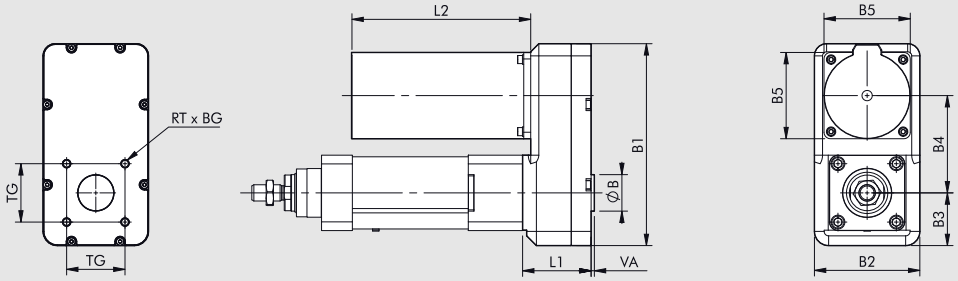
Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	TG	RT	VA
50	STEPPING	**371050_ _ _ _ _ _3430**	**37M3430000**	**2.9**	**NEMA 34**	40	159.5	79	39.5	80	86.6	17	64.5	59	156.5	61	46.5	M8	4
		371050_ _ _ _ _ _3460	**37M3460000**	**5.5**	**NEMA 34**	40	159.5	79	39.5	80	86.6	17	64.5	59	188.5	61	46.5	M8	4



For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	BRUSHLESS	**371032_ _ _ _ _ _2200**	**37M2200000**	**0.64**	**60**	30	128.5	62	31	67.5	60	15	46	49	69.5	50	51	32.5	M6	4
		371032_ _ _ _ _ _2220	**37M2220000**	**1.27**	**60**	30	128.5	62	31	67.5	60	15	46	49	95.5	50	51	32.5	M6	4

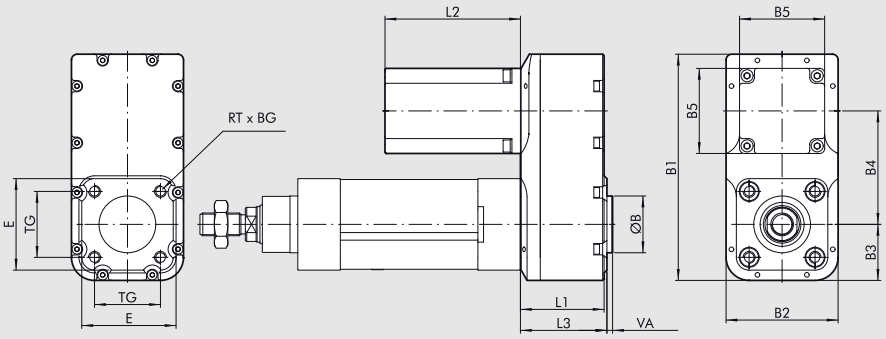


For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	L1	L2	TG	RT	VA
80	STEPPING	**371080_ _ _ _ _ _1890**	**37M1890000**	**17.5**	**NEMA 42**	45	249	130	65	120	106.4	21	84.5	221	72	M10	4
100	STEPPING	**371100_ _ _ _ _ _1890**	**37M1890000**	**17.5**	**NEMA 42**	55	285	150	75	120	106.4	21	91.5	221	89	M10	4

METAL WORK PNEUMATIC



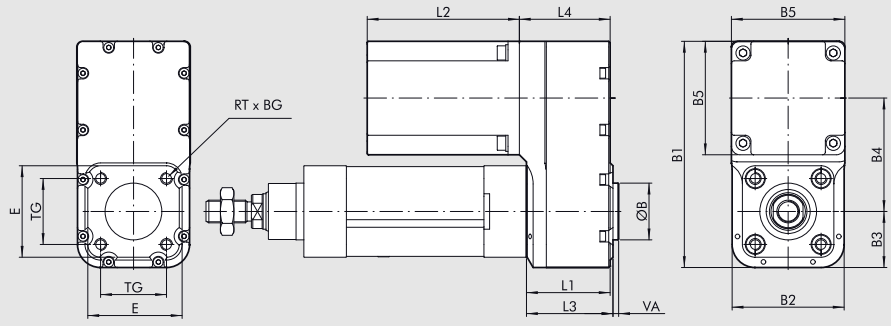
For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	TG	RT	VA
50	BRUSHLESS	371050_____2220	37M2220000	1.27	60	40	159.5	79	39.5	80	60	17	64.5	59	95.5	61	46.5	M8	4
63	BRUSHLESS	371063_____2330	37M2330000	2.39	80	45	179.5	92	46	87.5	80	17	75.5	70	107.3	72	56.5	M8	4
63 HD	BRUSHLESS	371H63_____2330	37M2330000	2.39	80	45	179.5	92	46	87.5	80	17	75.5	70	107.3	72	56.5	M8	4
		371H63_____2540	37M2540000	3.18	86	45	179.5	92	46	87.5	86	17	75.5	70	137.1	72	56.5	M8	4
	STEPPING	371H63_____1470	37M1470000	9.3	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	130	72	56.5	M8	4

VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	TG	RT	VA
50	BRUSHLESS	371050_____4220	37M4220000	1.27	60	40	159.5	79	39.5	80	60	17	64.5	59	123.5	61	46.5	M8	4
63	BRUSHLESS	371063_____4330	37M4330000	2.39	80	45	179.5	92	46	87.5	80	17	75.5	70	143	72	56.5	M8	4
	STEPPING	371063_____3460	37M3460000	5.5	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	188.5	72	56.5	M8	4
		371063_____3450	37M3450000	6.3	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	188.5	72	56.5	M8	4
63 HD	BRUSHLESS	371H63_____4330	37M4330000	2.39	80	45	179.5	92	46	87.5	80	17	75.5	70	143	72	56.5	M8	4
		371H63_____4540	37M4540000	3.18	86	45	179.5	92	46	87.5	86	17	75.5	70	163	72	56.5	M8	4
	STEPPING	371H63_____3470	37M3470000	9.3	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	220.5	72	56.5	M8	4
		371H63_____3450	37M3450000	6.3	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	188.5	72	56.5	M8	4
		371H63_____3460	37M3460000	5.5	NEMA 34	45	179.5	92	46	87.5	86.6	17	75.5	70	188.5	72	56.5	M8	4



For any missing dimensions, please refer to page **A5**.23

VERSION WITH MOTOR

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
50	BRUSHLESS	371050_____2330	37M2330000	2.39	80	40	159.5	79	39.5	80	80	17	64.5	59	107.3	61	64	46.5	M8	4
80	BRUSHLESS	371080_____2770	37M2770000	9.5	130	45	249	130	65	119	130	21	-	84.5	187.5	-	-	72	M10	4
100	BRUSHLESS	371100_____2770	37M2770000	9.5	130	55	285	150	75	145	130	21	-	91.5	187.5	-	-	89	M10	4

VERSION WITH MOTOR AND BRAKE

Size	Motor type	Code for cylinder complete with motor	Code for motor mounted on the cylinder	Motor torque [Nm]	Coupling flange	ØB (d11)	B1	B2	B3	B4	B5	BG	E	L1	L2	L3	L4	TG	RT	VA
32	BRUSHLESS	371032_____4200	37M4200000	0.64	60	30	128.5	62	31	67.5	60	15	46	49	67.5	50	51	32.5	M6	4
		371032_____4220	37M4220000	1.27	60	30	128.5	62	31	67.5	60	15	46	49	123.5	50	51	32.5	M6	4
50	BRUSHLESS	371050_____4330	37M4330000	2.39	80	40	159.5	79	39.5	80	80	17	64.5	59	143	61	64	46.5	M8	4
80	BRUSHLESS	371080_____4770	37M4770000	9.5	130	45	249	130	65	119	130	21	-	84.5	216	-	-	72	M10	4
100	BRUSHLESS	371100_____4770	37M4770000	9.5	130	55	285	150	75	145	130	21	-	91.5	216	-	-	89	M10	4

KEY TO CODES FOR ELECTRIC CYLINDER SERIE ELEKTRO ISO 15552

KEY TO CODES CYLINDER WITHOUT MOTOR

CYL	37 TYPE	1	032 SIZE	0100 STROKE	1 SCREW PITCH	5 VERSION
	37 Electric actuators	**1** ISO 15552 electric cylinder	**032** 32 **050** 50 **063** 63 ◆ **H63** 63 Heavy Duty ◀ **080** 80 ◀ **100** 100		**1** Pitch 4 **2** Pitch 5 **4** Pitch 10 **5** Pitch 12 **6** Pitch 16 **7** Pitch 20 **8** Pitch 32 **9** Pitch 40	**5** Without antirotation IP40 **6** With antirotation IP40 **7** Without antirotation IP55/IP65 **8** With antirotation IP55/IP65

N.B.: For the possible ordering codes, please refer to the next page.
◆ Only for Ø63 with screw pitch 5 or pitch 10
◀ Only for versions 7 and 8

N.B.: An piston rod anti-rotation system must be used. If the piston rod is not fixed firmly to an element, a flange or to any other device preventing it from rotating, a cylinder in the anti-rotation version must be used.

KEY TO CODES CYLINDER WITH MOTOR

CYL	37 TYPE	1	032 SIZE	0100 STROKE	1 SCREW PITCH	1 VERSION	1 MOTOR	2 DRIVE FLANGE	2 DRIVE TORQUE	0
	37 Electric actuators	**1** ISO 15552 electric cylinder	**032** 32 **050** 50 **063** 63 ◆ **H63** 63 Heavy Duty ◀ **080** 80 ◀ **100** 100		**1** Pitch 4 **2** Pitch 5 **4** Pitch 10 **5** Pitch 12 **6** Pitch 16 **7** Pitch 20 **8** Pitch 32 **9** Pitch 40	**IN-LINE** ● **1** Without antirotation IP40/IP20 ● **2** With antirotation IP40/IP20 ■ **3** Without antirotation IP55/IP65 ■ **4** With antirotation IP55/IP65 **GEARED** ● **5** Without antirotation IP40/IP20 ● **6** With antirotation IP40/IP20 ■ **7** Without antirotation IP55/IP65 ■ **8** With antirotation IP55/IP65	**1** STEPPING **2** BRUSHLESS **3** STEPPING with BRAKE + Encoder **4** BRUSHLESS with BRAKE **5** STEPPING with BRAKE without Encoder **6** BRUSHLESS with gearbox **7** BRUSHLESS with BRAKE + gearbox	**1** NEMA 23 **2** 60 **3** 80 **4** NEMA 34 **5** 86 **7** 130 **8** NEMA 42	**0** 0 - 0.79 Nm **1** 0.8 - 1.19 Nm **2** 1.2 - 2.19 Nm **3** 2.2 - 3 Nm **4** 3.01 - 5 Nm **5** 6.21 - 7 Nm **6** 5.01 - 6.2 Nm **7** 7.01 - 10 Nm **9** 15.01 - 25 Nm	**0** Base **1** Greater rpm

N.B.: For the possible ordering codes, please refer to the next page.
◆ Only for Ø63 with screw pitch 5 or pitch 10
◀ Only for versions 3, 4, 7 and 8
● Version IP40 available for all STEPPING and BRUSHLESS motors, for only the sizes 32, 50 and 63, with the exception of motor code 37M5120000 which it is IP20;
■ Version IP55 available for STEPPING motors, for only the sizes 50, 63, 80 and 100 all the motors, with the exception of motor code 37M1470000; for Ø 32 only for motor code 37M1120001; version IP65 available for BRUSHLESS motors, BRUSHLESS with BRAKE and STEPPING with BRAKE + ENCODER motors (all sizes).

N.B.: An piston rod anti-rotation system must be used. If the piston rod is not fixed firmly to an element, a flange or to any other device preventing it from rotating, a cylinder in the anti-rotation version must be used.

METAL WORK PNEUMATIC

POSSIBLE ORDERING CODES

Ø 32

Drive / Version / Screw pitch

371032_ _ _ _			
	1	1	1110
	5	2	1120
		5	1121
		6	5120
			2200
			2220
			3220
			3230
			4200
			4220
		3	1121
		4	2200
		7	2220
		8	3220
			3230
			4200
			4220

_ _ _ _ = Enter the stroke in mm

Ø 50

Drive / Version / Screw pitch

371050_ _ _ _			
	2	1	1430
	4	2	1440
	6	3	2220
		4	2330
		5	3430
		6	3460
		7	4220
		8	4330

_ _ _ _ = Enter the stroke in mm

Ø 63

Drive / Version / Screw pitch

371063_ _ _ _			
	2	1	1450
	4	2	2330
	7	3	3450
		4	3460
		5	4330
		6	
		7	
		8	

_ _ _ _ = Enter the stroke in mm

Ø 63 HD

Drive / Version / Screw pitch

371H63_ _ _ _			
	2	1	1450
	4	2	1470
		5	2330
		6	2540
			3450
			3460
			3470
			4330
			4540
		3	1450
		4	2330
		7	2540
		8	3450
			3460
			3470
			4330
			4540

_ _ _ _ = Enter the stroke in mm

Ø 80

Drive / Version / Screw pitch

371080_ _ _ _			
	2	3	1890
		4	2540
		7	4540
		8	
	4	3	1890
		4	2540
		7	2770
		8	4540
			4770
	8	3	1890
		4	2770
		7	4770
		8	

_ _ _ _ = Enter the stroke in mm

Ø 100

Drive / Version / Screw pitch

371100_ _ _ _			
	4	3	1890
	9	4	2770
			4770
			6770
			7770
		7	1890
		8	2770
			4770

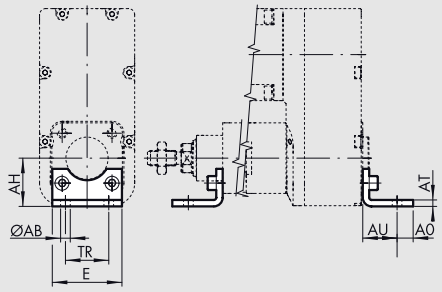
_ _ _ _ = Enter the stroke in mm

NOTES

ACCESSORIES FOR ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552

N.B.: Where specified, limit the maximum axial loads (Fmax) according to the electric cylinders

FOOT - MODEL A



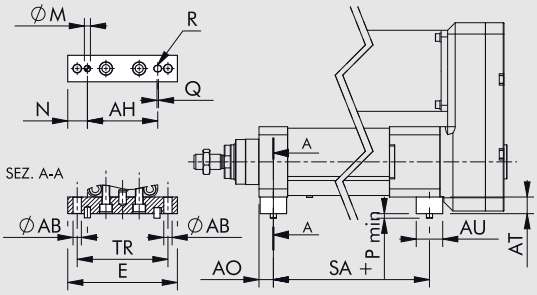
STEEL

Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	Weight [g]	Fmax [N]
W0950322001	32	7	32	11	4	24	32	45	76	1600
W0950502001	50	9	45	15	4	32	45	65	162	4000
W0950632001	63	9	50	15	6	32	50	75	266	6000
W0950632001	63 HD	9	50	15	6	32	50	75	266	6000
W095E802001	80	12	68.5*	20	6	41	63	95	414	10000
W095EA12001	100	14	79*	25	6	41	75	115	518	16000

* Dimensions not to ISO 15552

Note: Individually packed with 2 screws

FOOT ON CYLINDER HEADS

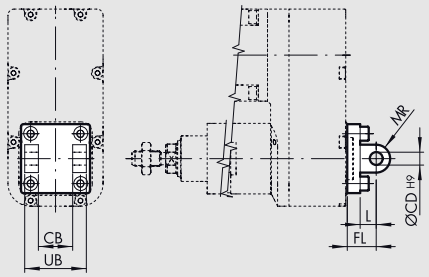


STEEL

Code	Ø	Ø AB	AH	AO	AT	AU	TR	E	ØM H7	N	P	Q	R H7	SA	Weight [g]	Fmax [N]
0950807042	80	11	93	19	22	35	120	145	8	26	6	2	8	215	770	10000
0951007042	100	13	111	19	24	35	140	165	8	27	6	2	8	232.5	945	16000

Note: Individually packed with 2 screws, 3 pins

FEMALE HINGE - MODEL B



ALUMINIUM

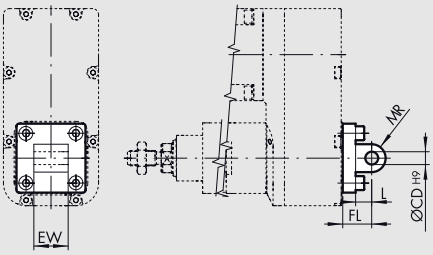
Code	Ø	UB	CB	FL	øCD	MR	L	Weight [g]	Fmax [N]
W0950322003	32	45	26	22	10	10	12	116	800
W0950502003	50	60	32	27	12	12	15	252	2000
W0950632003	63	70	40	32	16	16	20	394	3000
W0950632003	63 HD	70	40	32	16	16	20	394	3000

STEEL

Code	Ø	UB	CB	FL	øCD	MR	L	Weight [g]	Fmax [N]
W095E322003	32	45	26	22	10	10	13	348	1600
W095E502003	50	60	32	27	12	12	16	756	4000
W095E632003	63	70	40	32	16	16	21	1182	6000
W095E632003	63 HD	70	40	32	16	16	21	1182	6000
W095E802003	80	90	50	36	16	16	22	2010	10000
W095EA12003	100	110	60	41	20	20	27	3255	16000

Note: Supplied with 4 screws, 4 washers, 2 snap-rings, 1 pin

MALE HINGE - MODEL BA



ALUMINIUM

Code	Ø	EW	FL	MR	øCD	L	Weight [g]	Fmax [N]
W0950322004	32	26	22	11	10	12	94	800
W0950502004	50	32	27	13	12	15	220	2000
W0950632004	63	40	32	17	16	20	316	3000
W0950632004	63 HD	40	32	17	16	20	316	3000

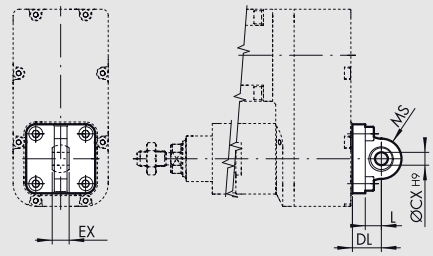
STEEL

Code	Ø	EW	FL	MR	øCD	L	Weight [g]	Fmax [N]
W095E322004	32	26	22	10	10	13	282	1600
W095E502004	50	32	27	12	12	16	660	4000
W095E632004	63	40	32	16	16	21	948	6000
W095E632004	63 HD	40	32	16	16	21	948	6000
W095E802004	80	50	36	16	16	22	1734	10000
W095EA12004	100	60	41	20	20	27	2550	16000

Note: Supplied with 4 screws, 4 washers

METAL WORK PNEUMATIC

ARTICULATED MALE HINGE - MODEL BAS



ALUMINIUM

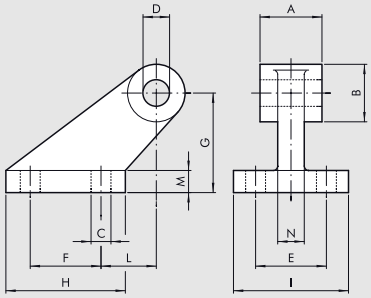
Code	Ø	DL	MS	L	øCX	EX	Weight [g]	Fmax [N]
W0950322006	32	22	16	12	10	14	106	800
W0950502006	50	27	21	15	12	16	236	2000
W0950632006	63	32	23	20	16	21	336	3000
W0950632006	63 HD	32	23	20	16	21	336	3000

STEEL

Code	Ø	DL	MS	L	øCX	EX	Weight [g]	Fmax [N]
W095E322006	32	22	15	14	10	14	318	1600
W095E502006	50	27	20	17	16	21	708	4000
W095E632006	63	32	23	22	16	21	1008	6000
W095E632006	63 HD	32	23	22	16	21	1008	6000
W095E802006	80	36	27	23	20	25	1716	10000
W095EA12006	100	41	30	28	20	25	2520	16000

Note: Supplied with 4 screws, 4 washers

CETOP HINGE FOR MODEL B - MODEL GL

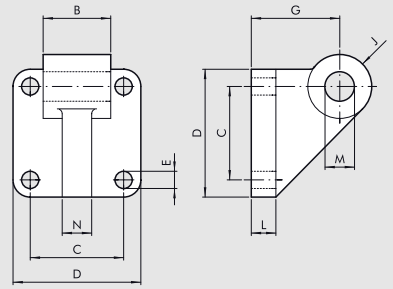


ALUMINIUM

Code	Ø	A	B	C	D	E	F	G	H	I	L	M	N	Weight [g]	Fmax [N]
W0950322008	32	26	19	7	10	25	20	32	37	41	18	8	10	96	800
W0950502008	50	32	26	9	12	32	32	45	54	52	25	10	12	212	2000
W0950632008	63	40	33	11	16	40	50	63	75	63	32	12	15	440	3000
W0950632008	63 HD	40	33	11	16	40	50	63	75	63	32	12	15	440	3000

Note: Supplied with 4 screws, 4 washers

ISO HINGE FOR MODEL B - MODEL GS

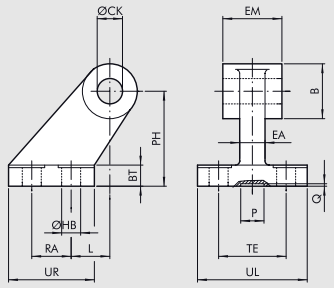


ALUMINIUM

Code	Ø	B	C	D	E	G	J	L	M	N	Weight [g]	Fmax [N]
W0950322108	32	25.5	32.5	45	7	32	11	10	10	10	106	800
W0950502108	50	31.5	46.5	65	9	45	13	12	12	12	252	2000
W0950632108	63	39.5	56.5	75	9	50	17	12	16	15	350	3000
W0950632108	63 HD	39.5	56.5	75	9	50	17	12	16	15	350	3000

Note: Supplied with 4 screws, 4 washers

ISO 15552 HINGE FOR MODEL B - MODEL AB7



ALUMINIUM

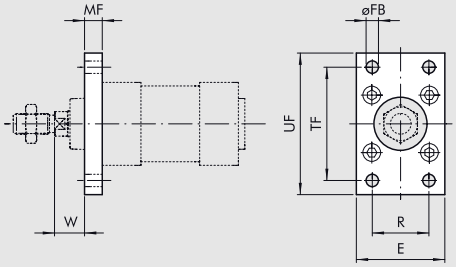
Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]	Fmax [N]
W0950322017	32	26	20	6.6	10	38	18	32	31	51	3	8	10	21	3	60	800
W0950502017	50	32	26	9	12	50	30	45	45	65	3	12	16	21	3	162	2000
W0950632017	63	40	30	9	16	52	35	50	50	67	2	14*16	21	3		191	3000
W0950632017	63 HD	40	30	9	16	52	35	50	50	67	2	14*16	21	3		191	3000

STEEL

Code	Ø	EM	B	ØHB	ØCK	TE	RA	PH	UR	UL	L	BT	EA	P	Q	Weight [g]	Fmax [N]
W095E322017	32	26	20	6.6	10	38	18	32	31	51	3	8	10	20	5	180	1600
W095E502017	50	32	26	9	12	50	30	45	45	65	3	12	16	30	5	486	4000
W095E632017	63	40	30	9	16	52	35	50	50	67	2	12	16	35	5	573	6000
W095E632017	63 HD	40	30	9	16	52	35	50	50	67	2	12	16	35	5	573	6000
W095E802017	80	50	30	11	16	66	40	63	60	86	7	14	20	45	5	996	10000
W095EA12017	100	60	38	11	20	76	50	71	70	96	5	15	20	55	5	1566	16000

* Dimensions not to ISO 15552

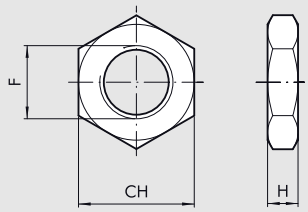
FRONT FLANGE - MODEL C



Code	Ø	TF	UF	E	MF	R	øFB	W	Weight [g]	Fmax [N]
W0950322002	32	64	80	50	10	32	7	16	246	1600
W0950502002	50	90	110	65	12	45	9	25	522	5000
W0950632002	63	100	120	75	12	50	9	25	670	7000
W0950632002	63 HD	100	120	75	12	50	9	25	670	7000

Note: Supplied with 4 screws

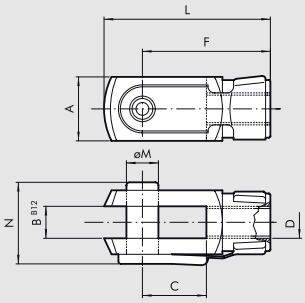
ROD NUT - MODEL S



Code	Ø	F	H	CH	Weight [g]
0950322010	32	M10x1.25	6	17	6
0950502010	50	M16x1.5	8	24	20
0950502010	63	M16x1.5	8	24	20
0950502010	63 HD	M16x1.5	8	24	20
0950802010	80	M20x1.5	9	30	32
0950802010	100	M20x1.5	9	30	32

Note: Individually packed

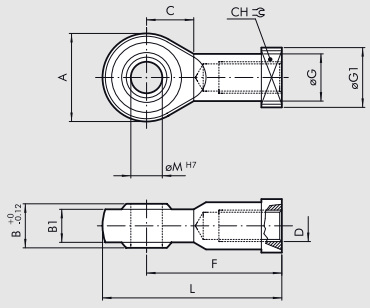
FORK MODEL GK-M



Code	Ø	øM	C	B	A	L	F	D	N	Weight [g]
W0950322020	32	10	20	10	20	52	40	M10x1.25	26	92
W0950502020	50	16	32	16	32	83	64	M16x1.5	40	340
W0950502020	63	16	32	16	32	83	64	M16x1.5	40	340
W0950502020	63 HD	16	32	16	32	83	64	M16x1.5	40	340
W0950802020	80	20	40	20	40	105	80	M20x1.5	40	690
W0950802020	100	20	40	20	40	105	80	M20x1.5	48	690

Note: Individually packed

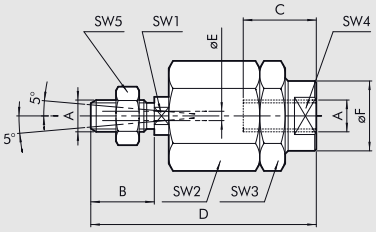
ROD EYE - MODEL GA-M



Code	Ø	øM	C	B1	B	A	L	F	D	øG	CH	øG1	Weight [g]
W0950322025	32	10	15	10.5	14	28	57	43	M10x1.25	15	17	19	78
W0950502025	50	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950502025	63	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950502025	63 HD	16	22	15	21	42	85	64	M16x1.5	22	22	22	226
W0950802025	80	20	26	18	25	50	102	77	M20x1.5	27.5	30	27	404
W0950802025	100	20	26	18	25	50	102	77	M20x1.5	27.5	30	27	404

Note: Individually packed

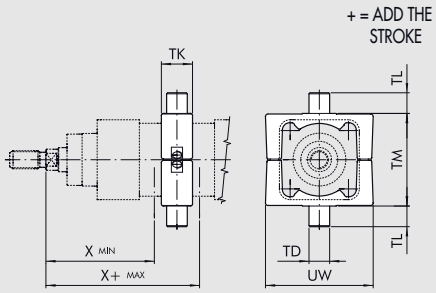
SELF ALIGNING ROD COUPLER - MODEL GA-K



Code	Ø	A	B	C	D	øF	øE	SW1	SW2	SW3	SW4	SW5	Weight [g]
W0950322030	32	M10x1.25	20	20	71	22	4	12	30	30	19	17	216
W0950502030	50	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950502030	63	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950502030	63 HD	M16x1.5	32	32	103	32	4	20	41	41	30	24	620
W0950802030	80	M20x1.5	40	40	119	32	4	20	41	41	30	30	680
W0950802030	100	M20x1.5	40	40	119	32	4	20	41	41	30	30	680

Note: Individually packed

INTERMEDIATE HINGE - MODEL EN



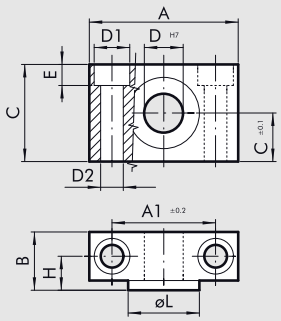
STEEL

Code	Ø	X (min)	X (max) IN LINE	X (max) GEARED	TM	TL	TD e9	TK	UW	Weight [g]	Fmax [N]
0950322107	**32**	63	123	*	50	12	12	22	65	170	500
0950502107	**50**	83	148	*	75	16	16	28	95	580	1200
0950632107	**63**	88	163	*	90	20	20	36	105	950	2000
0950632107	**63 HD**	88	163	*	90	20	20	36	105	950	2000

* Depending on motor length

Note: Supplied with 8 grub screws, 2 pins

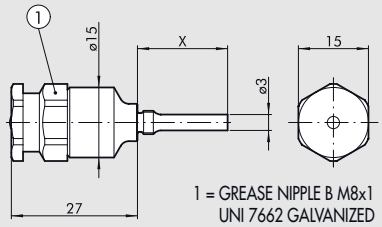
COUNTER-HINGE FOR MODEL EN - MODEL EL



Code	Ø	A	A_1	B	C	C_1	D_1	D_2	D	E	H	øL	Weight [g]
W0950322009	**32**	46	32	18	30	15	11	7	12	6.5	10.5	22	162
W0950402009	**50**	55	36	21	36	18	15	9	16	8.5	12	28	278
W0950632009	**63**	65	42	23	40	20	18	11	20	10.5	13	35	414
W0950632009	**63 HD**	65	42	23	40	20	18	11	20	10.5	13	35	414

Note: 2-pieces pack with 4 screws

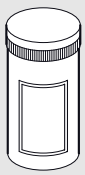
GREASING NEEDLE



Code	Ø	Pitch	X
0950327108	**32**	-	12
0950507108	**50**	-	19.3
0950637108	**63**	-	23.6
0950637108	**80**	-	23.6
0950637108	**100**	10	23.6
0951007108	**100**	40	28.6

Note: Individually packed

GREASE

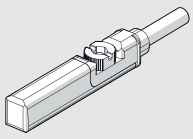


Code	Description	Weight [g]
9910506	Grease pipe RHEOLUBE 363 AX1	400

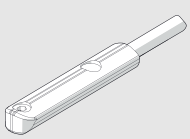
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

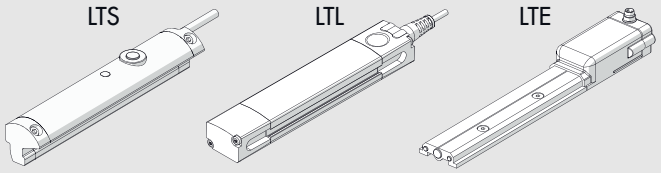
SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional

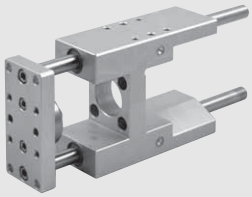


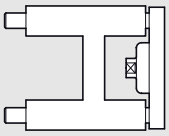
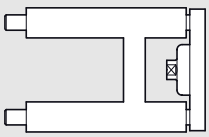
POSITION SENSORS



For technical data and usage strokes see **chapter A6**.

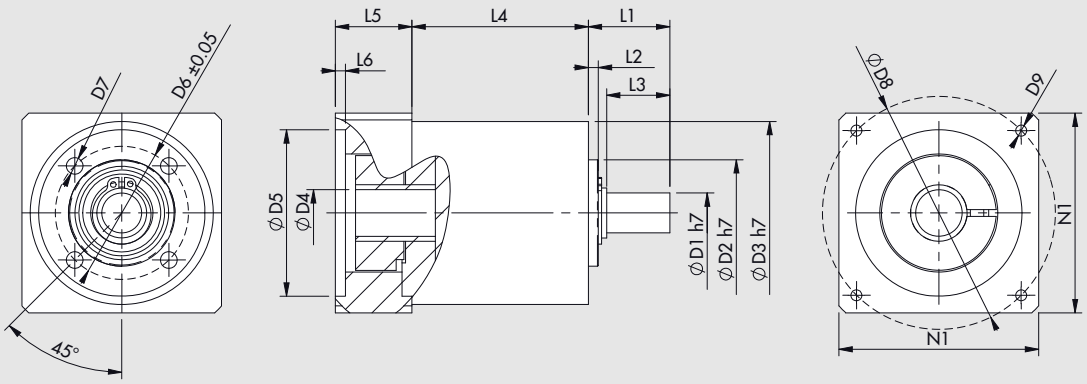
GUIDE UNIT



Version	Code	Bore	Type
Sliding on bronze bushings (GDH)			
	**W0700322...**	32*	UNIT MW DH 032...
	W0700502...	50	UNIT MW DH 050...
	W0700632...	63	UNIT MW DH 063...
	W070E802...	80	UNIT MW DH 080...
	W070EA12...	100	UNIT MW DH 100...
	* Also available in V-Lock version (see **chapter A3**).		
	Note: The guide units must only be used with anti-rotation cylinders.		
	To complete the type and code, add the 3-digit stroke (e.g. 50=050)		
	For technical data and dimensions, see **chapter A1**.		
Sliding on ball bearing (GDM)			
	**W0700323...**	32*	UNIT MW DM 032...
	W0700503...	50	UNIT MW DM 050...
	W0700633...	63	UNIT MW DM 063...
	W070E803...	80	UNIT MW DM 080...
	W070EA13...	100	UNIT MW DM 100...
	* Also available in V-Lock version (see **chapter A3**).		
	Note: The guide units must only be used with anti-rotation cylinders.		
	To complete the type and code, add the 3-digit stroke (e.g. 50=050)		
	For technical data and dimensions, see **chapter A1**.		

SPARE PARTS

ELEKTRO ISO 15552 Ø 100 GEARBOX



Code	Description	Application	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0364000	Gearbox MP105 1:3	Elektro ISO 15552 Ø 100	100	2500	222	6.5	25	70	106	24	110	85	M8	145	M8x20	57.5	5	50.5	107.5	48	6.5	120

C_{OUT} = rated output torque N_{IN} = nominal input speed J = mass moment of inertia of the gearhead

METAL WORK PNEUMATIC

NOTES

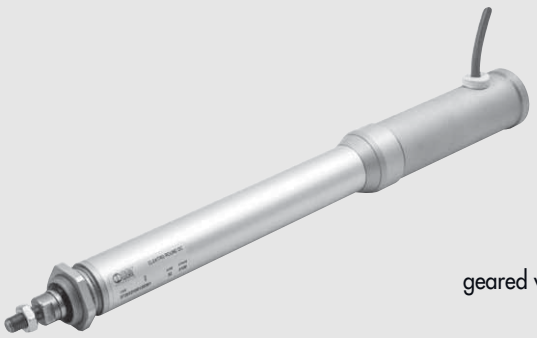
NOTES

ELECTRIC CYLINDER
SERIES ELEKTRO ROUND DC

In the ELEKTRO ROUND DC cylinder, the forward movement of the piston rod is obtained via an acme screw and a self-lubricating technopolymer nut. This piston has a guide ring that is calibrated to minimize the backlash with the cylinder liner and reduce vibration during rotation of the screw. The piston also comes with a magnet for magnetic sensors.
The system is driven by a direct current motor available in two versions, 12 and 24VDC. The position of the motor can be controlled using an optional encoder. A resettable optional fuse can be inserted in the cylinder for motor thermal overload protection. The motor used has a planetary gearbox with a 1/13 or 1/25 ratio.
Depending on the configuration (screw pitch and gear ratio), this cylinder can be either irreversible (supporting the load with the motor off) or reversible under load.
Both versions are supplied without piston rod anti-rotation device, which will be provided by the customer outside the cylinder.
It is available in two versions:
- with an in-line motor, where the motor shaft is connected directly to the screw via a coupling.
- with a geared motor, where the transmission of motion is ensured by three cogwheels with a ratio of 1:1.

This cylinder is designed for use with IP65 protection rating.
The solutions with the acme screw are generally suitable for applications where the number of operations per time unit is reduced; the degree of accuracy is not particularly high due to heating of the screw-leadscrew assembly; wear over time does not create inconveniences, no high forces and speeds are required at the same time.

in-line version

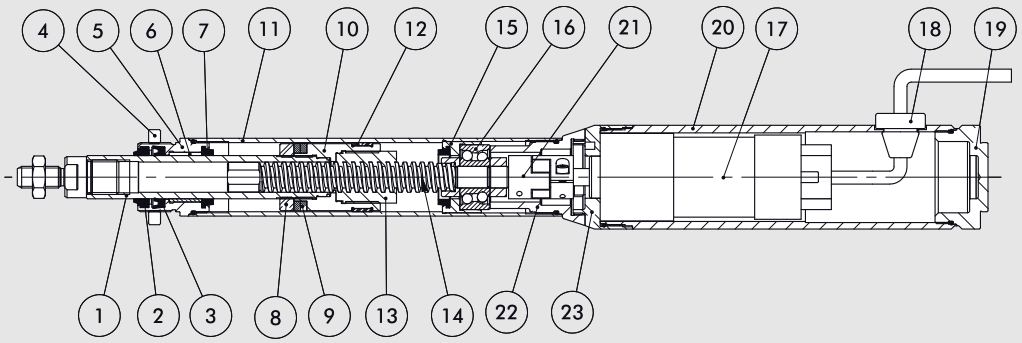


geared version

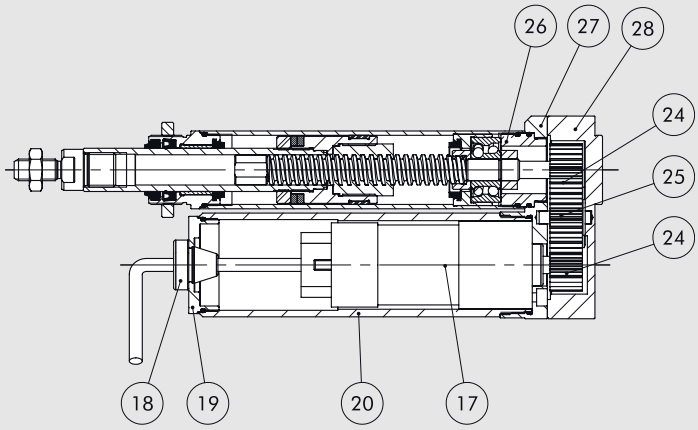
TECHNICAL DATA		Ø 32 pitch 4	Ø 32 pitch 20
Temperature range	°C	from -20 to +60	
Degree of protection		IP65	
Gearing ratio of the planetary gearbox	mm	1/13 or 1/25	
Minimum stroke	mm	25	50
Maximum stroke	mm	1000	
Piston rod diameter	mm	20	
Maximum thrust	N	see graphs on page **A5**.43	
Maximum speed	mm/s	see graphs on page **A5**.43	
Maximum load in vertical position and motor powered off (reversibility)	N	irreversible (max recommended 1000)	90 with 1/25 gear ratio 40 with 1/13 gear ratio
Work cycle at 25°C (duty cycle)	%	20 (example: 2 min. ON 8 min. OFF)	
Overall radial oscillation of the piston rod (without load) for 100 mm of stroke	mm	0.4	
Versions		In-line or geared	
Uncontrolled impact at the end of stroke		NOT ALLOWED (it provides an extra-stroke minimum 5 mm)	
Sensor magnet		YES	
Work position		Any	
Motor		Direct current DC	
Supply voltage	VDC	12 or 24	
Input power with MAX torque	W	24	
Input current with MAX torque	A	2 (12VDC) 1 (24VDC)	
Interference suppression		VDR and capacitors	
Direction of rotation		according to polarity	
Encoder (optional)		two channels, three pulses per rev for each channel	
Motor protection		Overload and short-circuiting protection using resettable fuse (optional)	
Power cable (length)	m	2	
Weight at stroke 0, in-line version	g	1247	1224
Weight at stroke 0, geared version	g	1461	1437
Additional weight for each mm stroke	g	1.4	

COMPONENTS

IN-LINE CYLINDER



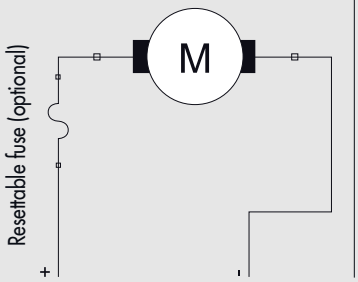
GEARED CYLINDER



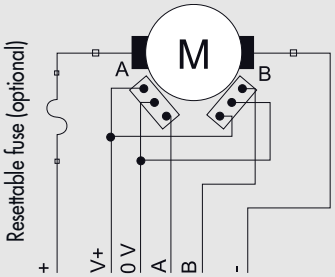
① PISTON ROD: ground chrome steel
② WIPER RING: polyurethane
③ PISTON ROD GASKET: NBR
④ FRONT FIXING RING NUT: anodised aluminium
⑤ FRONT CYLINDER HEAD: anodised aluminium
⑥ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑦ BUFFER: polyurethane
⑧ MAGNET LOCKING RING NUT: alumunium
⑨ MAGNET: plastoferrite
⑩ PISTON: alumunium
⑪ BARREL: anodized aluminium alloy
⑫ GUIDE STRIP: self-lubricated calibrated technopolymer
⑬ BALL SCREW: technopolymer
⑭ ACME SCREW: hardened steel
⑮ REAR CYLINDER HEAD: anodised aluminium
⑯ BEARING: oblique with two ball rings
⑰ GEARED MOTOR
⑱ CABLE GLAND RUBBER
⑲ MOTOR COVER PLUG: anodised aluminium
⑳ MOTOR COVER PIPE: anodised aluminium
㉑ COUPLING
㉒ MOTOR 1 PLATE: anodised aluminium
㉓ MOTOR 2 PLATE: anodised aluminium
㉔ COGWHEEL: steel
㉕ COGWHEEL: technopolymer
㉖ THREADED RING: alumunium
㉗ TRANSMISSION PLATE: anodised aluminium
㉘ COVER: anodised aluminium

CYLINDER CONNECTION AND WIRING DIAGRAM

WITHOUT ENCODER



WITH ENCODER



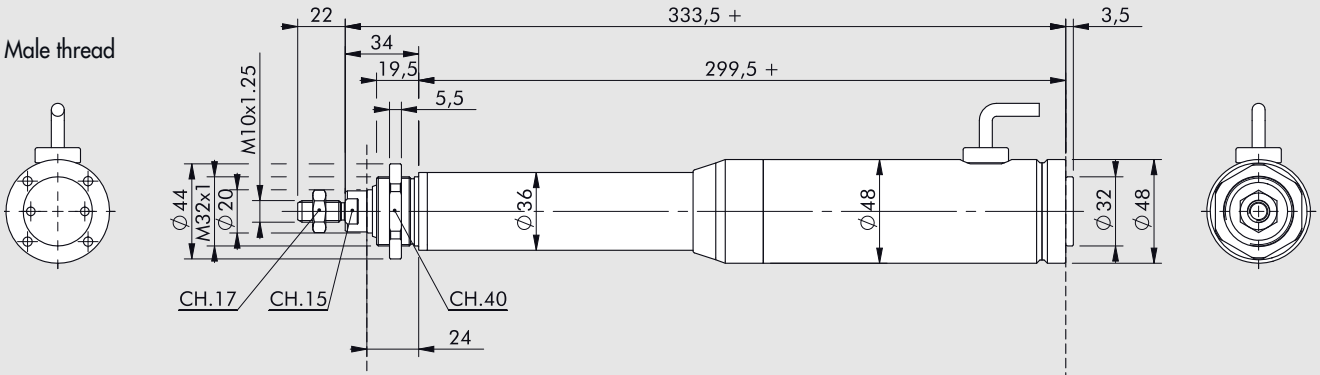
Function	Corresponding wire colour
Motor power supply +	Brown
Motor power supply -	Blue
ENCODER POWER SUPPLY V+ 5-24 VDC	Red
Encoder 0 V supply	Black
Encoder channel A (NPN)	Green
Encoder channel B (NPN)	Yellow
N/A	White
N/A	Gray

METAL WORK PNEUMATIC

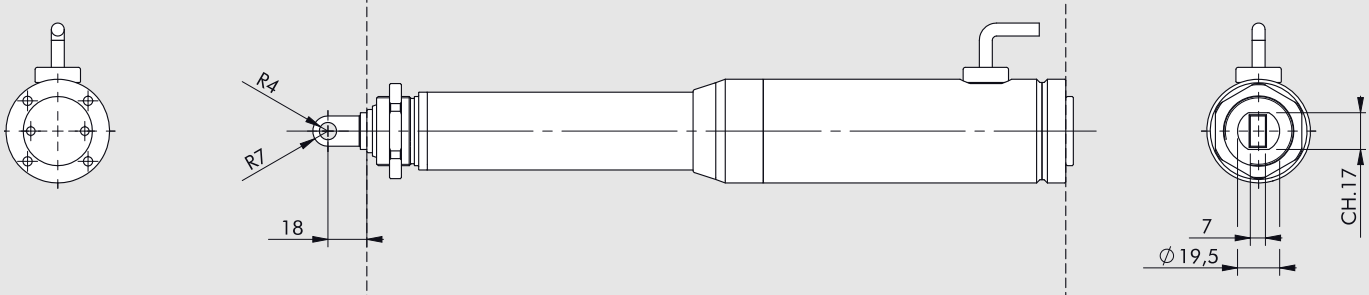
DIMENSIONS FOR IN-LINE VERSIONS

+ = add the stroke

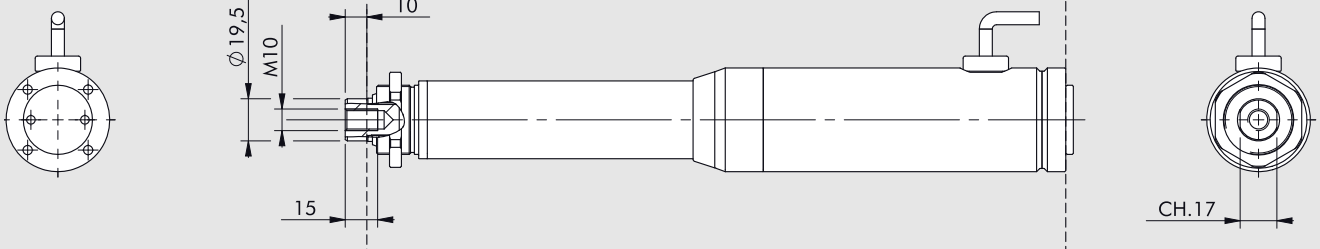
Male thread



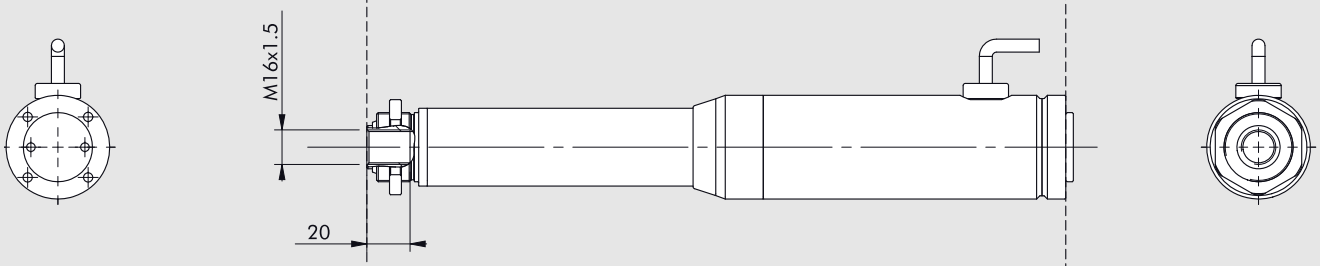
Drilled nose piece



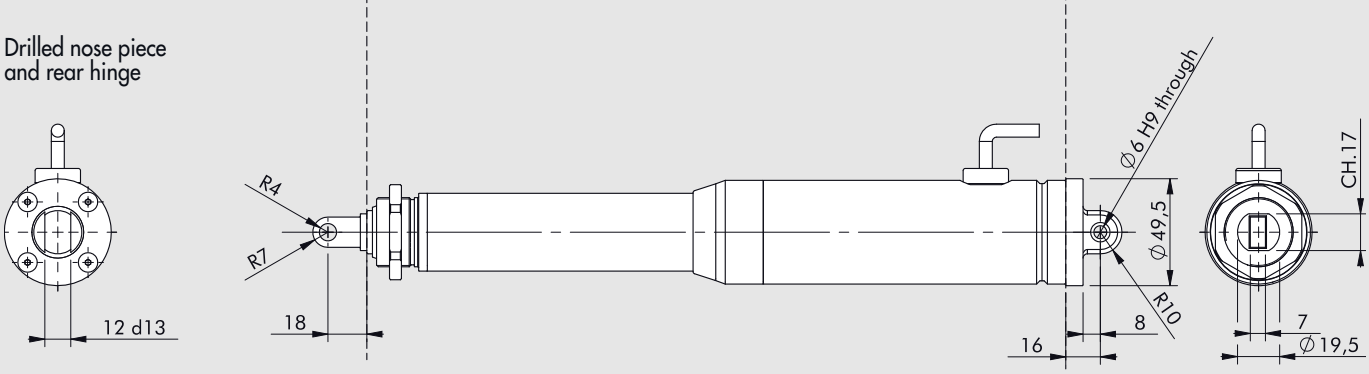
Female nose piece



Female piston rod



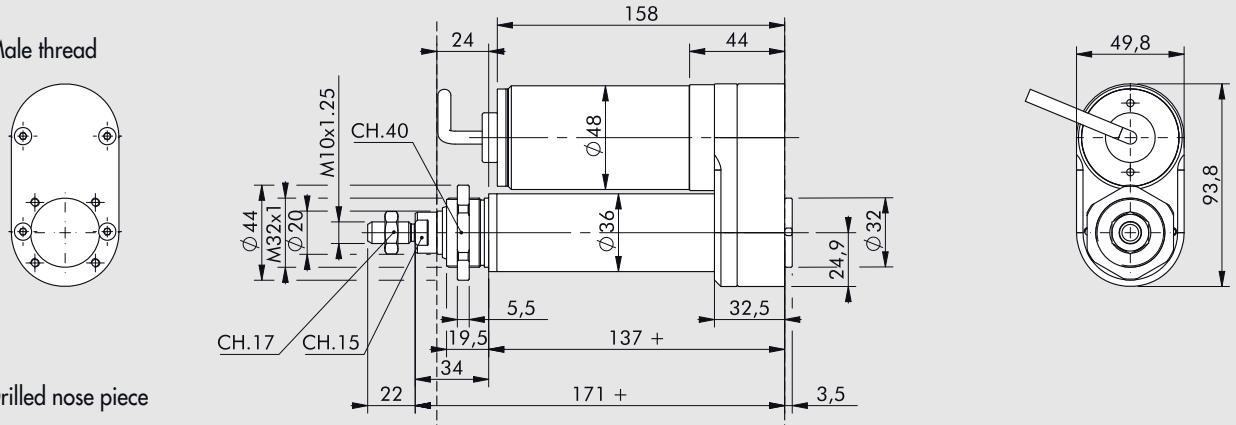
Drilled nose piece and rear hinge



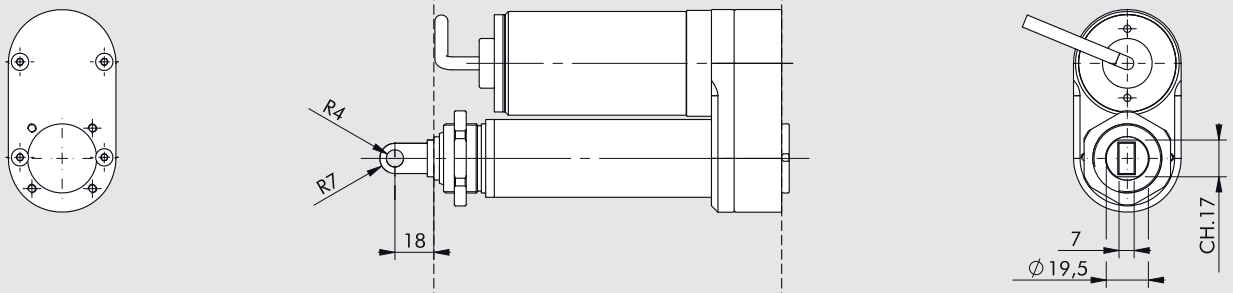
DIMENSIONS FOR GEARED VERSIONS

+ = add the stroke

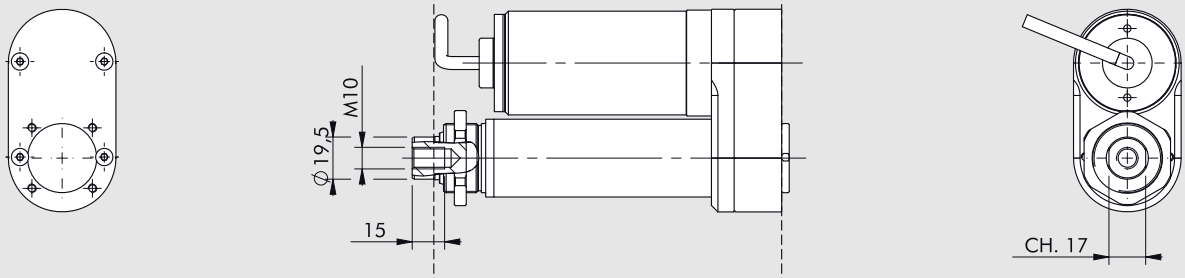
Male thread



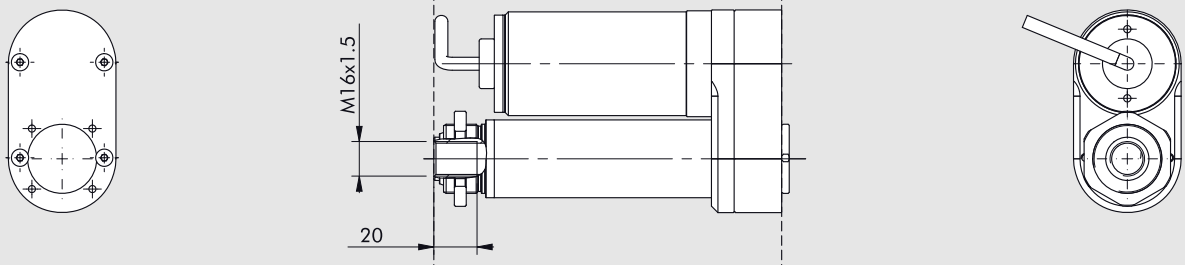
Drilled nose piece



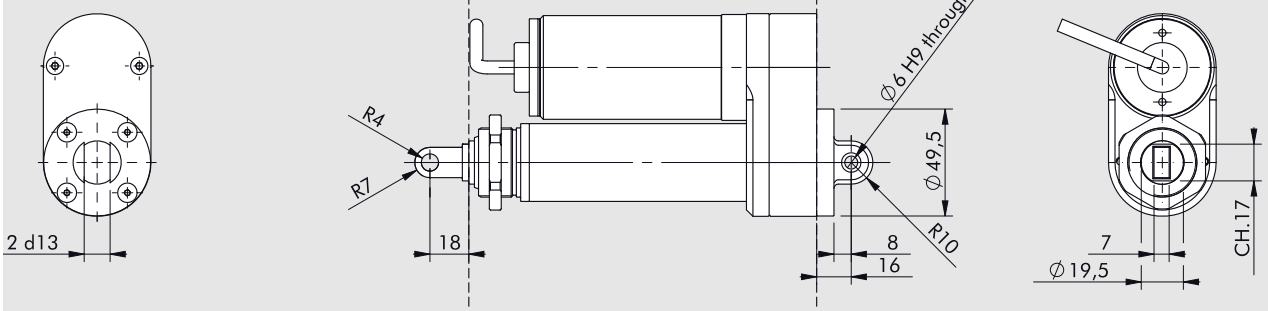
Female nose piece



Female piston rod

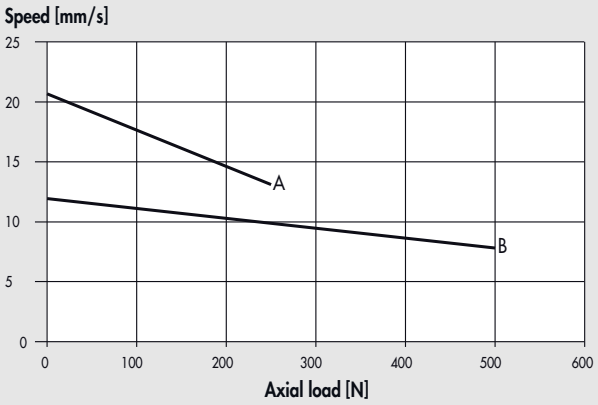


Drilled nose piece and rear hinge



AXIAL LOAD CURVES AS A FUNCTION OF SPEED

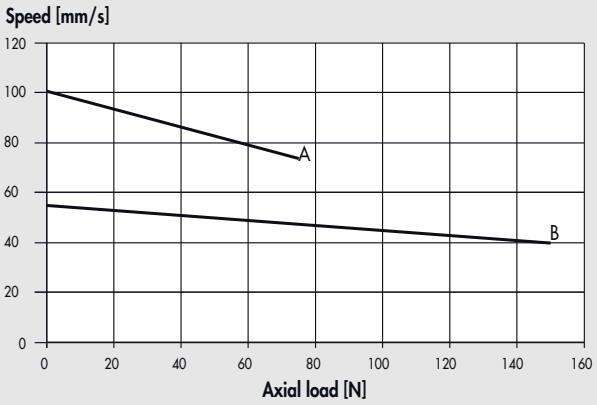
Ø32 WITH PITCH 4 WITH DC MOTOR



A = 372032___1_3_0_ (1/13 gear ratio)

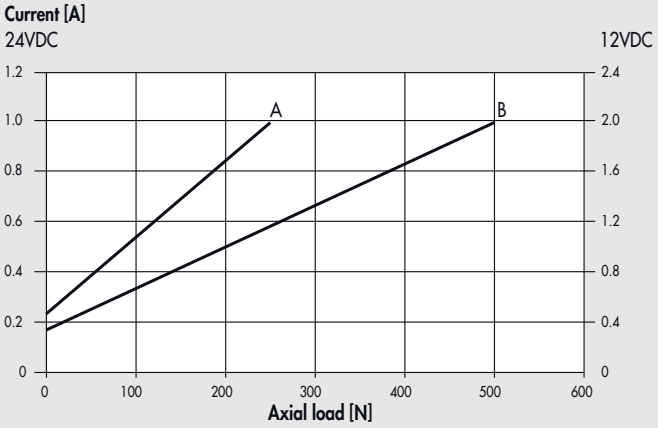
B = 372032___1_3_1_ (1/25 gear ratio)

Ø32 PITCH 20 WITH DC MOTOR



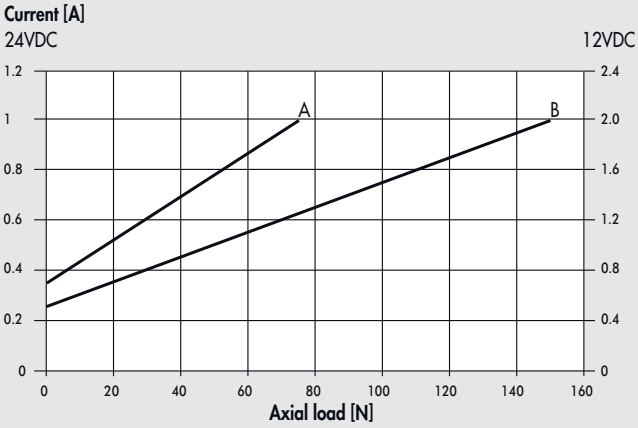
A = 372032___7_3_0_ (1/13 gear ratio)

B = 372032___7_3_1_ (1/25 gear ratio)



A = 372032___1_3_0_

B = 372032___1_3_1_



A = 372032___7_3_0_

B = 372032___7_3_1_

KEY TO CODES

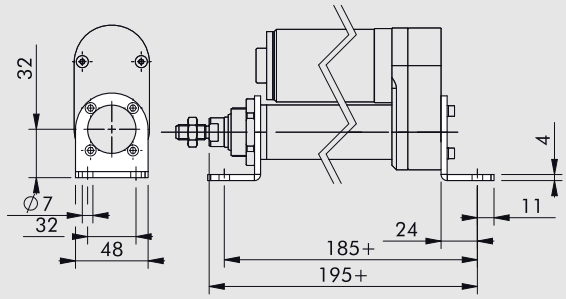
CYL	37 TYPE	2	0	32 BORE	0100 STROKE	1 SCREW PITCH	3 VERSION	3 DRIVE	2 SUPPLY VOLTAGE	0 GEAR RATIO	1 CYLINDER END TYPES
	37 Electric actuators	**2** Cylinder Elektro Round DC	**0** STD	32		**1** Screw pitch 4 **7** Screw pitch 20	**3** In-line without antirotation IP65 **7** Geared without antirotation IP65	**3** Motor Direct current	**1** 12VDC **2** 24VDC **3** 12VDC + Encoder **4** 24VDC + Encoder **5** 12VDC + fuse **6** 24VDC + fuse **7** 12VDC + Encoder + fuse **8** 24VDC + Encoder + fuse	**0** 1/13 **1** 1/25	**1** Thread male **2** Nose piece drilled **3** Nose piece female ◆ **4** Piston rod female **5** Nose piece drilled and rear hinge

◆ For the version with a female piston rod, a cap must be provided on the piston rod to ensure IP65 protection.

ACCESSORIES: FIXINGS

FOOT, CODE W095032C001

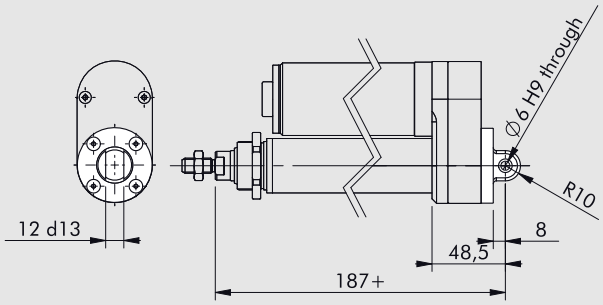
+ = add the stroke



Weight: 111 g
Note: 1 piece per pack complete with 4 screws and 4 roses

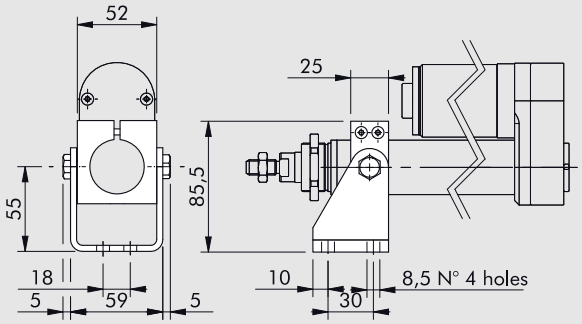
ARTICULATED MALE HINGE, CODE W095032C006

+ = add the stroke



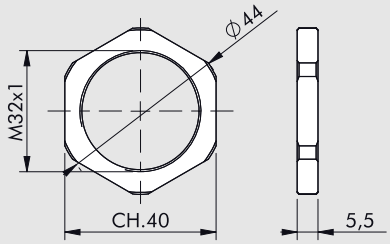
Weight: 41 g
Note: supplied complete with 4 screws and 1 dry bearing

INTERMEDIATE HINGE, CODE W095032C027



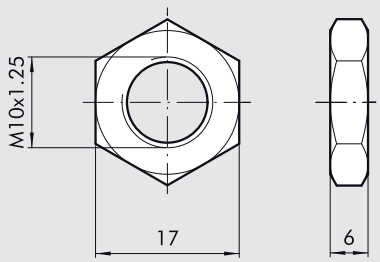
Weight: 375 g
Note: supplied complete with 2 screws

HEAD PIECE RING NUT, CODE W095032C010



Weight: 11 g
Note: individually packed

ROD NUT - MODEL S, CODE 0950322010



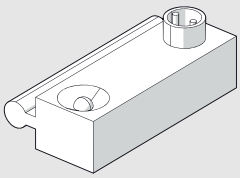
Weight: 6 g
Note: individually packed

NOTES

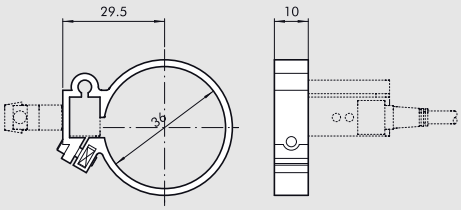
ACCESSORIES: MAGNETIC SENSORS

SENSOR SERIES DSM

For codes and technical data, see **chapter A6**.



SENSOR CIRCLIP



Code	Bore	Model	Ø	A	B
W0950000132	**32**	Circlip DXF 36-32	36	29.5	10

NOTES

ELECTRIC AXIS
SERIES ELEKTRO SHAK

Belt-driven rodless electric cylinder with V-Lock type interface.
The cylinder structure features a sturdy anodised aluminium extruded profile to ensure optimal rigidity. The typical V-Lock dovetail (no grooves) is provided for easy installation using QS elements. The V-Lock interface with a dovetail and standard grooves is mounted on the moving plate to fix the other components using K or QS elements. The slide is moved by means of adjustable casters running along hardened and tempered guides inserted into the extruded profile, to obtain a rigid system with adjustable clearance. Guide lubrication nipples are also mounted on the slide plate. The slide is driven by a reinforced belt that is in turn operated by a pulley keyed onto the motor; a mechanical belt-tensioning system is mounted on the cylinder.
Different drives are available, both brushless and stepping. The versions with a brushless motor can be equipped with a 1:3 speed gearbox, when you want to make the most of the available torque.
In addition to the standard drives included in the catalogue, custom cylinder can also mount other types of motor. The homing position is identified by a inductive sensor included in the supply.
Two different size are available, SHAK 340 and SHAK 470, with pre-set standard strokes. For each size it is possible to choose side on which to mount the motor (4 positions). A version with a smooth tree-type output, mounted in a pre-set position, is also available. The SHAK cylinder can be mounted both horizontally and vertically. With vertical installation, it is advisable to use motors with a holding brake that only activates in the event of a power failure but not when there is a motor overload. For the correct operation of the brake, it is necessary to meet the limits required by the axial load curves according to the speed. Among the accessories available there is a cable guiding system with a handy cable channel and bracket.

SHAK 340

SHAK 470

TECHNICAL DATA		SHAK 340	SHAK 470
WITH STEPPING MOTORS			
Ambient temperature	°C	from -10 to +50	
Maximum relative humidity		90% at 40°C / 57% at 50°C (no condensate)	
Maximum value of duty cycle		50%	
Maximum value of axial force available (with Metal Work motors)			
without brake	N	150	250
with brake	N	180	250
Maximum speed without load			
without brake and without gearbox	m/s	2.5	2
with brake and without gearbox	m/s	2	2
Maximum acceleration without load	m/s^2	50	50
Maximum admissible mass	kg	5	7.5
WITH BRUSHLESS MOTORS			
Ambient temperature	°C	from 0 to +40	
Maximum relative humidity		90% (no condensate)	
Maximum value of duty cycle		100%	
Maximum value of axial force available (with Metal Work motors)			
without gearbox	N	70	80
with gearbox	N	600	700
Maximum speed without load			
without gearbox	m/s	5	5
with gearbox	m/s	2.4	2.7
Maximum acceleration without load	m/s^2	50	50
Maximum admissible mass			
without gearbox, vertical orientation	kg	3	3
with gearbox, vertical orientation	kg	15	25
without gearbox, horizontal orientation	kg	5	5
with gearbox, horizontal orientation	kg	15	25

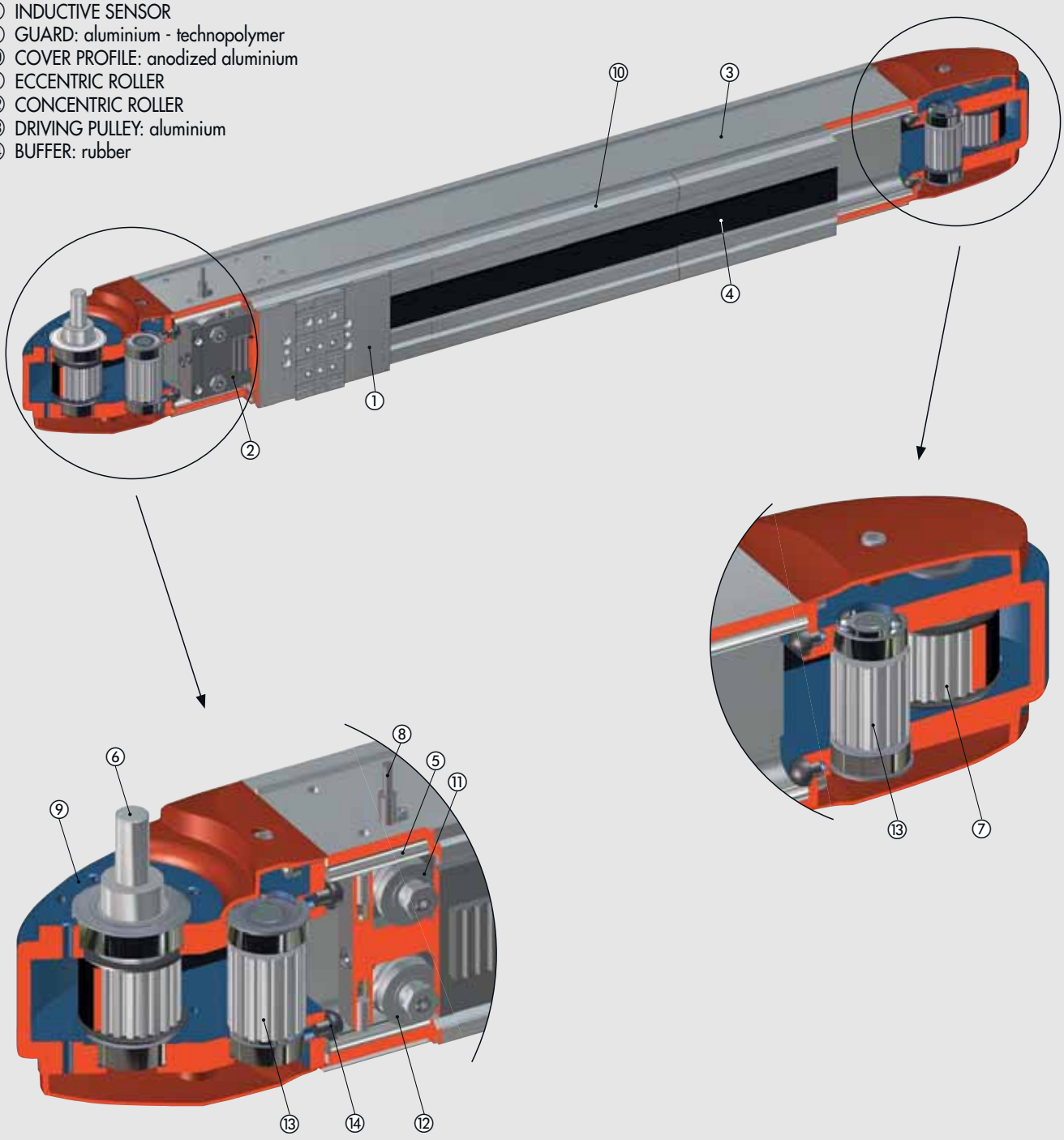
METAL WORK PNEUMATIC

MECHANICAL CHARACTERISTICS		SHAK 340	SHAK 470
Maximum movable mass	kg	15	25
Maximum speed (empty)	m/s	5	5
Maximum acceleration (empty)	m/s^2	50	50
Maximum axial force	N	800	1000
Maximum force applicable on the pulley	Nm	15	25
Standard strokes (special execution on request)	mm	400	800
		600	1200
		800	1600
		1000	2000
		1200	2400
Repetition accuracy	mm	±0.05	
Noise level	dBA	<66	
Mounting position		Any	
Protection level		IP30	
Toothed belt pitch	mm	5	
Type of belt		PowerGrip® LL GT 5MR 25 FV	PowerGrip® LL GT 5MR 30 ST
Belt elongation at maximum load		0.15%	0.25%
Pulley pitch diameter	mm	35.01	44.56
Stroke / Revolution	mm/rev	110	140
Homing position sensor		Inductive sensor switch	

MASS AND MOMENT OF INERTIA		SHAK 340	SHAK 470
Weight without motor	kg	7.7 (stroke 400)	15.9 (stroke 800)
		9 (stroke 600)	19.8 (stroke 1200)
		10.4 (stroke 800)	23.6 (stroke 1600)
		11.7 (stroke 1000)	27.5 (stroke 2000)
		13 (stroke 1200)	31.2 (stroke 2400)
Motor weight	kg		
Stepping motor without brake		2.5	4.2
Stepping motor with brake		3.7	4.5
Brushless motor without brake		1.3	2.6
Brushless motor with brake		1.7	2.2
Moving mass	kg	1.28 (stroke 400)	2.18 (stroke 800)
		1.32 (stroke 600)	2.28 (stroke 1200)
		1.36 (stroke 800)	2.38 (stroke 1600)
		1.40 (stroke 1000)	2.48 (stroke 2000)
		1.44 (stroke 1200)	2.58 (stroke 2400)
Gearbox weight	kg	0.8	4
Reduced inertia at motor (without load)	$kg\ mm^2$		
Versions without gearbox (without motor)		451 (stroke 400)	1414 (stroke 800)
		462 (stroke 600)	1467 (stroke 1200)
		474 (stroke 800)	1521 (stroke 1600)
		485 (stroke 1000)	1574 (stroke 2000)
		497 (stroke 1200)	1627 (stroke 2400)
Versions with gearbox (without motor)		58 (stroke 400)	216 (stroke 800)
		59 (stroke 600)	222 (stroke 1200)
		61 (stroke 800)	228 (stroke 1600)
		62 (stroke 1000)	234 (stroke 2000)
		63 (stroke 1200)	240 (stroke 2400)

COMPONENTS

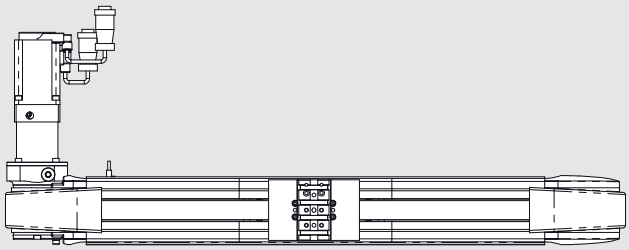
① INTERFACE PLATE: anodized aluminium
② SLIDE: aluminium
③ BODY: anodized aluminium
④ TOOTHED TRANSMISSION BELT: loaded polychloroprene (CR)
⑤ HARDENED GUIDE: hardened ground chromed steel
⑥ DRIVE PULLEY: steel
⑦ IDLE PULLEY: aluminium
⑧ INDUCTIVE SENSOR
⑨ GUARD: aluminium - technopolymer
⑩ COVER PROFILE: anodized aluminium
⑪ ECCENTRIC ROLLER
⑫ CONCENTRIC ROLLER
⑬ DRIVING PULLEY: aluminium
⑭ BUFFER: rubber



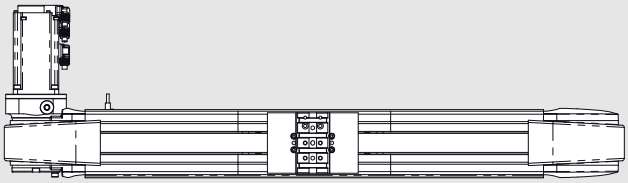
VERSIONS

VERSION WITHOUT MOTOR (attachment on the top left side only)

VERSION WITH MOTOR AND GEARBOX



VERSION WITH MOTOR WITHOUT GEARBOX

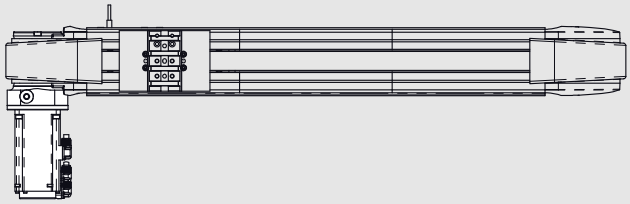


The versions supplied with **MOTOR** or with **MOTOR AND GEARBOX** are available in the following configurations:

VERSION WITH MOTOR OR MOTOR AND GEARBOX TOP LEFT

VERSION WITH MOTOR OR MOTOR AND GEARBOX TOP RIGHT

VERSION WITH MOTOR OR MOTOR AND GEARBOX BOTTOM LEFT



VERSION WITH MOTOR OR MOTOR AND GEARBOX BOTTOM RIGHT

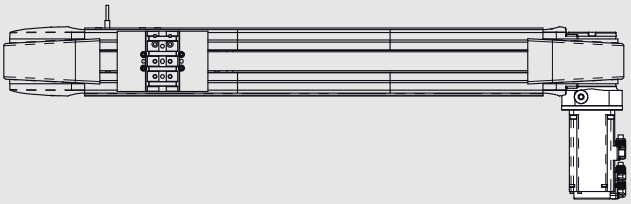
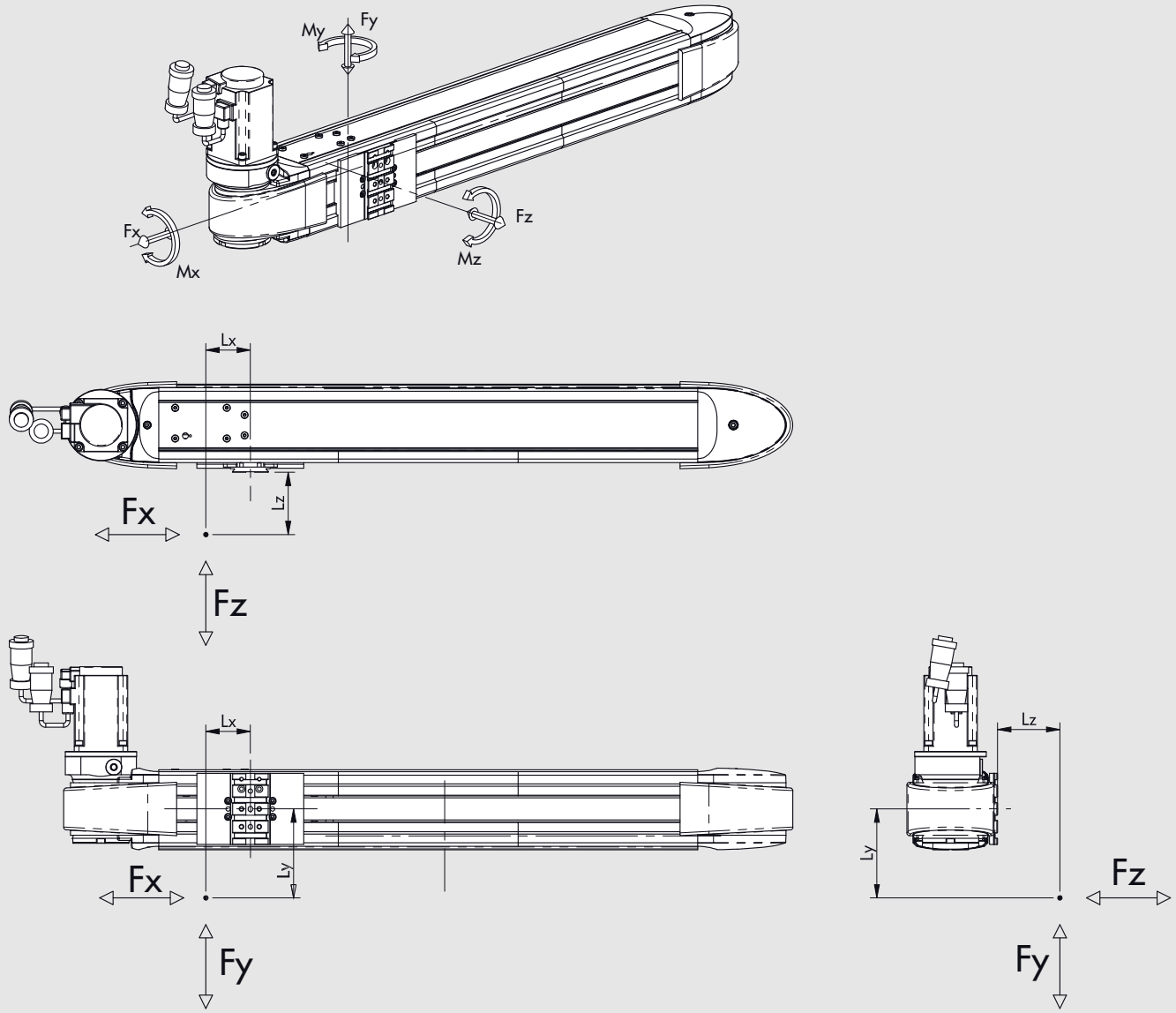


DIAGRAM OF FORCES AND MOMENTS



Size	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
SHAK 340	800	600	24	42	52
SHAK 470	1000	800	32	50	70

N.B.: The values are calculated on the basis of theoretical useful life of 10000 km.

N.B.: For the maximum value of Fx see the general technical data and the axial load curves depending on the speed.

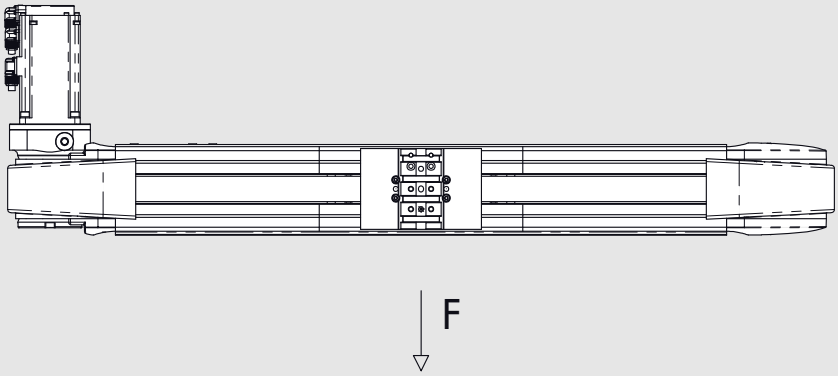
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where Lx, Ly and Lz have to be given in metre.

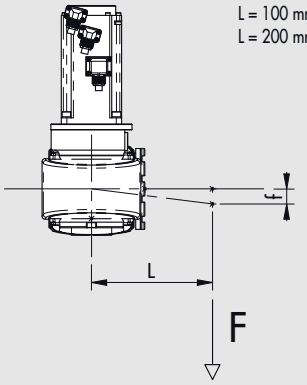
$Mx = Fz \cdot Ly + Fy \cdot Lz \qquad My = Fz \cdot Lx + Fx \cdot Lz \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fy)}{Fy\ max} + \frac{(Fz)}{Fz\ max} \leq 1$$

METAL WORK PNEUMATIC

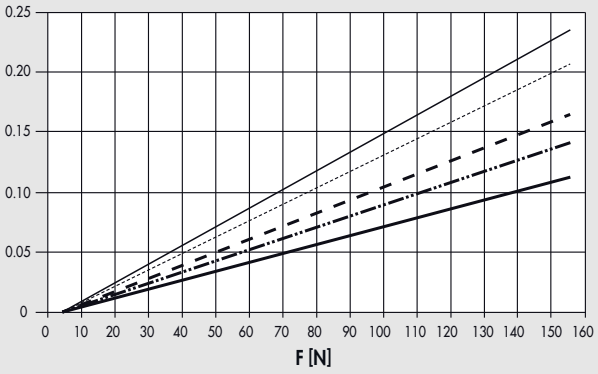
DEFORMATION ACCORDING TO LOAD





SHAK 340

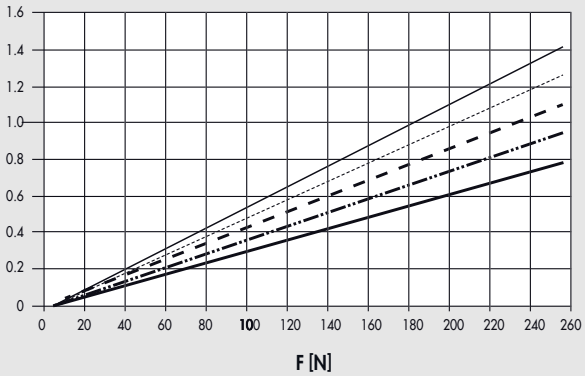
f [mm]



SHAK 340 Stroke 400
SHAK 340 Stroke 600
SHAK 340 Stroke 800
SHAK 340 Stroke 1000
SHAK 340 Stroke 1200

SHAK 470

f [mm]



SHAK 470 Stroke 800
SHAK 470 Stroke 1200
SHAK 470 Stroke 1600
SHAK 470 Stroke 2000
SHAK 470 Stroke 2400

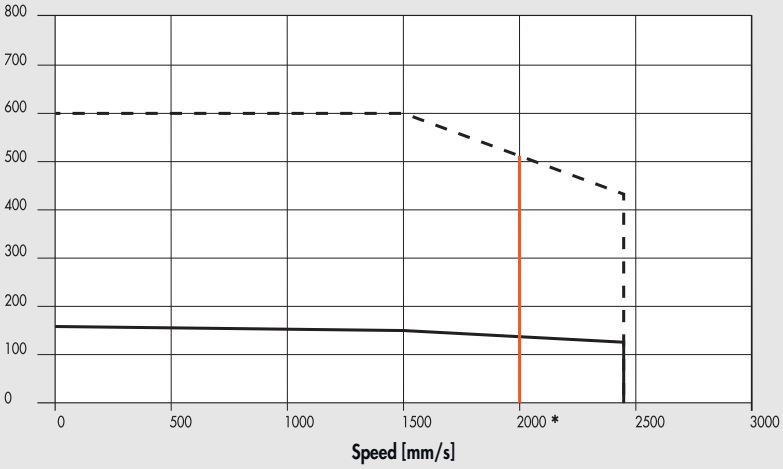
AXIAL LOAD-SPEED CURVES

N.B.: Check that the following constraints are met for each cycle phase:
- the maximum movable masses and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia).

The following diagrams show the axial load with changing speed (mm/s). Each diagram shows two separate curves:
- **NOMINAL AXIAL LOAD** curve: the nominal axial load delivered by the motor with a duty cycle of 100%
- **MAXIMUM AXIAL LOAD** curve: the axial load delivered by the motor with a duty cycle of less than 100%.

SHAK 340
BRUSHLESS and BRUSHLESS with BRAKE drives (versions with 1:3 gearbox)

Axial load [N]



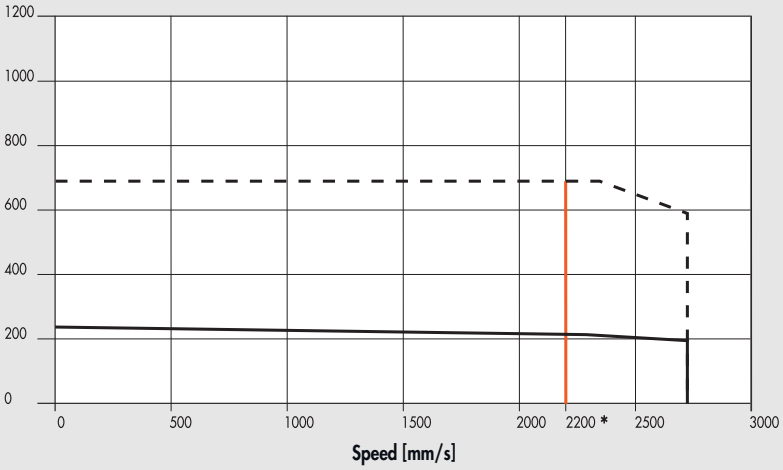
Force load with maximum torque load 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)

Force load with nominal torque load 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)

* = limit of gearbox continuous operation: higher speeds can be reached only for "duty cycle" ≤60% and for a maximum number of 1000 accelerations per hour.

SHAK 470
BRUSHLESS and BRUSHLESS with BRAKE drives (versions with 1:3 gearbox)

Axial load [N]



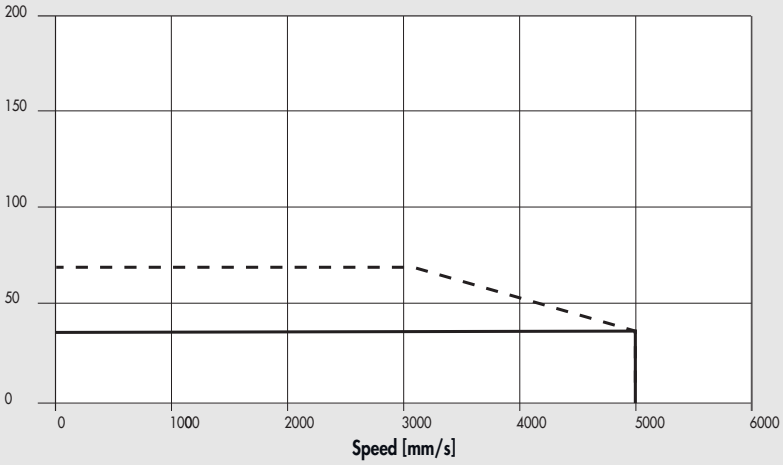
Force load with maximum torque load 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

Force load with nominal torque load 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

* = limit of gearbox continuous operation: higher speeds can be reached only for "duty cycle" ≤60% and for a maximum number of 1000 accelerations per hour.

SHAK 340
BRUSHLESS and BRUSHLESS with BRAKE drives

Axial load [N]

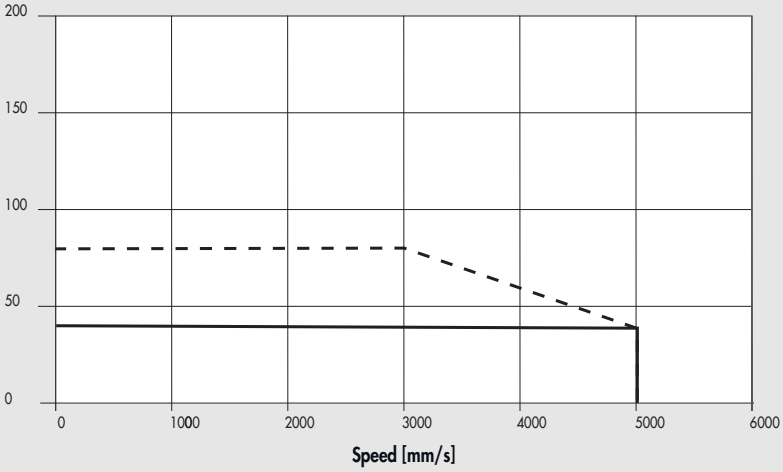


Force load with maximum torque load 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)

Force load with nominal torque load 37M2220000 or 37M4220000 (with brake) + 37D2400000 (400W)

SHAK 470
BRUSHLESS and BRUSHLESS with BRAKE drives

Axial load [N]



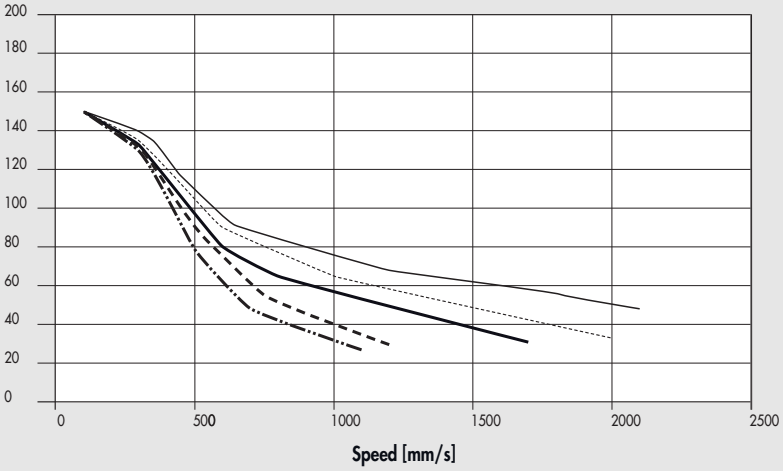
Force load with maximum torque load 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

Force load with nominal torque load 37M2330000 or 37M4330000 (with brake) + 37D2400000 (750W)

N.B.: The obtainable load values already take the efficiency of the system into account. For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available axial load with the motor stopped is also reduced by 50%.

SHAK 340
STEPPING drives

Axial load [N]



37M1440000 (24 VDC)

37M1440000 (48 VDC)

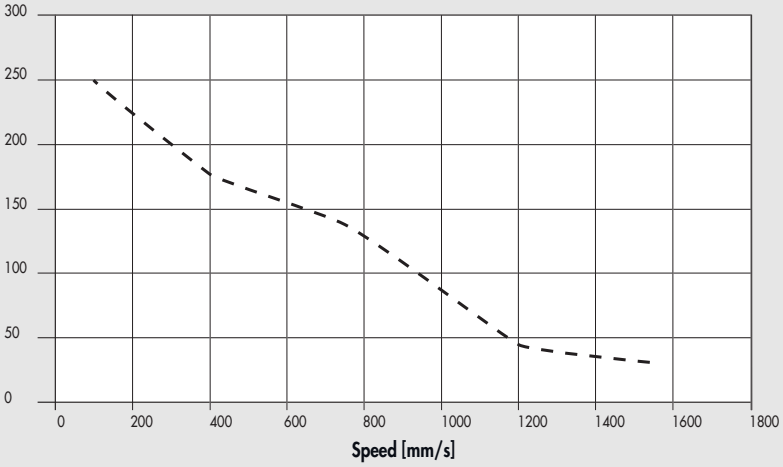
37M1440000 (75 VDC)

37M1440000 (100 VDC)

37M1440000 (140 VDC)

SHAK 470
STEPPING drives

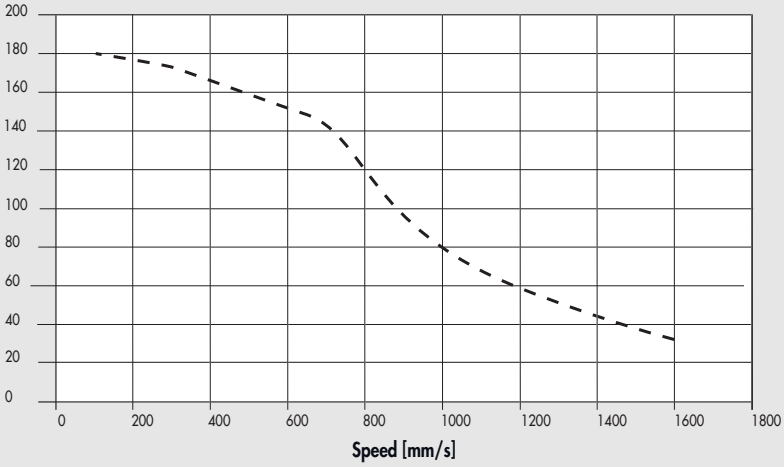
Axial load [N]



37M1470000 (80 VDC - 55 VAC)

SHAK 340
STEPPING + BRAKE and ENCODER drives

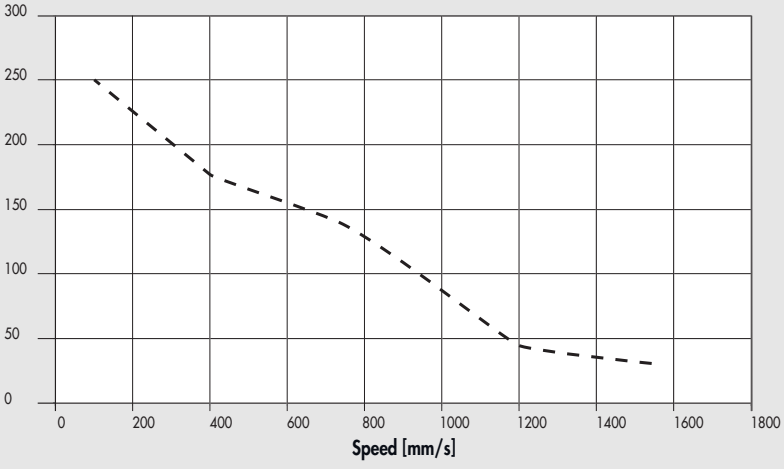
Axial load [N]



37M3450000 (80 VDC - 55 VAC)

SHAK 470
STEPPING + BRAKE and ENCODER drives

Axial load [N]



37M3470000 (80 VDC - 55 VAC)

METAL WORK PNEUMATIC

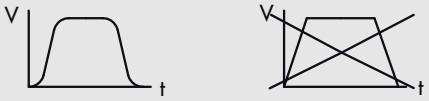
MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES		
	Metal Work	37D1332000 *	37D1442000 *	37D1552000
	Manufacturer	RTA NDC 96	RTA PLUS A4	RTA PLUS B7
Metal Work	Manufacturer	(6A 24 - 75VDC)	(6A 77 - 140VDC)	(10A 28 - 62VAC) ●
STEPPING				
37M1440000	Motor SANYO DENKI 103-H8222-6340 (6A 140V max)	SHAK 340	SHAK 340	SHAK 340 ◆
37M1470000	Motor B&R 80MPH6.101S000-01 (10A 80V max)	-	-	SHAK 470
STEPPING WITH BRAKE + ENCODER				
37M3450000	Motor B&R 80MPH4.101D114-01 (10A 80V max)	-	-	SHAK 340
37M3470000	Motor B&R 80MPH6.101D114-01 (10A 80V max)	-	-	SHAK 470

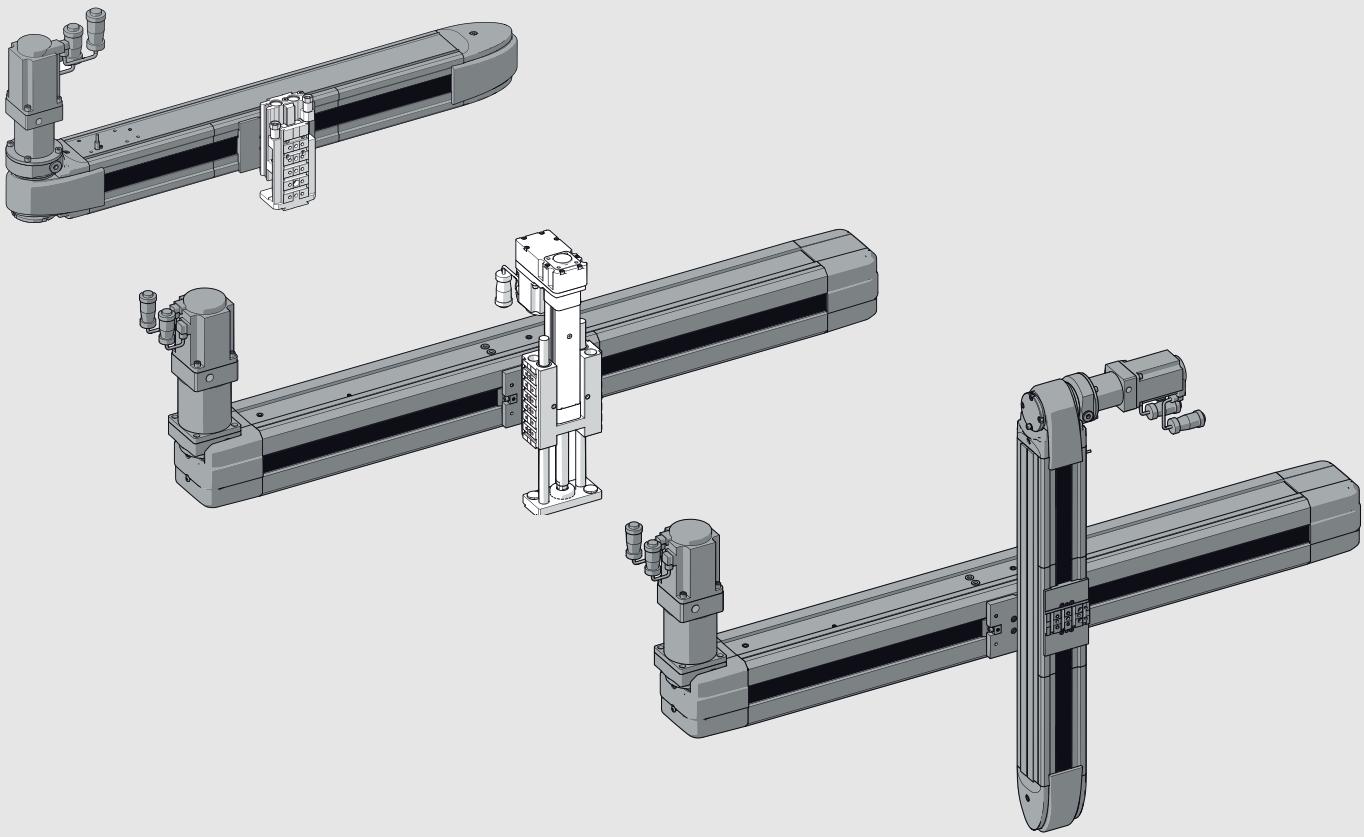
✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive **e**.drive, code 37D1332002, can be used.
◆ Important! Limit current
● Important! AC drive to continuous voltage VDC = VAC · $\sqrt{2}$

MOTOR CODES		DRIVES CODES
	Metal Work	37D2400000
	Manufacturer	SANYO DENKI RS1A03
Metal Work	Manufacturer	(30A 400 - 750 W)
BRUSHLESS		
37M2220000	Motor SANYO DENKI R2AA06040FXH11M (400W)	SHAK 340
37M2330000	Motor SANYO DENKI R2AA08075FXH11M (750W)	SHAK 470
BRUSHLESS WITH BRAKE		
37M4220000	Motor SANYO DENKI R2AA06040FCH11M (400W)	SHAK 340
37M4330000	Motor SANYO DENKI R2AA08075FCH11M (750W)	SHAK 470

The motor must be controlled in such a way as to avoid sudden changes in speed.

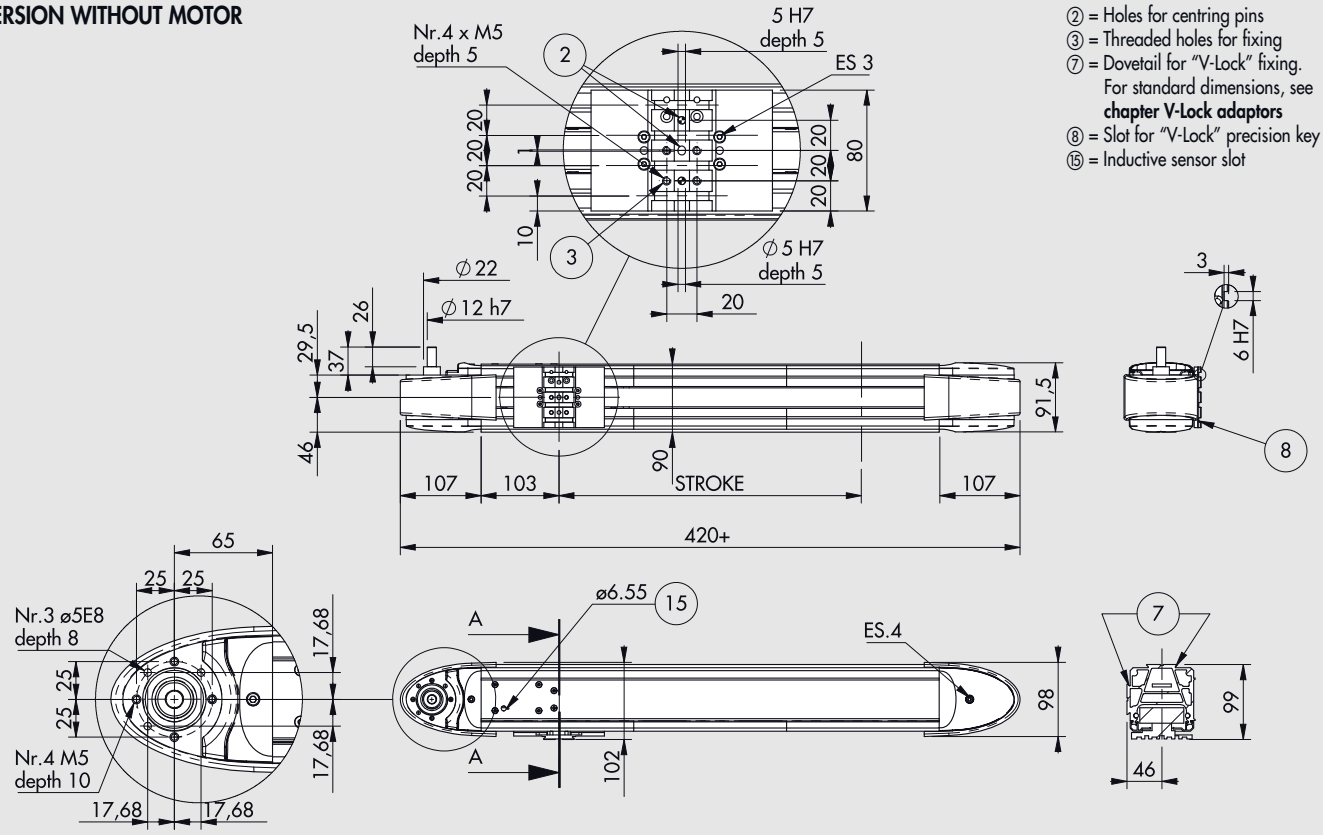


EXAMPLES OF APPLICATION



DIMENSIONS SHAK 340

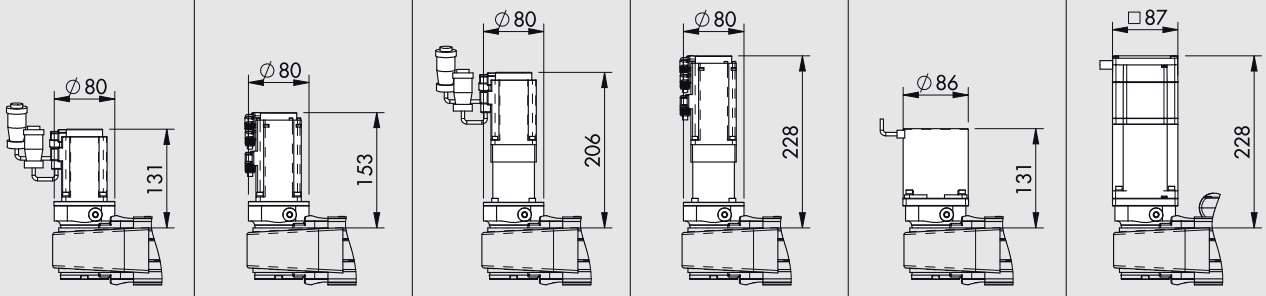
VERSION WITHOUT MOTOR



② = Holes for centring pins
③ = Threaded holes for fixing
⑦ = Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ = Slot for "V-Lock" precision key
⑮ = Inductive sensor slot

VERSION WITH MOTOR

Examples of overall dimensions referring to the version with motor on the top left; these values apply to the other versions as well.



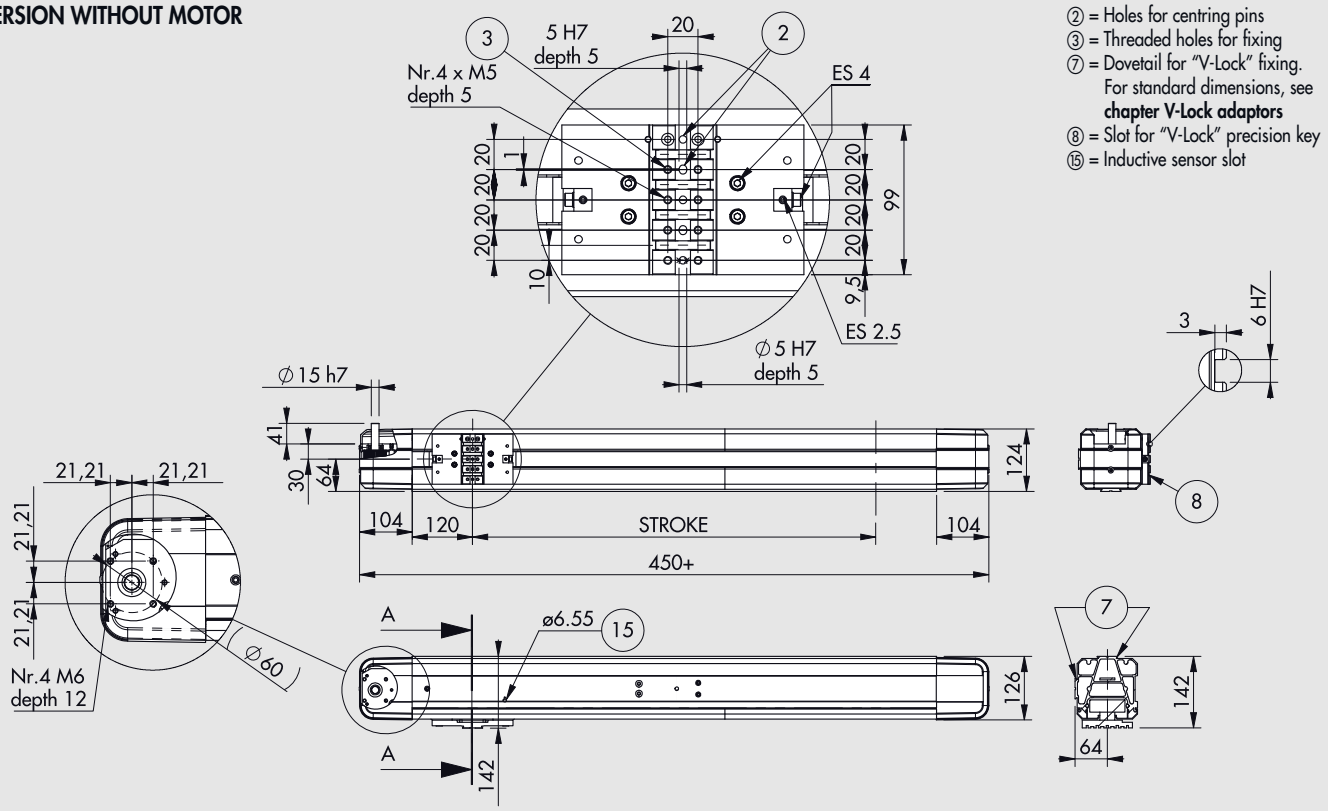
ORDERING CODES	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAKE	BRUSHLESS MOTOR WITH GEARBOX	BRUSHLESS MOTOR WITH GEARBOX AND BRAKE	STEPPING MOTOR	STEPPING MOTOR WITH BRAKE
	375010_ _ _ _0002220	375010_ _ _ _0004220	375010_ _ _ _0102220	375010_ _ _ _0104220	375010_ _ _ _0001440	375010_ _ _ _0003450
	375010_ _ _ _0012220	375010_ _ _ _0014220	375010_ _ _ _0112220	375010_ _ _ _0114220	375010_ _ _ _0011440	375010_ _ _ _0013450
	375010_ _ _ _0022220	375010_ _ _ _0024220	375010_ _ _ _0122220	375010_ _ _ _0124220	375010_ _ _ _0021440	375010_ _ _ _0023450
	375010_ _ _ _0032220	375010_ _ _ _0034220	375010_ _ _ _0132220	375010_ _ _ _0134220	375010_ _ _ _0031440	375010_ _ _ _0033450

_ _ _ _ = Standard stroke (0400; 0600; 0800; 1000; 1200)

METAL WORK PNEUMATIC

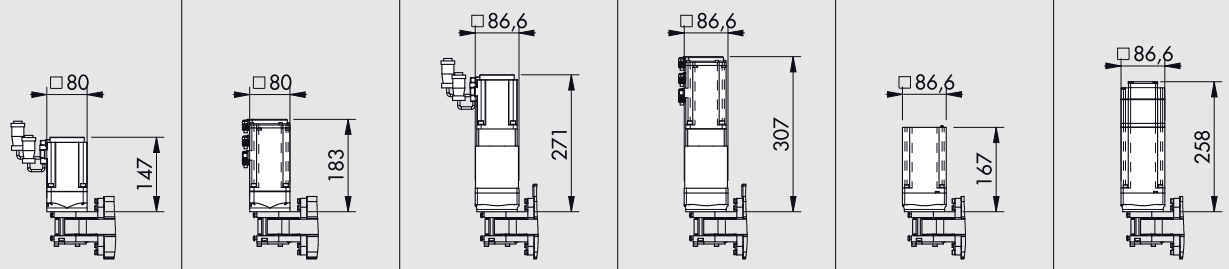
DIMENSIONS SHAK 470

VERSION WITHOUT MOTOR



VERSION WITH MOTOR

Examples of overall dimensions referring to the version with motor on the top left; these values apply to the other versions as well.



ORDERING CODES	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAKE	BRUSHLESS MOTOR WITH GEARBOX	BRUSHLESS MOTOR WITH GEARBOX AND BRAKE	STEPPING MOTOR	STEPPING MOTOR WITH BRAKE
	375020_ _ _ _0002330	375020_ _ _ _0004330	375020_ _ _ _0102330	375020_ _ _ _0104330	375020_ _ _ _0001470	375020_ _ _ _0003470
	375020_ _ _ _0012330	375020_ _ _ _0014330	375020_ _ _ _0112330	375020_ _ _ _0114330	375020_ _ _ _0011470	375020_ _ _ _0013470
	375020_ _ _ _0022330	375020_ _ _ _0024330	375020_ _ _ _0122330	375020_ _ _ _0124330	375020_ _ _ _0021470	375020_ _ _ _0023470
	375020_ _ _ _0032330	375020_ _ _ _0034330	375020_ _ _ _0132330	375020_ _ _ _0134330	375020_ _ _ _0031470	375020_ _ _ _0033470

_ _ _ _ = Standard stroke (0800; 1200; 1600; 2000; 2400)

KEY TO CODES (WITHOUT MOTOR)

CYL	37	5	0	1	0	0800	0
	TYPE			SIZE		STROKE ◆	
	37 Electric actuators	**5** SHAK electric axes	**0** STD	**1** Size 340	**0** STD	400 600 800 1000 1200	**0** STD
				2 Size 470		800 1200 1600 2000 2400	

◆ Other strokes on request.

KEY TO CODES AXIS ELECTRIC MOTOR

CYL	37	5	0	1	0	0800	0	0	0	2	2	2	0
	TYPE			SIZE		STROKE ◆		REDUCTION	MOTOR POSITION	MOTOR	DRIVE FLANGE	DRIVE TORQUE	
	37 Electric actuators	**5** SHAK electric axes	**0** STD	**1** Size 340	**0** STD	400 600 800 1000 1200	**0** STD	**0** No reduction **1** 1:3 ratio	**0** Top left **1** Bottom left **2** Top right **3** Bottom right	**1** STEPPING **2** BRUSHLESS **3** STEPPING with BRAKE (+ Encoder) **4** BRUSHLESS with BRAKE	**2** 60 **3** 80 **4** NEMA 34	**2** 1.2 - 2.19 Nm **3** 2.2 - 3 Nm **4** 3.01 - 5 Nm **5** 6.21 - 7 Nm **7** > 7 Nm	**0** STD
				2 Size 470		800 1200 1600 2000 2400							

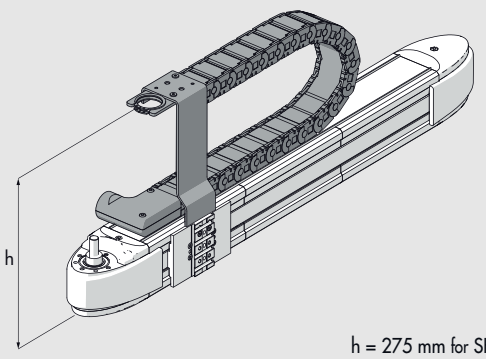
◆ Other strokes on request.
N.B.: The configurations available are shown in the preceding pages.

ACCESSORIES

OIL

Code	Description	Volume [ml]
9910490	PARALIQ P 460	80

CABLE TRAY CHAIN



h = 275 mm for SHAK 340
h = 310 mm for SHAK 470

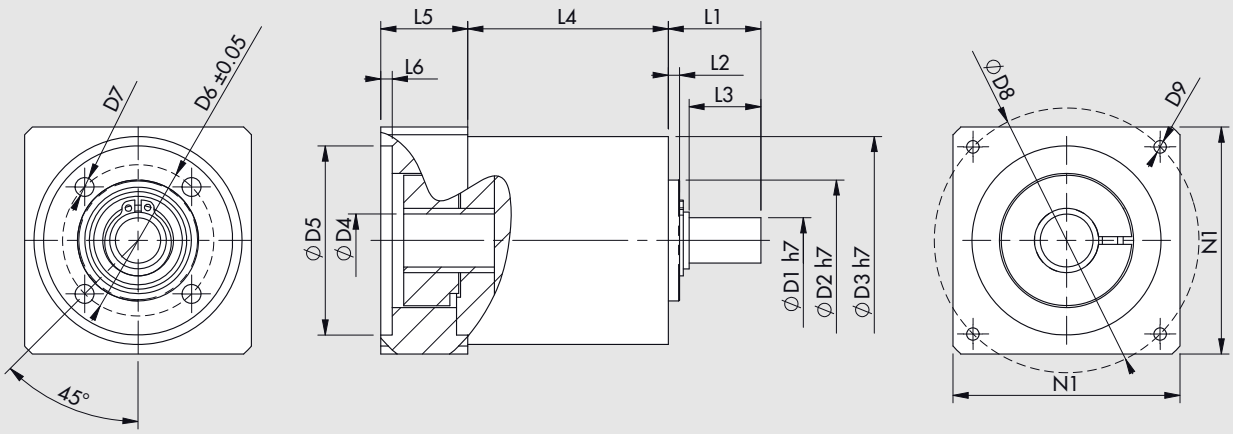
Code	Description
095340A0400	Cable tray chain accessory kit SHAK-340-400
095340A0600	Cable tray chain accessory kit SHAK-340-600
095340A0800	Cable tray chain accessory kit SHAK-340-800
095340A1000	Cable tray chain accessory kit SHAK-340-1000
095340A1200	Cable tray chain accessory kit SHAK-340-1200
095470A0800	Cable tray chain accessory kit SHAK-470-800
095470A1200	Cable tray chain accessory kit SHAK-470-1200
095470A1600	Cable tray chain accessory kit SHAK-470-1600
095470A2000	Cable tray chain accessory kit SHAK-470-2000
095470A2400	Cable tray chain accessory kit SHAK-470-2400

WARNING! You cannot mount the chain on versions with motor or gearmotor at the top right

METAL WORK PNEUMATIC

SPARE PARTS

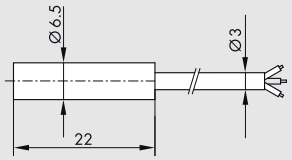
SHAK GEARBOXES



Code	Description	Application	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0341000	Gearbox MP053 1:3	SHAK 340	12	3300	8	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0343000	Gearbox MP080 1:3	SHAK 470	40	2900	59	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80

C_{OUT} = rated output torque N_{IN} = nominal input speed J = mass moment of inertia of the gearhead

SHAK INDUCTIVE SENSOR



Code	Description
095340A0000	SHAK inductive sensor accessory kit

ELECTRIC MOTORS

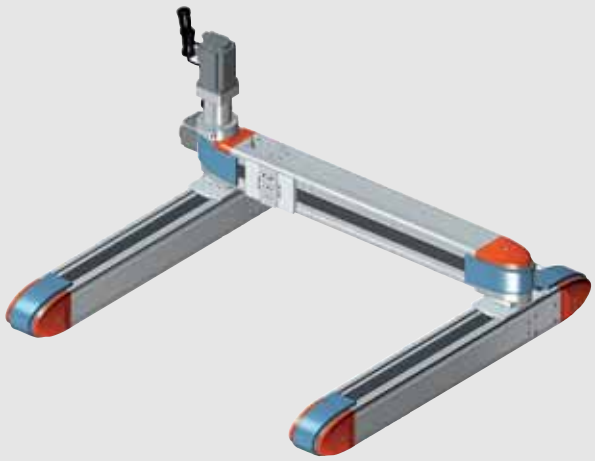
See page **A5**.104

DRIVES

See page **A5**.130

ELECTRIC AXIS
SERIES ELEKTRO SHAK GANTRY

The gantry consists of two parallel belt-driven axes, of which one acts as drive axis (drive X-axis) and the other as driven axis (geared X-axis). Both axes are connected one to the other by means of an anodized aluminium shaft and two flexible couplings that compensate for any minor misalignments between the axes caused by the support base. The shape of both coupling and drive shaft is designed to facilitate disassembly.
The carriages of the drive axis and the driven axis (both with a V-Lock interface featuring a typical shape and grooves) move synchronously thanks to the drive shaft. On the extruded body of both axes, on the side opposite to the carriages, the typical (no grooves) V-Lock dovetail is provided for easy fixing to the support to the support structure using QS elements. On the carriages of the X-axes another SHAK electric axis (Y-axis) is mounted transversally.
The motion is the same as for the single axis and has the same advantages: rigid structure, movement of the carriage with adjustable clearance, the presence of guide lubrication nozzles, the possibility of adjusting belt tensioning.
A BRUSHLESS motor with a 1:5 speed gearbox has been adopted as it ensures optimal load capacity without sacrificing the dynamic and speed performance typical of this product.



In addition to the standard drives proposed in the catalogue, the cylinder can be customised with the installation of other motors.
The homing position is identified by an inductive proximity sensor included in the supply.
Two sizes are available, SHAK-GANTRY 340 and SHAK-GANTRY 470, with standard pre-set strokes. For each size, it is also possible to choose on which side to mount the motors (right- or left-hand).
The Elektro SHAK-GANTRY was designed and optimized for horizontal installation. On request, the motors can be supplied with a holding brake, which activates only in the event of a power failure but not when there is a motor overload. For correct operation of the brake, it is important to comply with the limits required by the axial load curves according to speed. Among the accessories available there is a cable-guiding system with a handy cable channel and bracket (in the version with motors on the left-hand side).

TECHNICAL DATA		SHAK GANTRY 340	SHAK GANTRY 470
Ambient temperature	°C	from -10 to +50	
Maximum relative humidity		90% (no condensate)	
Maximum value of duty cycle		100%	
Maximum X-axis empty speed	m/s	1.8	2.1
Maximum Y-axis empty speed	m/s	2.4	2.7
Maximum X-axis empty acceleration	m/s^2	35	25
Maximum Y-axis empty acceleration	m/s^2	50	50
Maximum admissible mass	kg	15	25

MECHANICAL CHARACTERISTICS		SHAK GANTRY 340		SHAK GANTRY 470	
Maximum axial force	N	800		1000	
Maximum force applicable on the pulley	Nm	15		25	
Standard strokes (special execution on request)		**X-axis**	**Y-axis**	**X-axis**	**Y-axis**
(see dimensional drawings for standard combinations)	mm	400	400	800	600
	mm	600	600	1200	1000
	mm	800	800	1600	1400
	mm	1000	1000	2000	1800
	mm	1200	1200	2400	2200
Repetition accuracy	mm	±0.05			
Noise level	dBA	<66			
Mounting position		Horizontal			
Planarity required for the support surface	mm/m	0.1			
Protection level		IP30			
Toothed belt pitch	mm	5			
Type of belt		PowerGrip® LL GT 5MR 25 FV		PowerGrip® LL GT 5MR 30 ST	
Belt elongation at maximum load		0.15%		0.25%	
Pulley pitch diameter	mm	35.01		44.56	
Stroke / Revolution	mm/rev	110		140	
Homing position sensor		Inductive sensor switch			

METAL WORK PNEUMATIC

MASS AND MOMENT OF INERTIA SHAK GANTRY 340		X-AXIS					Y-AXIS				
Strokes	mm	400	600	800	1000	1200	400	600	800	1000	1200
Weight (without motor and gearbox)	kg	16.2	19	21.9	24.6	27.5	7.7	9	10.4	11.7	13
Motor weight	kg			1.3					1.3		
Gearbox weight	kg			0.8					0.8		
Moving mass (without motor and gearbox)	kg	10.3	11.6	13.1	14.5	15.9	1.28	1.32	1.36	1.40	1.44
J_X Reduced inertia at motor	kg mm²	476	523	573	620	667			-		
J_y Reduced inertia at motor	kg mm²			-			99	101	102	103	104
J_T Inertia connection joint	kg mm²			-			238	306	374	442	510

MASS AND MOMENT OF INERTIA SHAK GANTRY 470		X-AXIS					Y-AXIS				
Strokes	mm	800	1200	1600	2000	2400	600	1000	1400	1800	2200
Weight (without motor and gearbox)	kg	32.7	40.9	48.8	56.9	64.6	15.9	19.8	23.6	27.5	31.2
Motor weight	kg			2.6					2.6		
Gearbox weight	kg			4					4		
Moving mass (without motor and gearbox)	kg	20.3	24.4	28.4	32.5	36.4	2.18	2.28	2.38	2.48	2.58
J_X Reduced inertia at motor	kg mm²	1759	1986	2207	2434	2650			-		
J_y Reduced inertia at motor	kg mm²			-			399	404	410	416	422
J_T Inertia connection joint	kg mm²			-			315	451	587	723	859

Size	d_p [mm]	τ	J_R [kg mm²]	J_M [kg mm²]
SHAK GANTRY 340	35.01	1:5	6	41.2
SHAK GANTRY 470	44.56	1:5	37	182

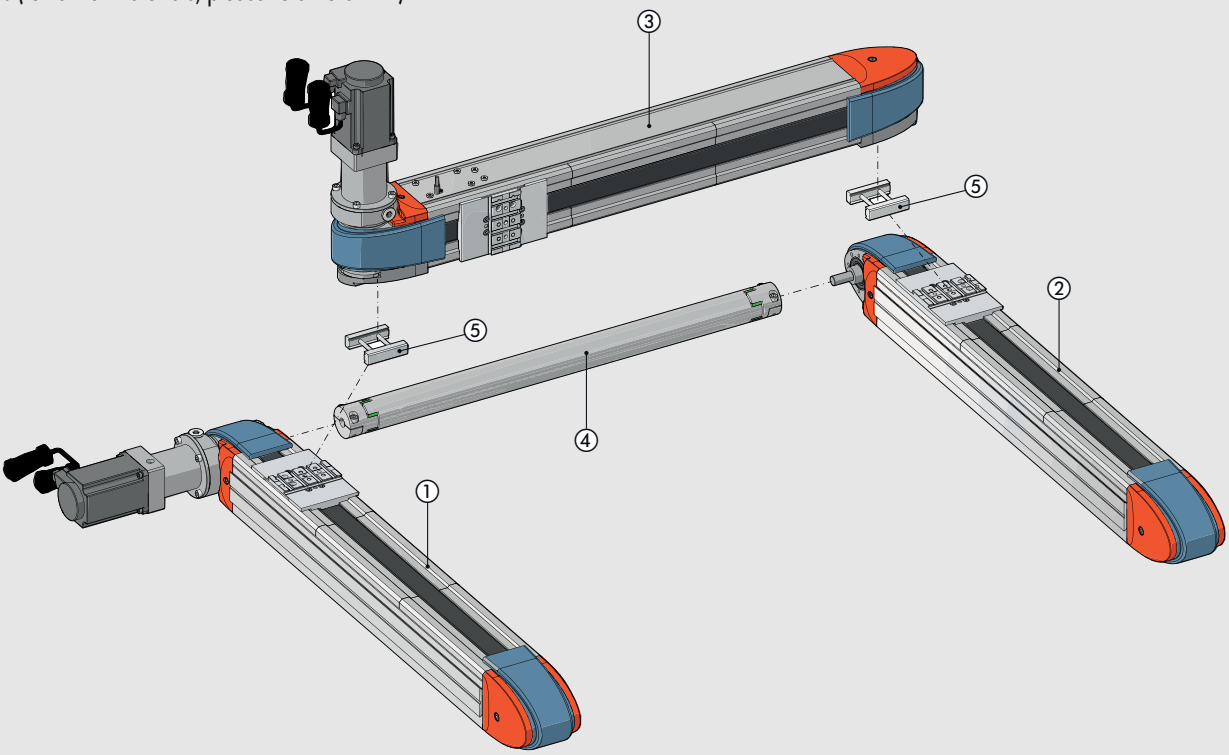
$$J_{tot} = [2 \cdot J_X + J_T + M \cdot (\frac{d_p}{2})^2] \cdot \tau^2 + J_R + J_M$$

N.B.: M = weight axis Y + mass applied on Y axis

CONNECTION JOINT		SHAK GANTRY 340 Y-AXIS	SHAK GANTRY 470 Y-AXIS
Max. number of revs	rpm	2000 (all strokes)	2000 (stroke 600/1000/1400) 1400 (stroke 1800) 1000 (stroke 2200)
Maximum transmissible torque	Nm	25 (hole Ø12)	32 (hole Ø15)

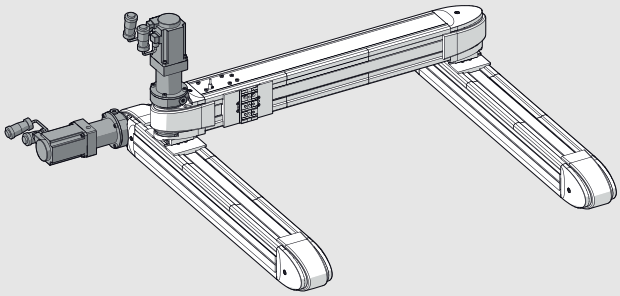
COMPONENTS

① Drive X-axis (for bill of materials, please refer to SHAK)
② Driven X-axis (for bill of materials, please refer to SHAK)
③ Y-axis (for bill of materials, please refer to SHAK)
④ Connection joint (aluminium and polyurethane)
⑤ QS fixing elements



VERSIONS

VERSION WITH MOTORS ON THE LEFT-HAND SIDE



VERSION WITH MOTORS ON THE RIGHT-HAND SIDE

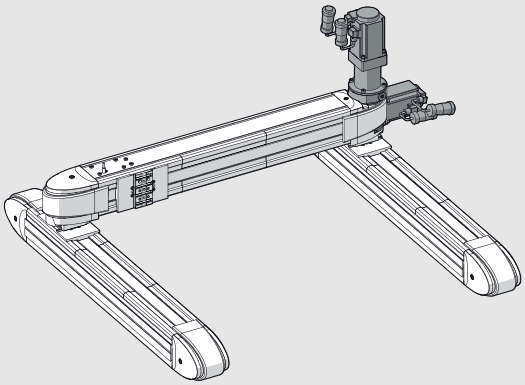
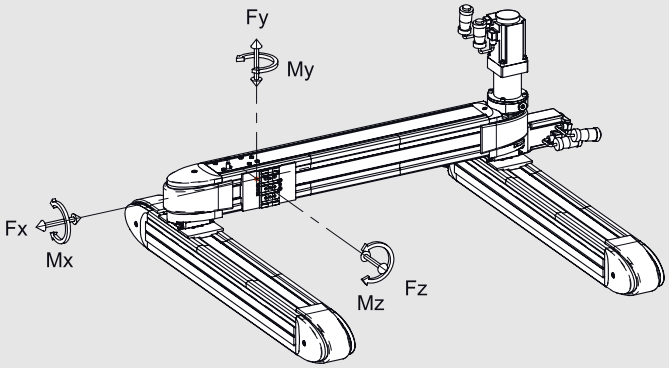
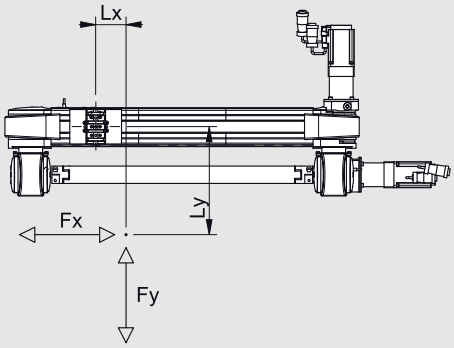
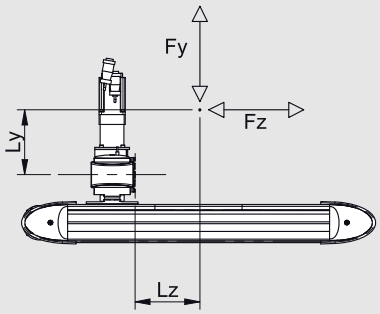
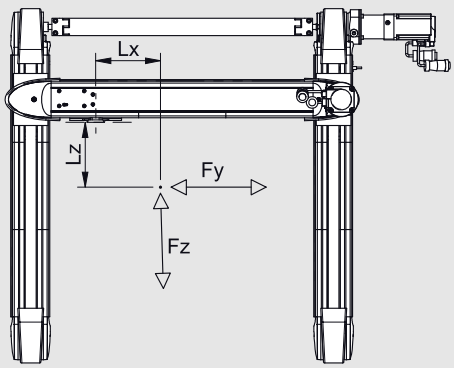


DIAGRAM OF FORCES AND MOMENTS









Size	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
SHAK GANTRY 340	800	600	24	42	52
SHAK GANTRY 470	1000	800	32	50	70

N.B.: The values are calculated on the basis of theoretical useful life of 10000 km.

N.B.: For the maximum value of Fx see the general technical data and the axial load curves depending on the speed for SHAK single axes. For the maximum value of Fz, please also refer to general technical data and axial load curves, depending on the speed for SHAK portal axes.

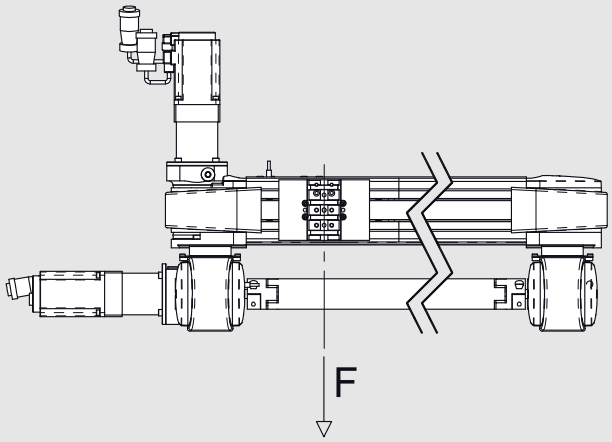
N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where Lx, Ly and Lz have to be given in metre.

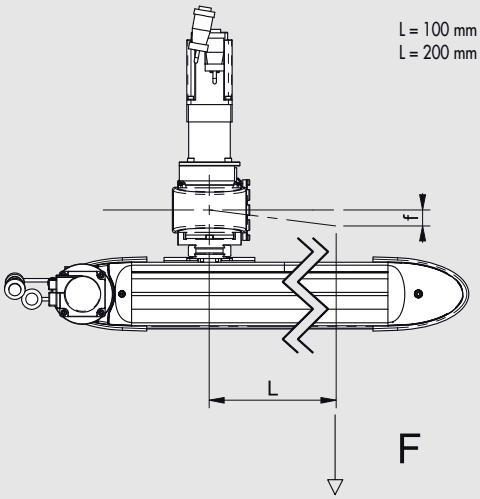
$$Mx = Fz \cdot Ly + Fy \cdot Lz \qquad My = Fz \cdot Lx + Fx \cdot Lz \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$$

$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fy)}{Fy\ max} + \frac{(Fz)}{Fz\ max} \leq 1 \quad e \quad \frac{(Fx)}{2Fy\ max} \leq 1$$

METAL WORK PNEUMATIC

DEFORMATION ACCORDING TO LOAD

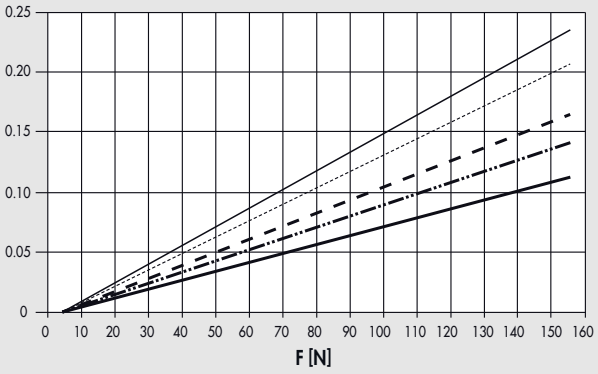




L = 100 mm for SHAK GANTRY 340
L = 200 mm for SHAK GANTRY 470

SHAK GANTRY 340

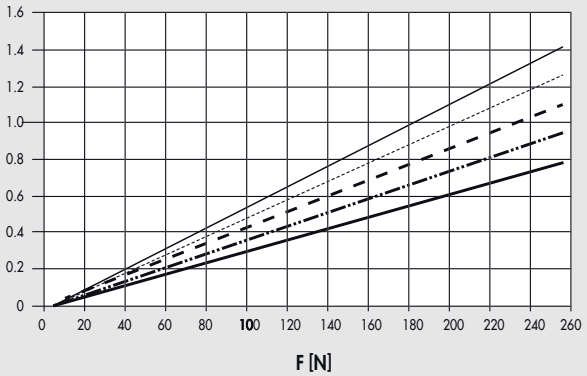
f [mm]



SHAK GANTRY 340 Stroke Y 400
SHAK GANTRY 340 Stroke Y 600
SHAK GANTRY 340 Stroke Y 800
SHAK GANTRY 340 Stroke Y 1000
SHAK GANTRY 340 Stroke Y 1200

SHAK GANTRY 470

f [mm]



SHAK GANTRY 470 Stroke Y 600
SHAK GANTRY 470 Stroke Y 1000
SHAK GANTRY 470 Stroke Y 1400
SHAK GANTRY 470 Stroke Y 1800
SHAK GANTRY 470 Stroke Y 2200

AVERAGE TRAVERSE TIMES

N.B.: Check that the following constraints are met for each cycle phase:
- the maximum movable masses and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia).

SHAK GANTRY 340 TRAVERSE TIMES

Size	Stroke X - Stroke Y	t X [s]	t Y [s]
340	400 - 400	0.50	0.45
	400 - 600		0.50
	400 - 800		0.60
	400 - 1000		0.70
	400 - 1200		0.80
	600 - 400	0.60	0.45
	600 - 600		0.50
	600 - 800		0.60
	600 - 1000		0.70
	600 - 1200		0.80
	800 - 400	0.70	0.45
	800 - 600		0.50
	800 - 800		0.60
	800 - 1000		0.70
	800 - 1200		0.80
	1000 - 400	0.80	0.45
	1000 - 600		0.50
	1000 - 800		0.60
	1000 - 1000		0.70
	1000 - 1200		0.80
	1200 - 400	0.90	0.45
	1200 - 600		0.50
	1200 - 800		0.60
	1200 - 1000		0.70
	1200 - 1200		0.80

N.B.: Maximum moving mass 15 kg

SHAK GANTRY 470 TRAVERSE TIMES

Size	Stroke X - Stroke Y	t X [s]	t Y [s]
470	800 - 600	0.90	0.55
	800 - 1000		0.75
	800 - 1400		0.90
	800 - 1800		1.00
	800 - 2200		1.20
	1200 - 600	1.20	0.55
	1200 - 1000		0.75
	1200 - 1400		0.90
	1200 - 1800		1.00
	1200 - 2200		1.20
	1600 - 600	1.40	0.55
	1600 - 1000		0.75
	1600 - 1400		0.90
	1600 - 1800		1.00
	1600 - 2200		1.20
	2000 - 600	1.75	0.55
	2000 - 1000		0.75
	2000 - 1400		0.90
	2000 - 1800		1.00
	2000 - 2200		1.20
	2400 - 600	2.00	0.55
	2400 - 1000		0.75
	2400 - 1400		0.90
	2400 - 1800		1.00
	2400 - 2200		1.20

N.B.: Maximum moving mass 25 kg

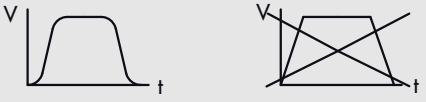
Traverse times relate to operation with motors supplied by Metal Work, using max. 200% of the rated torque.

EXAMPLE:
Average traverse times with SHAK GANTRY 340, 800-1200.
The following can be obtained from the tables: tX = 0.7 and tY = 0.80

MOTOR-DRIVE COUPLINGS

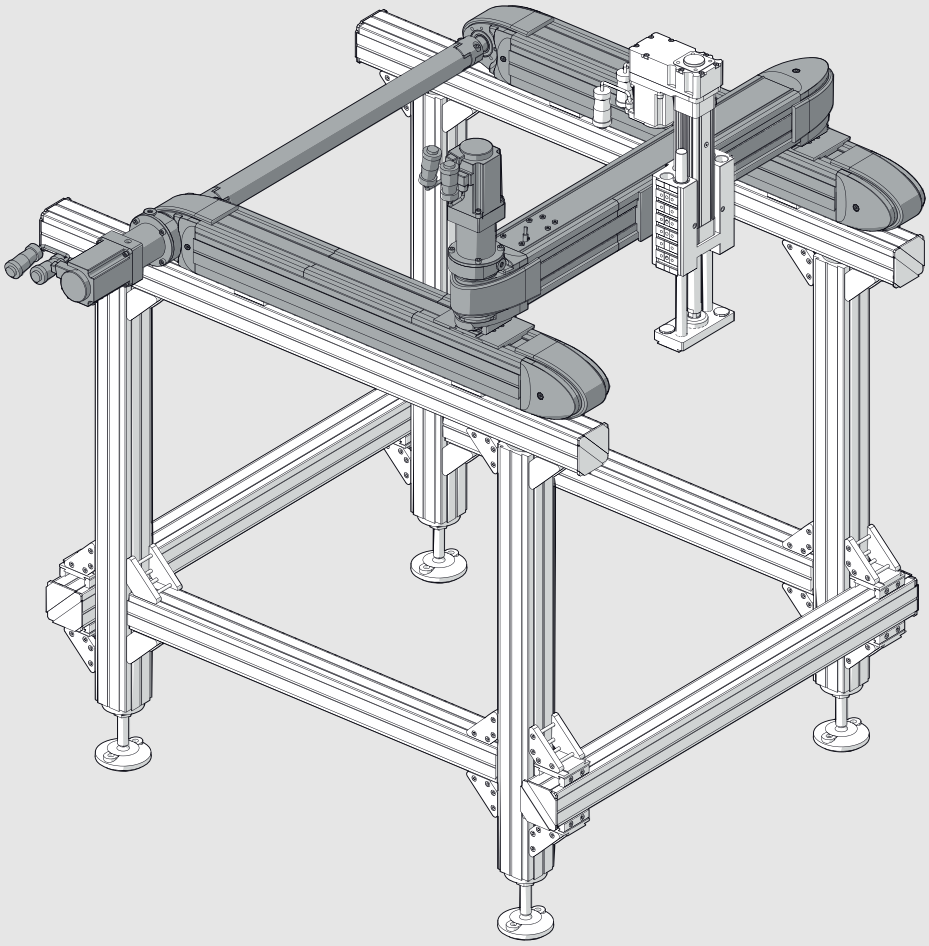
MOTOR CODES		**DRIVES CODES**
	Metal Work	37D2400000
	Manufacturer	SANYO DENKI RS1A03
Metal Work	Manufacturer	(30A 400 - 750 W)
37M2220000	Motor SANYO DENKI R2AA06040FXH11M (400W)	SHAK GANTRY 340
37M2330000	Motor SANYO DENKI R2AA08075FXH11M (750W)	SHAK GANTRY 470

The motor must be controlled in such a way as to avoid sudden changes in speed.



METAL WORK PNEUMATIC

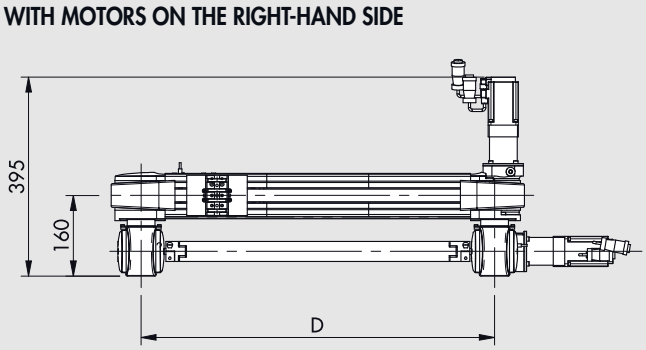
EXAMPLES OF APPLICATION

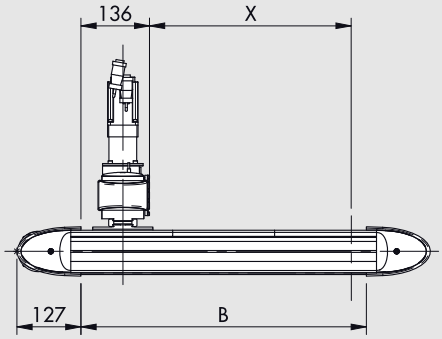


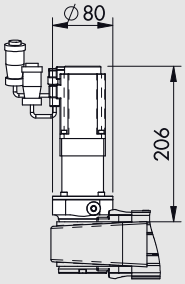
NOTES

DIMENSIONS SHAK GANTRY 340

VERSION WITH MOTORS ON THE RIGHT-HAND SIDE







BRUSHLESS MOTOR
WITH GEARBOX

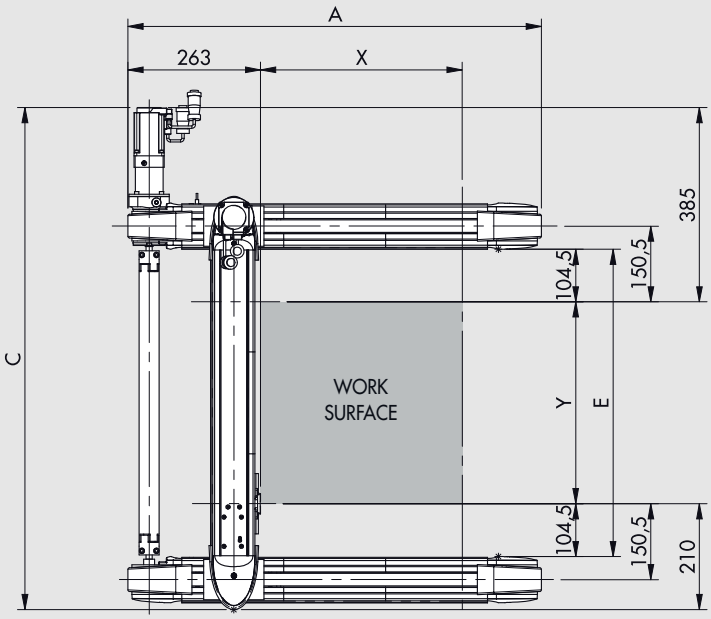


Table of dimensions referring to the version with motors on the right. The version with motor on the left is specular.

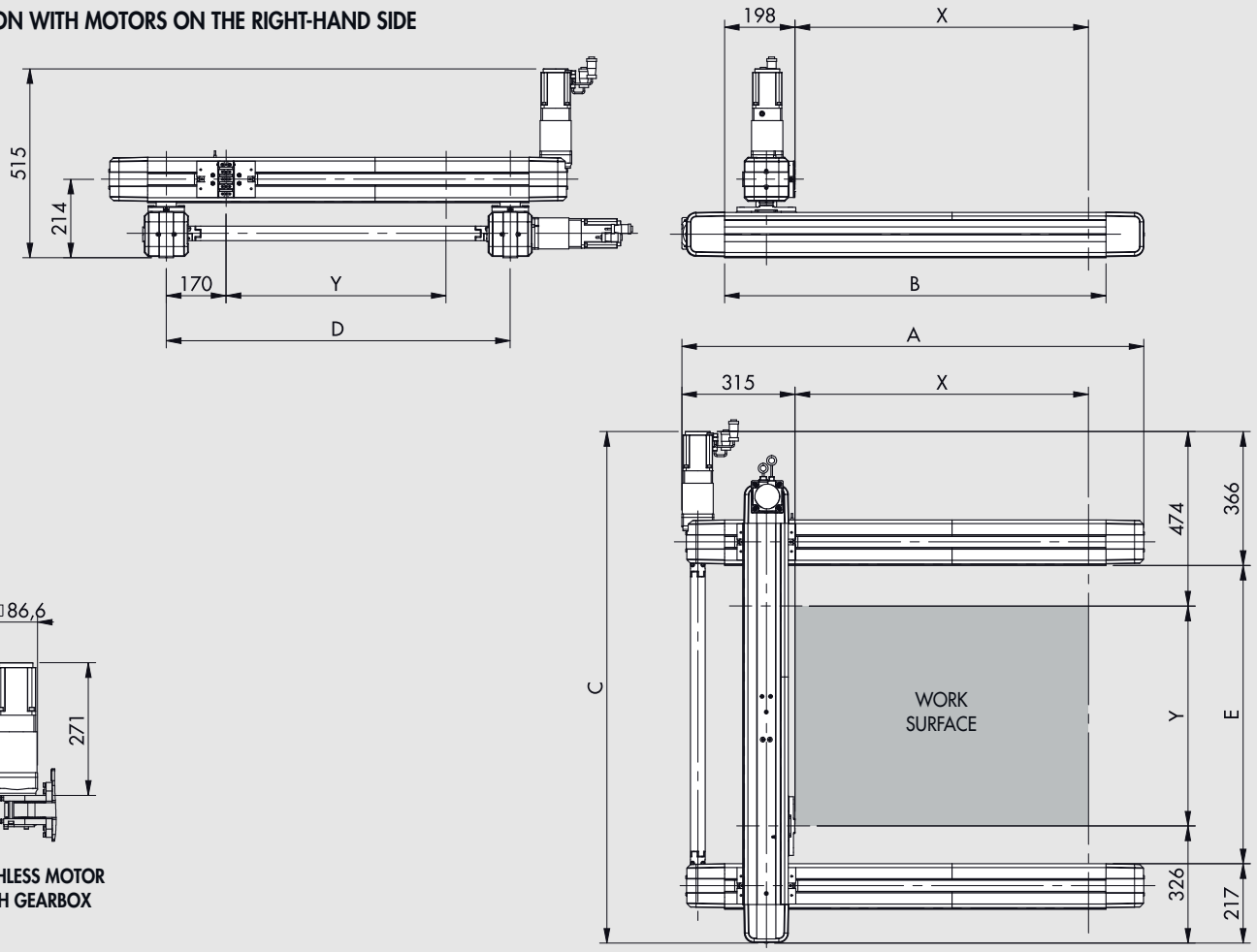
Code	Description	X	Y	A	B	C	D	E
375G1040004001_200	SHAK GANTRY-340-X400-Y400	400	400	820	566	996	701	609
375G1040006001_200	SHAK GANTRY-340-X400-Y600	400	600	820	566	1196	901	809
375G1040008001_200	SHAK GANTRY-340-X400-Y800	400	800	820	566	1396	1101	1009
375G1040010001_200	SHAK GANTRY-340-X400-Y1000	400	1000	820	566	1596	1301	1209
375G1040012001_200	SHAK GANTRY-340-X400-Y1200	400	1200	820	566	1796	1501	1409
375G1060004001_200	SHAK GANTRY-340-X600-Y400	600	400	1020	766	996	701	609
375G1060006001_200	SHAK GANTRY-340-X600-Y600	600	600	1020	766	1196	901	809
375G1060008001_200	SHAK GANTRY-340-X600-Y800	600	800	1020	766	1396	1101	1009
375G1060010001_200	SHAK GANTRY-340-X600-Y1000	600	1000	1020	766	1596	1301	1209
375G1060012001_200	SHAK GANTRY-340-X600-Y1200	600	1200	1020	766	1796	1501	1409
375G1080004001_200	SHAK GANTRY-340-X800-Y400	800	400	1220	966	996	701	609
375G1080006001_200	SHAK GANTRY-340-X800-Y600	800	600	1220	966	1196	901	809
375G1080008001_200	SHAK GANTRY-340-X800-Y800	800	800	1220	966	1396	1101	1009
375G1080010001_200	SHAK GANTRY-340-X800-Y1000	800	1000	1220	966	1596	1301	1209
375G1080012001_200	SHAK GANTRY-340-X800-Y1200	800	1200	1220	966	1796	1501	1409
375G1100004001_200	SHAK GANTRY-340-X1000-Y400	1000	400	1420	1166	996	701	609
375G1100006001_200	SHAK GANTRY-340-X1000-Y600	1000	600	1420	1166	1196	901	809
375G1100008001_200	SHAK GANTRY-340-X1000-Y800	1000	800	1420	1166	1396	1101	1009
375G1100010001_200	SHAK GANTRY-340-X1000-Y1000	1000	1000	1420	1166	1596	1301	1209
375G1100012001_200	SHAK GANTRY-340-X1000-Y1200	1000	1200	1420	1166	1796	1501	1409
375G1120004001_200	SHAK GANTRY-340-X1200-Y400	1200	400	1620	1366	996	701	609
375G1120006001_200	SHAK GANTRY-340-X1200-Y600	1200	600	1620	1366	1196	901	809
375G1120008001_200	SHAK GANTRY-340-X1200-Y800	1200	800	1620	1366	1396	1101	1009
375G1120010001_200	SHAK GANTRY-340-X1200-Y1000	1200	1000	1620	1366	1596	1301	1209
375G1120012001_200	SHAK GANTRY-340-X1200-Y1200	1200	1200	1620	1366	1796	1501	1409

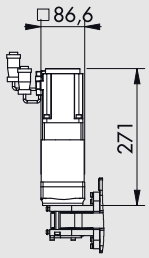
N.B.: _ To complete the code, enter **1** for motors on the left and **2** for motors on the right

METAL WORK PNEUMATIC

DIMENSIONS SHAK GANTRY 470

VERSION WITH MOTORS ON THE RIGHT-HAND SIDE





BRUSHLESS MOTOR
WITH GEARBOX

Table of dimensions referring to the version with motors on the right. The version with motor on the left is specular.

Code	Description	X	Y	A	B	C	D	E
375G2080006001_200	SHAK GANTRY-470-X800-Y600	800	600	1260	1040	1400	940	817
375G2080010001_200	SHAK GANTRY-470-X800-Y1000	800	1000	1260	1040	1800	1340	1217
375G2080014001_200	SHAK GANTRY-470-X800-Y1400	800	1400	1260	1040	2200	1740	1617
375G2080018001_200	SHAK GANTRY-470-X800-Y1800	800	1800	1260	1040	2600	2140	2017
375G2080022001_200	SHAK GANTRY-470-X800-Y2200	800	2200	1260	1040	3000	2540	2417
375G2120006001_200	SHAK GANTRY-470-X1200-Y600	1200	600	1660	1440	1400	940	817
375G2120010001_200	SHAK GANTRY-470-X1200-Y1000	1200	1000	1660	1440	1800	1340	1217
375G2120014001_200	SHAK GANTRY-470-X1200-Y1400	1200	1400	1660	1440	2200	1740	1617
375G2120018001_200	SHAK GANTRY-470-X1200-Y1800	1200	1800	1660	1440	2600	2140	2017
375G2120022001_200	SHAK GANTRY-470-X1200-Y2200	1200	2200	1660	1440	3000	2540	2417
375G2160006001_200	SHAK GANTRY-470-X1600-Y600	1600	600	2060	1840	1400	940	817
375G2160010001_200	SHAK GANTRY-470-X1600-Y1000	1600	1000	2060	1840	1800	1340	1217
375G2160014001_200	SHAK GANTRY-470-X1600-Y1400	1600	1400	2060	1840	2200	1740	1617
375G2160018001_200	SHAK GANTRY-470-X1600-Y1800	1600	1800	2060	1840	2600	2140	2017
375G2160022001_200	SHAK GANTRY-470-X1600-Y2200	1600	2200	2060	1840	3000	2540	2417
375G2200006001_200	SHAK GANTRY-470-X2000-Y600	2000	600	2460	2240	1400	940	817
375G2200010001_200	SHAK GANTRY-470-X2000-Y1000	2000	1000	2460	2240	1800	1340	1217
375G2200014001_200	SHAK GANTRY-470-X2000-Y1400	2000	1400	2460	2240	2200	1740	1617
375G2200018001_200	SHAK GANTRY-470-X2000-Y1800	2000	1800	2460	2240	2600	2140	2017
375G2200022001_200	SHAK GANTRY-470-X2000-Y2200	2000	2200	2460	2240	3000	2540	2417
375G2240006001_200	SHAK GANTRY-470-X2400-Y600	2400	600	2860	2640	1400	940	817
375G2240010001_200	SHAK GANTRY-470-X2400-Y1000	2400	1000	2860	2640	1800	1340	1217
375G2240014001_200	SHAK GANTRY-470-X2400-Y1400	2400	1400	2860	2640	2200	1740	1617
375G2240018001_200	SHAK GANTRY-470-X2400-Y1800	2400	1800	2860	2640	2600	2140	2017
375G2240022001_200	SHAK GANTRY-470-X2400-Y2200	2400	2200	2860	2640	3000	2540	2417

N.B.: _ To complete the code, enter **1** for motors on the left and **2** for motors on the right

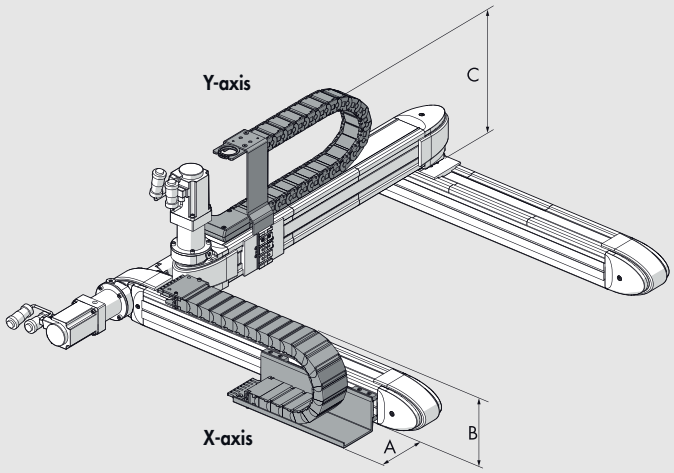
KEY TO CODES

CYL	37 TYPE	5	G	1 SIZE	0800 X-AXIS STROKE ♦	0600 Y-AXIS STROKE ♦	1 REDUCTION	1 MOTORS POSITION	200 DRIVE		
	37 Electric actuators	**5** SHAK electric axes	**G** GANTRY	**1** Size 340	400 600 800 1000 1200	400 600 800 1000 1200	**1** 1:5 ratio (X axis) 1:3 ratio (Y axis)	**1** Left **2** Right	**2** BRUSHLESS motor	**0** Standard	**0** Standard
				2 Size 470	800 1200 1600 2000 2400	600 1000 1400 1800 2200					

♦ For standard combinations, please refer to dimensional drawings.

ACCESSORIES

CABLE TRAY CHAIN



	SHAK GANTRY 340	SHAK GANTRY 470
A	95	120
B	180	182
C	275	310

WARNING! The chain cannot be mounted on versions with motor or geared motor on the right

X AXIS

Codice	Description
095340B0400	Cable tray chain kit, SHAK GANTRY 340 - X400 X-axis
095340B0600	Cable tray chain kit, SHAK GANTRY 340 - X600 X-axis
095340B0800	Cable tray chain kit, SHAK GANTRY 340 - X800 X-axis
095340B1000	Cable tray chain kit, SHAK GANTRY 340 - X1000 X-axis
095340B1200	Cable tray chain kit, SHAK GANTRY 340 - X1200 X-axis
095470B0800	Cable tray chain kit, SHAK GANTRY 470 - X800 X-axis
095470B1200	Cable tray chain kit, SHAK GANTRY 470 - X1200 X-axis
095470B1600	Cable tray chain kit, SHAK GANTRY 470 - X1600 X-axis
095470B2000	Cable tray chain kit, SHAK GANTRY 470 - X2000 X-axis
095470B2400	Cable tray chain kit, SHAK GANTRY 470 - X2400 X-axis

Y AXIS

Codice	Description
095340A0400	Cable tray chain kit, SHAK GANTRY 340 - Y400 Y-axis
095340A0600	Cable tray chain kit, SHAK GANTRY 340 - Y600 Y-axis
095340A0800	Cable tray chain kit, SHAK GANTRY 340 - Y800 Y-axis
095340A1000	Cable tray chain kit, SHAK GANTRY 340 - Y1000 Y-axis
095340A1200	Cable tray chain kit, SHAK GANTRY 340 - Y1200 Y-axis
095470A0800	Cable tray chain kit, SHAK GANTRY 470 - Y600 Y-axis
095470A1200	Cable tray chain kit, SHAK GANTRY 470 - Y1000 Y-axis
095470A1600	Cable tray chain kit, SHAK GANTRY 470 - Y1400 Y-axis
095470A2000	Cable tray chain kit, SHAK GANTRY 470 - Y1800 Y-axis
095470A2400	Cable tray chain kit, SHAK GANTRY 470 - Y2200 Y-axis

DRIVES AND CABLE

See drive code 37D2400000 page **A5**.136

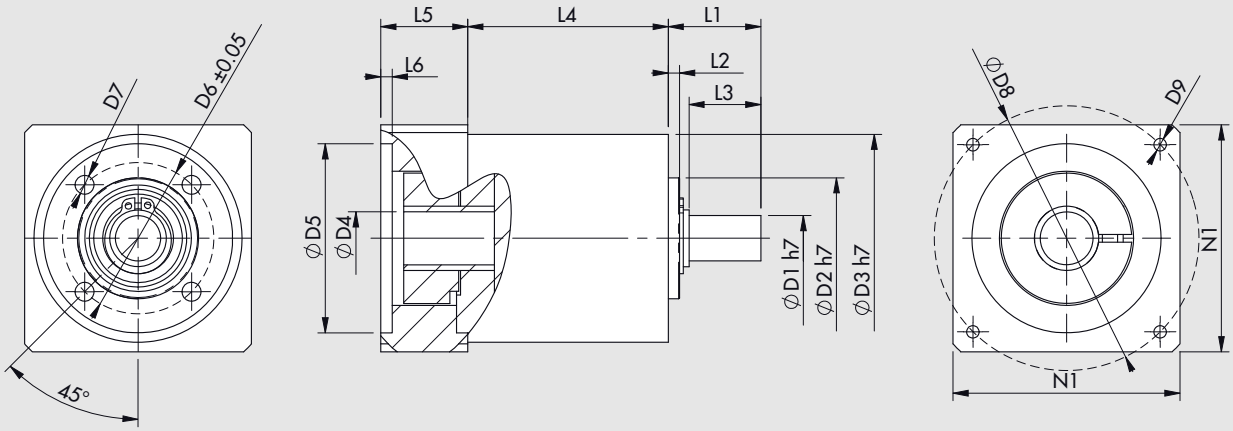
METAL WORK PNEUMATIC

OIL

Code	Description	Volume [ml]
9910490	PARALIQ P 460	80

SPARE PARTS

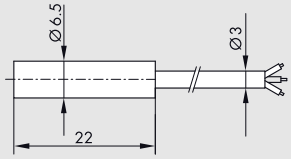
SHAK GANTRY GEARBOXES



Code	Description	Application	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0541000	Gearbox MP053 1:5	SHAK GANTRY 340 (X axis)	15	3500	6	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0543000	Gearbox MP080 1:5	SHAK GANTRY 470 (X axis)	50	3200	37	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80
37R0341000	Gearbox MP053 1:3	SHAK GANTRY 340 (Y axis)	12	3300	8	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0343000	Gearbox MP080 1:3	SHAK GANTRY 470 (Y axis)	40	2900	59	4	19	50	85	16	70	65	M6	90	M5x16	46	5	39	83.5	34	4	80

C_{OUT} = rated output torque N_{IN} = nominal input speed J = mass moment of inertia of the gearhead

SHAK INDUCTIVE SENSOR



Code	Description
095340A0000	SHAK inductive sensor accessory kit

ELECTRIC MOTORS

For SHAK GANTRY 340, please refer to motor code 37M2220000 page **A5**.122
For SHAK GANTRY 470, please refer to motor code 37M2330000 page **A5**.122

ELECTRIC AXIS
SERIES ELEKTRO SVAK

This belt-driven rodless electric actuator is characterised by the fact that the motor and reducer unit is integral with the carriage, instead of being fitted to one end of the extruded section.
This solution is known as "cantilever". In the typical application the carriage is fixed while the extruded section moves.
The SVAK can be used either horizontally or vertically, but the most common use is in vertical applications, which explains why the motor is supplied complete with a brake that causes the axis to remain still even when it is not electrically powered.
The SVAK can be applied to the SHAK GANTRY series to obtain an X-Y-Z Cartesian manipulator robot featuring high performance and rigidity.
The SVAK uses the universal V-Lock modular system for fixing the carriage to external auxiliaries and the various components to one end of the extruded section.
The sides of the extruded section, which is made of anodised aluminium, houses two hardened and ground guides that slide on adjustable wheels that are integral with the carriage. The carriage is moved by a toothed belt, complete with a tensioning system. Guide lubrication nozzles are also provided on the carriage.
A BRUSHLESS motor with a toothed belt 1:2 gear speed reducer for the pulleys was also chosen. This design was opted for because it ensures excellent load capacities without sacrificing dynamics and the typical speed of this product. In addition to the standard drive proposed in the catalogue, it is also possible to customise the cylinder by using other motors.
The homing position is detected by an inductive proximity sensor included in the supply.
A cable guiding system with cable-carrying chain and mounting bracket is also available on request as an accessory.

TECHNICAL DATA		
Ambient temperature	°C	from 0 to +40
Maximum relative humidity		90% (no condensate)
Maximum value of duty cycle		100%
Maximum speed without load	m/s	3.5
Maximum acceleration without load	m/s^2	50
Maximum additional load limit	kg	8
Maximum value of axial force available (with Metal Work motors)	N	300
Maximum axial force supportable by mechanical devices	N	600
Maximum torque applicable to the drive pulley	Nm	5
Standard strokes	mm	200
		400
		600
		800
Repetition accuracy	mm	± 0.05
Toothed belt reduction gear		1:2 ratio
Noise level	dBA	<66
Mounting position		Any
Degree of protection		IP30
Toothed belt pitch	mm	5
Type of belt		PowerGrip® LL GT 5MR 25 FV
Belt elongation at maximum load	mm	
Stroke 200		0.05
Stroke 400		0.06
Stroke 600		0.07
Stroke 800		0.08
Drive shaft pulley pitch diameter	mm	27.06
Stroke per motor rev.	mm/rev	42.5
Homing position sensor		Inductive sensor switch

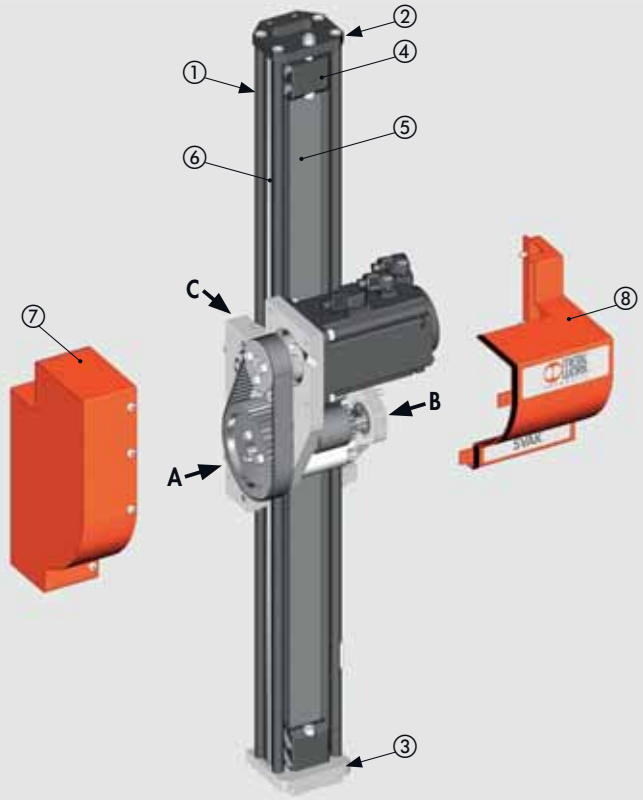
METAL WORK PNEUMATIC

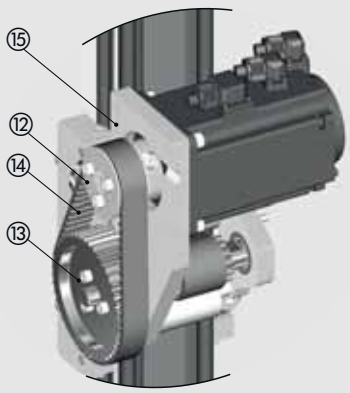
MASS AND MOMENT OF INERTIA

Stroke	mm	200	400	600	800
Weight without motor	kg	2.9	3.2	3.5	3.8
Weight of Brushless 200W motor with brake	kg	1.23			
Moving mass	kg	0.8	1.1	1.4	1.7
Reduced inertia at motor (without load)	kg mm^2	66	80	94	108
Moment of inertia reduced at motor for each kg of load	kg mm^2	45			

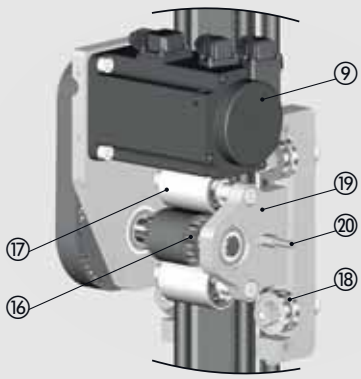
COMPONENTS

① EXTRUDED SECTION: anodized aluminium
② UPPER CLOSING PLATE: anodized aluminium
③ LOWER CLOSING PLATE: anodized aluminium
④ BELT TENSIONER: anodized aluminium
⑤ TOOTHED TRANSMISSION BELT: Polychloroprene (CR) loaded with fibreglass
⑥ HARDENED GUIDE: hardened ground chromed steel
⑦ LEFT-HAND GUARD: painted steel
⑧ RIGHT-HAND GUARD: painted steel
⑨ MOTOR: 200W BRUSHLESS with brake
⑩ FIXING PLATE: anodized aluminium
⑪ BUFFER: rubber
⑫ DRIVE PULLEY: hard-anodised aluminium
⑬ IDLE PULLEY: hard-anodised aluminium
⑭ REDUCTION BELT: loaded polychloroprene (CR)
⑮ LEFT-HAND PLATE: anodized aluminium
⑯ DRIVE SHAFT: steel
⑰ IDLE AXIS: steel
⑱ ROLLER
⑲ RIGHT-HAND PLATE: anodized aluminium
⑳ INDUCTION SENSOR

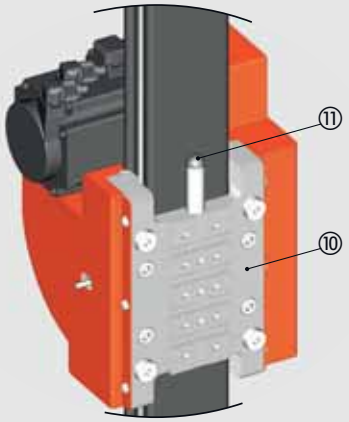




Viewed from A

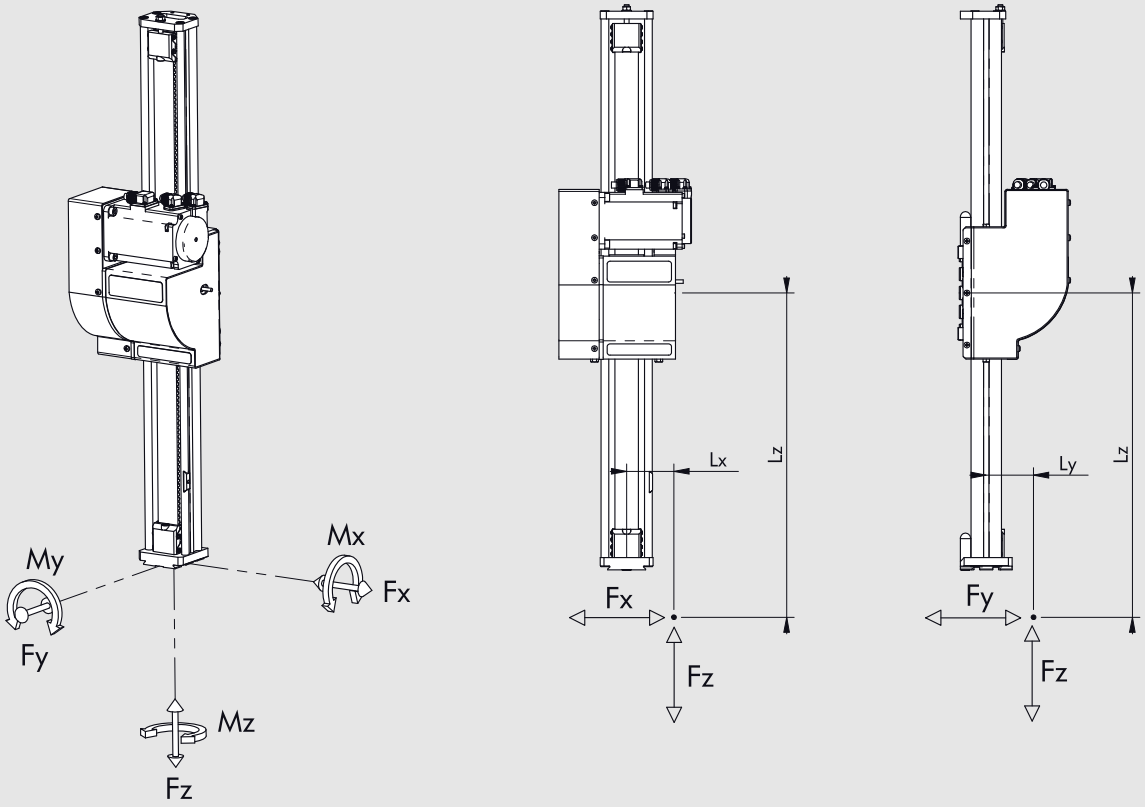


Viewed from B



Viewed from C

DIAGRAM OF FORCES AND MOMENTS



Fx max [N]	Fy max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
800	600	20	27	26

N.B.: The values are calculated on the basis of theoretical useful life of 10000 km.

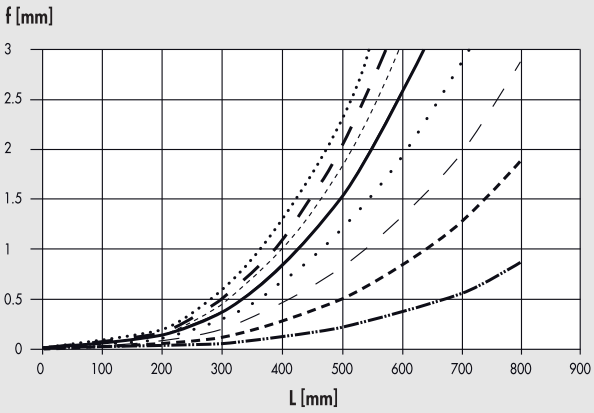
N.B.: For the maximum value of Fz see the general technical data and the axial load curves depending on the speed.

N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where Lx, Ly and Lz have to be given in metre.

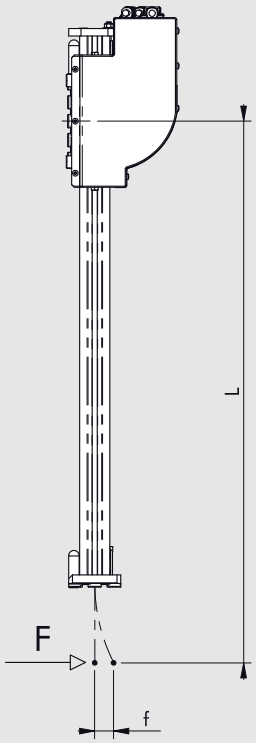
$Mx = Fz \cdot Ly + Fy \cdot Lz \qquad My = Fz \cdot Lx + Fx \cdot Lz \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fx)}{Fx\ max} + \frac{(Fy)}{Fy\ max} \leq 1$$

DEFORMATION ACCORDING TO LOAD



F = 10 N
F = 20 N
F = 30 N
F = 40 N
F = 50 N
F = 60 N
F = 70 N
F = 80 N



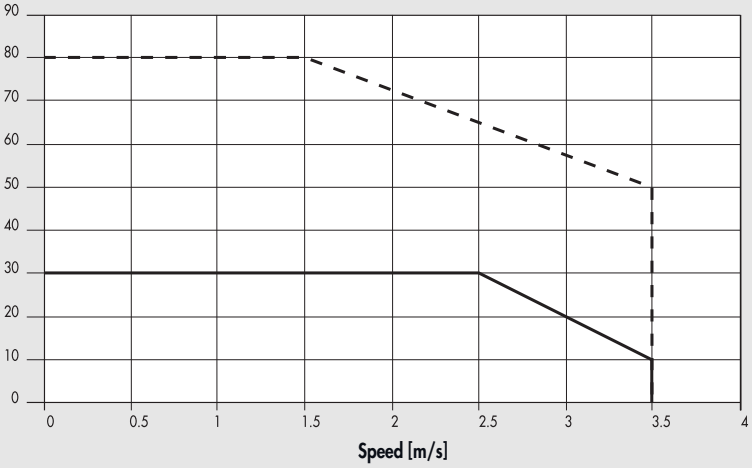
AXIAL LOAD-SPEED CURVES

N.B.: Check that the following constraints are met for each cycle phase:
- the maximum movable masses and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia).
- deformation according to load.

The following diagrams show the axial load with changing speed (mm/s). Each diagram shows two separate curves:
- **NOMINAL AXIAL LOAD** curve: the nominal axial load delivered by the motor with a duty cycle of 100%
- **MAXIMUM AXIAL LOAD** curve: the axial load delivered by the motor with a duty cycle of less than 100%.

BRUSHLESS WITH BRAKE DRIVES

Axial load [N]



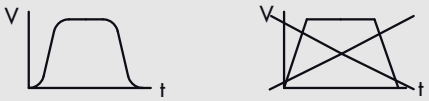
Force load with maximum torque load 37M4200000 (with brake) + 37D2200000 (200W)

Force load with maximum torque load 37M4200000 (with brake) + 37D2200000 (200W)

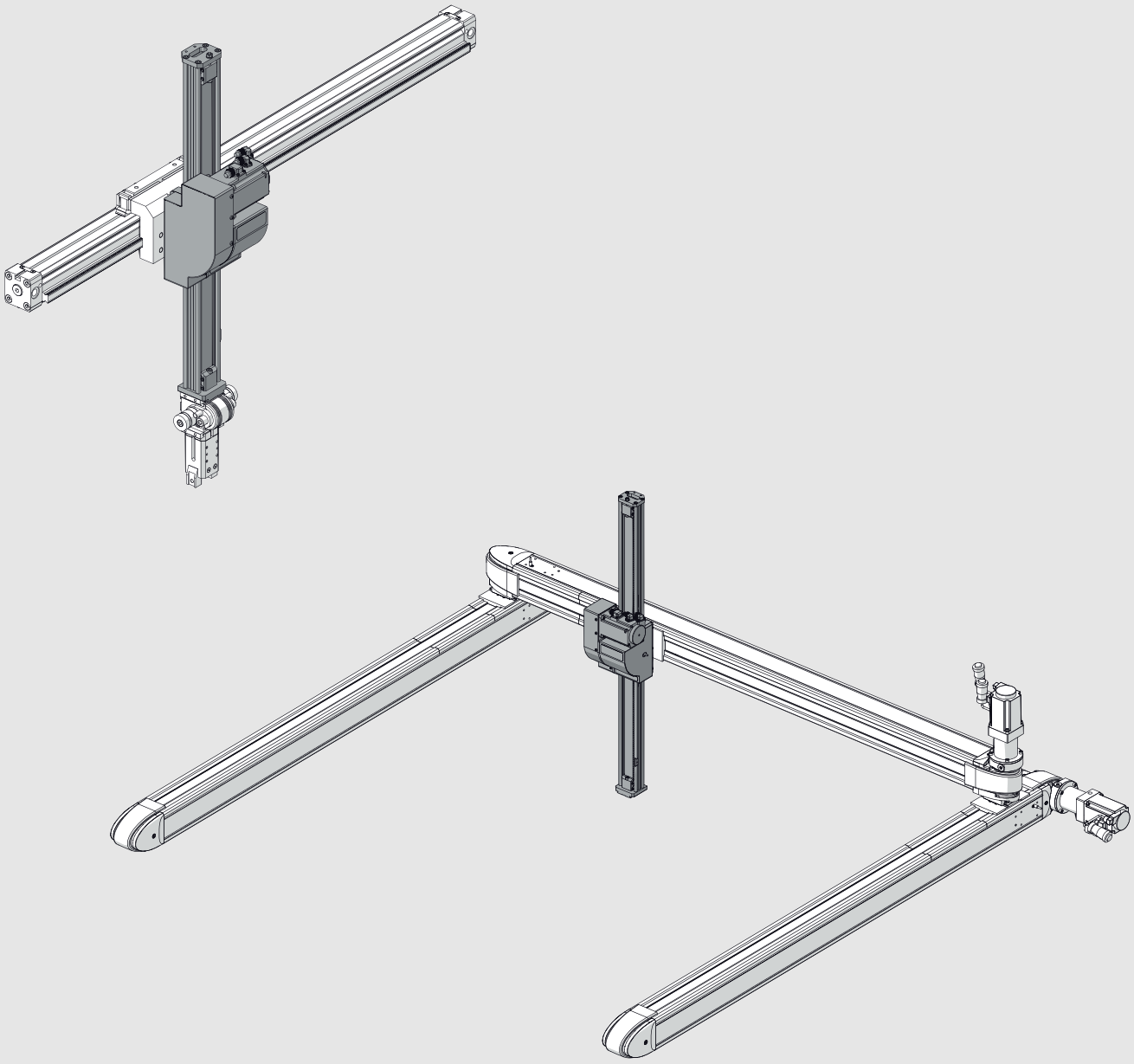
MOTOR-DRIVE COUPLINGS

BRUSHLESS MOTOR WITH BRAKE		DRIVES	
Code Metal Work	**Manufacturer**	**Code Metal Work**	**Manufacturer**
37M4200000	Motor SANYO DENKI R2AA06020FCH11M (200W)	**37D2200000**	SANYO DENKI RS1A01 (15A 200W)

The motor must be controlled in such a way as to avoid sudden changes in speed.

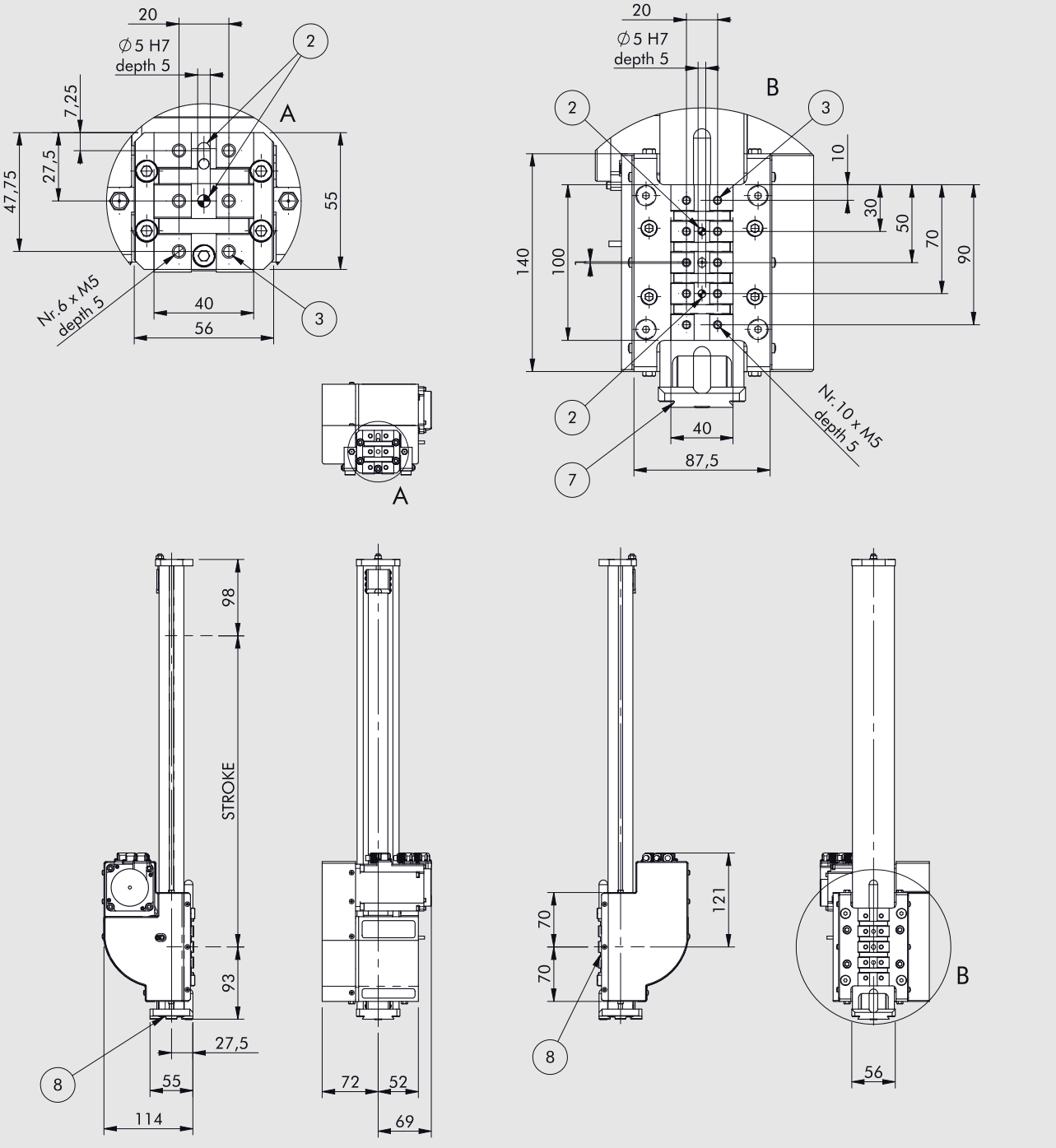


EXAMPLES OF APPLICATION



METAL WORK PNEUMATIC

DIMENSIONS



② Holes for centring pins
③ Threaded holes for fixing
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

Code	Description
375V00020004200	SVAK stroke 200
375V00040004200	SVAK stroke 400
375V00060004200	SVAK stroke 600
375V00080004200	SVAK stroke 800

KEY TO CODES

CYL	37	5	V	0	0	0200	0	4	2	0	0
	TYPE					STROKE ◆		MOTOR	FLANGE	DRIVE TORQUE	
	37 Electric actuators	**5** Belt-driven electric axes	**V** SVAK	**0** STD	**0** STD	0200 0400 0600 0800	**0** STD	**4** BRUSHLESS with BRAKE	**2** 60	**0** 0 - 0.79 Nm	**0** STD

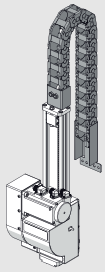
◆ Other strokes on request.

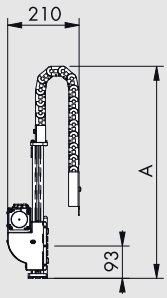
ACCESSORIES

OIL

Code	Description	Volume [ml]
9910490	PARALIQ P 460	80

CABLE TRAY CHAIN



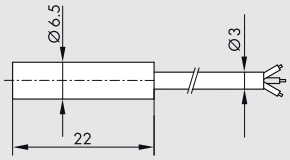


Code	Description	A
09500C0200	Cable tray chain accessory kit SVAK stroke 200	~ 550
09500C0400	Cable tray chain accessory kit SVAK stroke 400	~ 750
09500C0600	Cable tray chain accessory kit SVAK stroke 600	~ 950
09500C0800	Cable tray chain accessory kit SVAK stroke 800	~ 1150

Note: suitable for connection with SHAK 340 and SHAK 470

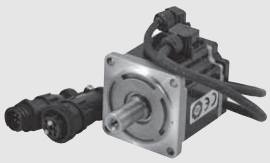
SPARE PARTS

SHAK INDUCTIVE SENSOR



Code	Description
095340A0000	SHAK inductive sensor accessory kit

ELECTRIC MOTORS



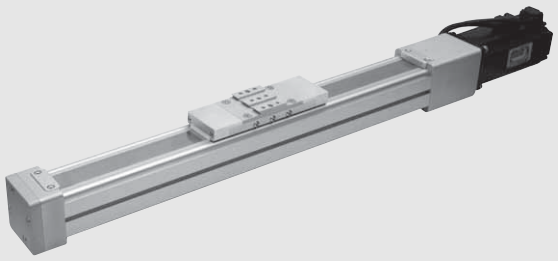
See motor code 37M4200000 see page **A5**.122

DRIVES

See drive code 37D2200000 see page **A5**.135

ELECTRIC AXIS - RODLESS SERIES ELEKTRO SK

Electric axis without screw piston rod, with V-Lock interface.
The cylinder frame is made of anodized extruded solid aluminium, which gives the cylinder optimal torsional and flexural rigidity. The typical V-Lock dovetail is provided on three sides of the channel for easy fixing with QS elements.
The carriage features an interchangeable fixing interface plate, which is available with V-Lock axial or V-Lock orthogonal ports or in the blank type for custom solutions.
The carriage is driven by two sturdy pre-loaded ball recirculation bearings that ensure great accuracy of movement.
Threaded holes for the lubrication of the guides and ball recirculation screws are provided on both sides of the carriage.
The carriage is driven by a system consisting of a hardened and tempered screw and a ball recirculation lead nut. The screw is pre-stressed with an elastic load device by means of cup springs in order to reduce vibration and hence noise level and the useful life of the system.
A series of slots for the fixing of magnetic sensors are provided on the two sides of the liner.
Various BRUSHLESS and STEPPING motor drives are available with optional motor brake and/or built-in encoder.
The cylinder can also be supplied without motor drive or, on request, with modules for interfacing with motors from the trade.
The motors can be installed in line with the liner or geared using toothed belt transmission gears.



TECHNICAL DATA		
Admissible ambient temperature for STEPPING motor	°C	from -10 to +50
BRUSHLESS motor	°C	from 0 to +40
Maximum relative humidity (IP40)		90% at 40°C; 57% at 50°C (no condensate)
Maximum duty cycle for STEPPING motor		50%
BRUSHLESS motor		100%
Minimum stroke	mm	100
Maximum stroke	mm	1200
Positioning repeatability	mm	± 0.02
Positioning accuracy	mm	± 0.2 **
Uncontrolled impact at the end of stroke		NOT ALLOWED (it provides an extra-stroke minimum 5 mm)
Sensor magnet		YES
Work position		Any
Interface for fixing on carriage		Axial V-Lock / Orthogonal V-Lock / Blank
Noise level	dBA	<66

** indicative average data that gets influenced by various factors such as the stroke, the type of motor, the cylinder version, etc ...

MECHANICAL FEATURES			
Worm screw pitch	mm	4	10
Worm screw diameter	mm	12	
Maximum static axial load* (F_0)	N	2800	
Dynamic axial load	N	5200	3600
Maximum number of revs	1/min	3000	4000
Maximum speed (V_{max})	mm/s	200	670
Maximum acceleration without load	m/s^2	5	
Maximum drive torque applicable to the worm screw shank	Nm	5	

* Maximum admissible static load without causing damage.
N.B.: For the verification of the linear guide system, please refer to page **A5**.79. For the verification of the screw, please refer to page **A5**.80

WEIGHTS			
Worm screw pitch (p)	mm	4	10
Weight at stroke 0 (excluding the carriage fixing interface)	g	2990	3000
Additional weight each mm of stroke	g	7	
Weight of the in-line transmission (without motor)	g	400	
Weight of the geared transmission (without motor)	g	600	
Moving mass	g	1050	

N.B.: You get the total weight of a complete cylinder by adding: weight stroke 0 + stroke [mm] x weight for each mm of stroke + weight of the transmission + weight of the motor

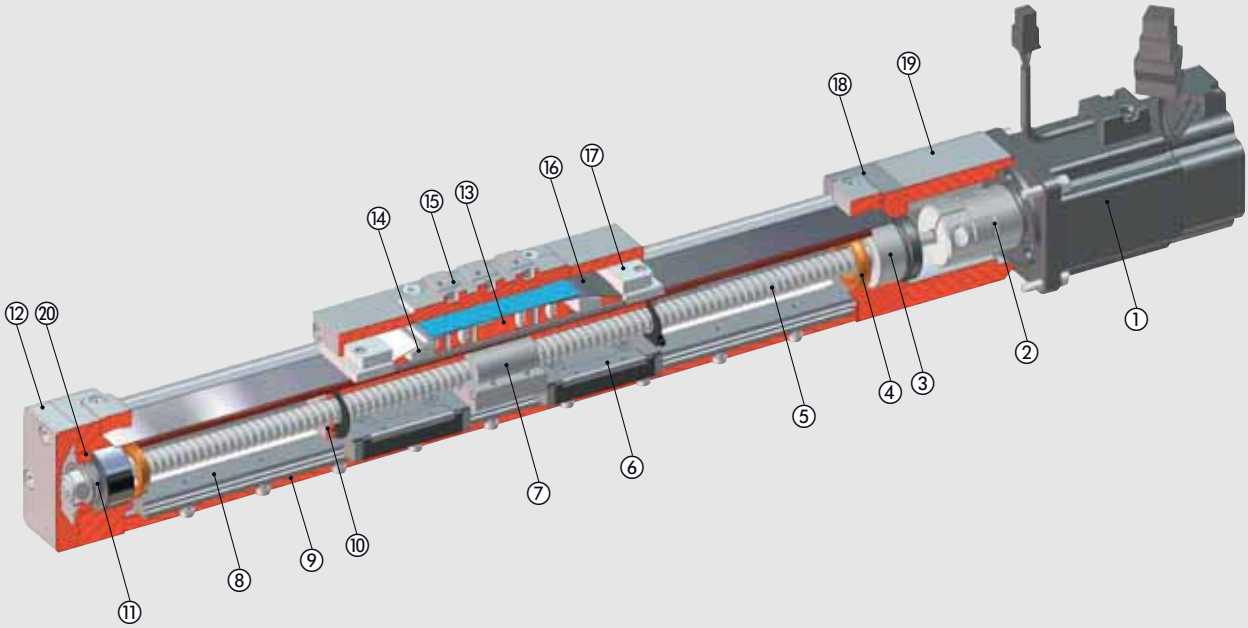
MASS MOMENTS OF INERTIA

Worm screw pitch	mm	4	10
J0 at stroke 0	kg mm²	2.7909	5.3633
J1 each metre of stroke	kg mm²/m	12.0259	17.3353
J2 each kg of load	kg mm²/kg	0.4056	2.5355
J3 in-line transmission	kg mm²	5.2	
J3 geared transmission	kg mm²	19	

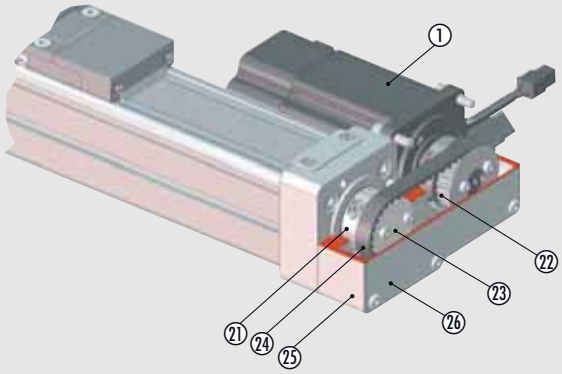
Total mass moment o inertia Jtot = J0 + J1 · stroke [m] + J2 · load [kg] + J3

COMPONENTS

ELECTRIC AXIS WITH IN-LINE MOTOR

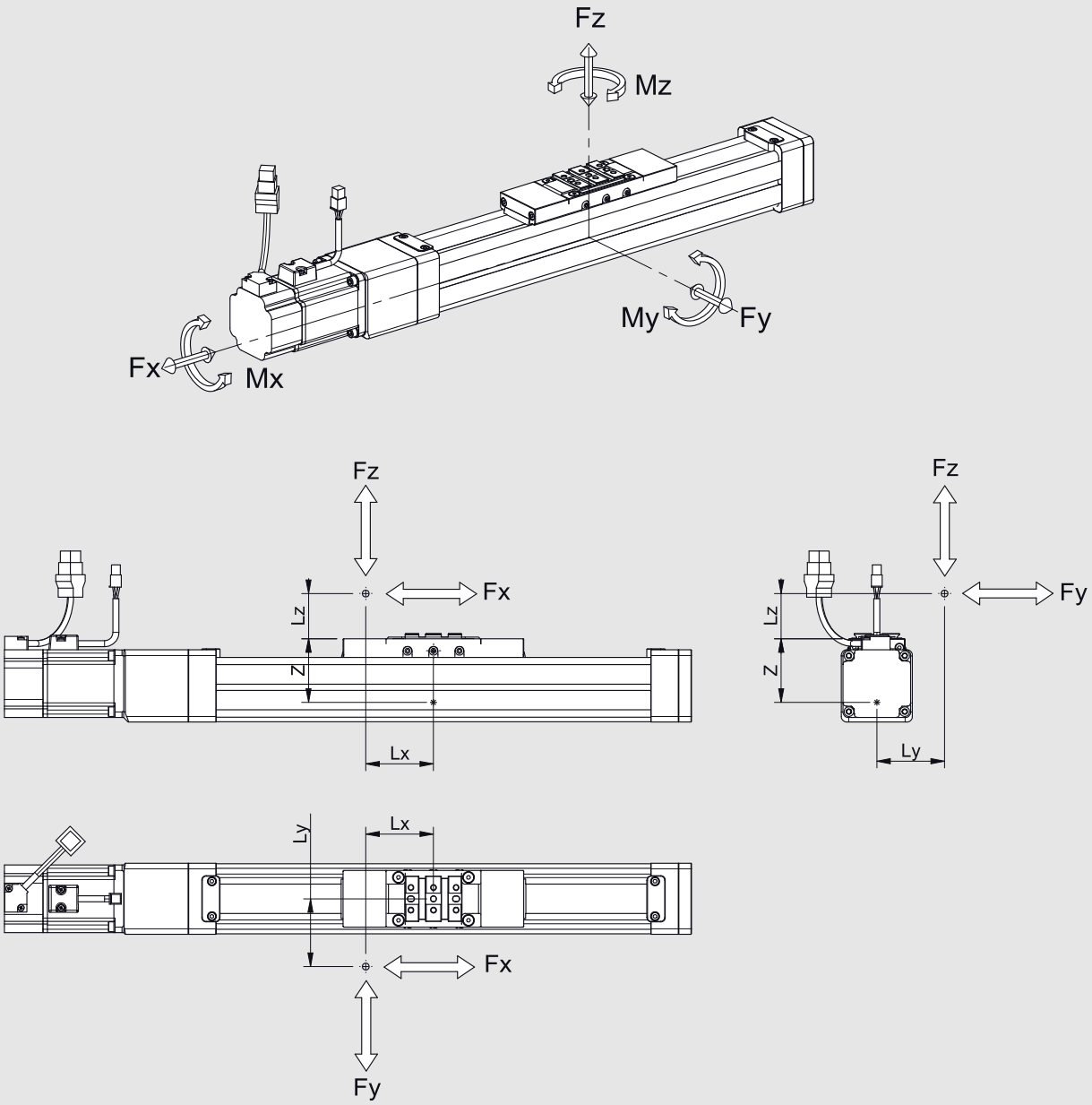


ELECTRIC AXIS WITH GEARED MOTOR



① MOTOR
② ELASTIC COUPLING: aluminium / polyurethane
③ DOUBLE-ROW ANGULAR BALL BEARING
④ BUFFER: polyurethane
⑤ RECIRCULATING BALL SCREW: hardened steel
⑥ BALL RECIRCULATION PAD: stainless steel / technopolymer
⑦ RECIRCULATING BALL SCROLL: hardened steel
⑧ RAIL: hardened steel
⑨ CYLINDER LINER: anodized aluminium
⑩ CARRIAGE LIMIT SWITCH: anodized aluminium
⑪ PRETENSIONING CUP SPRING: hardened steel
⑫ HEAD COVER: anodized aluminium
⑬ CARRIAGE BODY: anodized aluminium
⑭ LOWER STRAP PAD: technopolymer
⑮ INTERFACE FOR FIXING: anodized aluminium
⑯ PROTECTIVE STRAP: stainless steel
⑰ UPPER STRAP PAD: technopolymer
⑱ HEAD: anodized aluminium
⑲ MOTOR BEARING: anodized aluminium
⑳ BEARING LOCKING RING NUT: zinc-plated steel
㉑ ELASTIC COLLAR: aluminium
㉒ DRIVE GEAR PULLEY: aluminium
㉓ DRIVEN GEAR PULLEY: aluminium
㉔ TOOTHED TRANSMISSION BELT: reinforced rubber
㉕ GEARED MOTOR BEARING: aluminium
㉖ TRANSMISSION GUARD: aluminium

DIAGRAM OF FORCES AND MOMENTS



STATIC VERIFICATION

When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

Z [mm]	Fy0 max [N]	Fz0 max [N]	Mx0 max [Nm]	My0 max [Nm]	Mz0 max [Nm]
57	4500	4500	70	450	450

N.B.: The values in the table relates to the maximum admissible loads beyond which serious damage is likely to occur.

$Mx = Fz \cdot Ly + Fy \cdot (Lz + z)$ $My = Fz \cdot Lx + Fx \cdot (Lz + z)$ $Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx0\ max} + \frac{(My)}{My0\ max} + \frac{(Mz)}{Mz0\ max} + \frac{(Fy)}{Fy0\ max} + \frac{(Fz)}{Fz0\ max} \leq 1$$

DYNAMIC VERIFICATION

When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

Z [mm]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
57	2500	2500	35	250	250

N.B.: The values are calculated on the basis of theoretical useful life of 10000 km.

$Mx = Fz \cdot Ly + Fy \cdot (Lz + z)$ $My = Fz \cdot Lx + Fx \cdot (Lz + z)$ $Mz = Fy \cdot Lx + Fx \cdot Ly$

$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fy)}{Fy\ max} + \frac{(Fz)}{Fz\ max} \leq 1$$

CALCULATION OF MEAN AXIAL LOAD F_m AND VERIFICATION

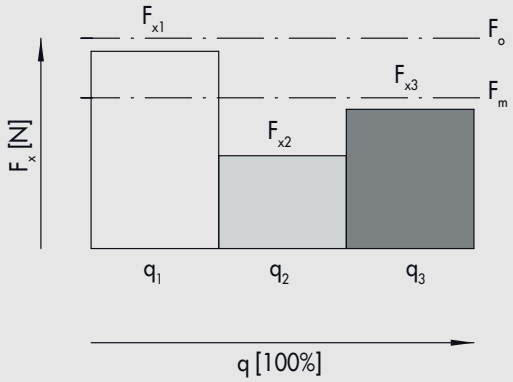
Peak axial load in a work cycle must not exceed the static axial load F_o. The peak value is usually achieved during upward acceleration in vertical installation. Exceeding this value leads to greater wear and hence shorter life of the recirculating ball screw.

Mean axial load F_m

$$F_m = \sqrt[3]{\sum F_x^3 \times \frac{V_x}{V_m} \times \frac{q}{100}} =$$

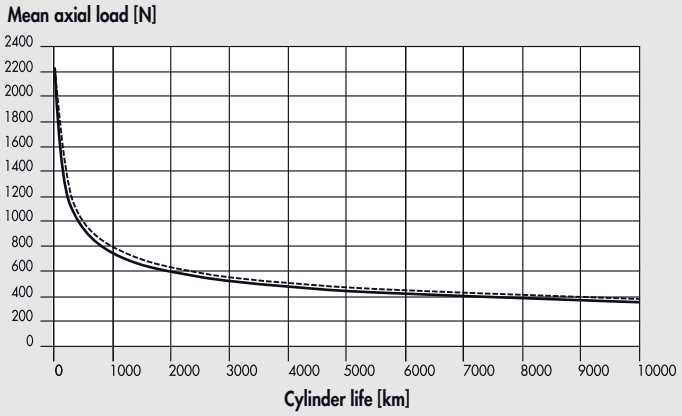
$$F_m = \sqrt[3]{F_{x1}^3 \times \frac{V_{X1}}{V_m} \times \frac{q_1}{100} + F_{x2}^3 \times \frac{V_{X2}}{V_m} + \frac{q_2}{100} + F_{x3}^3 \times \frac{V_{X3}}{V_m} \times \frac{q_3}{100} + \ldots}$$

F_x = Axial load at stage x
F_m = Mean axial load during extension
F_o = Static axial load
q = Time segment
V_x = Speed in the phase x
V_m = Average speed



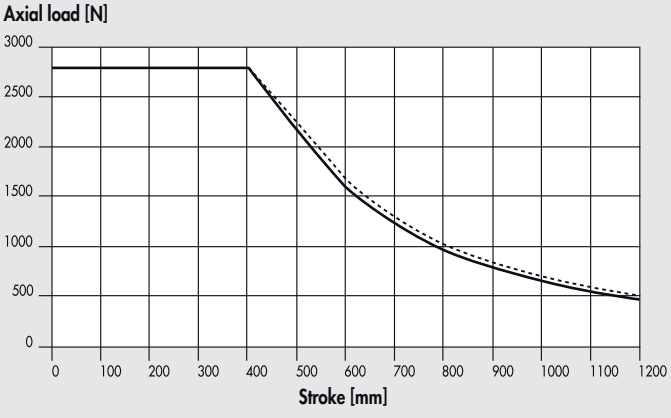
The mean axial load must not exceed the dynamic axial load: $F_m \leq F$
The graph below shows the lifecycle of the screw as a function of F_m

LIFE CHARACTERISTICS AS A FUNCTION OF THE MEAN AXIAL LOAD



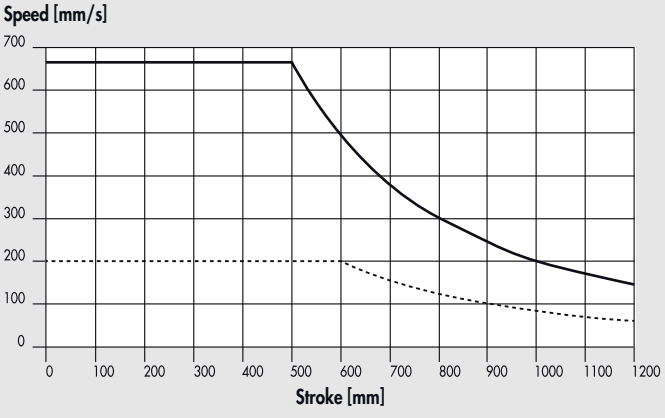
MAXIMUM AXIAL LOAD

The two variables (axial load and stroke) must comply with the conditions indicated in the graph, otherwise this could cause a serious damage.



CRITICAL SPEED

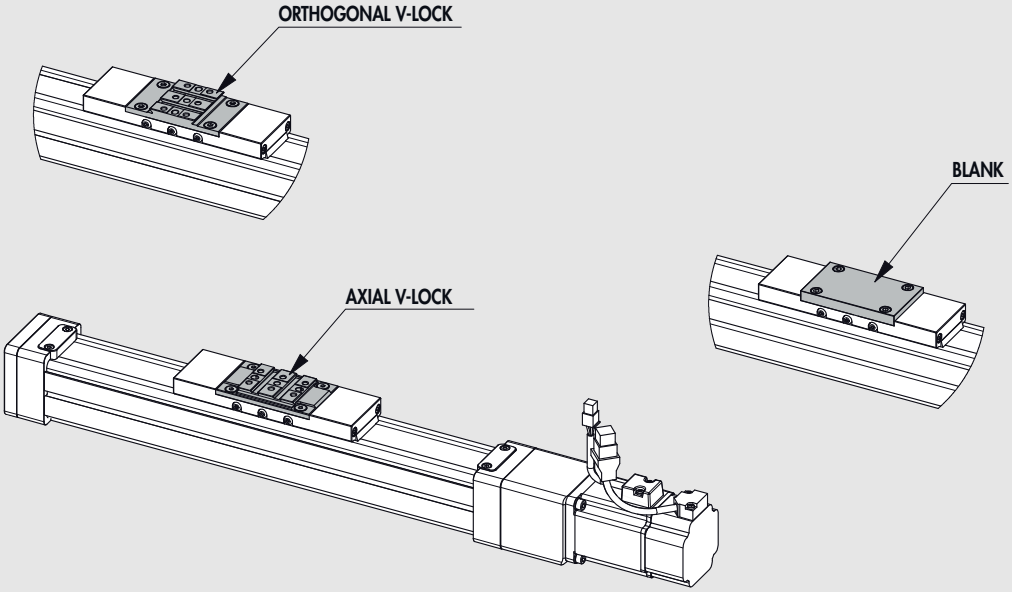
The two variables (axial load and stroke) must comply with the conditions indicated in the graph, otherwise this could trigger resonance phenomena that could impair the good functioning of the system.



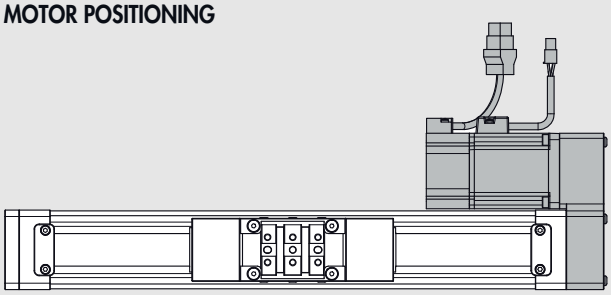
METAL WORK PNEUMATIC

VERSIONS

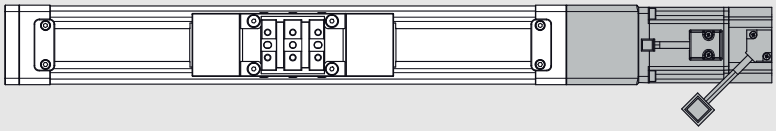
TYPE OF CARRIAGE INTERFACE



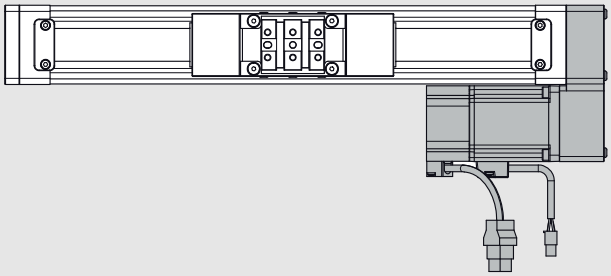
MOTOR POSITIONING



RIGHT GEARED MOTOR

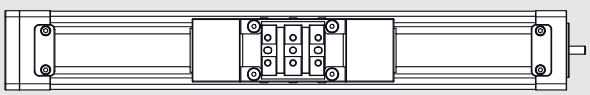


IN-LINE MOTOR



LEFT GEARED MOTOR

VERSION WITHOUT MOTOR



AXIAL LOAD CURVES AS A FUNCTION OF SPEED (CYLINDER COMPELTE WITH MOTOR AND DRIVE)

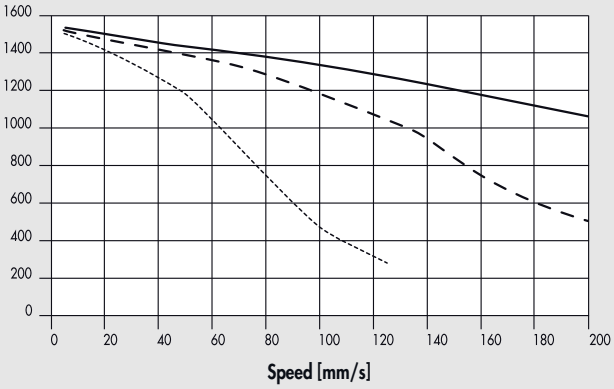
N.B.: Check that the following constraints are met for each cycle phase:
- the maximum movable masses and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia);
- calculation of average axial load and peak axial load.

N.B.: The obtainable load values already take the efficiency of the system into account. For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available axial load with the motor stopped is also reduced by 50%.

STEPPING motor code 37M1120001 (uprated revs)

Electric axis with a 4 mm-pitch screw

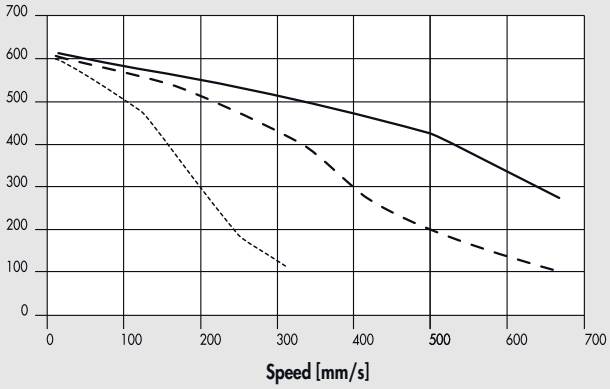
Axial load [N]



37M1120001 (24VDC)
37M1120001 (48VDC)
37M1120001 (75VDC)

Electric axis with a 10 mm-pitch screw

Axial load [N]

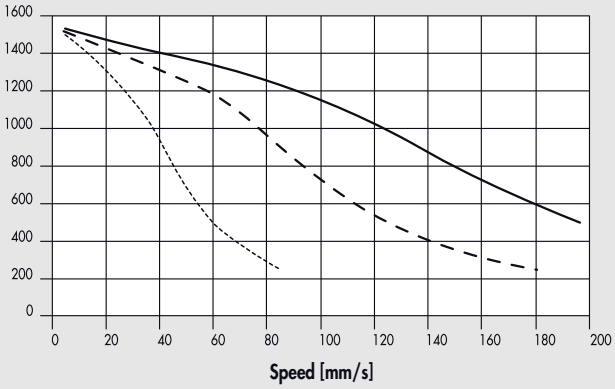


37M1120001 (24VDC)
37M1120001 (48VDC)
37M1120001 (75VDC)

STEPPING motor code 37M5120000 (with brake)

Electric axis with a 4 mm-pitch screw

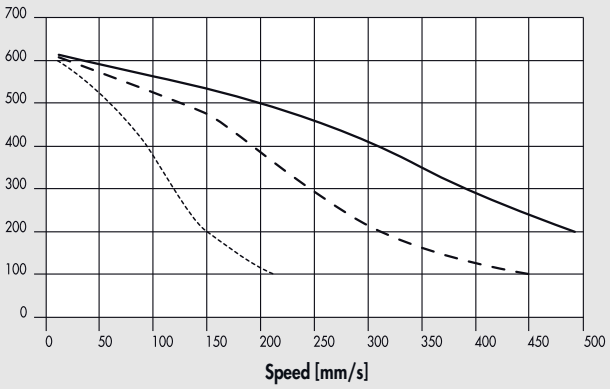
Axial load [N]



37M5120000 (24VDC)
37M5120000 (48VDC)
37M5120000 (75VDC)

Electric axis with a 10 mm-pitch screw

Axial load [N]

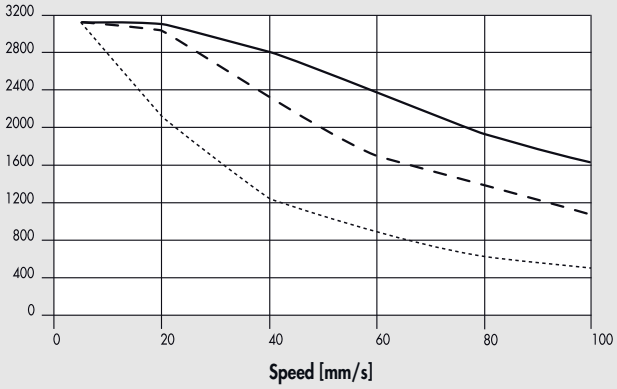


37M5120000 (24VDC)
37M5120000 (48VDC)
37M5120000 (75VDC)

STEPPING motor code 37M3230000 (with brake + encoder)

Electric axis with a 4 mm-pitch screw

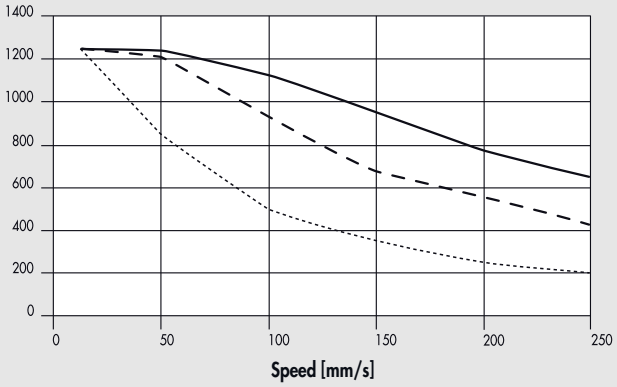
Axial load [N]



37M3230000 (24VDC)
37M3230000 (48VDC)
37M3230000 (75VDC)

Electric axis with a 10 mm-pitch screw

Axial load [N]

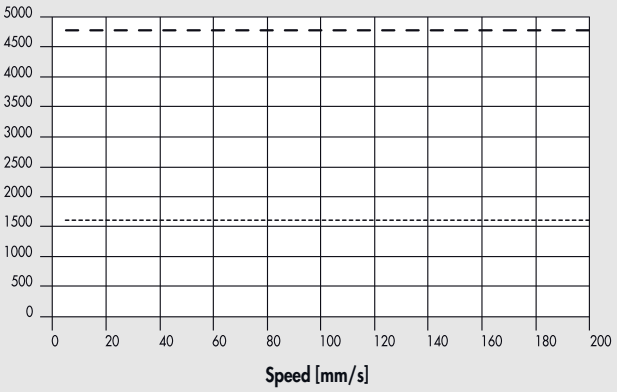


37M3230000 (24VDC)
37M3230000 (48VDC)
37M3230000 (75VDC)

BRUSHLESS motors code 37M2220001 and code 37M4220001 (with brake)

Electric axis with a 4 mm-pitch screw

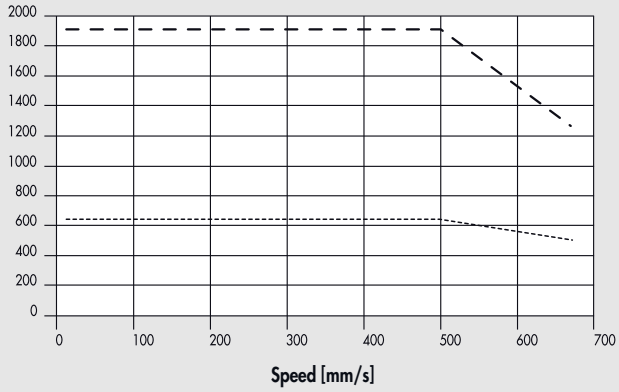
Axial load [N]



NOMINAL
MAXIMUM

Electric axis with a 10 mm-pitch screw

Axial load [N]



NOMINAL
MAXIMUM

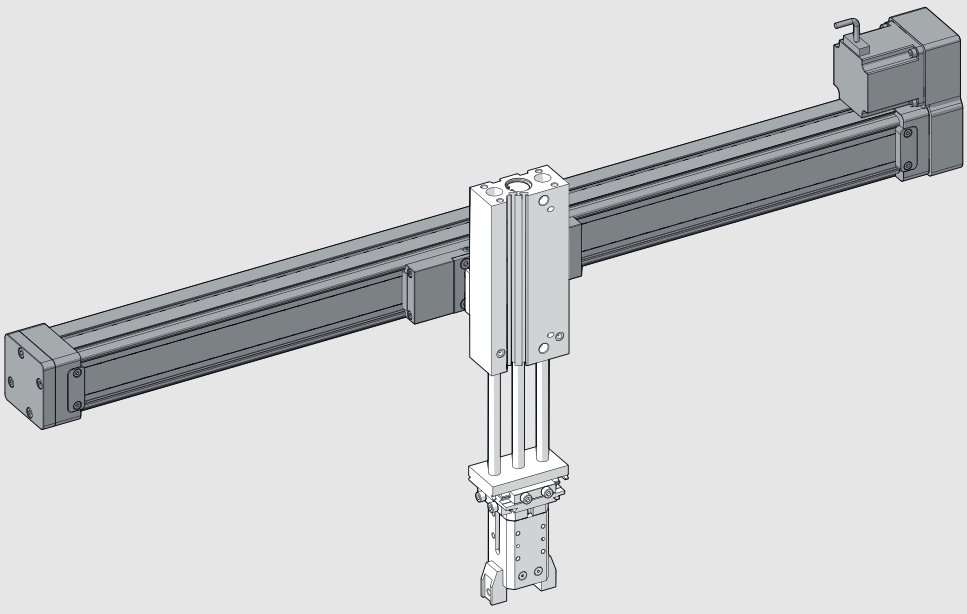
MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES			
	Metal Work	37D1222000 *	37D1332000 *	37D1442000	37D1552000
	Manufacturer	RTA CSD 94	RTA NDC 96	RTA PLUS A4	RTA PLUS B7
Metal Work	Manufacturer	(4.4A 24 - 48VDC)	(6A 24 - 75VDC)	(6A 77 - 140VDC)	(10A 28 - 62VAC) ●
STEPPING					
37M1120001	Motor SANYO DENKI 103-H7126-6640 (5.6A 75V max)	-	√	-	√ ■
STEPPING WITH BRAKE					
37M5120000	Motor SANYO DENKI 103-H7126-1710.B (4A 75V max)	√	√ ◆	-	√ ■
STEPPING WITH BRAKE + ENCODER					
37M3230000	Motor B&R 80MPF5.500D114-01 (5A 80V max)	-	√ ◆	√ ■	√ ■

✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive **e**.drive, code 37D1332002, can be used. ◆ Important! Limit current
■ Important! Limit current and voltage
● Important! AC drive to continuous voltage VDC VDC = VAC · $\sqrt{2}$

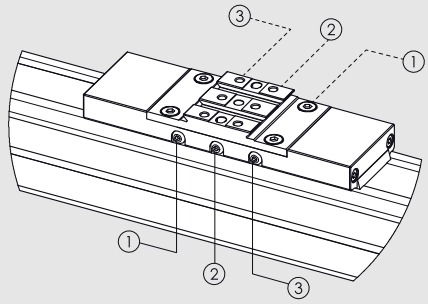
MOTOR CODES		DRIVES CODES
	Metal Work	37D2300000
	Manufacturer	DELTA ASD-A2-0421-M
Metal Work	Manufacturer	(400W)
BRUSHLESS		
37M2220001	Motor DELTA ECMA-C20604RS (400W)	√
BRUSHLESS WITH BRAKE		
37M4220001	Motor DELTA ECMA-C20604SS (400W)	√

EXAMPLES OF APPLICATION



METAL WORK PNEUMATIC

LUBRICATION DIAGRAM



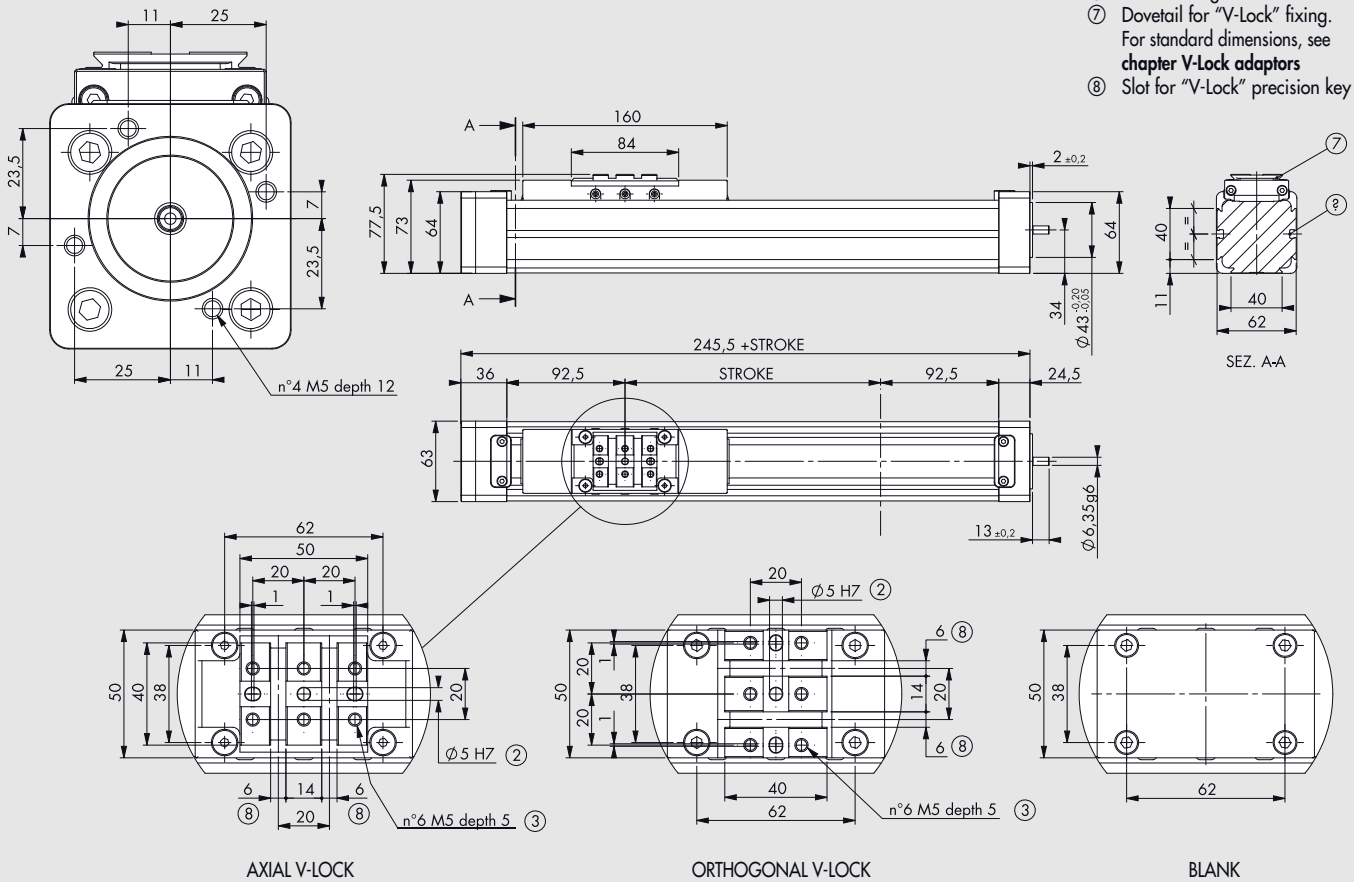
The actuator is provided with a series of sealing passages - made in the carriage - which directly connect the lubrication points of the sliding blocks and of the ball bearing screw nut with the outside.
The lubrication points are 3, on both sides of the carriage, in order to ensure greater accessibility in case of maintenance, closed by M4 screws, so identified:
① Lubrication point for the left ball bearing sliding block.
② Lubrication point for the ball bearing screw nut.
③ Lubrication point for the right ball bearing sliding block.
It is recommended to use the provided accessory (code 0950T2R108), which has spherical head according to UNI 7663 A and RHEOLUBE 363 AX1 grease (code 9910506).

Once you identify the most accessible side on the carriage:
- Unscrew the screw that closes the grease nipple.
- Screw, in the same thread, the provided accessory (0950T2R108).
- Pump grease (code 9910506) using the suitable lubricator according to the quantity in table.
- Let the actuator effect 4 complete strokes.
- Repeat the last two operations.
- Remove the grease nipple and stop the thread.
- Switch to the next lubrication point.
- The operation of re-greasing will have to be repeated every 200 km, approximately, at least once a year.

		① - ③	②	
Screw pitch (p)	mm	-	4	10
Relube grease quantity	g	0.7	0.3	0.5
	cc	0.61	0.26	0.43

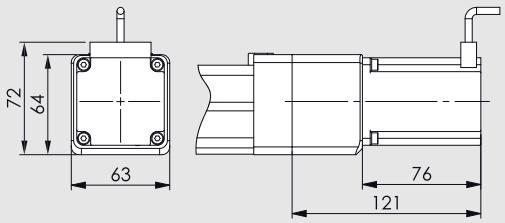
DIMENSIONS ELECTRIC AXIS (WITHOUT MOTOR)

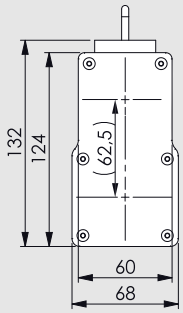
② Holes for centring pins
③ Threaded holes for fixing
⑥ Sensor fixing slots
⑦ Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**
⑧ Slot for "V-Lock" precision key

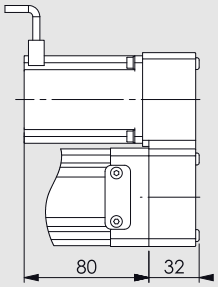


ELECTRIC AXIS DIMENSIONS WITH STEPPING MOTOR

Overall dimensions referring to versions with standard drive.
The geared motor versions represent right-hand positioning, the overall dimensions apply to left-hand positioning as well.

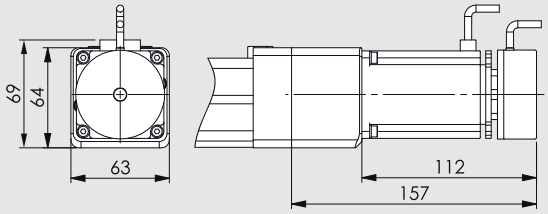


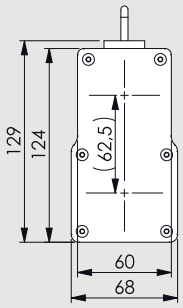


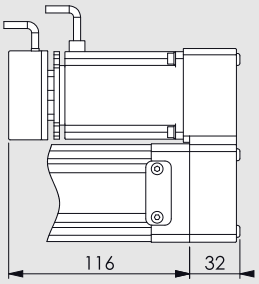


Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_ _ _ _ _ _21121	37M1120001

Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302_ _ _ _ _ _91121	37302_ _ _ _ _ _61121	37M1120001

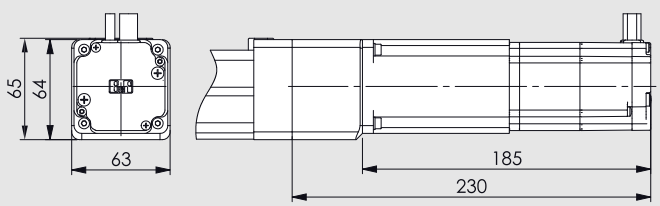


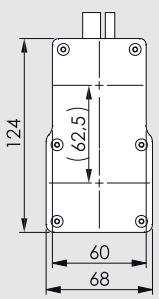


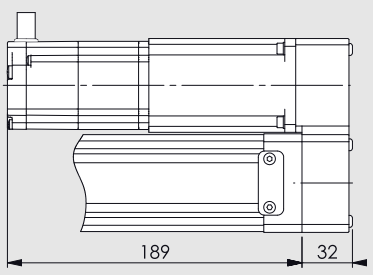


Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_ _ _ _ _ _25120	37M5120000

Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302_ _ _ _ _ _95120	37302_ _ _ _ _ _65120	37M5120000







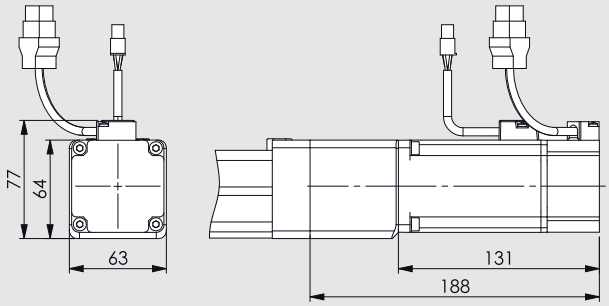
Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_ _ _ _ _ _23230	37M3230000

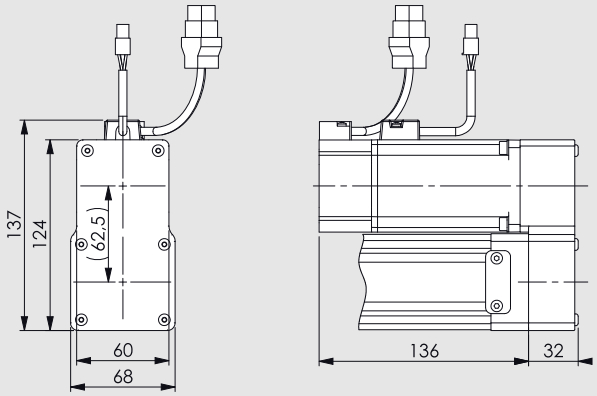
Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302_ _ _ _ _ _93230	37302_ _ _ _ _ _63230	37M3230000

METAL WORK PNEUMATIC

ELECTRIC AXIS DIMENSIONS WITH BRUSHLESS MOTOR

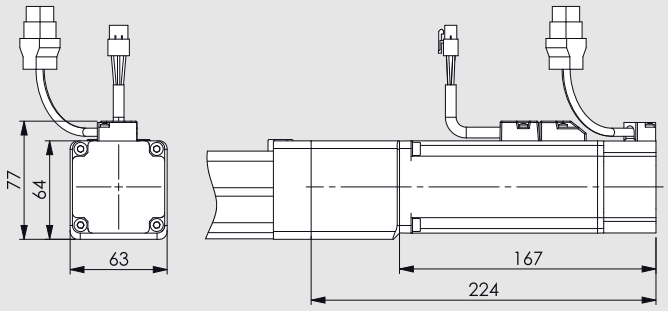
Overall dimensions referring to versions with standard drive.
The geared motor versions represent right-hand positioning, the overall dimensions apply to left-hand positioning as well.

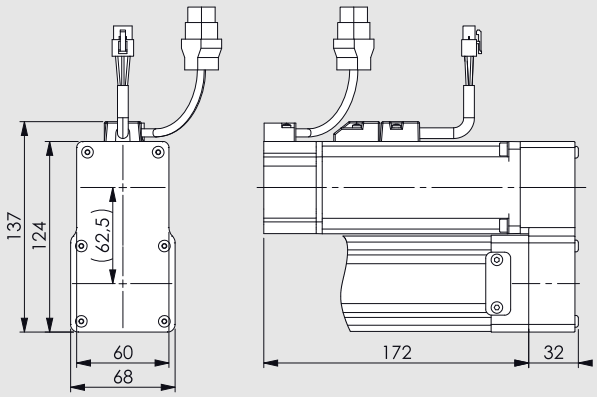




Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_ _ _ _ _ _22220	37M2220001

Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302_ _ _ _ _ _92220	37302_ _ _ _ _ _62220	37M2220001





Code of electric axis complete with IN-LINE motor	Code of motor mounted on the electric axis
37302_ _ _ _ _ _24220	37M4220001

Code of electric axis complete with		Code of motor mounted on the electric axis
LEFT GEARED MOTOR	RIGHT GEARED MOTOR	
37302_ _ _ _ _ _94220	37302_ _ _ _ _ _64220	37M4220001

NOTES

KEY TO CODES AXIS ELECTRIC (WITHOUT MOTOR)

CYL	37	3	0	2	1	0300	1
	TYPE			SIZE	INTERFACE	STROKE	SCREW PITCH
	37 Electric actuators	**3** Electric axis rodless elektro SK	**0** STD	**2** Size 2	**1** Axial V-lock **2** Orthogonal V-lock **3** Blank	From 100 to 1200 mm	**1** Screw pitch 4 **4** Screw pitch 10

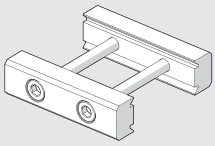
KEY TO CODES AXIS ELECTRIC MOTOR

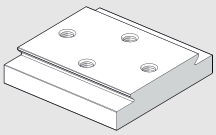
CYL	37	3	0	2	1	0300	1	2	1	1	2	0
	TYPE			SIZE	INTERFACE	STROKE	SCREW PITCH	VERSION	MOTOR	FLANGE	DRIVE TORQUE	
	37 Electric actuators	**3** Electric axis rodless elektro SK	**0** STD	**2** Size 2	**1** Axial V-lock **2** Orthogonal V-lock **3** Blank	From 100 to 1200 mm	**1** Pitch 4 **4** Pitch 10	● **2** In-line IP20/ IP40 ● **6** Geared IP20/ IP40 right ● **9** Geared IP20/ IP40 left	**1** STEPPING **2** BRUSHLESS **3** STEPPING with BRAKE + Encoder **4** BRUSHLESS with BRAKE **5** STEPPING with BRAKE without Encoder	**1** NEMA 23 **2** 60	**2** 1.2 - 2.19 Nm **3** 2.2 - 3 Nm	**0** Base **1** Greater rpm

● Version IP40 available for all STEPPING and BRUSHLESS motors, with the exception of motor code 37M5120000 which it is IP20

ACCESSORIES

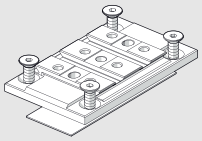
FIXING ELEMENTS



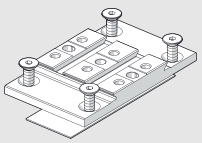


See V-Lock family.

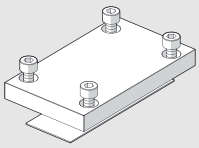
CARRIAGE INTERFACE KIT



Code	Description	Weight [g]
0950T2R016K	V-Lock axial interface kit	95
	Note: supplied complete with 4 screws, 1 adhesive pad	

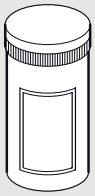


Code	Description	Weight [g]
0950T2R017K	V-Lock orthogonal interface kit	91
	Note: supplied complete with 4 screws, 1 adhesive pad	



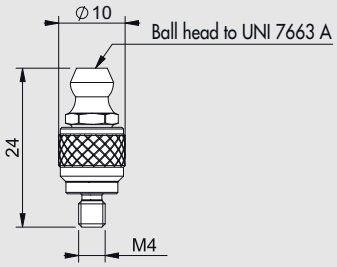
Code	Description	Weight [g]
0950T2R015	BLANK interface kit	127
	Note: supplied complete with 4 screws, 1 adhesive pad	

GREASE



Code	Description	Weight [g]
9910506	Tube of RHEOLUBE 363 AX1 grease	400

GREASE NIPPLE



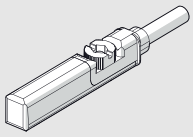
Code	Description
0950T2R108	Complete grease nipple for Elektro rodless SK cylinders

Note: Individually packed

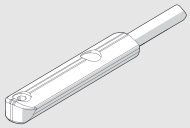
RETRACTABLE SENSOR

For codes and technical data, see **chapter A6**.

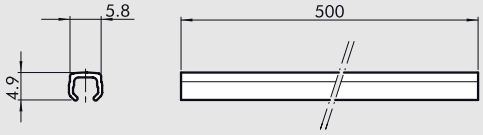
SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



BAR FOR GROOVING



Code	Description
W0950000160	Bar for grooving L = 500 mm

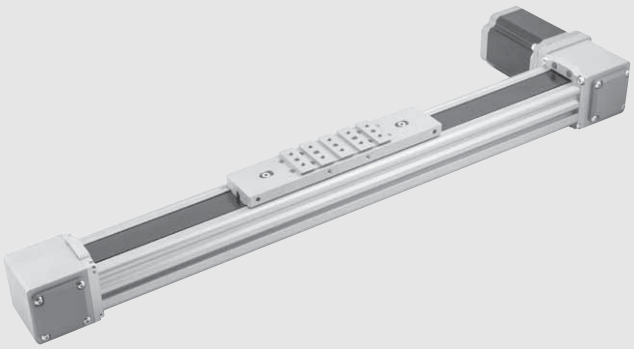
Note: The code corresponds to 1 piece.

Note. It is a plastic strap acting as dirt barrier and/or sensor wire protector to be fitted snugly into the section grooves

NOTES

ELECTRIC AXIS BELT-DRIVEN RODLESS, SERIES ELEKTRO BK

Belt-driven rodless electric axis with a V-Lock interface.
The structure features an extremely lightweight yet high-strength anodised aluminium extruded profile.
The typical V-Lock dovetail is obtained at the base of the extruded body ensures easy installation using QS elements; at both sides there are grooves for the installation of the fixing bracket of the (optional) proximity switch that detects the position of the slide.
The slide is moved by means of the polyurethane toothed belt with steel cables.
The parabolic profile of the belt tooth combines with the anti-friction nylon coating to enhance efficiency, reduce the level of noise and vibration from transmission gears.
The slide interface is characterised by the V-Lock profile complete with M5 threaded holes, pinholes and key seats, which guarantees numerous fixing options.
Two different variants of the in-line guiding system are available: the version Medium uses casters running along hardened and tempered steel guides with double-row ball bearings running along the specific H&T steel rail; the version Heavy, high-efficiency, consists of a guiding system with a rail and ball recirculation pads.



Different motor drives are available, both BRUSHLESS and STEPPING, with optional motor brake and/or built-in encoder.
The versions with a BRUSHLESS motor can be equipped with a speed gearbox.
The electric axis is also available without motor drive or, on request, with modules for interfacing with motors from the trade.
The motors can be installed on all the four hubs of the heads; the position can be changed at any time without requiring any additional operation.
A conversion kit for the installation of the gantry system starting from a single axis is also available.

TECHNICAL DATA		VERSION	
		Medium	Heavy
Admissible ambient temperature for STEPPING motor	°C	from -10 to +50	
BRUSHLESS motor	°C	from 0 to +40	
Maximum relative humidity		90% at 40°C; 57% at 50°C (no condensate)	
Maximum duty cycle for STEPPING motor		50%	
BRUSHLESS motor		100%	
Minimum stroke	mm	100	
Maximum stroke	mm	3800	1800
Repeatability	mm	± 0.05	
Positioning accuracy *	mm	± 0.4	
Uncontrolled impact at the end of stroke		NOT ALLOWED (it provides an extra-stroke minimum 5 mm)	
Homing position sensor		Inductive sensors	
Work position		Any	
Noise level	dBA	<66	
Type of belt		RPP5 in polyurethane with steel tensioning cables	
Maximum belt extension		0.1%	
Pulley travel/rotation	mm	110	
Pulley pitch diameter	mm	35.01	
Maximum axial force**	N	800	
Maximum number of revs	1/min	3500	3500
Maximum speed (without load)	m/s	6	6
Maximum acceleration without load	m/s^2	50	
Maximum driving torque applicable to the pulley	Nm	15	

* Indicative average data that gets influenced by various factors such as the stroke, the type of motor, the cylinder version, etc...
** Maximum load admissible on the belt: for the sizing, see page **A5**.96

WEIGHTS		VERSION Medium	Heavy
Weight at stroke 0 (drive excluded)	g	2324	2325
Additional weight each mm of stroke	g	4	3.7
Weight of standard motors with flange, joint and bolts and nuts	g		
STEPPING		1560	
BRUSHLESS		1750	
BRUSHLESS with brake		2150	
BRUSHLESS with 1:3 gearbox		2600	
BRUSHLESS with brake + 1:3 gearbox		3000	
BRUSHLESS with 1:5 gearbox		2600	
BRUSHLESS with brake + 1:5 gearbox		3000	

MASS AND MOMENT OF INERTIA		VERSION Medium	Heavy
Moving mass at stroke 0 (Mx)	g	570	625
Moving mass for each mm of stroke	g	0.22	
J_0 at stroke 0	kg mm^2	72	
J_1 each metre of stroke	kgmm^2/m	68	
J_2 each kg of load	kgmm^2/kg	307	
Maximum masses that can be moved VERTICALLY with standard motors:	kg		
STEPPING		1	1
BRUSHLESS		3	3
BRUSHLESS with brake		3	3
BRUSHLESS with gearbox		15	15
BRUSHLESS with brake + gearbox		15	15
Maximum masses that can be moved HORIZONTALLY with standard motors:	kg		
STEPPING		3	3
BRUSHLESS		3	3
BRUSHLESS with brake		3	3
BRUSHLESS with gearbox		15	15
BRUSHLESS with brake + gearbox		15	15

The reduced moment of inertia of total mass at the driving shaft is: $J_{tot} = [J_1 \cdot \text{Corsa [m]} + J_2 \cdot (\text{Carico [kg]} + \text{Mx [kg]}) + J_0] \cdot \tau^2 + J_3$

$\tau = 1/u$

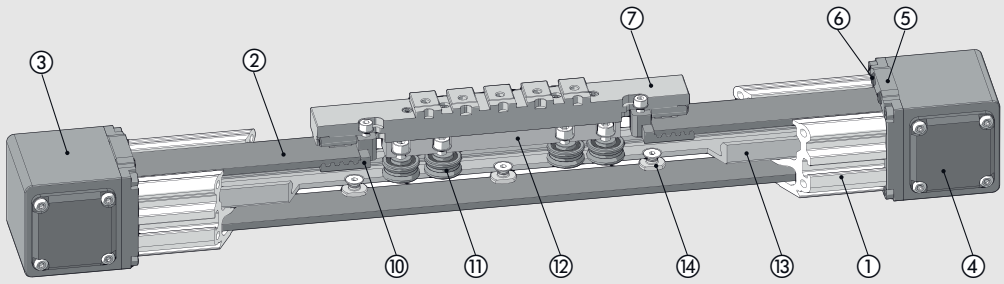
u = Gearing ratio

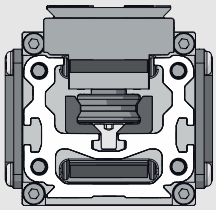
$J_3 = J_{\text{gear ratio}}$

NOTES

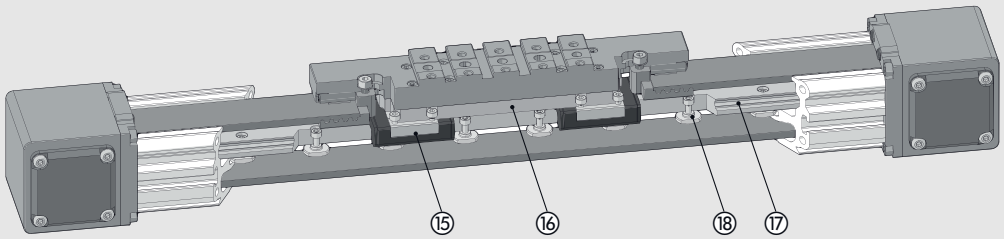
COMPONENTS

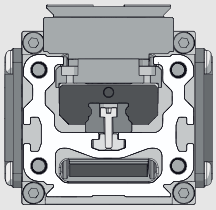
VERSION Medium (STEEL GUIDE AND STEEL WHEELS)



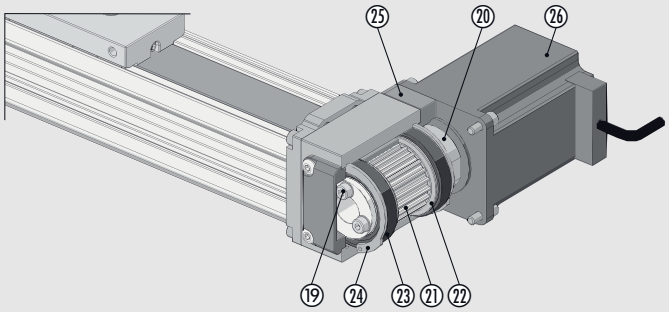


VERSION Heavy (STEEL GUIDE AND PADS BALL-RECIRCULATION)





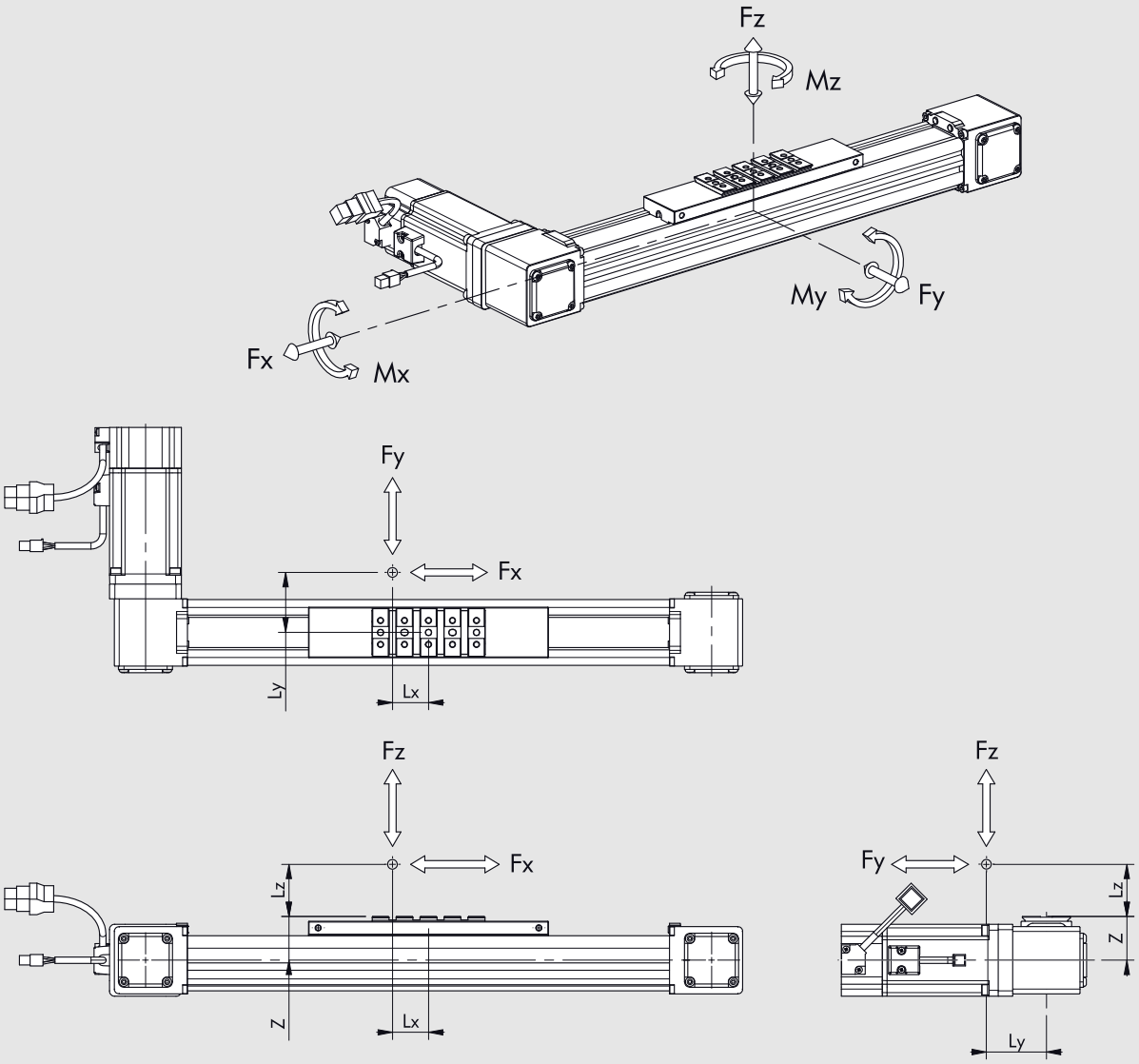
ELECTRIC AXIS WITH MOTOR



① BARREL: anodized aluminium
② TOOTHED BELT: polyurethane with steel cables
③ HEAD: anodized aluminium
④ HUB COVER: painted aluminium
⑤ HEAD SUPPORT: anodized aluminium
⑥ BUFFER: polyurethane
⑦ SLIDE WITH V-LOCK INTERFACE: anodized aluminium
⑩ BELT-LOCKING PLATE: anodized aluminium
⑪ DOUBLE-ROW BALL BEARING: hardened steel
⑫ SLIDING BEARING SUPPORT: anodized aluminium
⑬ GUIDING RAIL FOR STEEL WHEELS: hardened steel
⑭ GUIDE-LOCKING INSERT: zinc-plated steel
⑮ BALL RECIRCULATION PAD: stainless steel / technopolymer
⑯ PAD SUPPORT: anodized aluminium
⑰ GUIDING RAIL FOR PADS: hardened stainless steel
⑱ GUIDE-LOCKING INSERT: zinc-plated steel
⑲ ELASTIC COLLAR-LOCKING SCREWS: zinc-plated steel
⑳ ELASTIC COLLAR: anodized aluminium
㉑ COG PULLEY: hard-anodised aluminium
㉒ BELT FLANGES: zinc-plated steel
㉓ SHIELDED BALL BEARING: hardened steel
㉔ BEARING-LOCKING SNAP RING: zinc-plated steel
㉕ MOTOR-FIXING FLANGE: anodized aluminium
㉖ MOTOR

METAL WORK PNEUMATIC

DIAGRAM OF FORCES AND MOMENTS



STATIC VERIFICATION

When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

VERSION	Z [mm]	Fy0 max [N]	Fz0 max [N]	Mx0 max [Nm]	My0 max [Nm]	Mz0 max [Nm]
Medium	33	1600	900	18	60	140
Heavy	35	5700	5700	40	570	570

N.B.: The values in the table relates to the maximum admissible loads beyond which serious damage is likely to occur.

$$Mx = Fz \cdot Ly + Fy \cdot (Lz + z) \qquad My = Fz \cdot Lx + Fx \cdot (Lz + z) \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$$

$$\frac{(Mx)}{Mx0\ max} + \frac{(My)}{My0\ max} + \frac{(Mz)}{Mz0\ max} + \frac{(Fy)}{Fy0\ max} + \frac{(Fz)}{Fz0\ max} \leq 1$$

DYNAMIC VERIFICATION

When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

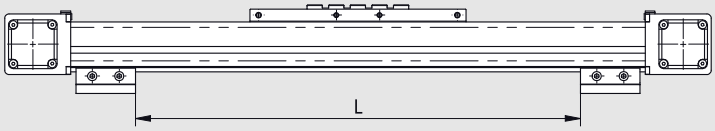
VERSION	Z [mm]	Fy max [N]	Fz max [N]	Mx max [Nm]	My max [Nm]	Mz max [Nm]
Medium	33	1000	600	12	40	90
Heavy	35	2850	2850	20	285	285

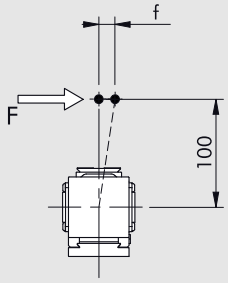
N.B.: The values are calculated on the basis of theoretical useful life of 10000 km.

$$Mx = Fz \cdot Ly + Fy \cdot (Lz + z) \qquad My = Fz \cdot Lx + Fx \cdot (Lz + z) \qquad Mz = Fy \cdot Lx + Fx \cdot Ly$$

$$\frac{(Mx)}{Mx\ max} + \frac{(My)}{My\ max} + \frac{(Mz)}{Mz\ max} + \frac{(Fy)}{Fy\ max} + \frac{(Fz)}{Fz\ max} \leq 1$$

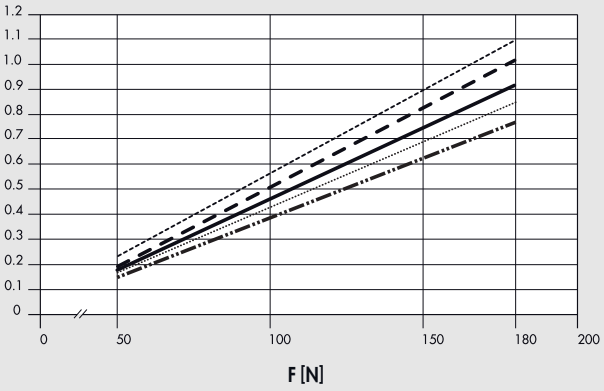
DEFORMATION ACCORDING TO LOAD WITH MISALIGNED LOAD





MEDIUM VERSION (guide and wheels)

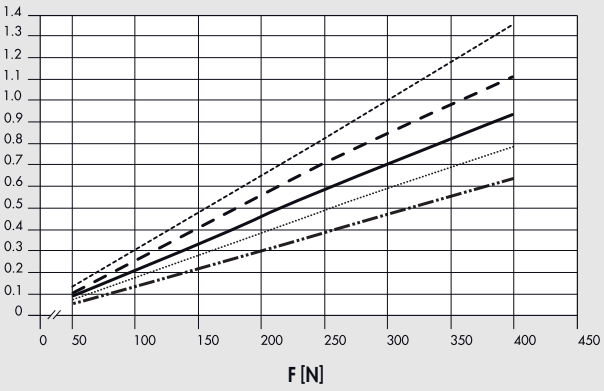
f [mm]



L = 200
L = 400
L = 600
L = 800
L = 1000

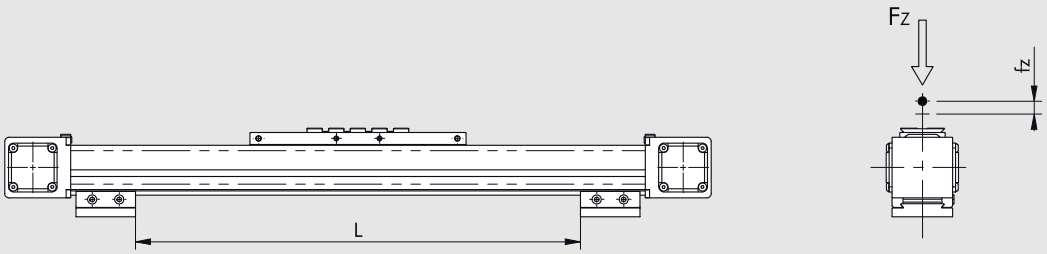
HEAVY VERSION (guide and ball-recirculation pads)

f [mm]

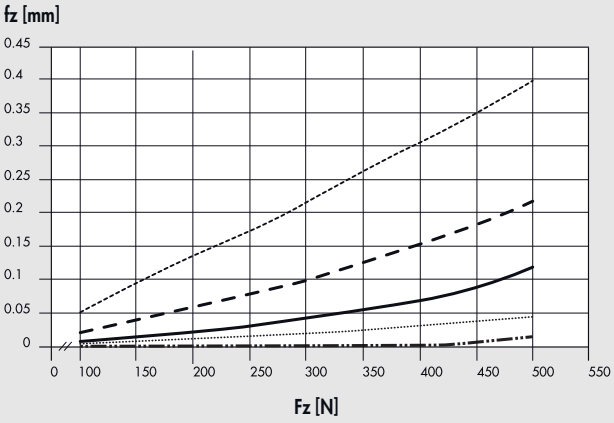


L = 200
L = 400
L = 600
L = 800
L = 1000

DEFORMATION ACCORDING TO LOAD WITH ALIGNED LOAD

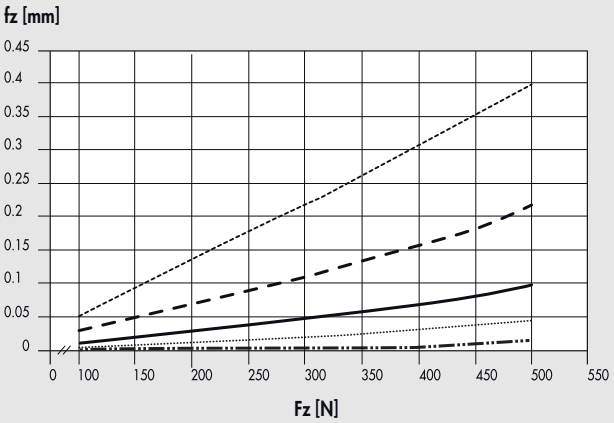


MEDIUM VERSION (guide and wheels)



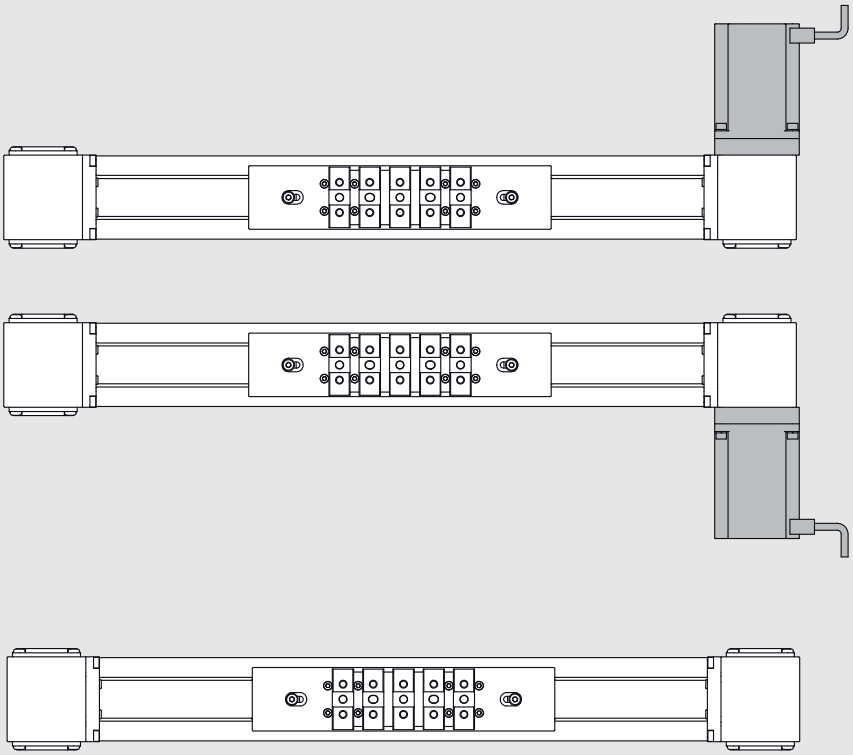
L = 200
L = 400
L = 600
L = 800
L = 1000

HEAVY VERSION (guide and ball-recirculation pads)



L = 200
L = 400
L = 600
L = 800
L = 1000

VERSIONS



RIGHT MOTOR

LEFT MOTOR

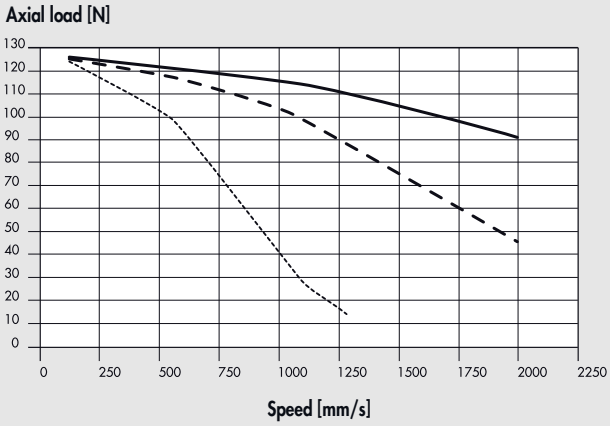
WITHOUT MOTOR

AXIAL LOAD CURVES AS A FUNCTION OF SPEED (AXIS COMPELTE WITH MOTOR AND DRIVE)

N.B.: Check that the following constraints are met for each cycle phase:
- the maximum movable masses and related acceleration values specified in the data sheets;
- the values specified in the force and moment calculation diagram (including moment of inertia);
- the maximum axial load of the belt.

N.B.: The obtainable load values already take the efficiency of the system into account.
For STEPPING motors, with the motor off, the drive current is automatically reduced by 50% to prevent overheating.
Consequently, available axial load with the motor stopped is also reduced by 50%.

STEPPING motor code 37M1230000

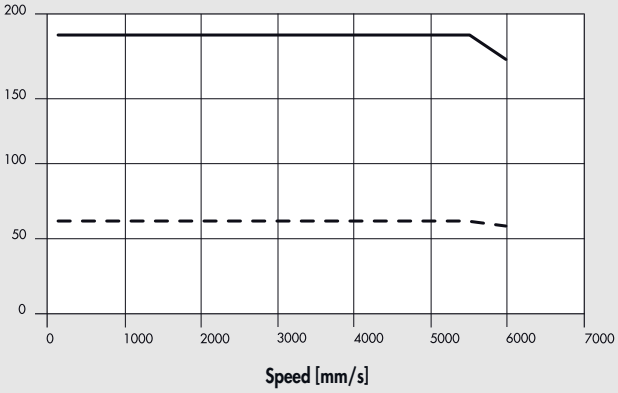


---------- 37M1230000 (24VDC)
– – – – – – 37M1230000 (48VDC)
———— 37M1230000 (75VDC)

BRUSHLESS motors code 37M2220001 and code 37M4220001 (with brake)

Direct type

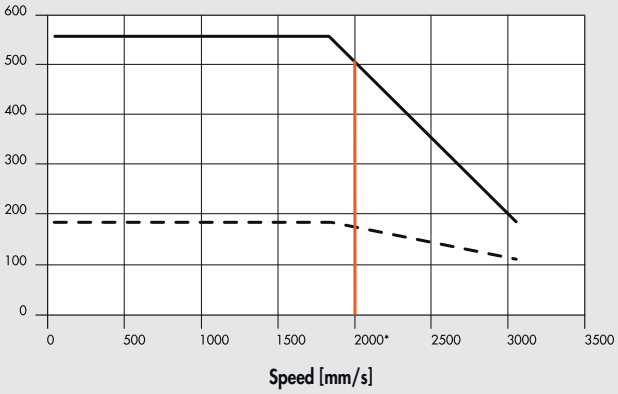
Axial load [N]



NOMINAL
MAXIMUM

With 1:3 gearbox

Axial load [N]

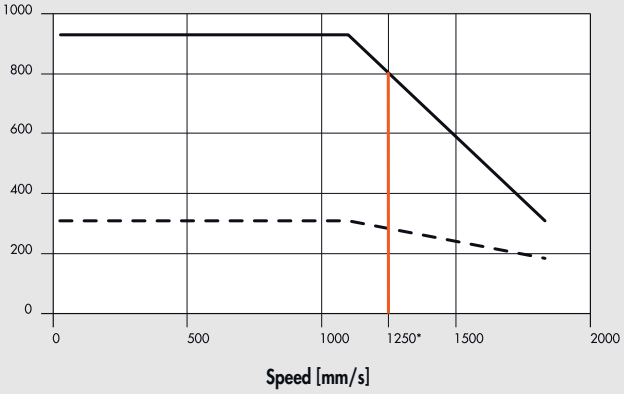


NOMINAL
MAXIMUM

* = limit of gearbox continuous operation: higher speeds can be reached only for "duty cycle" ≤60% and for a maximum number of 1000 accelerations per hour.

With 1:5 gearbox

Axial load [N]



NOMINAL
MAXIMUM

* = limit of gearbox continuous operation: higher speeds can be reached only for "duty cycle" ≤60% and for a maximum number of 1000 accelerations per hour.

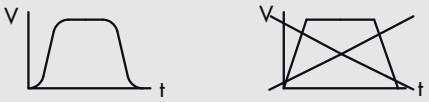
MOTOR-DRIVE COUPLINGS

MOTOR CODES		DRIVES CODES		
	Metal Work	37D1222000 *	37D1332000 *	37D1552000
	Manufacturer	RTA CSD 94	RTA NDC 96	RTA PLUS B7
Metal Work	Manufacturer	(4.4A 24÷48VDC)	(6A 24÷75VDC)	(10A 28÷62VAC) ●
STEPPING				
37M1230000	Motor SANYO DENKI 103-H7823-1740 (4A 75V max)	√	√ ◆	√ ■

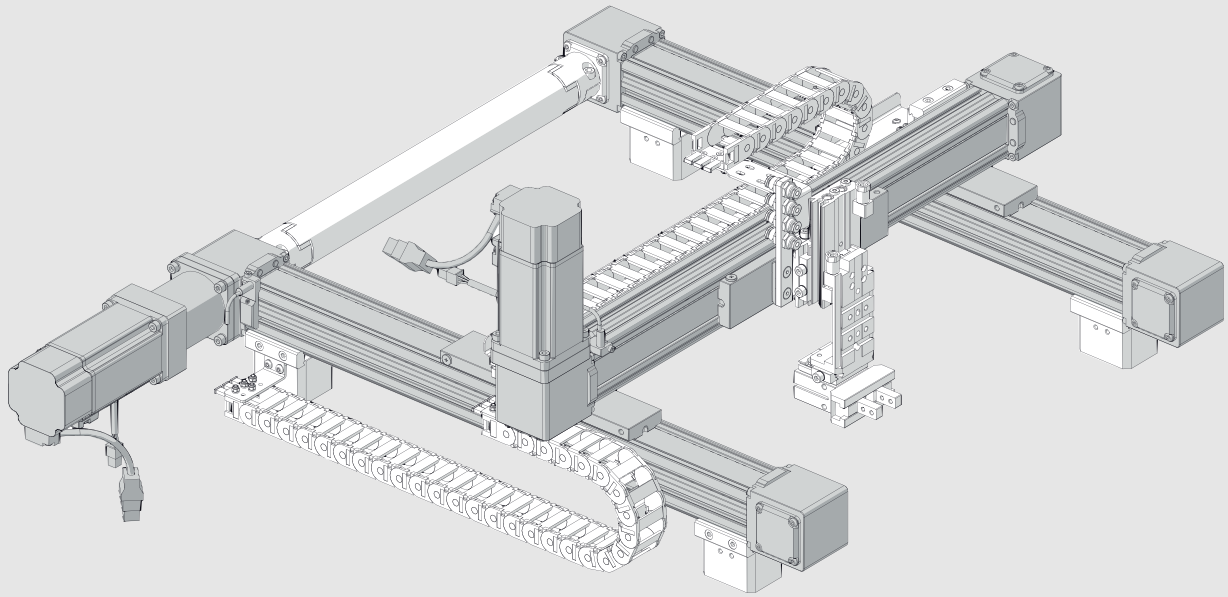
✱ In all applications requiring motor powered up to 6A / 55VDC, the programmable drive **e**.drive, code 37D1332002, can be used.
◆ **Important!** Limit current
■ **Important!** Limit current and voltage
● **Important!** AC drive to continuous voltage VDC = VAC · $\sqrt{2}$

MOTOR CODES		DRIVES CODES
	Metal Work	37D2300000
	Manufacturer	DELTA ASD-A2-0421-M
Metal Work	Manufacturer	(400W)
BRUSHLESS		
37M2220001	Motor DELTA ECMA-C20604RS (400W)	√
BRUSHLESS WITH BRAKE		
37M4220001	Motor DELTA ECMA-C20604SS (400W)	√

The motor must be controlled in such a way as to avoid sudden changes in speed.



EXAMPLES OF APPLICATION

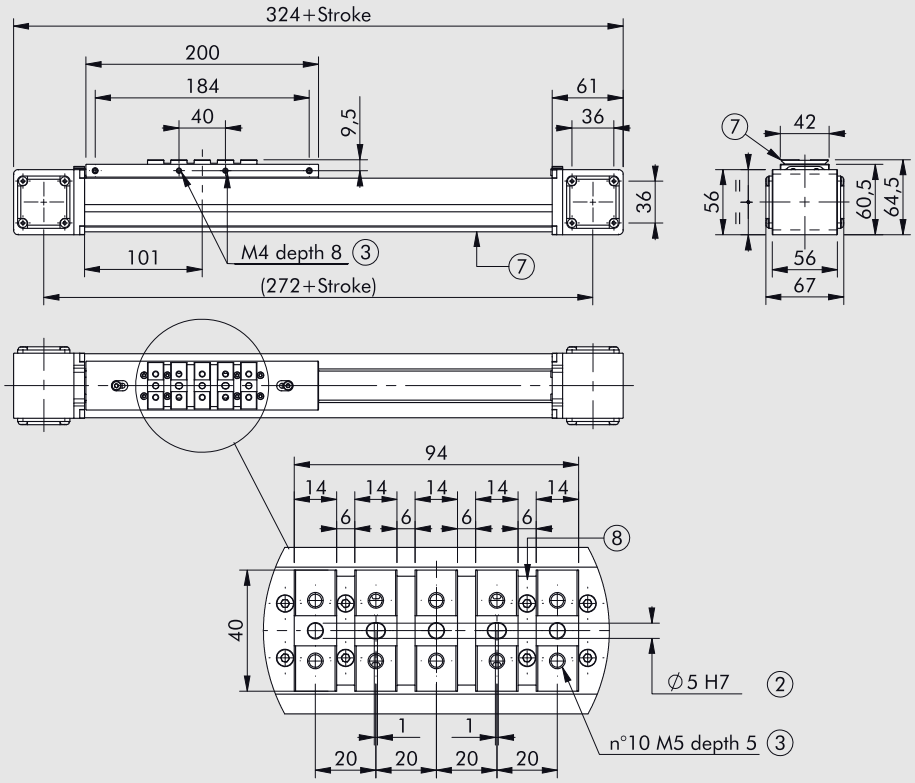


METAL WORK PNEUMATIC

DIMENSIONS

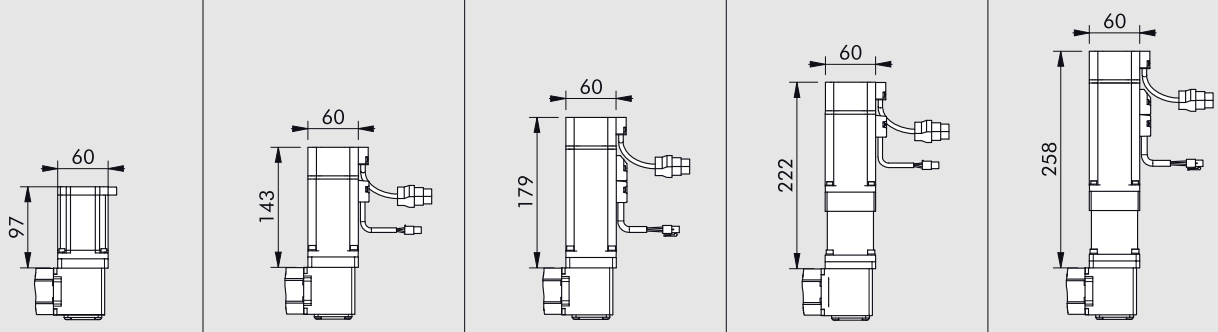
VERSION WITHOUT MOTOR

② = Holes for centring pins
③ = Threaded holes for fixing
⑦ = Dovetail for "V-Lock" fixing. For standard dimensions, see **chapter V-Lock adaptors**.
⑧ = Slot for "V-Lock" precision key



VERSION WITH MOTOR

Examples of layout dimensions relating to the version with right motor; the dimensions also apply to versions with left motor.



	STEPPING MOTOR	BRUSHLESS MOTOR	BRUSHLESS MOTOR WITH BRAK	BRUSHLESS MOTOR WITH GEARBOX	BRUSHLESS MOTOR WITH GEARBOX + BRAKE
ORDERING CODES	374011_ _ _ _261230	374011_ _ _ _262220	374011_ _ _ _264220	Reduction 1:3	Reduction 1:3
	374011_ _ _ _291230	374011_ _ _ _292220	374011_ _ _ _294220	374011_ _ _ _266220	374011_ _ _ _267220
	374011_ _ _ _361230	374011_ _ _ _362220	374011_ _ _ _364220	374011_ _ _ _296220	374011_ _ _ _297220
	374011_ _ _ _391230	374011_ _ _ _392220	374011_ _ _ _394220	374011_ _ _ _366220	374011_ _ _ _367220
				374011_ _ _ _396220	374011_ _ _ _397220
				Reduction 1:5	Reduction 1:5
				374011_ _ _ _268220	374011_ _ _ _269220
				374011_ _ _ _298220	374011_ _ _ _299220
				374011_ _ _ _368220	374011_ _ _ _369220
				374011_ _ _ _398220	374011_ _ _ _399220

_ _ _ _ = Enter the stroke to complete the code. See Key to Codes for an explanation of encoding.

KEY TO CODES AXIS ELECTRIC (WITHOUT MOTOR)

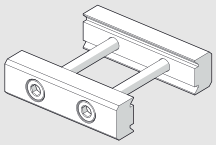
CIL	37 TYPE	4	0	1 SIZE	1 INTERFACE	0300 STROKE	2 VERSION	T
	37 Electric actuators	**4** Electric axis rodless elektro BK	**0** STD	**1** Size 1	**1** Axial V-lock	**Medium** From 100 to 3800 mm **Heavy** From 100 to 1800 mm	**2** Medium (steel guide and steel wheels) **3** Heavy (steel guide and pads ball-recirculation)	**T** Without motor (plugged outlets)

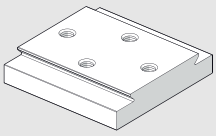
KEY TO CODES AXIS ELECTRIC MOTOR

CIL	37 TYPE	4	0	1 SIZE	1 INTERFACE	0300 STROKE	2 VERSION	6 MOTOR POSITION	1 MOTOR	2 DRIVE FLANGE	3 DRIVE TORQUE	0
	37 Electric actuators	**4** Electric axis rodless elektro BK	**0** STD	**1** Size 1	**1** Axial V-lock	**Medium** From 100 to 3800 mm **Heavy** From 100 to 1800 mm	**2** Medium (steel guide and steel wheels) **3** Heavy (steel guide and pads ball-recirculation)	**6** Right **9** Left	**1** Stepping **2** Brushless **4** Brushless with BRAKE + Encoder **6** Brushless with 1:3 gearbox **7** Brushless with BRAKE + 1:3 gearbox **8** Brushless with 1:5 gearbox **9** Brushless with BRAKE + 1:5 gearbox	**2** 60	**2** 1.2÷2.19 Nm **3** 2.2÷3 Nm	**0** Base

ACCESSORIES

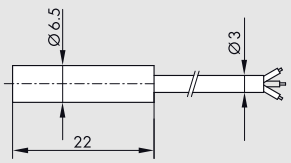
FIXING ELEMENTS





See V-Lock family.

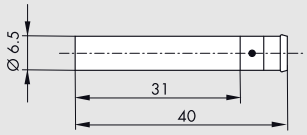
INDUCTION SENSOR Ø 6.5



Code	Description
W095K030006	PNP Ø 6.5 PNP inductive sensor with LED 2 m
W095K031006	NPN Ø 6.5 NPN inductive sensor with LED 2 m

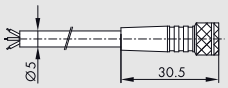
METAL WORK PNEUMATIC

QUICK-FIT INDUCTIVE SENSOR Ø 6.5



Code	Description
W095K030009	PNP Ø 6.5 inductive sensor with push-in LED

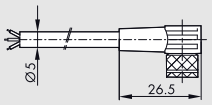
CABLE WITH STRAIGHT CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)



Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
W095K000005	Push-in cable female straight connector 5 m
W095K000010	Push-in cable female straight connector 10 m

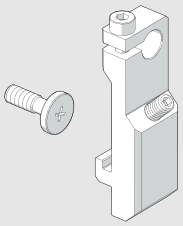
CABLE WITH 90° CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)



Pin	Cable color
1	Brown
3	Blue
4	Black

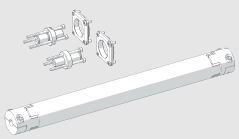
Code	Description
W095K010005	Push-in cable female elbow connector 5 m
W095K010010	Push-in cable female elbow connector 10 m

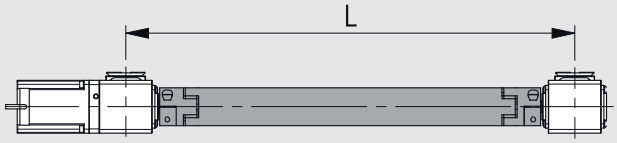
BRACKET FOR INDUCTION SENSOR Ø 6.5



Code	Description
095BK1R001	Proximity switch support for BK

GANTRY ASSEMBLY KIT (see example of application on page **A5**.98)



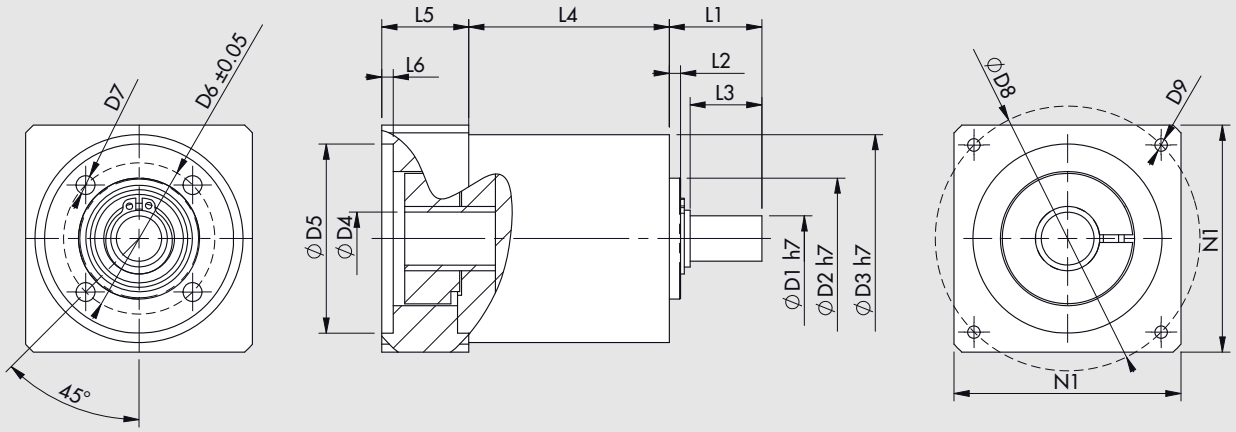


Code	Description	L
095BK1R011	Connection joint kit for BK, centre distance 475 mm	475
095BK1R012	Connection joint kit for BK, centre distance 675 mm	675
095BK1R013	Connection joint kit for BK, centre distance 875 mm	875
095BK1R014	Connection joint kit fo BK, centre distance 1075 mm	1075
095BK1R015	Connection joint kit for BK, centre distance 1275 mm	1275
095BK1R016	Connection joint kit for BK, centre distance 1475 mm	1475

Max revs: 2000 rpm.
Max torque: 25 Nm (hole Ø 12 mm)

SPARE PARTS

BK GEARBOXES



Code	Description	C_{OUT} nominal [Nm]	N_{IN} nominal [1/min]	J reduced to motor shaft [kgmm²]	Mass [kg]	D1	D2	D3	D4	D5	D6	D7	D8	D9	L1	L2	L3	L4	L5	L6	N1
37R0341000	Gearbox MP053 1:3	12	3300	8	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60
37R0541000	Gearbox MP053 1:5	15	3500	6	0.8	12	32	55	14	50	40	M5	70	M4x10	24.5	3	19	53	23	3	60

C_{OUT} = rated output torque N_{IN} = nominal input speed J = mass moment of inertia of the gearhead

ELECTRIC MOTORS

See page **A5**.104

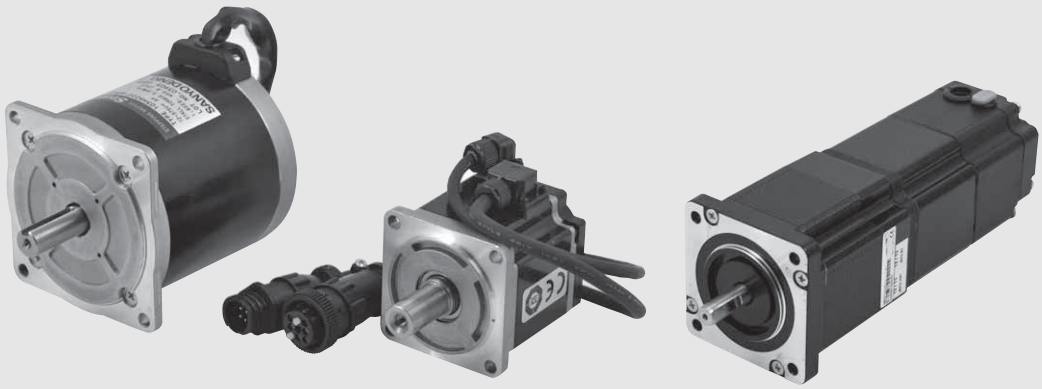
DRIVES

See page **A5**.130

METAL WORK PNEUMATIC

NOTES

ELECTRIC MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO



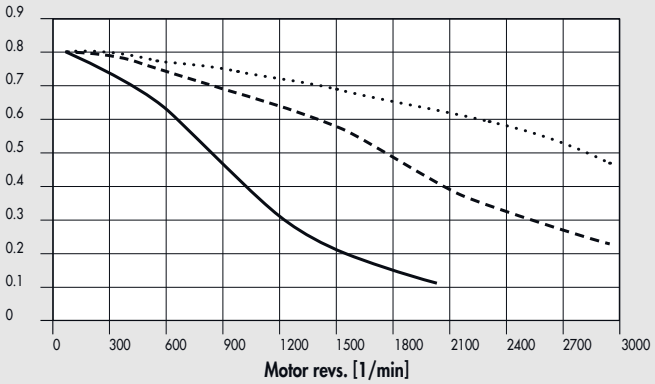
STEPPING MOTORS

N.B.: With motor off, the drive current is automatically reduced by 50% to prevent overheating. Consequently, available torque with the motor stopped is also reduced by 50%.

TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS

STEPPING motor code **37M1110000**

Motor torque [Nm]

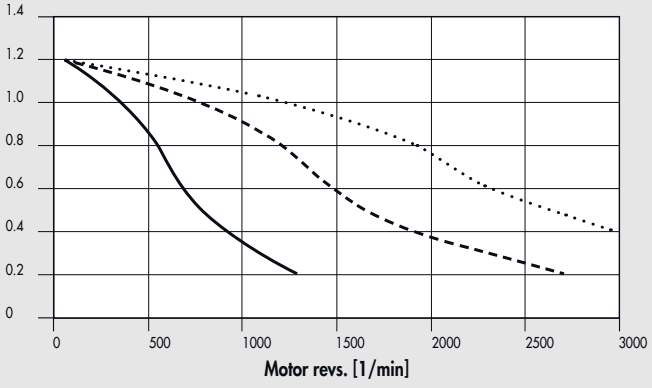


—— 37M1110000 (24VDC) ····· 37M1110000 (75VDC)
– – – 37M1110000 (48VDC)

TECHNICAL DATA		MOTOR 37M1110000
Motor type		STEPPING
Nominal torque	Nm	**0.8**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.41
Inductance	mH	1.6
Bipolar holding torque	Nm	1.1
Rotor inertia	kgmm²	21
Theoretical acceleration	rad · s⁻²	50000
Back E.M.F.	V/krpm	20
Mass	kg	0.65
Degree of protection		IP40

STEPPING motor code **37M1120000**

Motor torque [Nm]



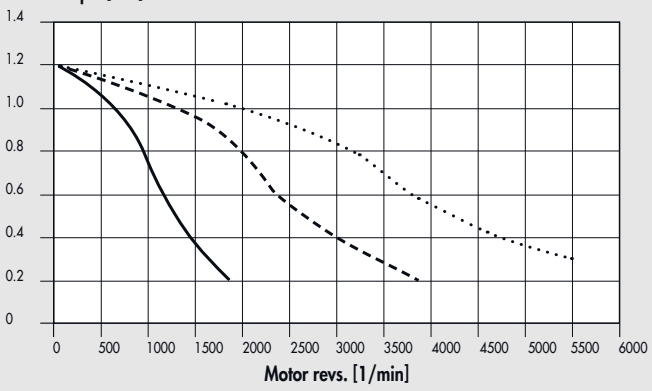
—— 37M1120000 (24VDC) ····· 37M1120000 (75VDC)
– – – 37M1120000 (48VDC)

TECHNICAL DATA		MOTOR 37M1120000
Motor type		STEPPING
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.48
Inductance	mH	2.2
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm²	36
Theoretical acceleration	rad · s⁻²	45800
Back E.M.F.	V/krpm	31
Mass	kg	1
Degree of protection		IP40

METAL WORK PNEUMATIC

STEPPING motor code **37M1120001**

Motor torque [Nm]

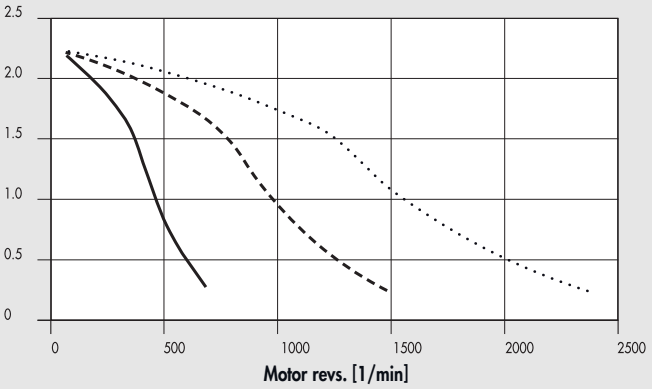


—— 37M1120001 (24VDC) ····· 37M1120001 (75VDC)
– – – 37M1120001 (48VDC)

TECHNICAL DATA		MOTOR 37M1120001
Motor type		STEPPING
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	5.6
Resistance	Ω	0.3
Inductance	mH	0.85
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm²	36
Theoretical acceleration	rad · s⁻²	45800
Back E.M.F.	V/krpm	23
Mass	kg	1
Degree of protection		IP43

STEPPING motor code **37M1230000**

Motor torque [Nm]

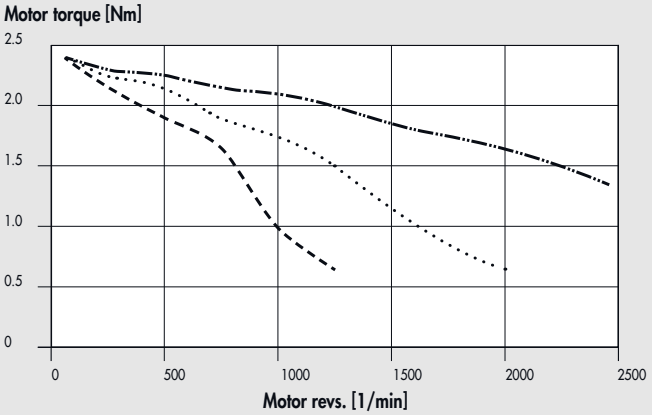


—— 37M1230000 (24VDC) ····· 37M1230000 (75VDC)
– – – 37M1230000 (48VDC)

TECHNICAL DATA		MOTOR 37M1230000
Motor type		STEPPING
Nominal torque	Nm	**2.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.65
Inductance	mH	2.4
Bipolar holding torque	Nm	3
Rotor inertia	kgmm²	84
Theoretical acceleration	rad · s⁻²	35700
Back E.M.F.	V/krpm	75
Mass	kg	1.4
Degree of protection		IP40

STEPPING motor code **37M1430000**

Motor torque [Nm]

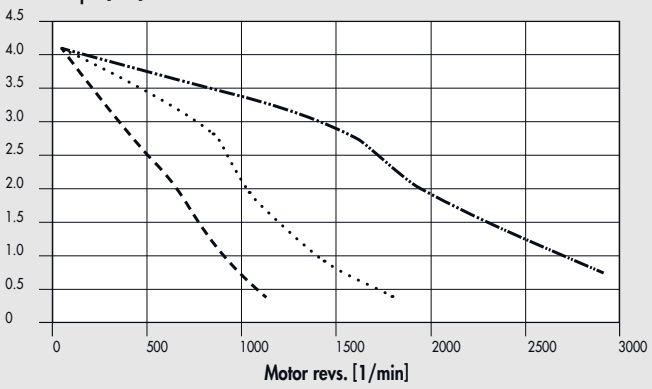


– – – 37M1430000 (48VDC) ··—··· 37M1430000 (140VDC)
·····37M1430000 (75VDC)

TECHNICAL DATA		MOTOR 37M1430000
Motor type		STEPPING
Nominal torque	Nm	**2.4**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.3
Inductance	mH	1.65
Bipolar holding torque	Nm	3
Rotor inertia	kgmm²	145
Theoretical acceleration	rad · s⁻²	20600
Back E.M.F.	V/krpm	50
Mass	kg	1.5
Degree of protection		IP43

STEPPING motor code **37M1440000**

Motor torque [Nm]

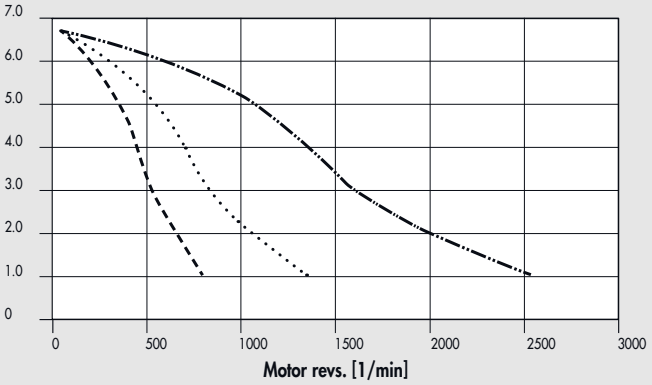


– – – 37M1440000 (48VDC)
..—... 37M1440000 (140VDC)
. . . . . 37M1440000 (75VDC)

TECHNICAL DATA		MOTOR 37M1440000
Motor type		STEPPING
Nominal torque	Nm	**4.2**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.35
Inductance	mH	2.7
Bipolar holding torque	Nm	5.6
Rotor inertia	kgmm²	290
Theoretical acceleration	rad · s⁻²	19300
Back E.M.F.	V/krpm	93
Mass	kg	2.5
Degree of protection		IP43

STEPPING motor code **37M1450000**

Motor torque [Nm]

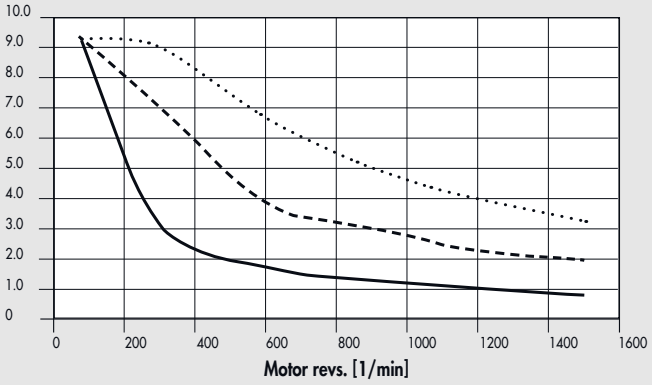


– – – 37M1450000 (48VDC)
..—... 37M1450000 (140VDC)
. . . . . 37M1450000 (75VDC)

TECHNICAL DATA		MOTOR 37M1450000
Motor type		STEPPING
Nominal torque	Nm	**6.7**
Coupling flange		**NEMA 34**
Base step angle		1.8°±0.09°
Bipolar current parallel	A	6
Resistance	Ω	0.46
Inductance	mH	3.8
Bipolar holding torque	Nm	9.2
Rotor inertia	kgmm²	450
Theoretical acceleration	rad · s⁻²	20500
Back E.M.F.	V/krpm	161
Mass	kg	4
Certifications		UL, CSA, CE, RoHS
Insulation voltage		250VAC (350VDC)
Degree of protection		IP43 - F

STEPPING motor code **37M1470000**

Motor torque [Nm]

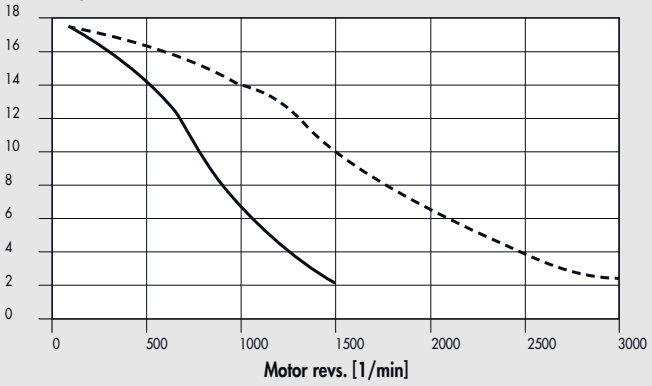


—— 37M1470000 (24VDC)
. . . . . 37M1470000 (75VDC)
– – – 37M1470000 (48VDC)

TECHNICAL DATA		MOTOR 37M1470000
Motor type		STEPPING
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm²	392
Mass	kg	4.2
Degree of protection		IP40
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**

STEPPING motor code **37M1890000**

Motor torque [Nm]



37M1890000 (230VAC)
37M1890000 (115VAC)

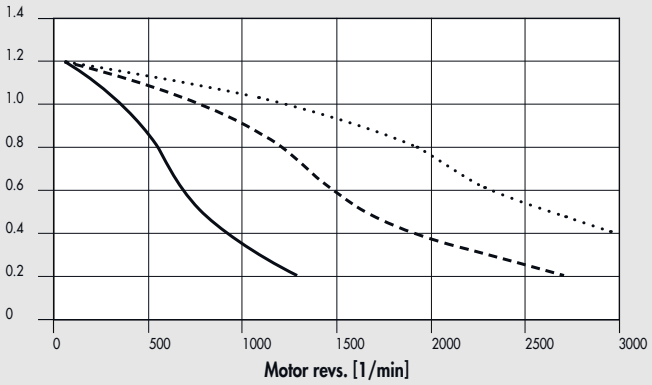
TECHNICAL DATA		MOTOR 37M1890000
Motor type		STEPPING
Nominal torque	Nm	**17.5**
Coupling flange		**NEMA 42**
Base step angle		1.8°±0.09°
Bipolar current	A	6
Resistance	Ω	0.63
Inductance	mH	8
Bipolar holding torque	Nm	24.6
Rotor inertia	kgmm^2	2200
Theoretical acceleration	rad · s^{-2}	11100
Back E.M.F.	V/krpm	410
Mass	kg	10
Degree of protection		IP43

STEPPING MOTORS WITH BRAKE

TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE

STEPPING motor with BRAKE code **37M5120000**

Motor torque [Nm]



37M5120000 (24VDC)
37M5120000 (75VDC)
37M5120000 (48VDC)

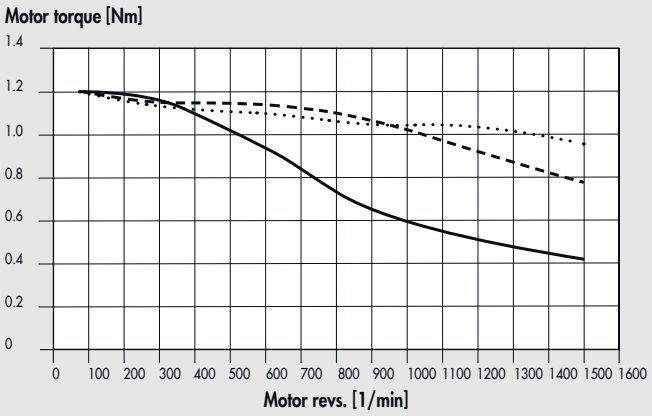
TECHNICAL DATA		MOTOR 37M5120000
Motor type		STEPPING with BRAKE
Nominal torque	Nm	**1.2**
Coupling flange		**NEMA 23**
Base step angle		1.8°±0.09°
Bipolar current	A	4
Resistance	Ω	0.48
Inductance	mH	2.2
Bipolar holding torque	Nm	1.65
Rotor inertia	kgmm^2	36
Theoretical acceleration	rad · s^{-2}	45800
Back E.M.F.	V/krpm	31
Mass	kg	1 - 5
Degree of protection		IP20
BRAKE		
Braking torque	Nm	3.3
Duty Cycle		50% max
Supply voltage	VDC	24
Power consumption	W	18
Connecting time	ms	300

NOTES

STEPPING MOTORS WITH BRAKE + ENCODER

TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC STEPPING MOTORS WITH BRAKE + ENCODER

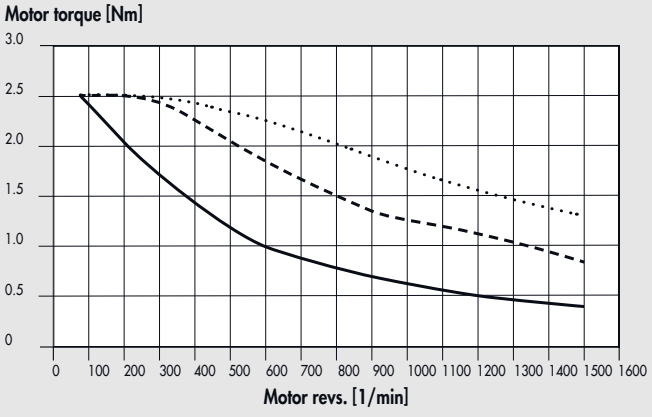
STEPPING motor with BRAKE + ENCODER code **37M3220000**



—— 37M3220000 (24VDC)
- - - 37M3220000 (48VDC)
. . . . . 37M3220000 (75VDC)

TECHNICAL DATA		MOTOR 37M3220000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**1.2**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Current	A	5
Resistance	Ω	0.38
Inductance	mH	1.4
Bipolar holding torque	Nm	1.7
Rotor inertia	kgmm²	44
Mass	kg	1.28
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	2
Power consumption	W	11
Connecting time	ms	6
Delay time	ms	2
Disconnection time	ms	25

STEPPING motor with BRAKE + ENCODER code **37M3230000**

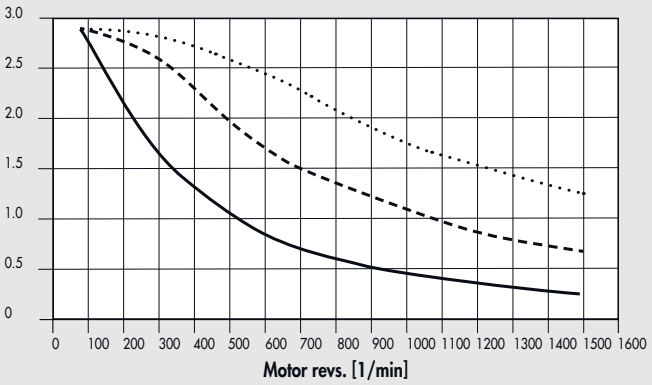


—— 37M3230000 (24VDC)
- - - 37M3230000 (48VDC)
. . . . . 37M3230000 (75VDC)

TECHNICAL DATA		MOTOR 37M3230000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**2.5**
Coupling flange (square)	mm	**60**
Base step angle		1.8°
Bipolar current	A	5
Resistance	Ω	0.6
Inductance	mH	2.8
Bipolar holding torque	Nm	3.5
Rotor inertia	kgmm²	92
Mass	kg	1.8
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	2
Power consumption	W	11
Connecting time	ms	6
Delay time	ms	2
Disconnection time	ms	25

STEPPING motor with BRAKE + ENCODER code **37M3430000**

Motor torque [Nm]

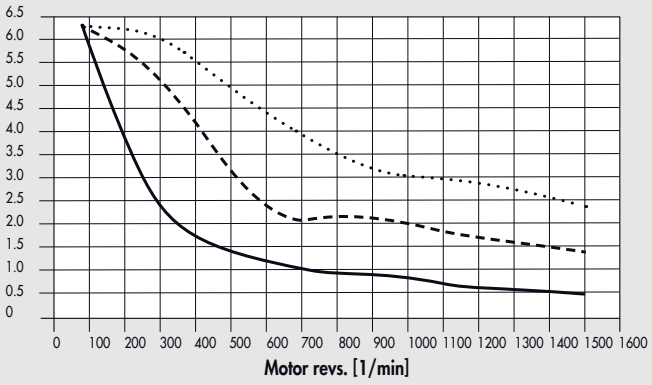


—— 37M3430000 (24VDC)
– – – 37M3430000 (48VDC)
. . . . . 37M3430000 (75VDC)

TECHNICAL DATA		MOTOR 37M3430000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**2.9**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	6
Resistance	Ω	0.4
Inductance	mH	3.2
Bipolar holding torque	Nm	4
Rotor inertia	kgmm²	131
Mass	kg	2.5
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40

STEPPING motor with BRAKE + ENCODER code **37M3450000**

Motor torque [Nm]

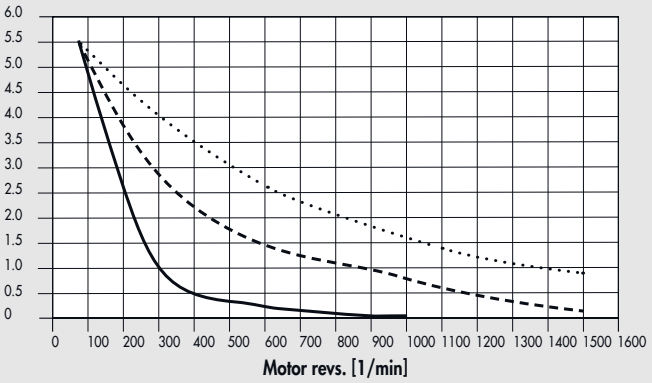


—— 37M3450000 (24VDC)
– – – 37M3450000 (48VDC)
. . . . . 37M3450000 (75VDC)

TECHNICAL DATA		MOTOR 37M3450000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**6.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.2
Inductance	mH	1.4
Bipolar holding torque	Nm	9.5
Rotor inertia	kgmm²	261
Mass	kg	3.7
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40

STEPPING motor with BRAKE + ENCODER code **37M3460000**

Motor torque [Nm]

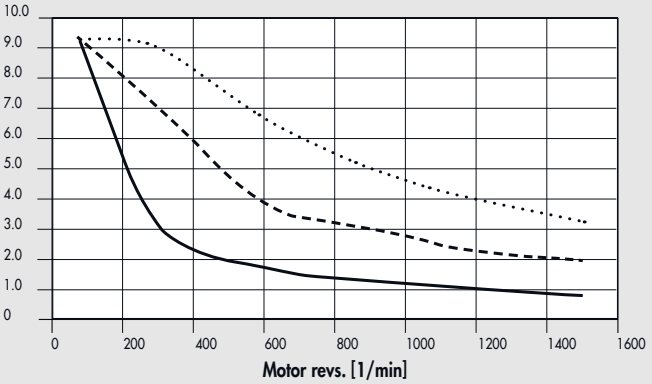


—— 37M3460000 (24VDC)
– – – 37M3460000 (48VDC)
· · · · · 37M3460000 (75VDC)

TECHNICAL DATA		MOTOR 37M3460000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**5.5**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	6
Resistance	Ω	0.6
Inductance	mH	4.3
Bipolar holding torque	Nm	7.8
Rotor inertia	kgmm²	261
Mass	kg	3.7
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40

STEPPING motor with BRAKE + ENCODER code **37M3470000**

Motor torque [Nm]



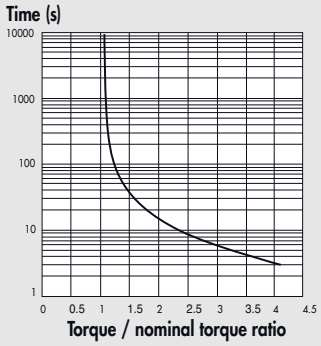
—— 37M3470000 (24VDC)
– – – 37M3470000 (48VDC)
· · · · · 37M3470000 (75VDC)

TECHNICAL DATA		MOTOR 37M3470000
Motor type		STEPPING with BRAKE + ENCODER
Nominal torque	Nm	**9.3**
Coupling flange		**NEMA 34**
Base step angle		1.8°
Bipolar current	A	10
Resistance	Ω	0.24
Inductance	mH	1.6
Bipolar holding torque	Nm	13.6
Rotor inertia	kgmm²	392
Mass	kg	4.2
Degree of protection		IP65
Encoder cable for stepping motors with brake, 3 metres		**37C1230000**
Power cable for stepping motors with brake, 3 metres		**37C1330000**
Encoder cable for stepping motors with brake, 5 metres		**37C1250000**
Power cable for stepping motors with brake, 5 metres		**37C1350000**
ENCODER		
Number of outputs		3 A / B / R
Resolution	positions per rev	1024
Supply voltage	VDC	18 - 30
BRAKE		
Supply voltage	VDC	24 +6% / -10%
Braking torque	Nm	9
Power consumption	W	18
Connecting time	ms	7
Delay time	ms	2
Disconnection time	ms	40

BRUSHLESS MOTORS

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.

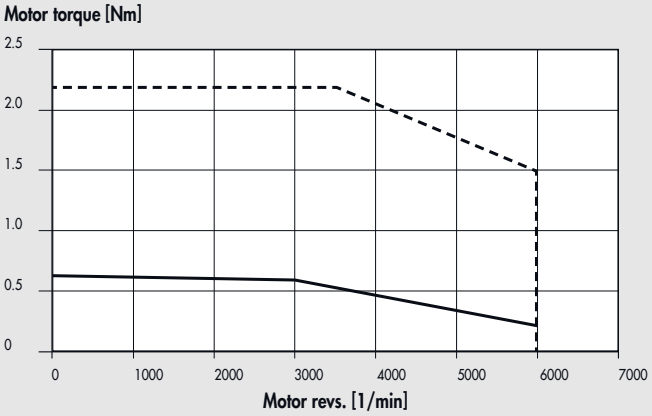


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

The following diagrams show the torque delivered by the motor with changing speed (rpm). Each diagram shows two separate curves:

- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

BRUSHLESS motor code **37M2200000** + drive code **37D2200000** (200W)

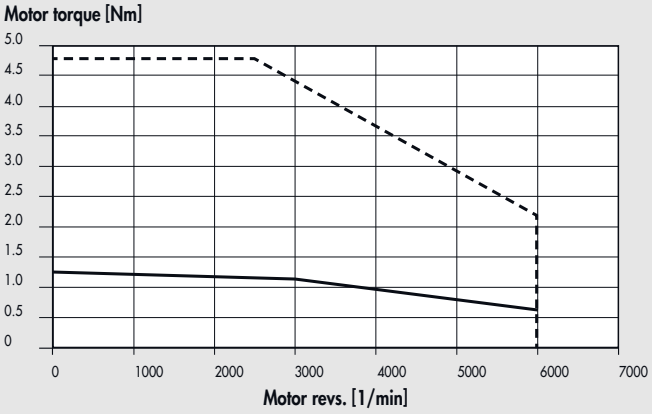


—— Nominal torque 37M2200000 + 37D2200000 (200W)

- - - Max torque 37M2200000 + 37D2200000 (200W)

TECHNICAL DATA		MOTOR 37M2200000
Motor type		BRUSHLESS
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	21.9
Mass	kg	0.84
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		**37D2200000**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C2130000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230000**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-drive**, 5 metres		**37C2150000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250000**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2210003**

BRUSHLESS motor code **37M2220000** + drive code **37D2400000** (400W)

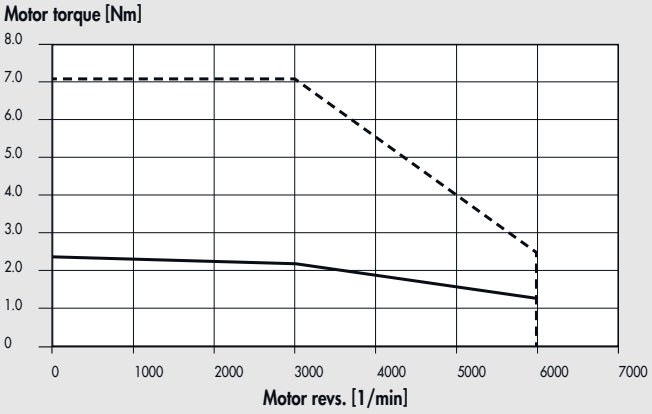


—— Nominal torque 37M2220000 + 37D2400000 (400W)

- - - Max torque 37M2220000 + 37D2400000 (400W)

TECHNICAL DATA		MOTOR 37M2220000
Motor type		BRUSHLESS
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm²	41.2
Mass	kg	1.3
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		**37D2400000**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C2130000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230000**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-drive**, 5 metres		**37C2150000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250000**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2210003**

BRUSHLESS motor code **37M2330000** + drive code **37D2400000** (750W)



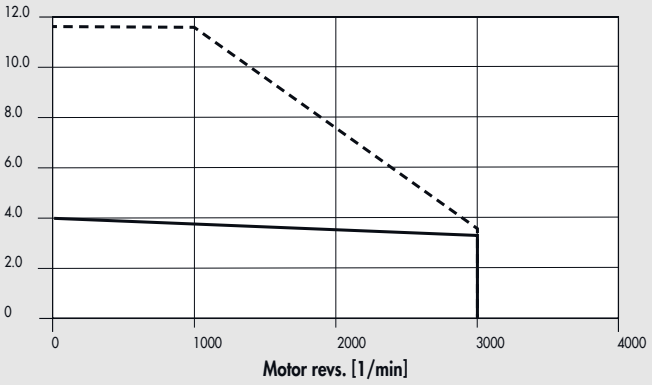
—— Nominal torque 37M2330000 + 37D2400000 (750W)

- - - Max torque 37M2330000 + 37D2400000 (750W)

DATI TECNICI		MOTORE 37M2330000
Motor type		BRUSHLESS
Nominal torque	Nm	**2.39**
Coupling flange (square)	mm	**80**
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	2.55
Maximum torque	Nm	7.1
Rotor inertia	kgmm²	182
Mass	kg	2.6
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		**37D2400000**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C2130000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230000**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-drive**, 5 metres		**37C2150000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250000**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2210003**

BRUSHLESS motor code **37M2540000** + drive code **37D2400000** (1000W)

Motor torque [Nm]



—— Nominal torque 37M2540000 + 37D2400000 (1000W)

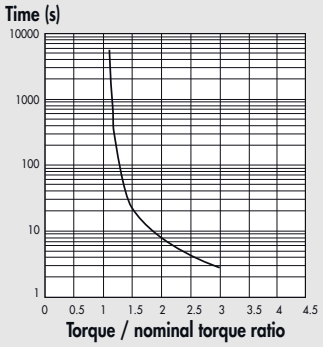
- - - Max torque 37M2540000 + 37D2400000 (1000W)

TECHNICAL DATA		MOTOR 37M2540000
Motor type		BRUSHLESS
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	$kgmm^2$	238.3
Mass	kg	3.5
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		**37D2400000**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C2130000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230000**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-drive**, 5 metres		**37C2150000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250000**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2210003**

NOTES

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (DELTA)

The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.

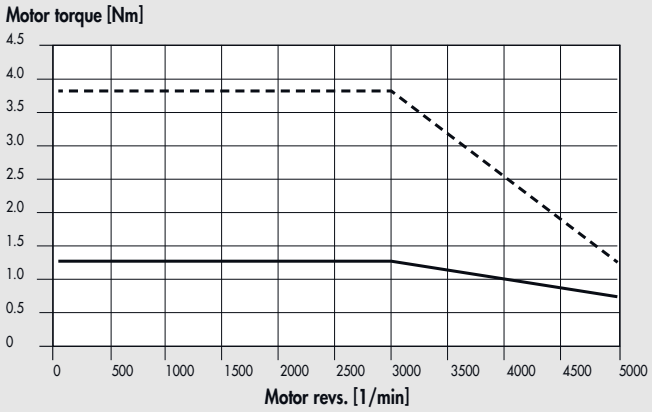


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS (DELTA)

The following diagrams show the torque delivered by the motor with changing speed (rpm). Each diagram shows two separate curves:

- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

BRUSHLESS motor code **37M2220001** + drive code **37D2300000** (400W)

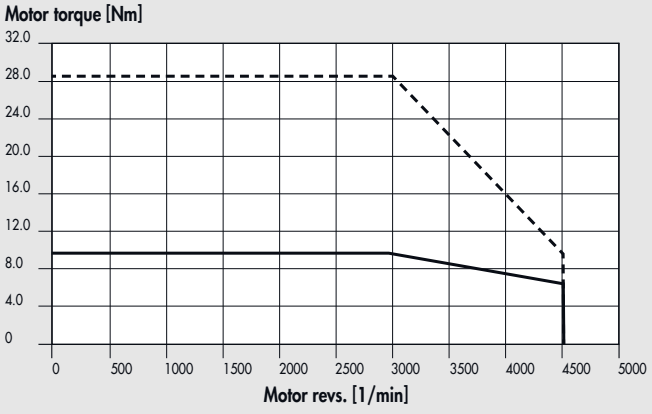


—— Nominal torque 37M2220001 + 37D2300000 (400W)

– – – Max torque 37M2220001 + 37D2300000 (400W)

TECHNICAL DATA		MOTOR 37M2220001
Motor type		BRUSHLESS
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	1.27
Maximum torque	Nm	3.82
Rotor inertia	kgmm²	27.7
Mass	kg	1.6
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP40
Drive code		**37D2300000**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C2130001**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive**, 5 metres		**37C2150001**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**

BRUSHLESS motor code **37M2770000** + drive code **37D2600001** (3000W)



—— Nominal torque 37M2770000 + 37D2600001 (3000W)

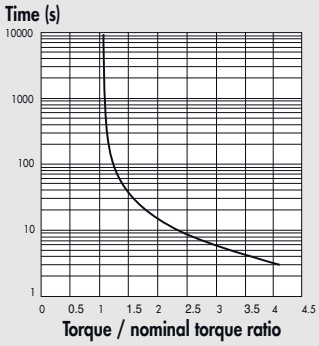
– – – Max torque 37M2770000 + 37D2600001 (3000W)

TECHNICAL DATA		MOTOR 37M2770000
Motor type		BRUSHLESS
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	kgmm²	1270
Mass	kg	7.8
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
Drive code		**37D2600001**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C3130001**
Brushless **motor-drive-encoder**, 3 metres		**37C3230001**
Brushless **motor-drive**, 5 metres		**37C3150001**
Brushless **motor-drive-encoder**, 5 metres		**37C3250001**

BRUSHLESS MOTORS WITH BRAKE

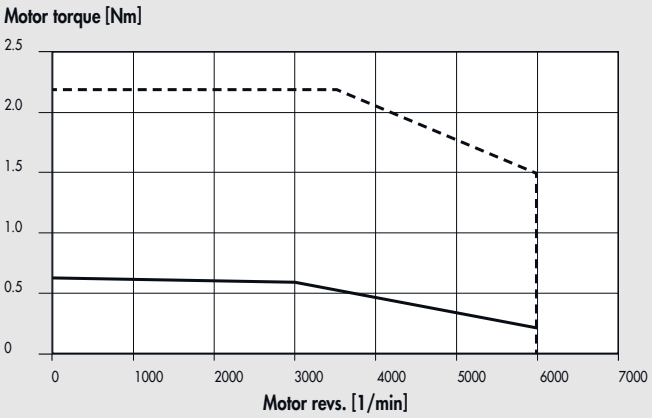
OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (SANYO DENKI)

The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.



TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (SANYO DENKI)

BRUSHLESS motor with BRAKE code **37M4200000** + drive code **37D2200000** (200W)

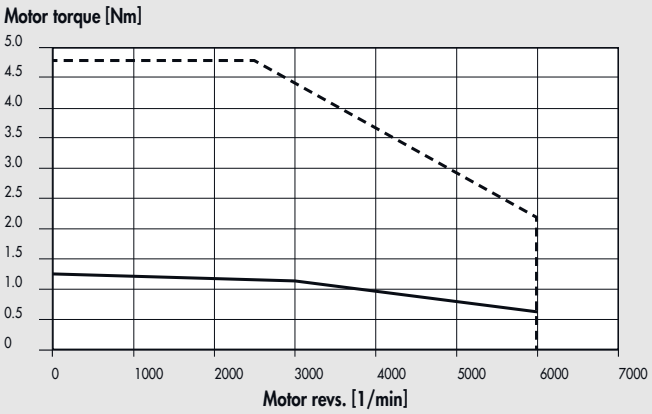


—— Nominal torque 37M4200000 + 37D2200000 (200W)

- - - Max torque 37M4200000 + 37D2200000 (200W)

TECHNICAL DATA		MOTOR 37M4200000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**0.64**
Coupling flange (square)	mm	**60**
Nominal power	W	200
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	0.686
Maximum torque	Nm	2.2
Rotor inertia	$kgmm^2$	27.9
Mass	kg	1.23
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		**37D2200000**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C2130000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230000**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-brake**, **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive**, 5 metres		**37C2150000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250000**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-brake**, **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2210003**
Brushless **motor-brake**, **dynamic** cable, 10 metres		**37C2310000**
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.37 min

BRUSHLESS motor with BRAKE code **37M4220000** + drive code **37D2400000** (400W)

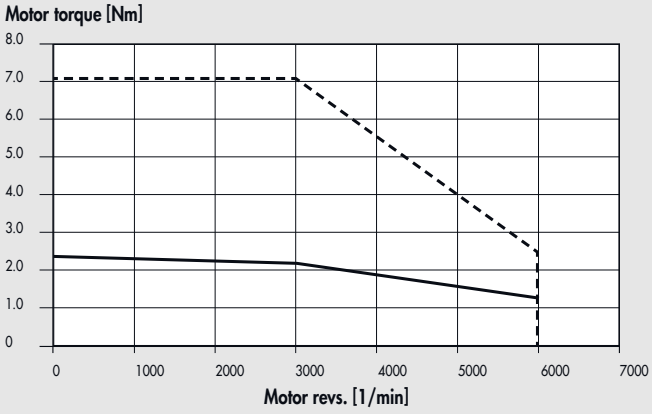


—— Nominal torque 37M4220000 + 37D2400000 (400W)

- - - Max torque 37M4220000 + 37D2400000 (400W)

TECHNICAL DATA		MOTOR 37M4220000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	1.37
Maximum torque	Nm	4.8
Rotor inertia	kgmm²	47.2
Mass	kg	1.69
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		**37D2400000**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C2130000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230000**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-brake**, **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive**, 5 metres		**37C2150000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250000**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-brake**, **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2210003**
Brushless **motor-brake**, **dynamic** cable, 10 metres		**37C2310000**
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.37 min

BRUSHLESS motor with BRAKE code **37M4330000** + drive code **37D2400000** (750W)



—— Nominal torque 37M4330000 + 37D2400000 (750W)

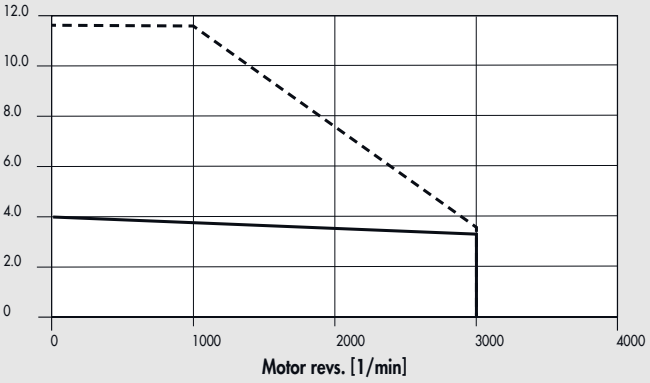
- - - Max torque 37M4330000 + 37D2400000 (750W)

TECHNICAL DATA		MOTOR 37M4330000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**2.39**
Coupling flange (square)	mm	**80**
Nominal power	W	750
Nominal speed	rpm	3000
Maximum speed	rpm	6000
Stall torque	Nm	2.55
Maximum torque	Nm	8.5
Rotor inertia	kgmm²	207
Mass	kg	2.19
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		**37D2400000**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C2130000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230000**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-brake**, **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive**, 5 metres		**37C2150000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250000**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-brake**, **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2210003**
Brushless **motor-brake**, **dynamic** cable, 10 metres		**37C2310000**
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	2.55 min

METAL WORK PNEUMATIC

BRUSHLESS motor with BRAKE code **37M4540000** + drive code **37D2400000** (1000W)

Motor torque [Nm]



—— Nominal torque 37M4540000 + 37D2400000 (1000W)

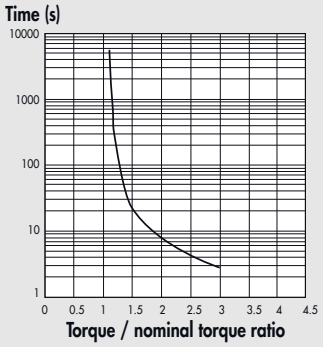
- - - Max torque 37M4540000 + 37D2400000 (1000W)

TECHNICAL DATA		MOTOR 37M4540000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**3.18**
Coupling flange (square)	mm	**86**
Nominal power	W	1000
Nominal speed	rpm	3000
Maximum speed	rpm	3000
Stall torque	Nm	3.92
Maximum torque	Nm	11.6
Rotor inertia	kgmm²	272.6
Mass	kg	4.34
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP65
Drive code		**37D2400000**
Connecting cable:		
Brushless **motor-drive**, 3 metres		**37C2130000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230000**
Brushless **motor-drive**, **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder**, **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-brake**, **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive**, 5 metres		**37C2150000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250000**
Brushless **motor-drive**, **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder**, **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-brake**, **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive**, **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder**, **dynamic** cable, 10 metres		**37C2210003**
Brushless **motor-brake**, **dynamic** cable, 10 metres		**37C2310000**
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	3.92 min

NOTES

OVERLOAD CURVES FOR ELECTRIC BRUSHLESS MOTORS (DELTA)

The torque used can exceed the nominal torque within the time limits shown in the diagram. Never exceed the maximum torque.

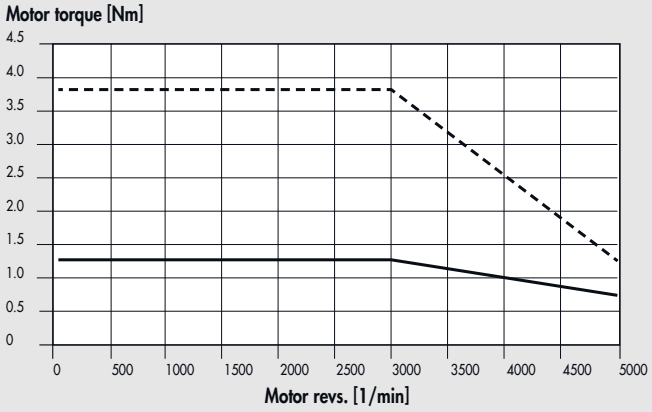


TORQUE CURVES / TECHNICAL FEATURES OF ELECTRIC BRUSHLESS MOTORS WITH BRAKE (DELTA)

The following diagrams show the torque delivered by the motor with changing speed (rpm). Each diagram shows two separate curves:

- **NOMINAL TORQUE** curve: the nominal torque delivered by the motor with a duty cycle of 100%
- **MAXIMUM TORQUE** curve: the torque delivered by the motor with a duty cycle of less than 100%

BRUSHLESS motor with BRAKE code **37M4220001** + drive code **37D2300000** (400W)



Nominal torque 37M4220001 + 37D2300000 (400W)

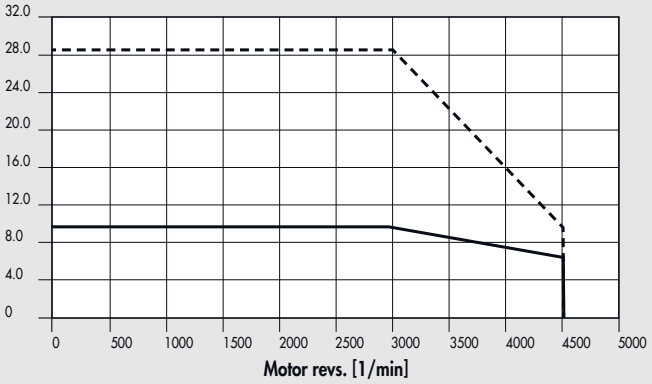
Max torque 37M4220001 + 37D2300000 (400W)

TECHNICAL DATA		MOTOR 37M4220001
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**1.27**
Coupling flange (square)	mm	**60**
Nominal power	W	400
Nominal speed	rpm	3000
Maximum speed	rpm	5000
Stall torque	Nm	1.27
Maximum torque	Nm	3.82
Rotor inertia	kgmm^2	30
Mass	kg	2
Encoder	pulse/rev	131072 (17 bit)
Degree of protection		IP40
Drive code		**37D2300000**
Connecting cable:		
Brushless **motor-drive** with brake, 3 metres		**37C2730000**
Brushless **motor-drive-encoder**, 3 metres		**37C2230001**
Brushless **motor-drive** with brake, 5 metres		**37C2750000**
Brushless **motor-drive-encoder**, 5 metres		**37C2250001**
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	1.3
Absorption	W	6.5

METAL WORK PNEUMATIC

BRUSHLESS motor with BRAKE code **37M4770000** + drive code **37D2600001** (3000W)

Motor torque [Nm]



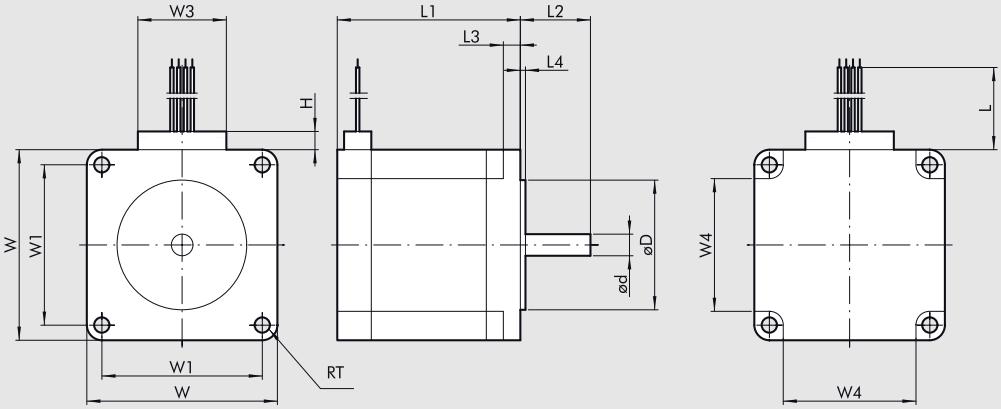
—— Nominal torque 37M4770000 + 37D2600001 (3000W)

- - - Max torque 37M4770000 + 37D2600001 (3000W)

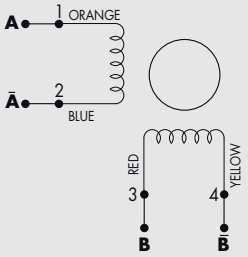
TECHNICAL DATA		MOTOR 37M4770000
Motor type		BRUSHLESS with BRAKE
Nominal torque	Nm	**9.55**
Coupling flange (square)	mm	**130**
Nominal power	W	3000
Nominal speed	rpm	3000
Maximum speed	rpm	4500
Stall torque	Nm	9.55
Maximum torque	Nm	28.65
Rotor inertia	$kgmm^2$	1400
Mass	kg	9.2
Encoder	pulse/rev	1048576 (20 bit)
Degree of protection		IP65
Drive code		**37D2600001**
Connecting cable:		
Brushless **motor-drive-encoder**, 3 metres		**37C3230001**
Brushless **motor-drive** with brake, 3 metres		**37C3730000**
Brushless **motor-drive-encoder**, 5 metres		**37C3250001**
Brushless **motor-drive** with brake, 5 metres		**37C3750000**
BRAKE		
Supply voltage	VDC	24 ±10%
Braking torque static	Nm	10

NOTES

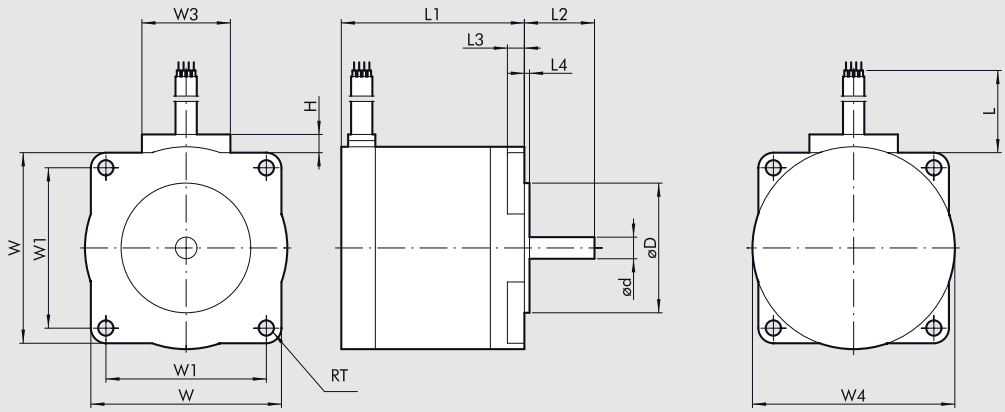
DIMENSIONS OF ELECTRIC MOTORS



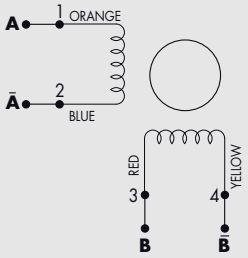
WIRING DIAGRAM



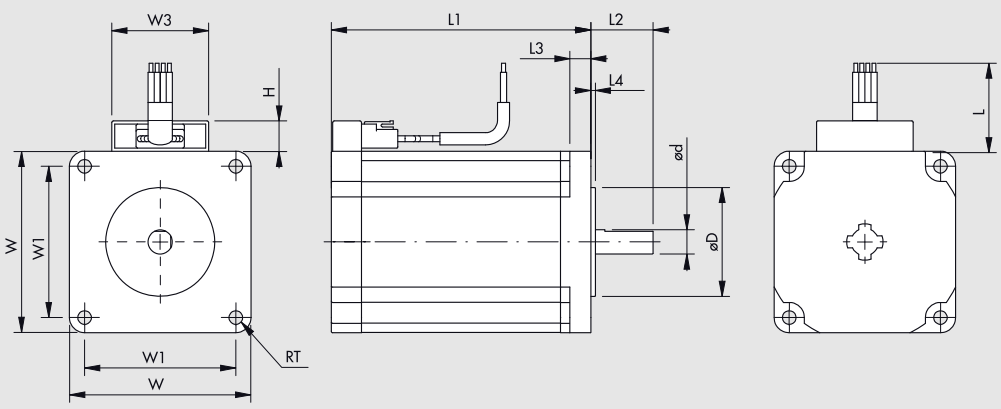
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5
STEPPING	**37M1110000**	**0.8**	**NEMA 23**	6.35	38.1	7	305	53.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120000	**1.2**	**NEMA 23**	6.35	38.1	7	305	75.8	20.6	5	1.5	4.5	56	47.14	26	39
	37M1120001	**1.2**	**NEMA 23**	6.35	38.1	10	305	75.8	20.6	5	1.5	4.5	56	47.14	39	39



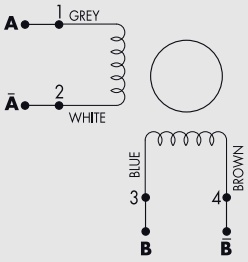
WIRING DIAGRAM



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H	L min	L1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.2	W3	W4 ±0.5
STEPPING	**37M1430000**	**2.4**	**NEMA 34**	9.525	73.02	10	305	62	30	4.8	1.5	5.4	82.5	69.6	37	85.8
	37M1440000	**4.2**	**NEMA 34**	12	73.02	10	305	92.2	30	4.8	1.5	5.4	82.5	69.6	37	85.8
	37M1890000	**17.5**	**NEMA 42**	16	55.52	10	305	221	35	8.6	1.5	6.9	106.4	88.9	37	106.4

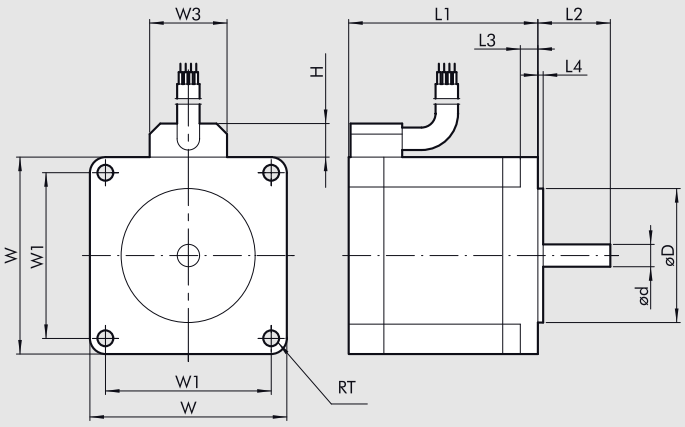


WIRING DIAGRAM

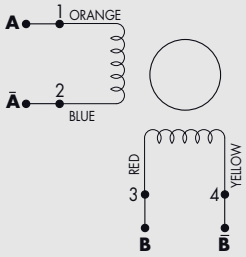


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H max	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	RT +0.2	W ±0.5	W1 ±0.25	W3 max
STEPPING	**37M1230000**	**2.2**	**60**	8	36	10	3000	86	20.6	7	1.5	4.5	60	50	32

METAL WORK PNEUMATIC

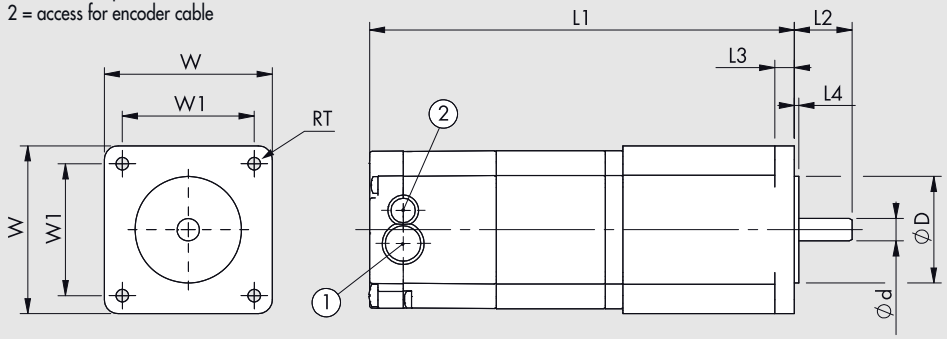


WIRING DIAGRAM

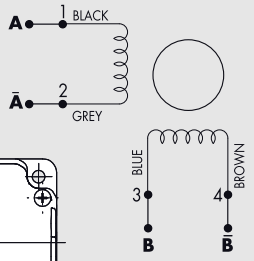


Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.018	øD ±0.025	H max	L min	L1 ±1	L2 ±0.5	L3 ±0.50	L4 ±0.25	L5	RT +0.2	W ±0.5	W1 ±0.25	W3 max
STEPPING	**37M1450000**	**6.7**	**NEMA 34**	14	73.02	12	305	127	30	8	1.5	50	5.6	85.5	69.6	27

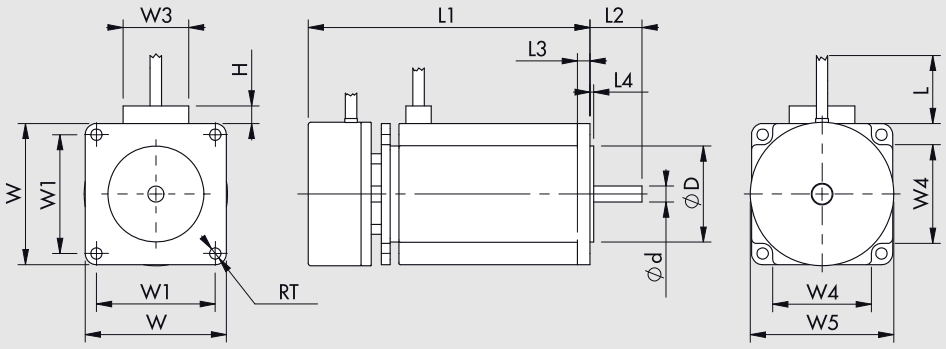
1 = access for power cable and brake
2 = access for encoder cable



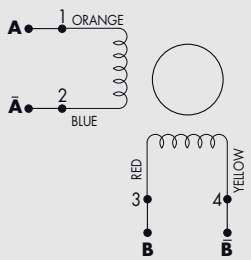
WIRING DIAGRAM



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.25	L1	L2 ±0.51	L3	L4	RT	W	W1 ±0.13
STEPPING	**37M1470000**	**9.3**	**NEMA 34**	12.7	73.02	130	31.75	9.91	2.03	5.6	86.6	69.6
STEPPING	**37M3220000**	**1.2**	**60**	8	38.1	151.8	20.6	7	1.6	4.5	60	47.14
+ BRAKE	**37M3230000**	**2.5**	**60**	8	38.1	184.5	20.6	7	1.6	4.5	60	47.14
+ ENCODER	**37M3430000**	**2.9**	**NEMA 34**	12.7	73.02	156.5	31.75	9.9	2	5.6	86.6	69.6
	37M3460000	**5.5**	**NEMA 34**	12.7	73.02	188.5	31.75	9.9	2	5.6	86.6	69.6
	37M3450000	**6.3**	**NEMA 34**	12.7	73.02	188.5	31.75	9.9	2	5.6	86.6	69.6
	37M3470000	**9.3**	**NEMA 34**	12.7	73.02	220.5	31.75	9.9	2	5.6	86.6	69.6

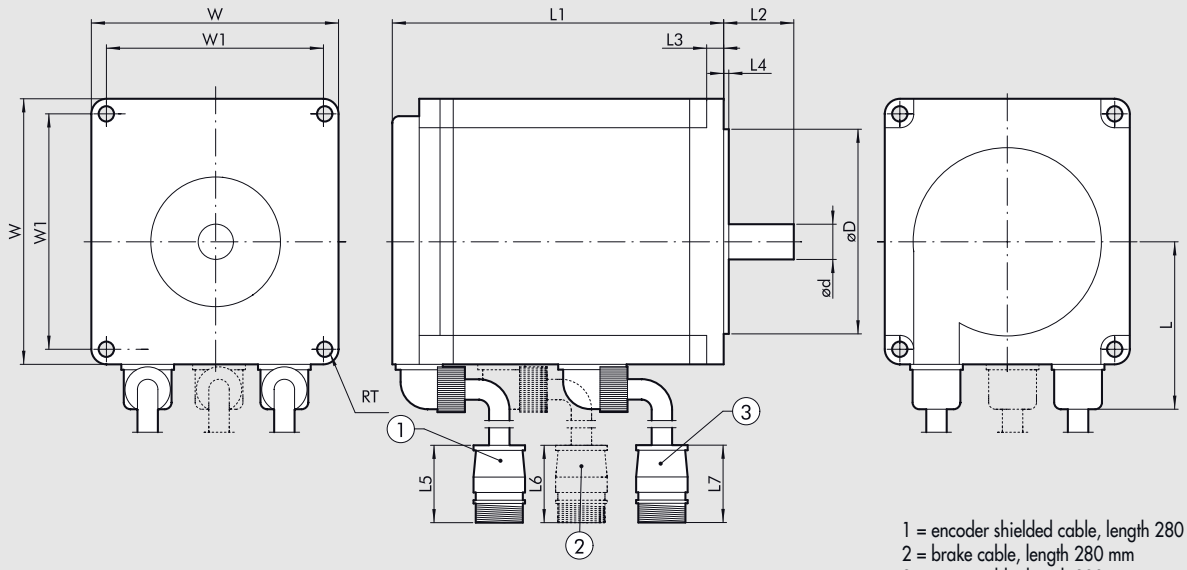


WIRING DIAGRAM



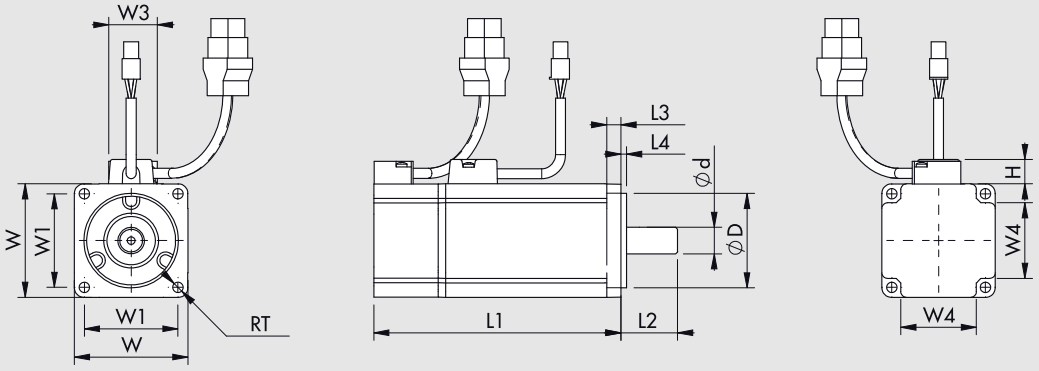
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD ±0.025	H	L min	L1 ±0.8	L2 ±0.5	L3 ±0.25	L4 ±0.25	RT +0.5/0	W ±0.5	W1 ±0.13	W3 max	W4 ±0.5	W5 ±0.5
STEPPING + BRAKE	**37M5120000**	**1.2**	**NEMA 23**	6.35	38.1	7	305	111.8	20.6	5	1.5	4.5	56	47.14	26	39	56.9

DIMENSIONS OF ELECTRIC MOTORS

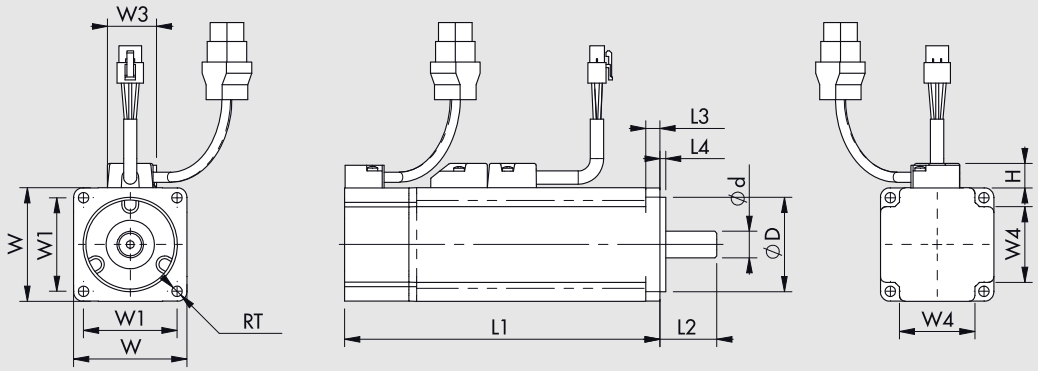


1 = encoder shielded cable, length 280 mm
2 = brake cable, length 280 mm
3 = motor cable, length 280 mm

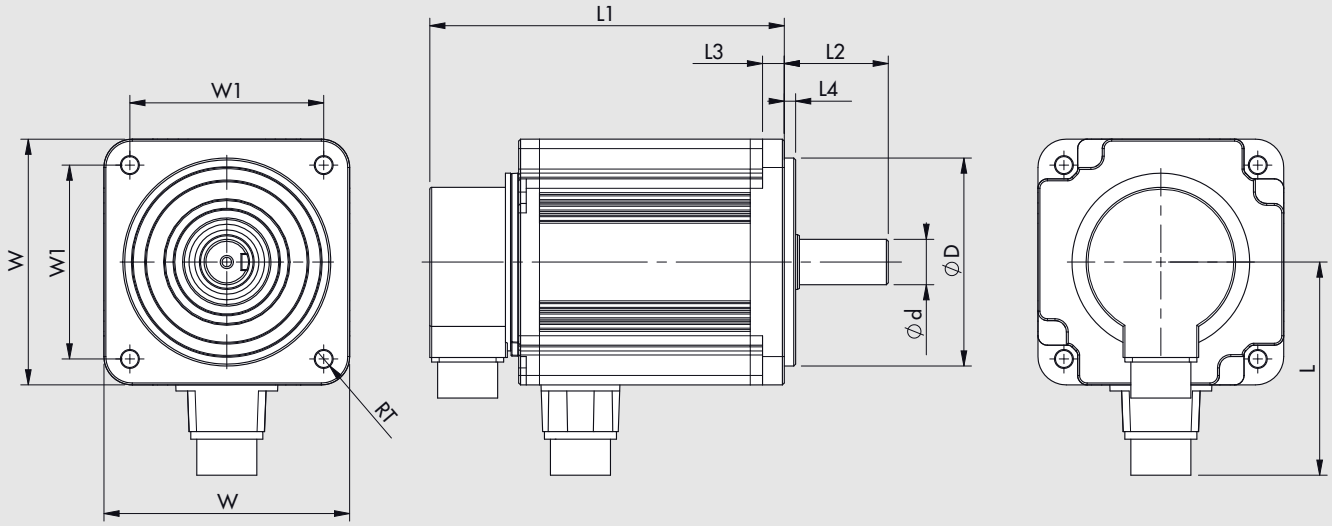
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.011	øD h7	L	L1 ±1	L2 ±1	L3	L4	L5	L6	L7	RT	W	W1
BRUSHLESS (SANYO DENKI)	**37M2200000**	**0.64**	**60**	14	50	44.6	69.5	30	6	3	55	-	58	5.5	60	49.5
	37M2220000	**1.27**	**60**	14	50	44.6	95.5	30	6	3	55	-	58	5.5	60	49.5
	37M2330000	**2.39**	**80**	16	70	54.4	107.3	40	8	3	55	-	58	6.6	80	63.6
	37M2540000	**3.18**	**86**	16	80	59.55	137.1	35	8	3	55	-	58	6.6	86	70.7
BRUSHLESS + BRAKE (SANYO DENKI)	**37M4200000**	**0.64**	**60**	14	50	44.6	97.5	30	6	3	55	55	58	5.5	60	49.5
	37M4220000	**1.27**	**60**	14	50	44.6	117.5	30	6	3	55	55	58	5.5	60	49.5
	37M4330000	**2.39**	**80**	16	70	54.4	143	40	8	3	55	55	58	6.6	80	63.4
	37M4540000	**3.18**	**86**	16	80	59.55	162.95	35	8	3	55	55	58	6.6	86	70.7



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.011	øD 0/-0.025	H max	L1 ±0.3	L2 ±0.2	L3 ±0.2	L4 ±0.2	RT ±0.2	W ±0.25	W1 ±0.2	W3 max	W4 ±0.2
BRUSHLESS (DELTA)	**37M2220001**	**1.27**	**60**	14	50	13	130.7	30	7.5	3	5.5	60	49.5	30	40



Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.011	øD 0/-0.025	H max	L1 ±0.3	L2 ±0.2	L3 ±0.2	L4 ±0.2	RT ±0.2	W ±0.25	W1 ±0.2	W3 max	W4 ±0.2
BRUSHLESS + BRAKE (DELTA)	**37M4220001**	**1.27**	**60**	14	50	13	166.8	30	7.5	3	5.5	60	49.5	30	40



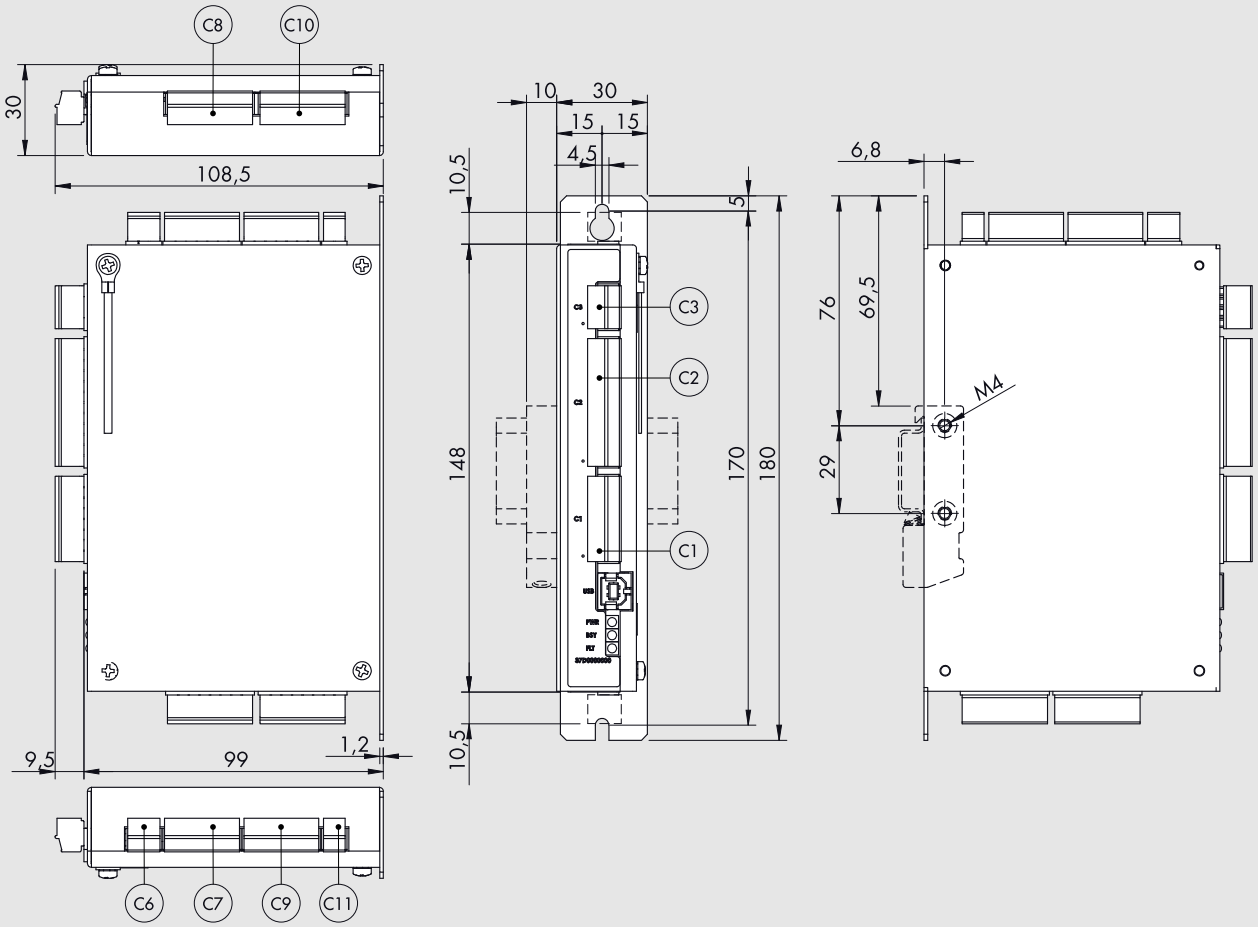
Motor type	Motor code	Motor torque [Nm]	Coupling flange	ød 0/-0.013	øD 0/-0.035	L	L1	L2	L3	L4	RT	W	W1
BRUSHLESS (DELTA)	**37M2770000**	**9.55**	**130**	24	110	113	187.5	55	11.5	6	9	130	102.53
BRUSHLESS + BRAKE (DELTA)	**37M4770000**	**9.55**	**130**	24	110	111	216	55	11.5	6	9	130	102.53

PROGRAMMABLE UNIT
e.motion

An independent system, ideal for stand-alone applications not requiring the use of any PLC. It can control electric cylinders simply and intuitively, or any other electric actuator, using either a STEPPING MOTOR or a BRUSHLESS motor of any size and capacity, connected to the relevant drive with a STEP/DIRECTION interface. It is connected to PC via USB port, and the user has access to a motion-control configuration, programming and debug environment irrespective of the type of motor/drive/actuator chosen, which uses a user-friendly language (MW POS) and a set of simple instructions and functions to create work cycles, including complex ones as it can handle both digital and analogue inputs and outputs.
It consists of an electronic board housed in a metal box, which is designed for fixing to a wall or on a DIN bar with a fitting, and is equipped with removable screw connectors for wiring purposes.

TECHNICAL DATA		
Code		**37D0000000**
Stand-alone motion programming unit for motors-drives with a STEP/DIRECTION interface, type		Metal box
Dimensions	mm	148 x 99 x 30
Weight	g	460
Connectors		Screw type, pull-out
Temperature range		0 to 50 °C – relative humidity 10-90%, non-condensing
Degree of protection		IP 20
Voltage		24VDC ±10%
Communication interface		Serial USB port for connection to PC
Configuration/programming/debug and diagnosis software		MW POS in Windows® environment
Dedicated signals		Encoder input (A + B + Z), Line Driver type
		STEP/DIRECTION outputs, with frequency up to 100 kHz, Line Driver type
Digital inputs		16, optoisolati, configurabili PNP o NPN, liberamente programmabili
Analogue inputs		2, from 0 to 10V, freely programmable
Digital outputs		15, Line Driver type, PNP, freely programmable
Analogue outputs		1, from 0 to 10V, freely programmable
Controls available		- Search for home position on the end stop, up against the stop, on the end stop and the encoder mark, up against the stop and the encoder zero mark; - Positioning in relative or absolute mode; - Force control; - Closed-loop motion control and step-loss control in the case of STEPPING motors with encoder; - Integrated brake control in the case of motors with a brake; - Possible control of multiple separate drivers in parallel for concurrent applications; - Complementary and logical instructions for complex work cycles, such as: timings; repetitions; analogue and digital I/O control; variables control; tests

DIMENSIONS

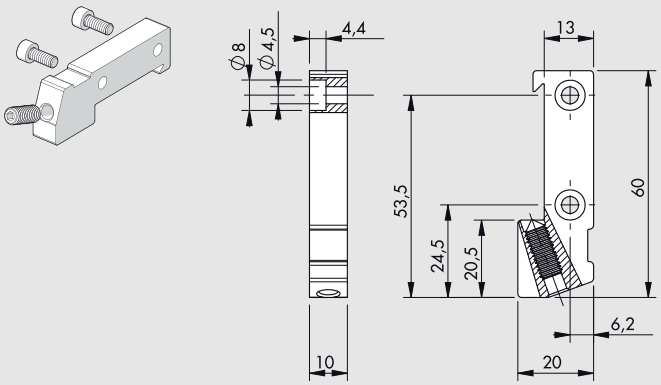


Below is a list of Phoenix Contact codes for the board connectors.

Connector	Description	Code Phoenix Contact
C11	2-pin plug with screw connection, MC 1.5/2-ST-3.5	1840366
C6	3-pin plug with screw connection, MC 1.5/3-ST-3.5	1840379
C3	4-pin plug with screw connection, MC 1.5/4-ST-3.5	1840382
C7, C9	7-pin plug with screw connection, MC 1.5/7-ST-3.5	1840418
C1, C8, C10	8-pin plug with screw connection, MC 1.5/8-ST-3.5	1840421
C2	12-pin plug with screw connection, MC 1.5/12-ST-3.5	1840463

ACCESSORIES

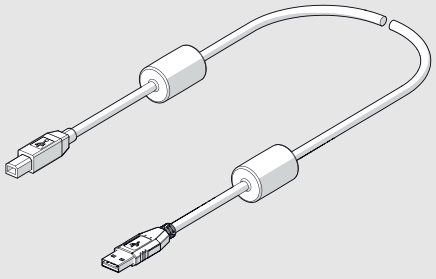
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



Code	Description	Weight [g]
095000M000	Bracket mountaing **e**.motion / **e**.drive on Omega bar (DIN EN 50022)	30

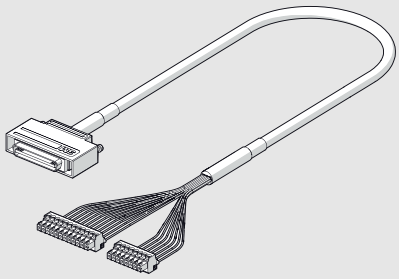
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

CABLE USB



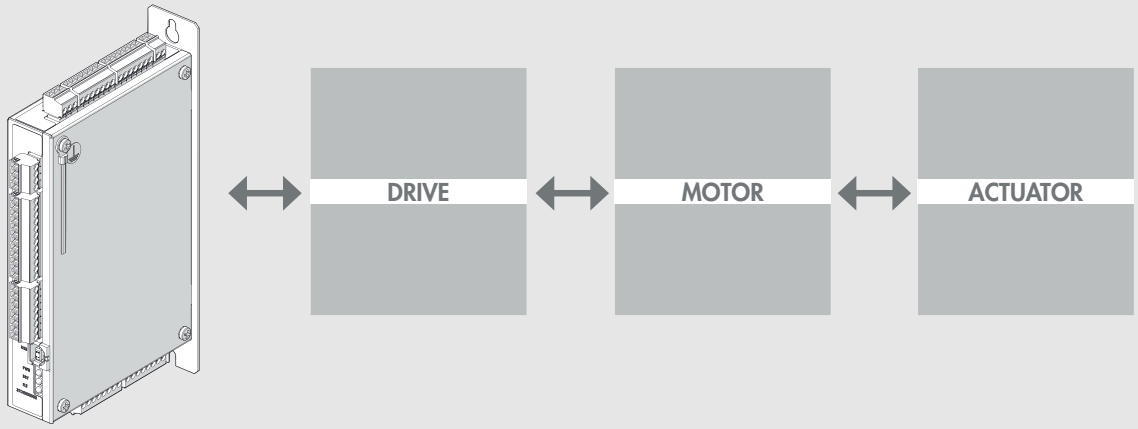
Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the ***e***.motion / ***e***.drive board to a PC, 3 m	150

CABLE FOR BRUSHLESS DRIVERS



Code	Description	Weight [g]
37C2510000	Cable for connecting the ***e***.motion board to Sanyo Denki RS1A0x driver, 1 m	130
37C2510001	Cable for connecting the ***e***.motion board to Delta ASDA A2, 1 m	130

CONNECTION SCHEME



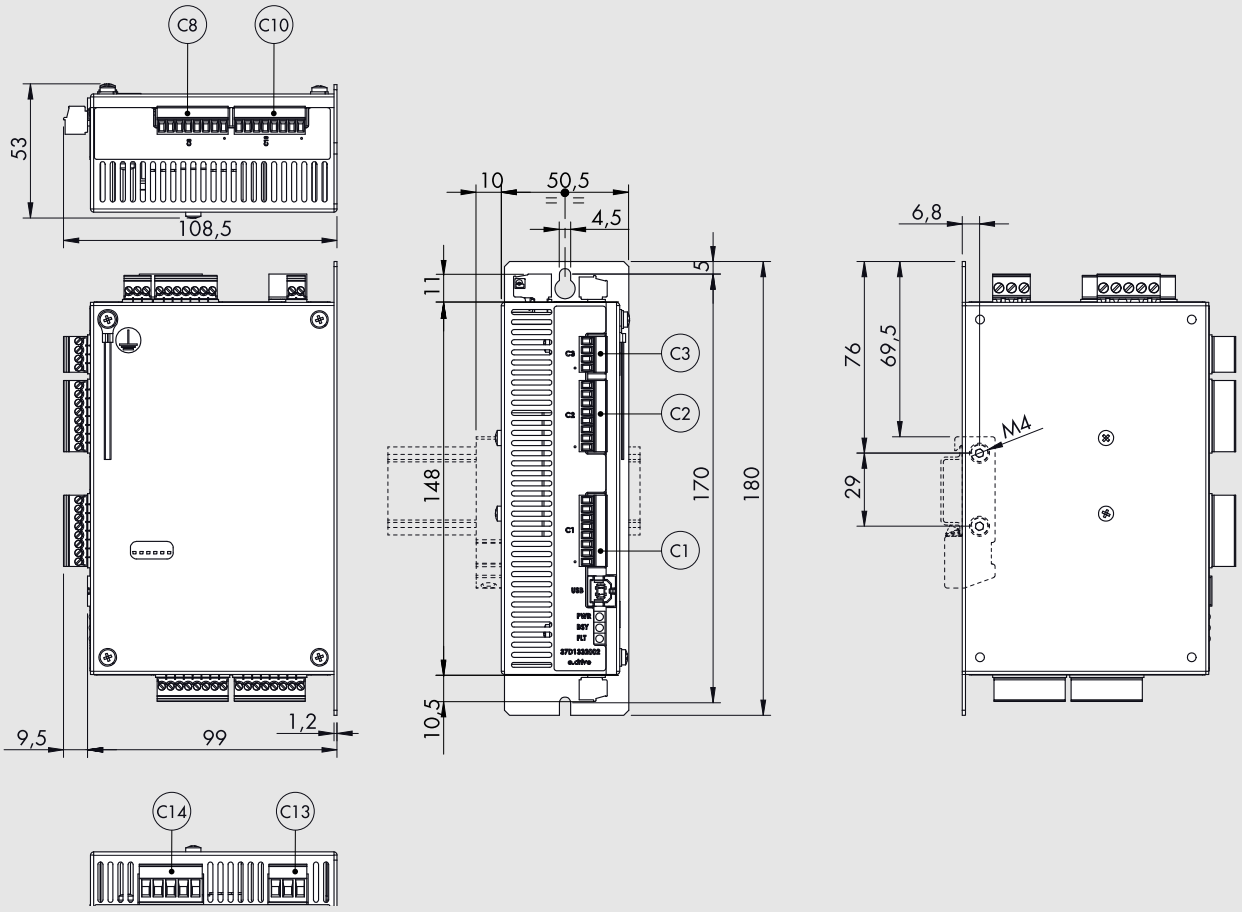
NOTES

PROGRAMMABLE STEPPING MOTOR DRIVE - *e*.drive

It can be used to control, easily and intuitively, electric cylinders that use a STEPPING motor with a rated current of up to 6A, two phases, with four, six or eight output wires. It connects up to a PC via a USB port and the user is provided with motion control configuration, programming and debugging environment, which allows you to create complex work cycles as it can handle both digital and analogue inputs and outputs, thanks to a user-friendly language (MW DRIVE) and a series of simple instructions and functions.
It consists of two electronic boards housed in a metal box that has been designed to be fixed onto a wall or to a DIN rail, using an accessory, and is equipped with removable screw connectors for wiring.
The electronic boards can control both the logic "motion control" stage and the power supply stage.
This independent system is ideal for use in stand-alone applications not requiring the use of any PLC.
The power stage consists of a ministep bipolar chopper drive. It is characterised by a supply voltage of up to 55VDC for the power supply side and 24VDC for the logic side, compact dimensions and great flexibility of use.

TECHNICAL DATA		
Code		**37D1332002**
Motion control logic power supply	VDC	24
Drive power supply	VDC	24 to 55
Motor phase peak current	A	1 to 6
Temperature range	°C	-20 to 40
Relative humidity (without condensation)	%	5 to 85
Bipolar motor inductance (1.8° angle)	mH	1 to 12
Dimensions	mm	148 x 99 x 50.5
Weight	g	790
Degree of protection		IP20
Communication interface		Serial USB port for connection to PC
Configuration/programming/debug and diagnosis software		MW DRIVE in Windows® environment
Dedicated signals		Encoder input (A + B + Z), 5V line driver or 24V Push-Pull/Open collector
Digital inputs		14
Digital outputs		7
Analogue inputs		2, from 0 to 10V, freely programmable
Analogue outputs		1, from 0 to 10V
Controls available		- Can be used with motors with a 1.8° base angle, 200 pulses/rev.; - Step Mode settable in various ways: Full Step, Half Step, 1/4, 1/8, 1/16 of step; - Integrated linear position transducer by connecting directly to the analogue output; - Automatic 60% reduction of the current supplied with motor stopped; - Possible dynamic regulation of the current supplied via cycle software instructions, for energy-saving purposes; - Home position search on limit switch, mechanical stop, encoder limit switch and zero mark, encoder mechanical stop and zero mark; - Positioning in relative or absolute mode; - Closed-loop motion control and step-loss control in the case of STEPPING motors with an encoder; - Integrated, automatic brake control via dedicated digital output in the case of motors with a brake; - Complementary and logical instructions for complex work cycles, such as: timings; variables control; test; analogue and digital I/O control

DIMENSIONS

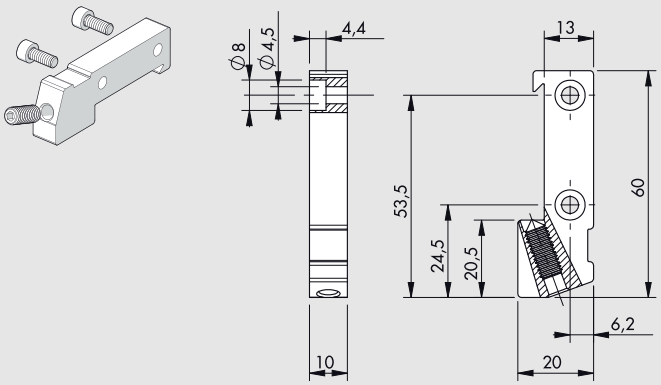


Below is a list of Phoenix Contact codes for the board connectors.

Connector	Description	Code Phoenix Contact
C11	2-pin plug with screw connection, MC 1.5/2 - ST - 3.5	1840366
C6	3-pin plug with screw connection, MC 1.5/3 - ST - 3.5	1840379
C3	4-pin plug with screw connection, MC 1.5/4 - ST - 3.5	1840382
C7	7-pin plug with screw connection, MC 1.5/7 - ST - 3.5	1840418
C1, C2, C8, C10	8-pin plug with screw connection, MC 1.5/8 - ST - 3.5	1840421
C13	3-pin plug with screw connection, MSTB 2.5/3 - ST - 5	1754465
C14	5-pin plug with screw connection, MSTB 2.5/5 - ST - 5	1754504

ACCESSORIES

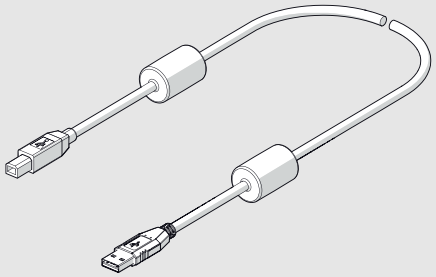
BRACKET MOUNTAING ON OMEGA BAR (DIN EN 50022)



Code	Description	Weight [g]
095000M000	Bracket mountaing **e**.motion / **e**.drive on Omega bar (DIN EN 50022)	30

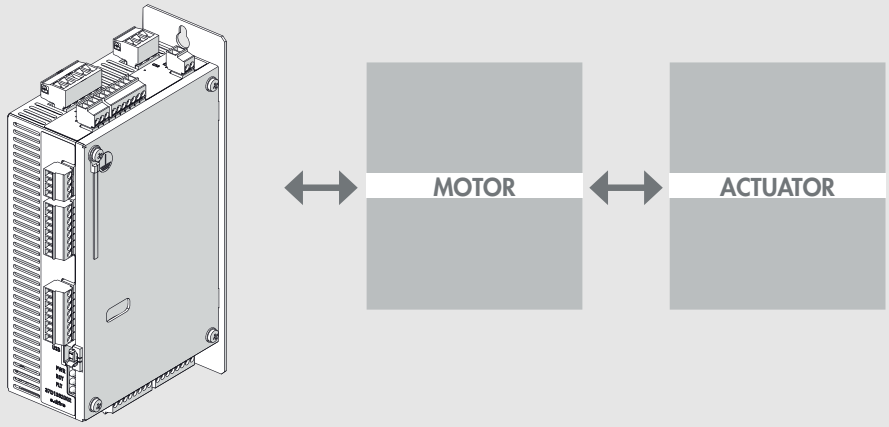
Note: Individually packed with 2 screws M4x10, 1 M6x16 grub screw

CABLE USB



Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the **e**.motion / **e**.drive board to a PC, 3 m	150

CONNECTION SCHEME



NOTES

DRIVES FOR STEPPING MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO

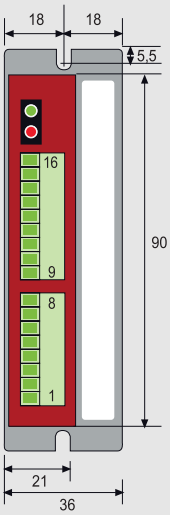
4.4A - 48VDC DRIVE FOR STEPPING MOTORS, CODE 37D1222000

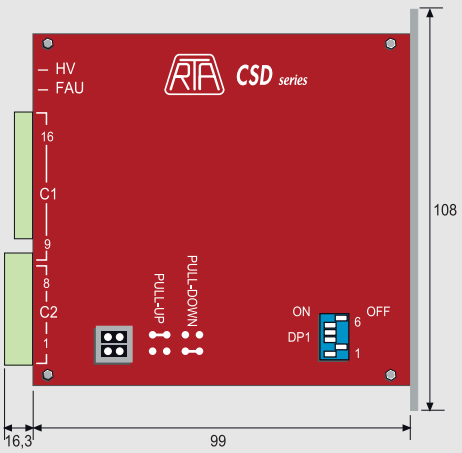
This is a ministep bipolar chopper drive made by RTA S.r.l. It comes with a STEP & DIRECTION interface for piloting low/medium-power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 48VDC, compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box, which does not require external ventilation, and comes with separate logic and power pull-out screw connectors. It can control STEPPING motors with a nominal current up to 4.4A, the perfect choice for low/medium-power applications using small motors.

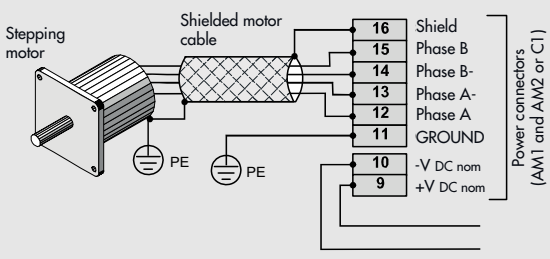
DRIVE TECHNICAL DATA

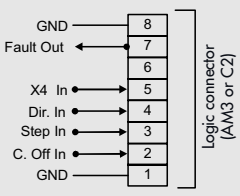
Drive code		**37D1222000**
Type of STEPPING motor drive		Metal box
Dimensions	mm	90 x 99 x 21
Connectors		Screw type, pull-out
Onboard power supply		NO
Control		Step and direction
Operating voltage range	VDC	24 - 48
Current range	A	2.6 - 4.4
Current values selected via a dip-switch		8
Pulses per rev values selected by dip-switch	pulse/rev	400, 800, 1600, 3200
Automatic current reduction with motor off		YES (50%)
Type of inputs		Pull-up or Pull-down, settable
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection. Electronic damping circuit for maximum control of noise and vibration.

OVERALL DIMENSIONS AND WIRING DIAGRAM









METAL WORK PNEUMATIC

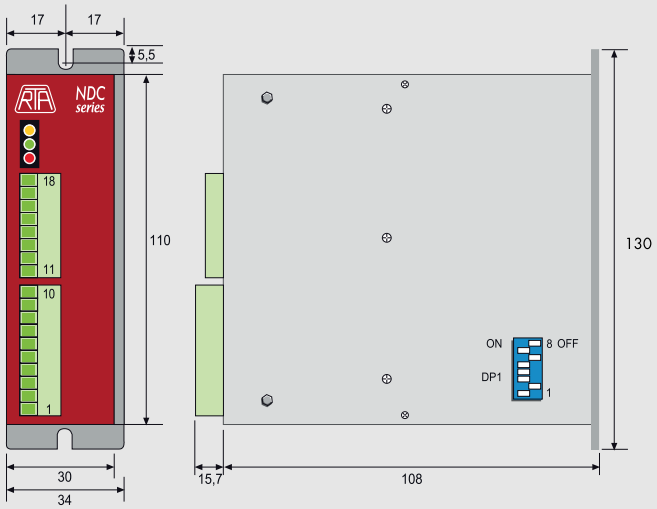
6A - 75VDC DRIVE FOR STEPPING MOTORS, CODE 37D1332000

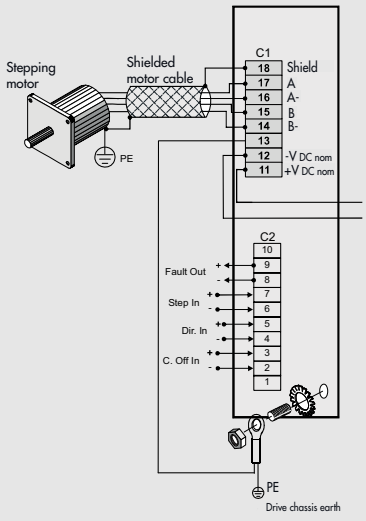
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 75VDC, compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box and comes with separate logic and power pull-out screw connectors. It can control STEPPING motors with a nominal current up to 6A, the perfect choice for medium power applications using small and medium-size motors.

DRIVE TECHNICAL DATA

Drive code		**37D1332000**
Type of STEPPING motor drive		Metal box
Dimensions	mm	110 x 108 x 34
Connectors		Screw type, pull-out
Onboard power supply		NO
Control		Step and direction
Operating voltage range	VDC	24 - 75
Current range	A	1.9 - 6
Current values selected via a dip-switch		8
Pulses per rev values selected by dip-switch	pulse/rev	400, 500, 800, 1000, 1600, 2000, 3200, 4000
Automatic current reduction with motor off		YES (50%)
Type of inputs		Opto-isolated
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection. Electronic damping circuit for maximum control of noise and vibration.

OVERALL DIMENSIONS AND WIRING DIAGRAM





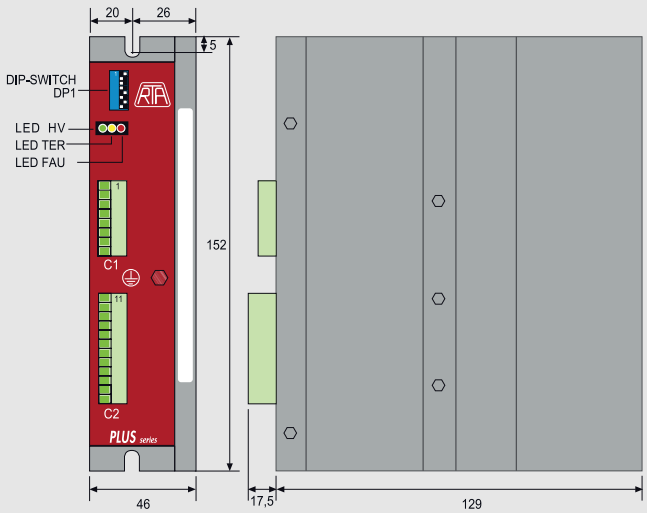
6A - 140VDC DRIVE FOR STEPPING MOTORS, CODE 37D1442000
10A - 62VAC DRIVE FOR STEPPING MOTORS, CODE 37D1552000

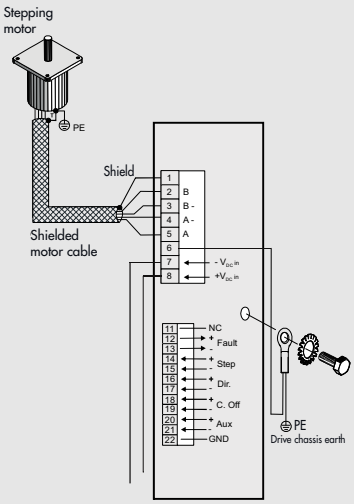
These are two ministep bipolar chopper drives made by RTA S.r.l.
They come with a STEP & DIRECTION interface for piloting medium/high-power two-stage STEPPING motors with four, six or eight terminals.
They consist of a board housed in a metal box, which does not require external ventilation, and come with separate logic and power pull-out screw connectors.
Drive code 37D1442000 is characterised by a voltage range up to 140VDC, compact dimensions and considerable operating flexibility.
This drive can control STEPPING motors with a nominal current up to 6A, the perfect choice for medium-power applications requiring a DC supply.
Drive code 37D1552000 is characterised by a voltage range up to 62VAC, compact dimensions and considerable operating flexibility.
This drive can control STEPPING motors with a nominal current up to 10A, the perfect choice for medium-power applications requiring an AC supply.

DRIVE TECHNICAL DATA

Drive code		**37D1442000**	**37D1552000**
Type of STEPPING motor drive		Metal box	
Dimensions	mm	152 x 129 x 46	
Connectors		Screw type, pull-out	
Onboard power supply		NO	
Control		Step and direction	
Operating voltage range		77 - 140 VDC	28 - 62 VAC
Current range	A	1.9 - 6	3 - 10
Current values selected via a dip-switch		8	
Pulses per rev values selected by dip-switch	pulse/rev	400, 500, 800, 1000, 1600, 2000, 3200, 4000	
Automatic current reduction with motor off		YES (50%)	YES (50%)
Type of inputs		Opto-isolated	
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection. Electronic damping circuit for maximum control of noise and vibration.	

OVERALL DIMENSIONS AND WIRING DIAGRAM





METAL WORK PNEUMATIC

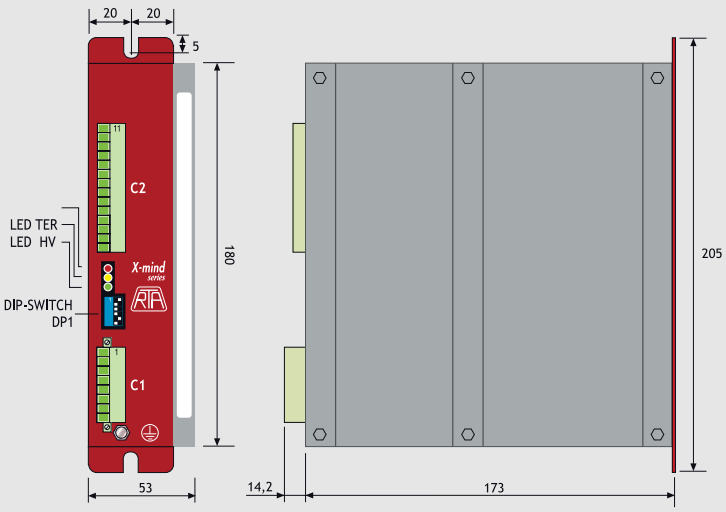
6A - 110 - 230VAC DRIVE FOR STEPPING MOTORS, CODE 37D1362001

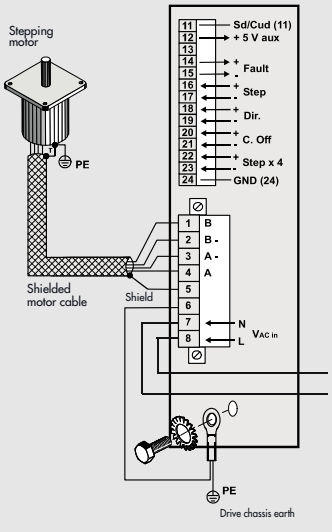
This is a ministep bipolar chopper drive made by RTA Srl. It comes with a STEP & DIRECTION interface for piloting medium-low power two-stage STEPPING motors with four, six or eight terminals.
It has a supply voltage range up to 230VAC, compact dimensions and considerable operating flexibility. It consists of a board housed in a metal box and comes with separate logic and power pull-out screw connectors. It can control STEPPING motors with a nominal current up to 6A, the perfect choice for medium-high power applications using medium and big-size motors.

DRIVE TECHNICAL DATA

Drive code		**37D1362001**
Type of STEPPING motor drive		Metal box
Dimensions	mm	180 x 173 x 53
Connectors		Screw type, pull-out
Onboard power supply		NO
Control		Step and direction
Operating voltage range	VAC	Single-phase 110 - 230
Current range	A	3.4 - 6
Motor output stage		High-efficiency CHOPPER with IGBT final stage output
Current values selected via a dip-switch		8
Pulses per rev values selected by dip-switch	pulse/rev	400, 500, 800, 1000, 1600, 2000, 3200, 4000
Automatic current reduction with motor off		YES
Type of inputs		Opto-isolated
Protections		Maximum and minimum voltage. Motor output short-circuiting. Thermal protection.
		Electronic damping circuit for maximum control of noise and vibration.
Standards		UL and CSA
Other features		Possibility to switch off motor current via an external logic control device.
		Electronic sound-damping circuit for enhanced reduced noise and mechanical vibration at low and medium speed.
		Storage and reporting of the intervention of protection circuits.
		It must be coupled with STEPPING motors designed for high-voltage rating and flanges not below 86 mm.
		No need for forced ventilation.
Suitable for motors code		**37M1890000**

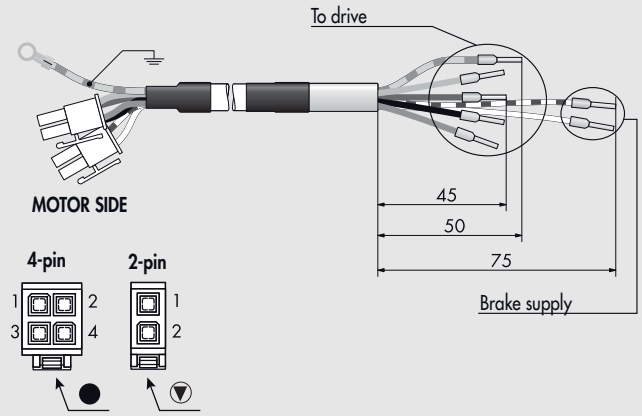
OVERALL DIMENSIONS AND WIRING DIAGRAM





ACCESSORIES

POWER CABLE FOR MOTOR WITH BRAKE

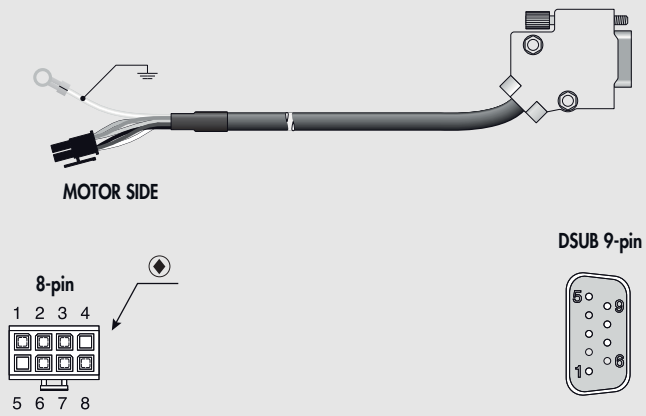


For use with stepping motors with brake and stepping motor code 37M1470000.

Code	Description
37C1330000	Power cable for stepping motor with brake, 3 metres
37C1350000	Power cable for stepping motor with brake, 5 metres

	Pin	Function	Corresponding wire colour
4-pin connector	1	A\	Gray
	2	B\	Blue
	3	A	Black
	4	B	Brown
2-pin connector	1	24VDC brake	White + red ring
	2	GND	White

ENCODER CABLE



Optional – Can be used with stepping motor with encoder and brake.

Code	Description
37C1230000	Encoder cable for stepping motors with brake, 3 metres
37C1250000	Encoder cable for stepping motors with brake, 5 metres

8-pin connector	Function		DSUB 9-pin connector (6 pins used)
1	A	A	1
2	B	B	3
3	R	R	5
4	-	NC	-
5	-	NC	-
6	+ 24VDC	Encoder +24 V supply	8
7	COM	Encoder 0 V supply	9
8	Temp	Temperature	7

REFERENCES FOR THE CONNECTORS

Below you find the codes of Molex to allow the customer to manufacture cables.

	Code Molex	Description
▼	39-01-2020	1 x 2 pin plug connector
	44476-1111	Crimping contacts
●	39-01-2040	1 x 4 pin plug connector
	44476-1111	Crimping contacts
◆	43025-0800	1 x 8 pin plug connector
	43030-0002	Crimping contacts

SPECIAL TOOLS FOR CRIMPING OR PULLING OUT CONTACTS

	Code Molex	Description
Crimping gripper	0638190000	For 8-pin connector
	0638190900	For 4-pin and 2-pin connectors
Contact pull-out tool	0011030043	For 8-pin connector
	0011030044	For 4-pin and 2-pin connectors

NOTES

DRIVES FOR BRUSHLESS MOTORS FOR ELECTRIC CYLINDERS SERIES ELEKTRO

METAL WORK PNEUMATIC

15A DRIVE FOR BRUSHLESS MOTORS, CODE 37D2200000

This drive made by SANYO DENKI is suitable for piloting BRUSHLESS motors.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic. It can control BRUSHLESS motors with a nominal current up to 15A.

DRIVE TECHNICAL DATA		
Drive code		**37D2200000**
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	45 x 168 x 130
Power connectors and motor power		Screw type, pull-out
Encoder connectors and signals		Plug-type 3M
Max output current	A	15
Motor output stage		IGBT, PWM control, sinusoidal current
Power voltage		Single-phase or three-phase (user configurable) 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Logic voltage		Single-phase 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Control		With analogue signal (proportional to speed and torque). Pulse-train (clock + direction; forward + backward pulse; 90° phase difference) 8 inputs and 8 outputs, user configurable
		In the event of pulse-train command, the control system outputs should be the Line Driver type.
		If the outputs are the open-collector type, you can use a 37D2000000 board, which is sold separately (see accessories).
Auto-tuning		Yes
Communication interface		RS232 for settings and monitoring via a personal computer
Protections		Integrated against overloads, input extra-voltages, incorporated filters for suppressing the system's own resonance frequencies.
Standards		CE, UL and CSA.
Other features		5-digit display and programming keypad.
		Integrated closed-loop system with position, speed and torque control modes.
		Instant changeover option: position + speed; position + torque; speed + torque.
		Automatic dynamic braking circuit in a alarm and power-off conditions.
		Connector for external braking resistance (optional).
		Configuration and control software (optional).
Connecting cable:		
Brushless **motor-drive** connecting cable, 3 metres		**37C2130000**
Brushless **motor-drive-encoder** connecting cable, 3 metres		**37C2230000**
Brushless **motor-drive** connecting **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-brake** connecting **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive** connecting cable, 5 metres		**37C2150000**
Brushless **motor-drive-encoder** connecting cable, 5 metres		**37C2250000**
Brushless **motor-drive** connecting **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-brake** connecting **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 10 metres		**37C2210003**
Brushless **motor-brake** connecting **dynamic** cable, 10 metres		**37C2310000**

30A DRIVE FOR BRUSHLESS MOTORS, CODE 37D2400000

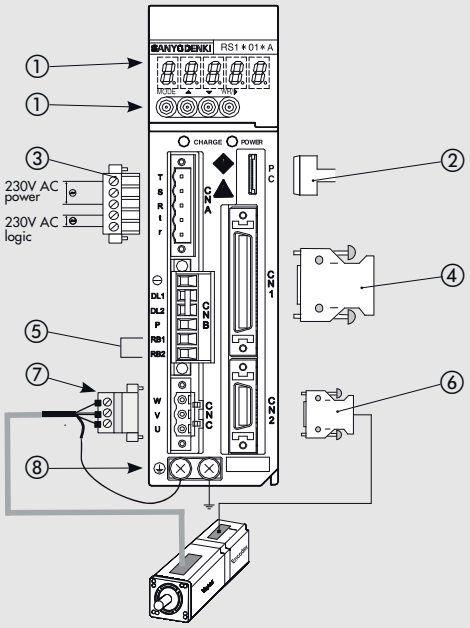
This drive made by SANYO DENKI is suitable for piloting BRUSHLESS motors.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.
It can control BRUSHLESS motors with a nominal current up to 30A.
All the system parameters can be configured and controlled using (optional) R-Set up software.

DRIVE TECHNICAL DATA		
Drive code		**37D2400000**
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	50 x 168 x 130
Power connectors and motor power		Screw type, pull-out
Encoder connectors and signals		Plug-type 3M
Max output current	A	30
Motor output stage		IGBT, PWM control, sinusoidal current
Power voltage		Single-phase or three-phase (user configurable) 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Logic voltage		Single-phase 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Control		With analogue signal (proportional to speed and torque).
		Pulse-train (clock + direction; forward + backward pulse; 90° phase difference)
		8 inputs and 8 outputs, user configurable.
		In the event of pulse-train command, the control system outputs should be the Line Driver type.
		If the outputs are the open-collector type, you can use a 37D2000000 board,
		which is sold separately (see accessories).
Auto-tuning		YES
Communication interface		RS232 for settings and monitoring via a personal computer.
Protections		Integrated against overloads, input extra-voltages,
		incorporated filters for suppressing the system's own resonance frequencies
Standards		CE, UL and CSA.
Other features		5-digit display and programming keypad.
		Integrated closed-loop system with position, speed and torque control modes.
		Instant changeover option: position + speed; position + torque; speed + torque.
		Automatic dynamic braking circuit in a alarm and power-off conditions.
		Connector for external braking resistance (optional).
		Configuration and control software (optional).
Connecting cable:		
Brushless **motor-drive** connecting cable, 3 metres		**37C2130000**
Brushless **motor-drive-encoder** connecting cable, 3 metres		**37C2230000**
Brushless **motor-drive** connecting **dynamic** cable, 3 metres		**37C2130003**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 3 metres		**37C2230003**
Brushless **motor-brake** connecting **dynamic** cable, 3 metres		**37C2330000**
Brushless **motor-drive** connecting cable, 5 metres		**37C2150000**
Brushless **motor-drive-encoder** connecting cable, 5 metres		**37C2250000**
Brushless **motor-drive** connecting **dynamic** cable, 5 metres		**37C2150003**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 5 metres		**37C2250003**
Brushless **motor-brake** connecting **dynamic** cable, 5 metres		**37C2350000**
Brushless **motor-drive** connecting **dynamic** cable, 10 metres		**37C2110003**
Brushless **motor-drive-encoder** connecting **dynamic** cable, 10 metres		**37C2210003**
Brushless **motor-brake** connecting **dynamic** cable, 10 metres		**37C2310000**

WIRING DIAGRAM FOR BRUSHLESS MOTOR DRIVES

① 5-DIGIT DISPLAY and PROGRAMMING KEYPAD:
to display and modify parameters and monitor system operation in real time.
② PC CONNECTOR: settings and monitoring by PC via RS232 (supplied with configuration software kit)
③ POWER CONNECTOR: 230VAC, single-phase and three-phase (user configurable). **Included in the supply**.
Separate supply section for logic/signal and power electronics.
Integrated circuits protecting against overloads and input extra-voltages.
④ SIGNAL CONNECTOR: pulse-train command (clock + direction; forward + backward pulse; 90° phase difference) or with analogue signal (proportional to speed or torque) 8 inputs and 8 outputs, user configurable. **Included in the supply**.
⑤ CONNECTOR: for external braking resistance (optional)
⑥ ENCODER CONNECTOR: compatible with any type of Sanyo Denki encorder
⑦ MOTOR POWER CONNECTOR
⑧ EARTH CONNECTION

Log on to www.metalwork.it to view the instruction manual.



ACCESSORIES FOR BRUSHLESS MOTORS DRIVES

⑥ ENCODER CABLE

Code	Description
37C2230000	Brushless motor-drive-encoder connecting cable 3 m
37C2250000	Brushless motor-drive-encoder connecting cable 5 m
37C2230003	Brushless motor-drive-encoder connecting dynamic cable, 3 m
37C2250003	Brushless motor-drive-encoder connecting dynamic cable, 5 m
37C2210003	Brushless motor-drive-encoder connecting dynamic cable, 10 m

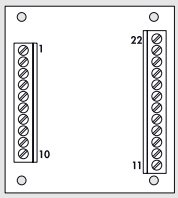
⑦ MOTOR POWER CABLE

Code	Description
37C2130000	Brushless motor-drive connecting cable 3 m
37C2150000	Brushless motor-drive connecting cable 5 m
37C2130003	Brushless motor-drive connecting dynamic cable, 3 m
37C2150003	Brushless motor-drive connecting dynamic cable, 5 m
37C2110003	Brushless motor-drive connecting dynamic cable, 10 m

BRAKE CABLE

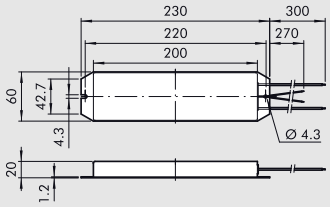
Code	Description
37C2330000	Brushless motor-brake connecting dynamic cable, 3 m
37C2350000	Brushless motor-brake connecting dynamic cable, 5 m
37C2310000	Brushless motor-brake connecting dynamic cable, 10 m

LINE-DRIVER INTERFACE BOARD



Code	Description
37D2000000	BRINT.A line driver interface board

EXTERNAL BRAKING RESISTANCES



Code	Description	For drive code
37D2R00000	220W 50 Ω braking resistance	37D2400000
37D2R00001	220W 100 Ω braking resistance	37D2200000

Under certain operating conditions, such as sudden deceleration with high inertial load, it may be necessary to dissipate externally the reverse energy generated by the motor. The drive indicates this requirement via a specific alarm. Excess energy is dissipated externally via a braking resistance.

CONFIGURATION SOFTWARE + PC CONNECTING CABLE KIT, R - SETUP SOFTWARE CODE 37D2S00000

R-Setup communication software is used for parameter setting and complete control of all functions of the system.
Access to parameter configuration can take place at three levels: basic level, standard level, advanced level.
The software includes a detailed description of each parameter.
In addition to parameter setting R-Setup software can accurately analyse operation of the system via the following functions.

- Monitor Display: real-time display of all details about the system.
- Trace Operation: a complete oscilloscope with 4 analogue channels and 4 digital channels. Use to save and print traces and settings.
- System Analysis: used to study the system's frequency response to identify and correct any mechancal resonance phenomena.

JOG modes for speed (Jogging Operation) and position (Operation Pulse Feed Jogging) are also available.

N.B.: the software can be used only with drives for brushless motors.

GRAPHIC MONITOR

Thanks to the integrated oscilloscope function, some important system parameters, such as speed and torque, can be displayed and saved on the PC monitor.
Data can be downloaded and saved in compatible Excel format.
The time setting range is 10 ms to 2 s. Single values acquired and displayed can be read using the cursor.

METAL WORK PNEUMATIC

DRIVE FOR 400W BRUSHLESS MOTOR, CODE 37D2300000

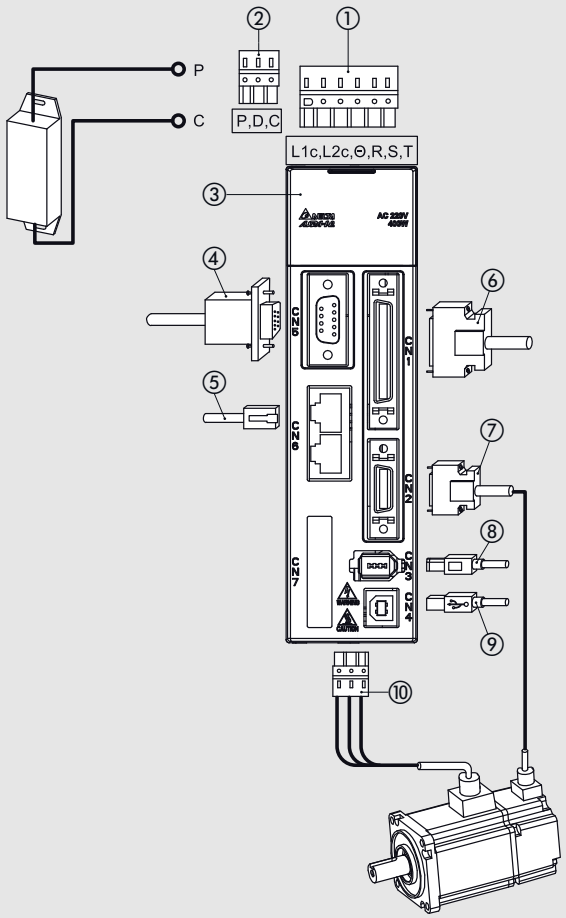
It is a DELTA ASDA-A2-0421-M drive to be used only with a DELTA 400W motor.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.

DRIVE TECHNICAL DATA		
Drive code		**37D2300000**
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	170 x 173 x 45
Power connectors and motor power		Screw type, pull-out
Encoder connectors and signals		Plug-type 3M
Max output current	A	7.80
Motor output stage		IGBT, PWM control, sinusoidal current
Power voltage		Single-phase or three-phase (user configurable) 200VAC-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Logic voltage		Single-phase 200-230VAC (+10%, -15%) 50/60 Hz (± 3 Hz)
Control		With analogue signal (proportional to speed and torque).
		Pulse-train (clock + direction; forward + backward pulse; 90° phase difference)
		8 inputs and 5 outputs, user configurable
		In the event of pulse-train command, the control system outputs should be the Line Driver type.
		If the outputs are the open-collector type, you can use a 37D2000000 board,
		which is sold separately (see accessories).
Auto-tuning		Yes
Communication interface		Serial USB port for settings and monitoring via a personal computer
Protections		Integrated against overloads, input extra-voltages,
		incorporated filters for suppressing the system's own resonance frequencies.
Standards		CE and UL
Other features		5-digit display and programming keypad.
		Integrated closed-loop system with position, speed and torque control modes.
		Control mode: position + speed; position + torque; speed + torque.
		Circuito automatico di frenatura dinamica in condizioni di allarme o power-off.
		Connector for external braking resistance (optional).
		Configuration and control software (optional).
Suitable for motors code		**37M2220001 - 37M4220001**
Connecting cable:		
Brushless **motor-drive** connecting cable, 3 metres		**37C2130001**
Brushless **motor** with **brake-drive** connecting cable, 3 metres		**37C2730000**
Brushless **motor-drive-encoder** connecting cable, 3 metres		**37C2230001**
Brushless **motor-drive** connecting cable, 5 metres		**37C2150001**
Brushless **motor** with **brake-drive** connecting cable, 5 metres		**37C2750000**
Brushless **motor-drive-encoder** connecting cable, 5 metres		**37C2250001**

WIRING DIAGRAM FOR 400W BRUSHLESS MOTOR DRIVES

① POWER CONNECTOR: 230VAC, single-phase and three-phase (user configurable). **Included in the supply**.
Separate supply section for logic/signal and power electronics.
Integrated circuits protecting against overloads and input extra-voltages.
② CONNECTOR: for external braking resistance code 37D2R00000 (optional).
③ 5-DIGIT DISPLAY and PROGRAMMING KEYPAD: to display and modify parameters and monitor system operation in real time.
④ EXTERNAL ENCODER CONNECTOR (optional): possibility of connecting an external encoder to create a feedback of the linear axis position. Can support encoders A, B, Z, supplied at 5VDC.
⑤ CANOpen CONNECTOR (optional): this drive is designed for communication with other devices via CANOpen Fieldbus.
⑥ SIGNAL CONNECTOR: pulse-train command (clock + direction; forward + backward pulse; 90° phase difference) or with analogue signal (proportional to speed or torque) 8 inputs and 5 outputs, user configurable.
⑦ ENCODER CONNECTOR: connection for 400W BRUSHLESS motor encoder.
⑧ IEEE 1394 PC CONNECTOR: settings and possible connection to other devices via RS485 or RS232 (cable not included in the supply).
⑨ USB PC CONNECTOR: settings and monitor through personal computer via RS232 (not included in the supply).
Data acquisition is only possible via this connection.
⑩ MOTOR POWER CONNECTOR

Log on to www.metalwork.it to view the instruction manual.



ACCESSORIES

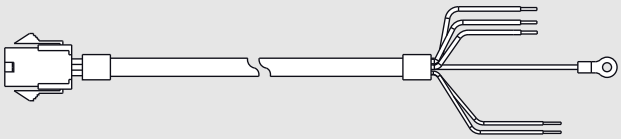
⑦ ENCODER CABLE

Code	Description
37C2230001	400W Brushless motor-drive-encoder connecting cable, 3 m
37C2250001	400W Brushless motor-drive-encoder connecting cable, 5 m

⑩ MOTOR POWER CABLE

Code	Description
37C2130001	400W Brushless motor-drive connecting cable, 3 m
37C2150001	400W Brushless motor-drive connecting cable, 5 m

MOTOR POWER CABLE + BRAKE



Code	Description
37C2730000	400W brushless motor drive connecting cable + brake, 3 m
37C2750000	400W brushless motor drive connecting cable + brake, 5 m

METAL WORK PNEUMATIC

DRIVE FOR 3kW BRUSHLESS MOTOR, CODE 37D2600001

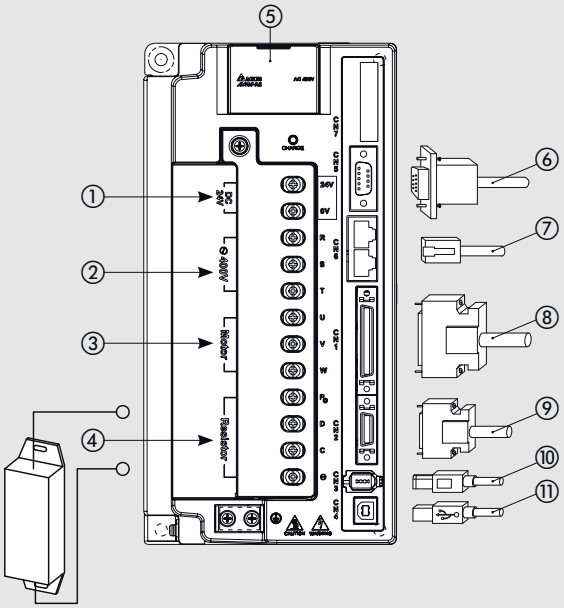
It is a DELTA ASDA-A2-3043-M drive to be used only with a DELTA 3kW motor.
It features compact dimensions and considerable operating flexibility.
It consists of a board housed in a metal box. It comes with pull-out screw connectors for power and plug connectors for logic.

DRIVE TECHNICAL DATA		
Drive code		**37D2600001**
Type of drive for BRUSHLESS motors		Metal box
Dimensions	mm	245 x 205.4 x 123
Power connectors and motor power		Screw type, pull-out
Encoder connectors and signals		Plug-type 3M
Max output current	A	33.32
Motor output stage		IGBT, PWM control, sinusoidal current
Power voltage		Three-phase from 380VAC to 480VAC ±10% 50/60 Hz (± 3 Hz)
Logic voltage		24VDC ±10%
Control		With analogue signal (proportional to speed and torque).
		Pulse-train (clock + direction; forward + backward pulse; 90° phase difference)
		8 inputs and 5 outputs, user configurable
		In the event of pulse-train command, the control system outputs should be the Line Driver type.
		If the outputs are the open-collector type, you can use a 37D2000000 board,
		which is sold separately (see accessories).
Auto-tuning		Yes
Communication interface		Serial USB port for settings and monitoring via a personal computer
Protections		Integrated against overloads, input extra-voltages,
		incorporated filters for suppressing the system's own resonance frequencies.
Standards		CE and UL
Other features		5-digit display and programming keypad.
		Integrated closed-loop system with position, speed and torque control modes.
		Control mode: position + speed; position + torque; speed + torque.
		Circuito automatico di frenatura dinamica in condizioni di allarme o power-off.
		Connector for external braking resistance (optional).
		Configuration and control software (optional).
Suitable for motors code		**37M2770000 - 37M4770000**
Connecting cable:		
Brushless **motor-drive** connecting cable, 3 metres		**37C3130001**
Brushless **motor** with **brake-drive** connecting cable, 3 metres		**37C3730000**
Brushless **motor-drive-encoder** connecting cable, 3 metres		**37C3230001**
Brushless **motor-drive** connecting cable, 5 metres		**37C3150001**
Brushless **motor** with **brake-drive** connecting cable, 5 metres		**37C3750000**
Brushless **motor-drive-encoder** connecting cable, 5 metres		**37C3250001**

WIRING DIAGRAM FOR 3kW BRUSHLESS MOTOR DRIVES

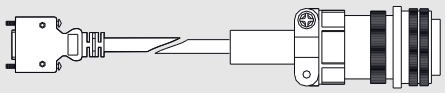
① LOGIC POWER CONNECTOR: 24VDC.
Included in the supply. Power section for logic electronics.
② POWER CONNECTOR: 400VAC, three-phase.
Included in the supply. Power signal supply section.
Integrated circuits protected against overload, input extra-voltages.
③ MOTOR POWER CONNECTOR
④ CONNECTOR: for external braking resistance code 37D2R00002 (optional).
⑤ 5-DIGIT DISPLAY and PROGRAMMING KEYPAD: to display and modify parameters and monitor system operation in real time.
⑥ EXTERNAL ENCODER CONNECTOR (optional): possibility of connecting an external encoder to create a feedback of the linear axis position. Can support encoders A, B, Z, supplied at 5VDC.
⑦ CANOpen CONNECTOR (optional): this drive is designed for communication with other devices via CANOpen Fieldbus.
⑧ SIGNAL CONNECTOR: pulse-train command (clock + direction; forward + backward pulse; 90° phase difference) or with analogue signal (proportional to speed or torque) 8 inputs and 5 outputs, user configurable. **Included in the supply**.
⑨ CENCODER CONNECTOR: connection for 3kW BRUSHLESS motor encoder.
⑩ IEEE 1394 PC CONNECTOR: settings and possible connection to other devices via RS485 or RS232 (cable not included in the supply).
⑪ USB PC CONNECTOR: settings and monitor through personal computer via RS232 (not included in the supply).
Data acquisition is only possible via this connection.

Log on to www.metalwork.it to view the instruction manual.



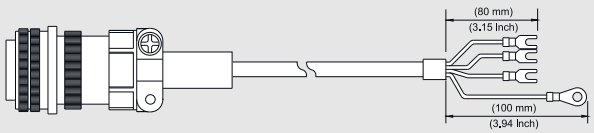
ACCESSORIES

⑥ CAVO ENCODER



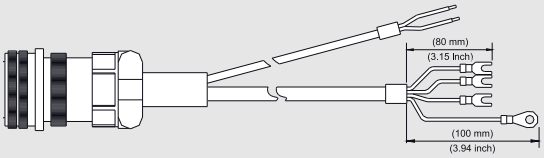
Code	Description
37C3230001	3kW Brushless motor-drive-encoder connecting cable, 3 m
37C3250001	3kW Brushless motor-drive-encoder connecting cable, 5 m

⑦ MOTOR POWER CABLE



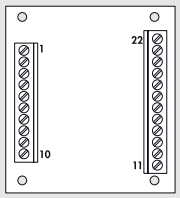
Code	Description
37C3130001	3kW Brushless motor-drive connecting cable, 3 m
37C3150001	3kW Brushless motor-drive connecting cable, 5 m

MOTOR POWER CABLE + BRAKE



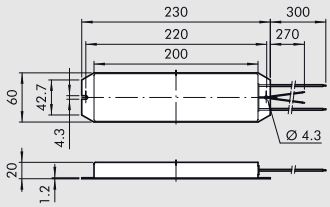
Code	Description
37C3730000	3kW brushless motor drive connecting cable + brake, 3 m
37C3750000	3kW brushless motor drive connecting cable + brake, 5 m

LINE-DRIVER INTERFACE BOARD



Code	Description
37D2000000	BRINT.A line driver interface board

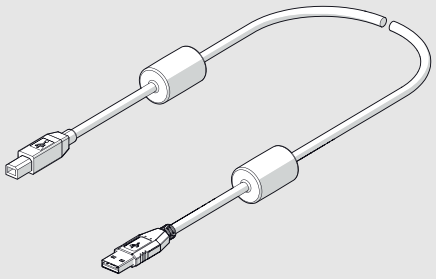
EXTERNAL BRAKING RESISTANCES



Code	Description	For drive code
37D2R00000	220W 50 Ω braking resistance	37D2300000
37D2R00002	500W 10 Ω braking resistance	37D2600001

Under certain operating conditions, such as sudden deceleration with high inertial load, it may be necessary to dissipate externally the reverse energy generated by the motor. The drive indicates this requirement via a specific alarm. Excess energy is dissipated externally via a braking resistance.

CABLE USB



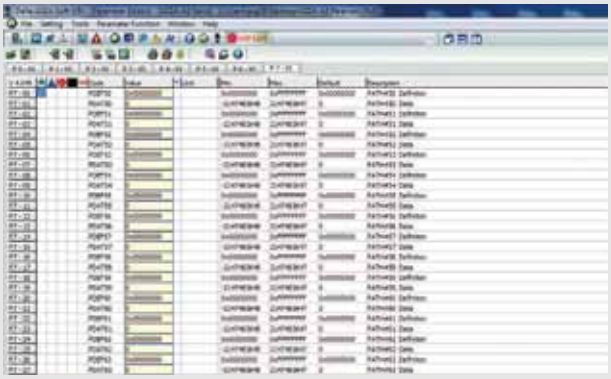
Code	Description	Weight [g]
37C0030000	Cable for USB 2.0 male A-B connector with ferrite core, for connecting the drive brushless to a PC, 3 m	150

NOTES

CONFIGURATION SOFTWARE ASDASoft

ASDASoft communication software is used for parameter setting and complete control of all functions of the system.
The configuration software can be downloaded free from the website http://www.deltaww.com
Access to parameter setting is done through the setup menus.
The software includes a detailed description of each parameter.
In addition to parameter setting ASDASoft software can accurately analyse operation of the system via the following functions.

- Status Monitor: real-time display of all details about the system.
- Data Scope: a complete oscilloscope with 4 channels that can be selected as desired among analogue and digital signals.
- System Analisis: used to study the system's frequency response to identify and correct any mechancal resonance phenomena.

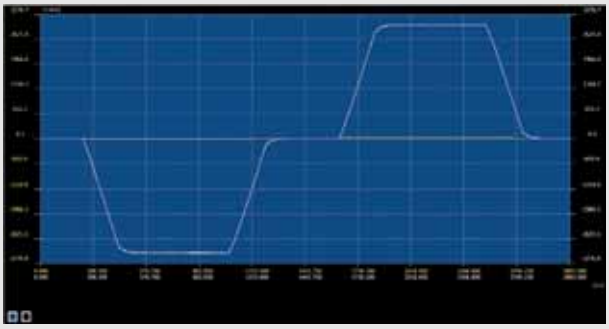


JOG speed modes are also available (Digital IO/Jog Control) and Gain Auto-Tuning.

N.B.: the software can be used only with drives for BRUSHLESS motors.

GRAPHIC MONITOR

Thanks to the integrated oscilloscope function, some important system parameters, such as speed and torque, can be displayed and saved on the PC monitor.
Data can be downloaded and saved in compatible Excel format.
displayed can be read using the cursor.



NOTES

SUMMARY SENSORS, POSITION SENSOR AND ACCESSORIES T-SLOT

METAL WORK PNEUMATIC

MAGNETIC SENSORS

- RETRACTABLE SENSOR, TYPE SQUARE — A6.2

- RETRACTABLE SENSOR, TYPE OVAL — A6.4

- SENSOR Ø 4 — A6.6

- SENSOR SERIES DSM — A6.7

- SENSOR SERIES DCB — A6.8

POSITION SENSORS

- POSITION SENSORS: INTRODUCTION — A6.10

- LTS POSITION SENSORS — A6.11

- LTL POSITION SENSORS — A6.16

- LTE POSITION SENSORS — A6.19

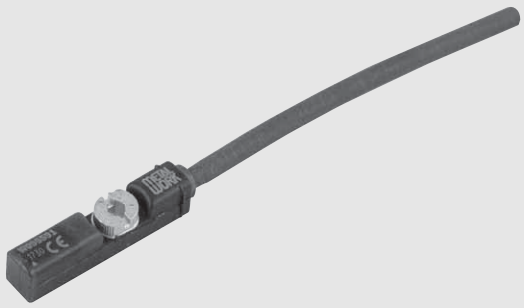
ACCESSORIES

- ACCESSORIES FOR T-SLOT — A6.23

- SENSOR TESTER — A6.24

RETRACTABLE SENSOR, SQUARE TYPE

Traditional sensor, featuring:
- secure fixing by means of a steel eccentric pin that engages the sides of the seat;
- fixing screw suitable for flat screwdriver or a 2.5 mm Allen wrench;
- equipped with retaining tabs to hold the sensor in position during installation;
- increased resistance to atmospheric agents and moisture;
- compatible for use with both traditional T-slots and rectangular slots.

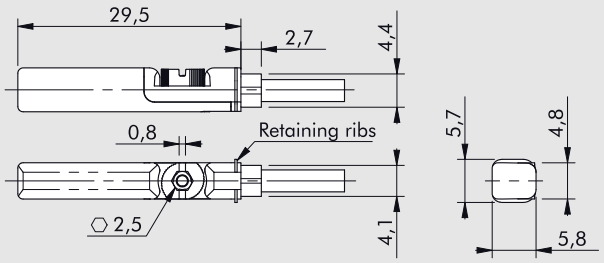


TECHNICAL DATA		RZT7	MRZT7	ATEX MZT8	HCR
		REED	HALL EFFECT	HALL EFFECT	HALL EFFECT
Type of contact		N.O.	N.O.	N.O.	N.O.
Switch		-	PNP	PNP	PNP
Supply voltage (Ub)	V	5 to 30 AC/DC	10 to 30 DC	10 to 26 DC	10 to 30 DC
Power	W	3 (6 di picco)	-	≤ 1.7	-
Voltage variation		-	≤ 10% of Ub	≤ 10% of Ub	-
Voltage drop at Imax	V	≤ 3.5	≤ 2.5	≤ 2.2	≤ 2.2
Input current	mA	-	≤ 8	≤ 10	≤ 10
Output current	mA	≤ 100	≤ 100	≤ 50	≤ 200
Switching frequency	Hz	≤ 400	≤ 1000	1000	≤ 1000
Short-circuit protection		-	Yes	Yes	Yes
Over-voltage suppression		-	-	-	Yes
Polarity inversion protection		-	Yes	Yes	Yes
EMC		EN 60 947-5-2	EN 60 947-5-2	EN 60 947-5-2	EN 60 947-5-2
LED display		Yellow	Yellow	Yellow	Yellow
Magnetic sensitivity	mT	2.1 - 3.5	2.4 - 3.6	2.4 - 3.6	2.4 - 3.6
Repeatability	mT	≤ 0.1	≤ 0.1	≤ 0.1 (Ub and ta fixed)	≤ 0.1
Degree of protection (EN 60529)		IP 67	IP 67	IP 67	IP 68 (M8) - IP69K 2m
Vibration and shock resistance		30 g, 11 ms, 10 ÷ 55 Hz, 1 mm			
Operating life		10^7 impulses	10^9 impulses	10^9 impulses	-
Temperature range	°C				
with polyurethane cable		-30 to 80 (static installation) / -20 to 80 (dynamic installation)			-30 to 80 (static installation)
with PVC cable		-30 to 80 (static installation) / -5 to 80 (dynamic installation)			-
Sensor capsule material		PA	PA	PA	PA12
2.5 m/2 m connecting cable		PVC; 2 x 0.12 mm^2	PVC; 3 x 0.12 mm^2	PVC; 3 x 0.14 mm^2	PUR; 3 x 0.14 mm^2
Connecting cable with M8x1		Polyurethane; 2 x 0.14 mm^2	Polyurethane; 3 x 0.14 mm^2	-	PUR; 3 x 0.14 mm^2
Wire NO.		2	3	3	3
Category ATEX		-	-	II 3G Ex nA op is IIC T4 Gc X II 3D Ex tc IIIC T135°C Dc IP67 X	-
Certifications		CE	CE	CE cULus Ex	CE cULus
ROBOTICS VERSIONS					
Angle of twist		±270° / 10 cm			
No. of cycles torsion		> 350.000 (±270° / 0.1 mm)			
Bending cycles		> 5 Mio (bending radius 29 mm)			
Maximum acceleration	m/s^2	max 5			
Maximum traverse speed at 5 m horizontal path	m/min	max 200			

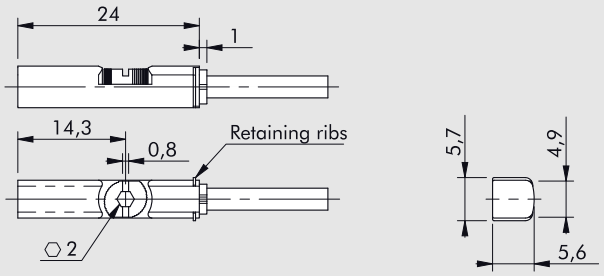
METAL WORK PNEUMATIC

OVERALL DIMENSIONS AND ORDERING CODES

T7

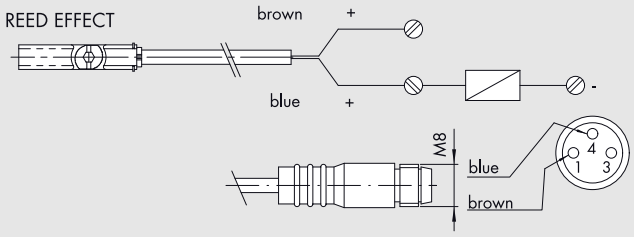


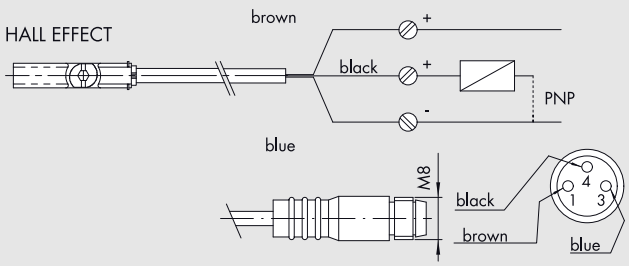
T8



Code	Description
T7	
W095414	REED sensor, T7 SQUARE, 2 wires 2.5 m
W095415	REED sensor, T7 SQUARE, 2 wires 5 m
W095416	REED sensor, T7 SQUARE, 2 wires 10 m
W09541C	REED sensor, T7 SQUARE, 2 wires 2.5 m robotics
W095411	REED sensor, T7 SQUARE, 2 wires 300 mm M8 robotics
W095434	HALL sensor, T7 SQUARE, 3 wires 2.5 m
W095435	HALL sensor, T7 SQUARE, 3 wires 5 m
W09543C	HALL sensor, T7 SQUARE, 3 wires 2.5 m robotics
W095431	HALL sensor, T7 SQUARE, 3 wires 300 mm M8 robotics
T8 ATEX	
W0955A9	HALL sensor, T8 SQUARE, 3 wires ATEX 2 m SH.OV.
T8 (for corrosive environments)	
W0952125396	HALL sensor, T8 SQUARE, 3 wires 2 m HCR
W0952129394	HALL sensor, T8 SQUARE, 3 wires 300 mm M8 HCR

WIRING DIAGRAM





NOTES

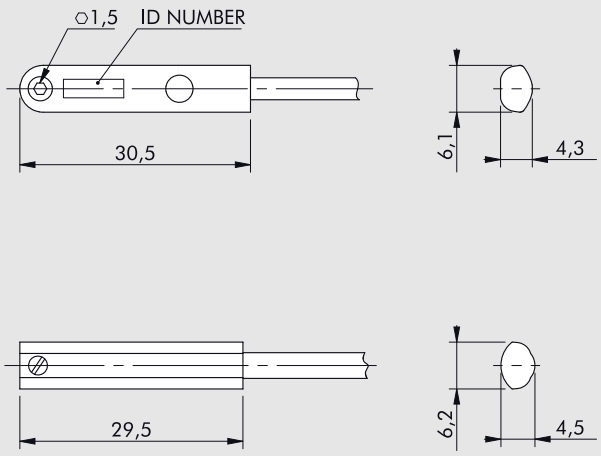
RETRACTABLE SENSOR, TYPE OVAL

Traditional sensor, featuring:
- the sensor is inserted into the slot from the narrowest side and then rotated into the fixing position;
- fixing using a screw that is pressed against the bottom of the T-slot to cause the sensor to rest on the narrowest part of the T-slot;
- fixing screw suitable for a 1.5 mm Allen wrench;
- compatible for use with traditional T-slots.

TECHNICAL DATA				ATEX
		REED	HALL EFFECT	HALL EFFECT
Type of contact		N.O.	N.O.	N.O.
Switch		-	PNP	PNP
Supply voltage (Ub)	V	10 to 30 AC/DC	10 to 30 DC	18 to 30 DC
Power	W	3 (peak valve = 6)	3	≤ 1.7
Voltage variation		-	≤ 10% of Ub	≤ 10% of Ub
Voltage drop	V	-	≤ 2	≤ 2.2
Input current	mA	-	≤ 10	≤ 10
Output current	mA	≤ 100	≤ 100	≤ 70
Switching frequency	Hz	≤ 400	≤ 5000	1000
Short-circuit protection		-	Yes	Yes
Over-voltage suppression		-	Yes	Yes
Polarity inversion protection		-	Yes	Yes
EMC		EN 60 947-5-2	EN 60 947-5-2	EN 60 947-5-2
LED display		Yellow	Yellow	Yellow
Magnetic sensitivity		2.8 mT ± 25%	2.8 mT ± 25%	2.6 mT
		1.9 mT ± 20% (for HS)	2.1 mT ± 20% (for HS)	-
Repeatability		≤ 0.1 mT	≤ 0.1 mT	≤ 0.1 mT (Ub and ta fixed)
Degree of protection (EN 60529)		IP 67	IP 67	IP 68, IP 69K
Vibration and shock resistance		30 g, 11 ms, 10 to 55 Hz, 1 mm	30 g, 11 ms, 10 to 55 Hz, 1 mm	30 g, 11 ms, 10 to 55 Hz, 1 mm
Operating life		10^7 impulses	10^9 impulses	10^9 impulses
Temperature range	°C	-25 to +75	-25 to +75	-20 to +45
Sensor capsule material		PA66 + PA6I/6T	PA66 + PA6I/6T	PA
2.5 m/2 m connecting cable		PVC; 2 x 0.12 mm²	PVC; 3 x 0.14 mm²	PVC; 3 x 0.12 mm²
Connecting cable with M8x1		Polyurethane; 2 x 0.14 mm²	Polyurethane; 3 x 0.14 mm²	-
Wire NO.		2	3	3
Category ATEX		-	-	II 3G Ex nA op is IIC T4 Gc X II 3D Ex tc IIIC T135°C Dc IP67 X
Certifications		CE	CE	CE cULus Ex
ROBOTICS VERSIONS				
2.5 m / 300 mm connecting cables		Polyurethane; 2 x 0.14 mm²	Polyurethane; 3 x 0.14 mm²	-
Cable test conditions:	bending	> 5.000.000 cycles (bending radius 29 mm)		-
	torsion	> 350.000 cycles (± 270°/0.1 mm)		-

METAL WORK PNEUMATIC

OVERALL DIMENSIONS AND ORDERING CODES

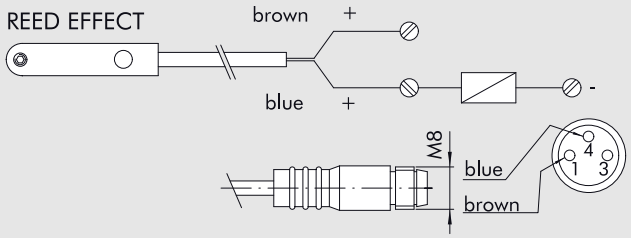


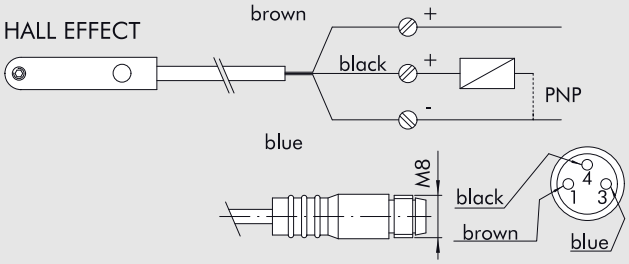
Code	Description	ID Number
W0952025390	HALL N.O. sensor, OVAL, 2.5 m	CE32MP
W0952225390	HALL N.O. sensor, OVAL, 2.5 m robotics	CE32MPR
W0952029394	HALL N.O. sensor, OVAL, 300 mm M8 robotics	CE3M8P
W0952022180	REED N.O. sensor, OVAL, 2.5 m	CR22M
W0952222180	REED N.O. sensor, OVAL, 2.5 m robotics	CR22RM
W0952028184	REED N.O. sensor, OVAL, 300 mm M8 robotics	CR2M8
W0952125556	HALL N.O. sensor, OVAL, 2 m ATEX	-
W0952025500*	HALL N.O. sensor, OVAL, HS 2.5 m	-
W0952029504*	HALL N.O. sensor, OVAL, HS 300 mm M8	-
W0952022500*	REED N.O. sensor, OVAL, HS 2.5 m	-
W0952128184*	REED N.O. sensor, OVAL, HS 300 mm M8	-

*** For use on the rodless cylinder "V" guide Ø25 or when standard sensors do not detect the magnet, e.g. near metal masses.**

Note: Individually packed

WIRING DIAGRAM



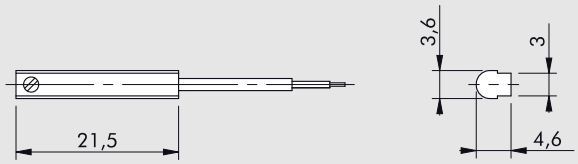


NOTES

SENSOR Ø 4

SENSOR Ø 4

Code	Description
W0950044180	Sensor REED 2 wires 2.5 m robotics
W0950045390	Sensor HALL 3 wires 2.5 m robotics



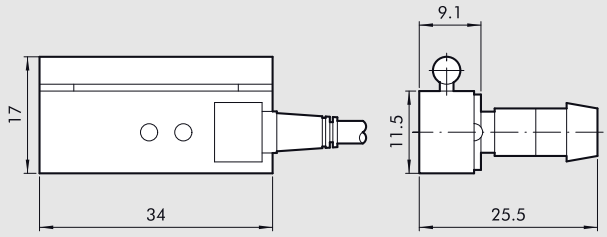
TECHNICAL DATA

		REED	HALL EFFECT
Type of contact		N.O.	N.O.
Switch		-	PNP
Supply voltage (Ub)	V	3 to 30 AC/DC	6 to 30 DC
Power (resistive load)	W	6	6
Voltage drop	V	< 3	< 1
Input current	mA	-	≤ 10
Output current	mA	≤ 200	≤ 200
Switching frequency	Hz	≤ 500	≤ 200000
Short-circuit protection		-	-
Over-voltage suppression		-	-
Polarity inversion protection		-	Yes
EMC		EN 60 947-5-2	EN 60 947-5-2
LED display		Yellow	Yellow
Magnetic sensitivity		2.3 mT ± 10%	2.8 mT ± 25%
Repeatability		≤ 0.1 mT	≤ 0.1 mT
Degree of protection (EN 60529)		IP 67	IP 67
Operating life		10^7 impulses	10^9 impulses
Temperature range	°C	-10 to +60	-10 to +60
Sensor capsule material		PET + AISI 303	PET + AISI 303
2.5 m connecting cable		Polyurethane; 2 x 0.13 mm²	Polyurethane; 3 x 0.13 mm²
Wire NO.		2	3
Certifications		CE UL	CE UL
Cable test conditions:	bending	> 5.000.000 cycles (bending radius 28 mm)	
	torsion	> 350.000 cycles (± 270°/0.1 mm)	

WIRING DIAGRAM

SENSOR SERIE DSM

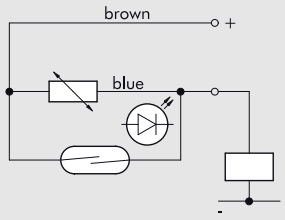
SENSOR SERIES DSM



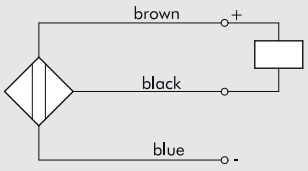
Code	Description
W0950000201	Reed sensor DSM2-C525 HS
W0950000222	E.HALL PNP sensor DSM3-N225
W0950000232	E. HALL NPN sensor DSM3-M225

TECHNICAL DATA SERIE DSM		REED	HALL EFFECT	
Type of contact		N.O.	N.O.	N.O.
Switch		-	PNP	NPN
Supply voltage (Ub)	V	3 to 250 AC/DC	6 to 30 DC	
Power	W	10	6	
Voltage drop	V	< 3	< 1	
Output current	mA	1500	250	
Switching frequency	Hz	500	> 2000	
Polarity inversion protection		Sì	Sì	
EMC		EN 60 947-5-2	EN 60 947-5-2	
LED display		Yellow	Yellow	
Degree of protection (EN 60529)		IP 67	IP 67	
Operating life		10^7 impulses	10^9 impulses	
Temperature range	°C	-10 to +70	-10 to +70	
Sensor capsule material		PA; AISI 303; OT 63	PA; AISI 303; OT 63	
2.5 m connecting cable		PVC; 2 x 0.25 mm²	PVC; 3 x 0.25 mm²	
Wire NO.		2	3	
Certifications		CE	CE	

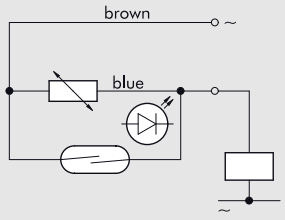
DC



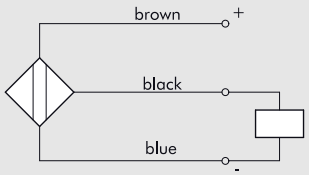
Version NPN



AC

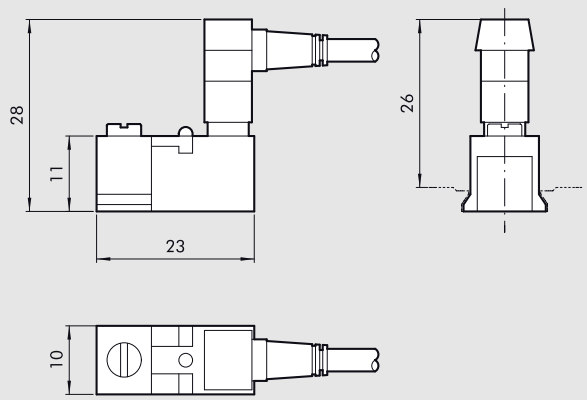


Version PNP



SENSOR SERIE DCB

SENSOR SERIE DCB

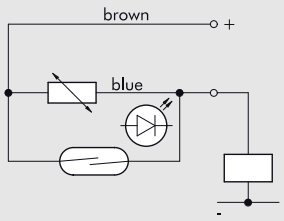


Code	Bore	Model	Version
W0950000252	12 to 100	REED sensor DCB 2C-425	Reed connector + bracket - CB
W0950000253	12 to 100	HALL PNP sensor DCB3-N225	Hall PNP connector + bracket - CB
W0950014360	12 to 100	HALL NPN sensor DCB3-M225	Hall NPN connector + bracket - CB

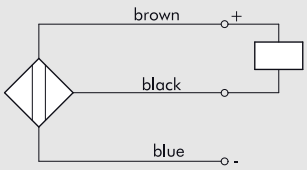
TECHNICAL DATA SERIE DCB

Type		REED + VARISTOR + LED 2 WIRES	HALL VERSION PNP/NPN 3 WIRES
Contact		REED + VARISTOR + LED NO	HALL EFFECT NO PNP/NPN
Max AC/DC voltage	V	3 to 48 (DC); 3 to 110 (AC)	6-30 V DC
Max current at 25°C	mA	300	250
Power with inductive load	VA	8	–
Power with resistive load	Watt	15	6
Switch-on time	m sec	0.5	0.8
Switch-off time	m sec	0.1	3
Switch-on point	Gauss	110	15
Switch-off point	Gauss	60	8
Operating life		10^7 impulses	10^9 impulses
Contact resistance		0.1	–
Cable length	m	2.5	2.5
Cable cross section	mm^2	0.35	0.35
Cable material		Soft PVC	Soft PVC
Circuit			

DC



Version NPN



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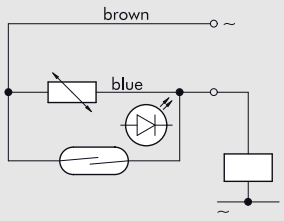
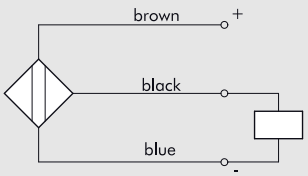


Version PNP



METAL WORK PNEUMATIC

NOTES

POSITION SENSOR: INTRODUCTION

Magnetic position sensors are used for measuring the linear stroke of actuators. The position of the piston is measured without contact and given via a configurable analogue output signal, as voltage (0-10 V) or current (4-20 mA).
Our position sensors are divided into three types: LTS, LTL and LTE.
The LTS position sensors can be used for various product families with strokes up to 256 mm. It is used for ISO 15552 type A and series 3 cylinders, CMPC and ISO 21287 LINER compact cylinders, ELEKTRO ISO 15552 electric cylinders and R3 rotary actuators.
With ISO 15552 type A and ELEKTRO ISO 15552 cylinders, the other two types of position sensors, LTL and LTE, can be used when the stroke exceeds 256 mm (see table).

LTS

LTL

LTE

RANGE OF APPLICATION OF LTS, LTL AND LTE SENSORS ON ISO 15552 TYPE A CYLINDERS

Bore	LTS	LTL	LTE
mm	Strokes from 0 to 256 mm	Strokes from 257 to 503 mm	Strokes from 150 to 500 mm
32	YES	NO	YES
40	YES	NO	YES
50	YES	YES	YES
63	YES	YES	NO
80	YES	YES	NO
100	YES	YES	NO
125	YES	YES	NO

NOTES

LTS POSITION SENSOR

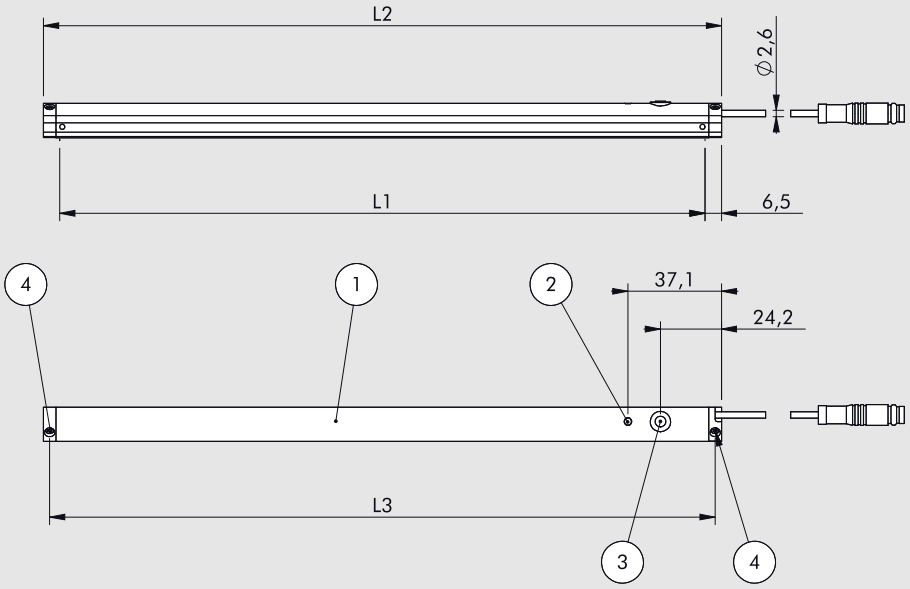
The LTS is a magnetic position sensor for measuring linear strokes of actuators. The position of the piston is measured without contact and given via a configurable analogue output signal, as voltage or current. The body of the LTS is very compact, so it can be used in applications where limited space is available.
This position sensor can measure the strokes of various families of actuators up to 256 mm.
Correct operation requires a magnetic field strength of between 4 and 30 mT.
The measurement range can be regulated accurately using the Teach-in button (zero point and end point). Teach-in can be performed regardless of the polarity of the magnetic field and the position of the sensor. The yellow ON light comes on when the piston is in measuring range.
The position sensor is out of the measuring range when:

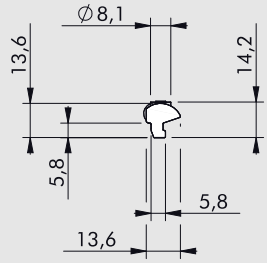
- the yellow light is off; and
- the voltage signal is 11V (range 0-10V) or the current 3 mA (range 4-20 mA).

TECHNICAL DATA		
Measuring length (± 1 mm)	mm	from 0 to 256
Electrical connection		M8x1 – 4 pin
Electromagnetic compatibility in accordance with standard		EN 60947-5-7
Sample time	ms	1
IEC 60068-2-6 shock test		30 g, 11 ms
IEC 60068-2-6 vibration test		10 Hz ... 55 Hz, 1 mm
Maximum displacement speed	m/s	< 3
Linearity*	mm	0.3
Resolution	mm	0.03 % FSR (≥ 0.05 mm)
Repeatability	mm	0.06 % FSR (≥ 0.1 mm)
Operating temperature	°C	–20 to +70
Index of protection		IP 67
Protection class		III
Voltage	V	15 - 30
Black current (without load)	mA	< 25
Analogue output (voltage)	V	0 to 10
Out-of-range analogue output	V	11
Analogue output (current)	mA	4 to 20
Out-of-range analogue output	mA	3
Max. load resistance (current output)	Ω	500
Min. load resistance (voltage output)	Ω	2000
Polarity inversion protection		YES
Short-circuit protection		YES
Overload protection		YES

* In some applications, linearity may be higher than the value indicated.

DIMENSIONS AND ELECTRICAL CONNECTION

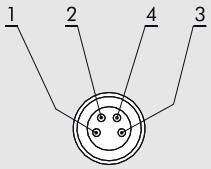




① LTS
② LED (yellow)
③ TEACH-IN button
④ Fixing screw

L1 = Measuring range
L2 = Total length
L3 = Fixing screws centre

Type	L1 [mm]	L2 [mm]	L3 [mm]
LTS-032	32	45	40
LTS-064	64	77	72
LTS-096	96	109	104
LTS-128	128	141	136
LTS-160	160	173	168
LTS-192	192	205	200
LTS-224	224	237	232
LTS-256	256	269	264

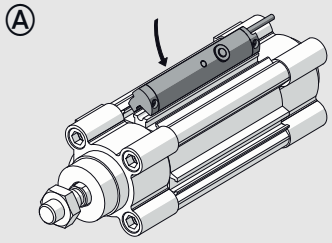


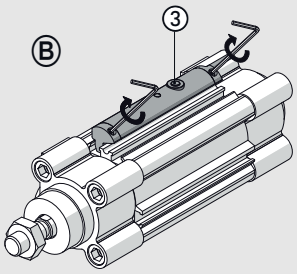
PIN	Colour	Function
1	Brown	Positive
2	White	Current output
3	Blue	Negative
4	Black	Voltage output

FIXING ON THE ACTUATOR AND START-UP

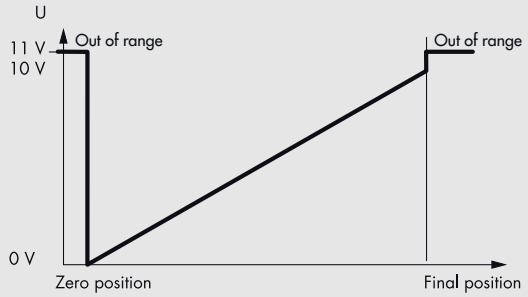
1. Connect the position sensor to the power supply using the M8x1 4-pin connector, wiring the voltage or the current output;
2. Insert the position sensor in one of the T-slots in the actuator (fig. A) and tighten the two screws using the key provided (fig. B);
3. If you wish to determine a specific measuring range, perform the procedure with the Teach-In button ③ (see instruction manual).

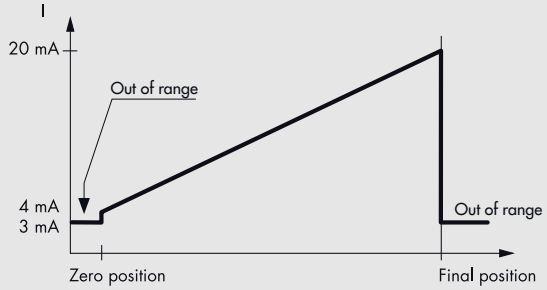
N.B. If a measuring range is not set, the maximum range is used automatically.





GRAPH OF THE VOLTAGE OR CURRENT ANALOGUE OUTPUT SIGNAL VALUE AND THE OUT-OF-RANGE VALUE

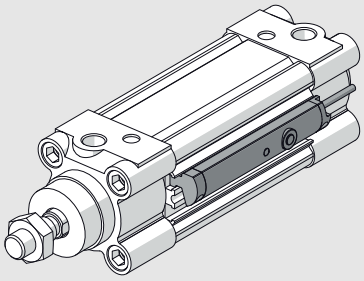




CHOICE OF POSITION SENSOR BASED ON THE MEASURING STROKE

The tables below show the recommended position sensors model for some families of actuators. For other products it is necessary to determine whether the LTS operates correctly.

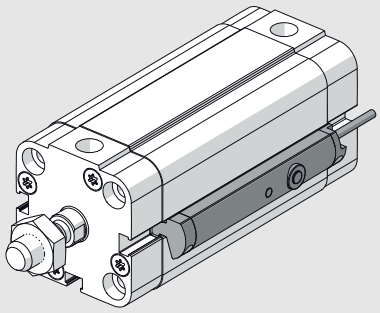
ISO 15552 TYPE A CYLINDERS – SERIES 3



Ø 32* - Ø 40 - Ø 50 - Ø 63 - Ø 80 - Ø 100 - Ø 125	
Stroke [mm]	Position sensors model
up to 32	LTS-032
from 33 to 64	LTS-064
from 65 to 96	LTS-096
from 97 to 128	LTS-128
from 129 to 160	LTS-160
from 161 to 192	LTS-192
from 193 to 224	LTS-224
from 225 to 256	LTS-256

* ISO 15552 series 3 cylinders cannot be used for strokes up to 3 mm.

COMPACT CYLINDERS - SERIES CMPC



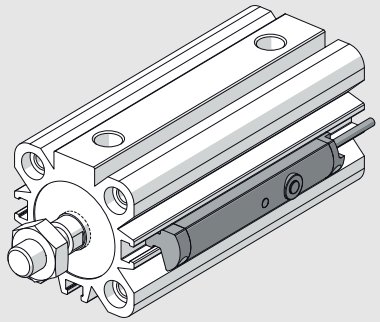
Ø 12- Ø 16 - Ø 20		
Stroke [mm]	Position sensors model	Strokes for which the LTS projects beyond the cylinder heads, despite being fixed correctly.
up to 32	LTS-032	-
from 34 to 64	LTS-064	from 34 to 38
from 66 to 96	LTS-096	from 66 to 70
from 98 to 128	LTS-128	from 98 to 102
from 130 to 160	LTS-160	from 130 to 134
from 162 to 192	LTS-192	from 162 to 166
from 194 to 224	LTS-224	from 194 to 198
from 226 to 256	LTS-256	from 226 to 230

The LTS cannot be used with some strokes (e.g. 33 mm).

Ø 25		
Stroke [mm]	Position sensors model	Strokes for which the LTS projects beyond the cylinder heads, despite being fixed correctly.
up to 32	LTS-032	-
from 33 to 64	LTS-064	from 33 to 37
from 65 to 96	LTS-096	from 65 to 69
from 97 to 128	LTS-128	from 97 to 101
from 129 to 160	LTS-160	from 129 to 133
from 161 to 192	LTS-192	from 161 to 165
from 193 to 224	LTS-224	from 193 to 197
from 225 to 256	LTS-256	from 225 to 229

Ø 32 - Ø 40 - Ø 50 - Ø 63 - Ø 80 - Ø 100	
Stroke [mm]	Position sensors model
up to 32	LTS-032
from 33 to 64	LTS-064
from 65 to 96	LTS-096
from 97 to 128	LTS-128
from 129 to 160	LTS-160
from 161 to 192	LTS-192
from 193 to 224	LTS-224
from 225 to 256	LTS-256

ISO 21287 COMPACT CYLINDERS – LINER SERIES



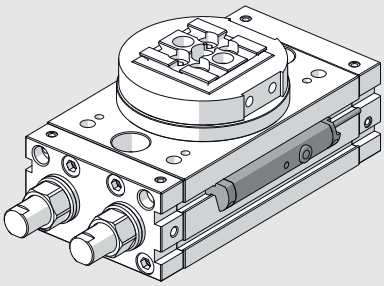
Ø 20		
Stroke [mm]	Position sensor model	Strokes for which the LTS projects beyond the cylinder heads, despite being fixed correctly.
up to 32	LTS-032	-
from 35 to 64	LTS-064	from 39 to 64
from 67 to 96	LTS-096	from 71 to 96
from 99 to 128	LTS-128	from 103 to 128
from 131 to 160	LTS-160	from 135 to 160
from 163 to 192	LTS-192	from 167 to 192
from 195 to 224	LTS-224	from 199 to 224
from 227 to 256	LTS-256	from 231 to 256

The LTS cannot be used with some strokes (e.g. 33 mm).

Ø 25		
Stroke [mm]	Position sensor model	Strokes for which the LTS projects beyond the cylinder heads, despite being fixed correctly.
up to 32	LTS-032	-
from 33 to 64	LTS-064	from 37 to 64
from 65 to 96	LTS-096	from 69 to 96
from 97 to 128	LTS-128	from 101 to 128
from 129 to 160	LTS-160	from 133 to 160
from 161 to 192	LTS-192	from 165 to 192
from 193 to 224	LTS-224	from 197 to 224
from 225 to 256	LTS-256	from 229 to 256

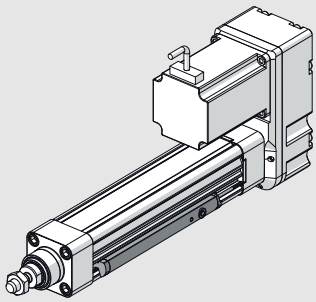
Ø 32 - Ø 40 - Ø 50 - Ø 63 - Ø 80 - Ø 100	
Stroke [mm]	Position sensor model
up to 32	LTS-032
from 33 to 64	LTS-064
from 65 to 96	LTS-096
from 97 to 128	LTS-128
from 129 to 160	LTS-160
from 161 to 192	LTS-192
from 193 to 224	LTS-224
from 225 to 256	LTS-256

ROTARY ACTUATORS - SERIES R3



Bore [mm]	Position sensor model
16	LTS-64
20	LTS-64
22	LTS-64
25	LTS-64
30	LTS-64
40	LTS-64

ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552



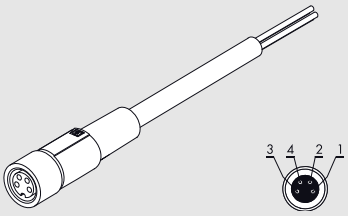
Ø 32 - Ø 50 - Ø 63	
Bore [mm]	Position sensor model
up to 32	LTS-032
from 33 to 64	LTS-064
from 65 to 96	LTS-096
from 97 to 128	LTS-128
from 129 to 160	LTS-160
from 161 to 192	LTS-192
from 193 to 224	LTS-224
from 225 to 256	LTS-256

ORDERING CODES

Code	Description
W0950000470	LTS-032 position sensor with M8 4-PIN 0.3 m connector
W0950000471	LTS-064 position sensor with M8 4-PIN 0.3 m connector
W0950000472	LTS-096 position sensor with M8 4-PIN 0.3 m connector
W0950000473	LTS-128 position sensor with M8 4-PIN 0.3 m connector
W0950000474	LTS-160 position sensor with M8 4-PIN 0.3 m connector
W0950000475	LTS-192 position sensor with M8 4-PIN 0.3 m connector
W0950000476	LTS-224 position sensor with M8 4-PIN 0.3 m connector
W0950000477	LTS-256 position sensor with M8 4-PIN 0.3 m connector

ACCESSORIES

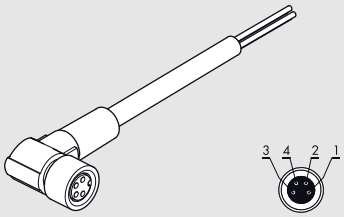
STRAIGHT M8 CONNECTORS



Pin	Cable colour
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009100	M8 4-pin connector – female, straight L = 2 m
0240009101	M8 4-pin connector – female, straight L = 5 m

90° M8 CONNECTORS



Pin	Cable colour
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009102	M8 4-pin connector – female, 90° angle L = 2 m
0240009103	M8 4-pin connector – female, 90° angle L = 5 m

NOTES

LTL POSITION SENSOR

The LTL position sensor uses an array of Hall sensors to measure positions without contact, thanks to the presence of a magnet inside the cylinder.
It uses a smart algorithm to adapt dynamically to the magnets during operation, so that the output signal is always linear and reproducible.
This technology allows the position sensor to adapt dynamically to changes in the intensity of the magnetic field connected with ageing of the magnet and the different operating temperatures.
A magnetic field intensity of between 2 and 15 mT is required for correct operation.
The LTL can be set by means of a TEACH-PAD capacitive button that allows rapid actuation of the position sensor and adaptation to the user's requirements. Just press slightly with the fingers to:

- select an output current (4-20 mA) or output voltage (0-10 V);
- establish the desired measuring range;
- reset the position sensor to the factory setting.

The button is designed to prevent unintentional changes to the parameters.
The position sensor is out of the measuring range when:

- the yellow light is off; and
- the voltage signal is 11V (range 0-10V) or the current 3 mA (range 4-20 mA).

LED1 (operating light) comes on when the piston is in the measuring range:

- yellow on - optimal signal power;
- yellow on and red flashing - signal power not optimal.

LED2 tells you which analogue output is active:

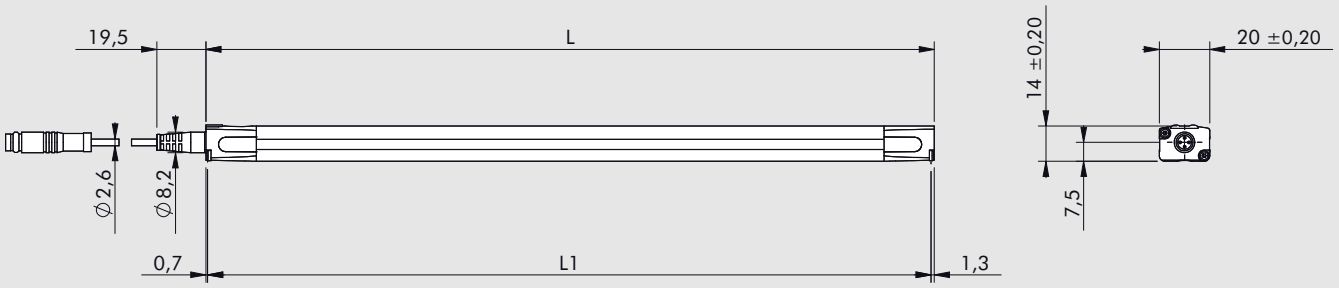
- green – voltage analogue output;
- blue – current analogue output.

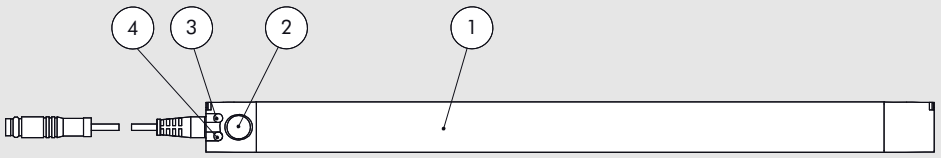
The position sensor is secured by means of brackets near one of the actuator T-slots.
The LTL position sensor is applied to ISO 15552 type A cylinders, and electric cylinders serie ELEKTRO ISO 15552.
For longer strokes please contact our sales department.

TECHNICAL DATA		
Measuring length (± 1 mm)	mm	from 257 to 503
Electrical connection		M8x1 – 4 pin
Electromagnetic compatibility in accordance with standard		EN 60947-5-7
Sample time	ms	1.15
IEC 60068-2-6 shock test		30 g, 11 ms
IEC 60068-2-6 vibration test		10 Hz ... 55 Hz, 1 mm
Maximum displacement speed	m/s	< 3
Linearity	mm	0.5
Resolution	mm	0.03 % FSR (≥ 0.06 mm)
Repeatability	mm	0.06 % FSR (≥ 0.1 mm)
Operating temperature	°C	–20 to +70
Index of protection		IP 65, IP 67
Protection class		III
Voltage	V	15 to 30
Black current (without load)	mA	< 35
Analogue output (voltage)	V	0 to 10
Out-of-range analogue output	V	11
Analogue output (current)	mA	4 to 20
Out-of-range analogue output	mA	3
Max. load resistance (current output)	Ω	< 500
Min. load resistance (voltage output)	Ω	> 2000
Polarity inversion protection		YES
Short-circuit protection		YES

METAL WORK PNEUMATIC

DIMENSIONS AND ELECTRICAL CONNECTION

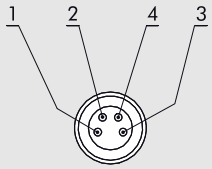




① LTL
② TEACH PAD button
③ LED1 (yellow/red)
④ LED2 (blue/green)

L = Total length
L1 = Measuring range

Type	L [mm]	L1 [mm]
LTL-287	289	287
LTL-359	361	359
LTL-431	433	431
LTL-503	505	503



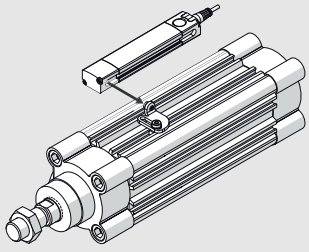
PIN	Colour	Function
1	Brown	Voltage +
2	White	Current output
3	Blue	Voltage -
4	Black	Voltage output

FIXING ON THE ACTUATOR AND START-UP

1. Position the brackets (code W0950000721) in one of the T-slots in the cylinder liner (fig. A);
2. Fix the brackets in the position sensor slot at least 30 mm from the ends of the position sensor (fig. B). The brackets are used to adjust the position along the axis of the piston rod, including perpendicular to the T-slot (fig. C). This allows you to fix the position sensor in as central a position as possible (fig. D);
3. Connect the position sensor to the power supply using the M8x1 4-pin connector, wiring the voltage or the current output;
4. If you wish to determine a specific measuring range, perform the procedure with the Teach pad (②) (see user manual).

N.B. If a measuring range is not set, the maximum range is used automatically.

Ⓐ



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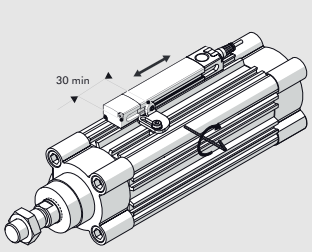

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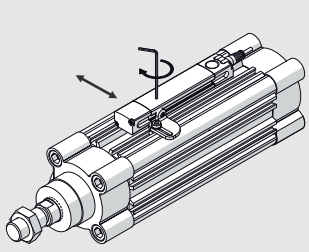

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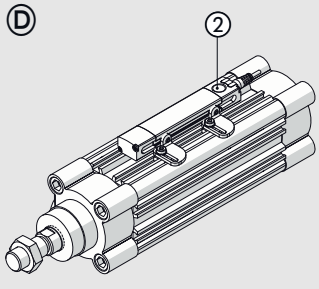
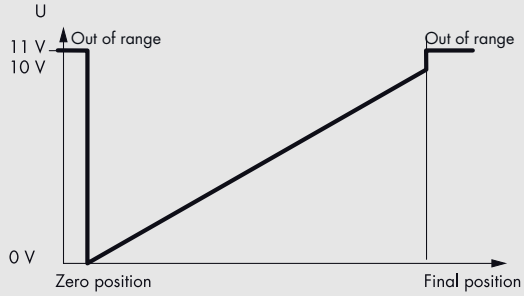
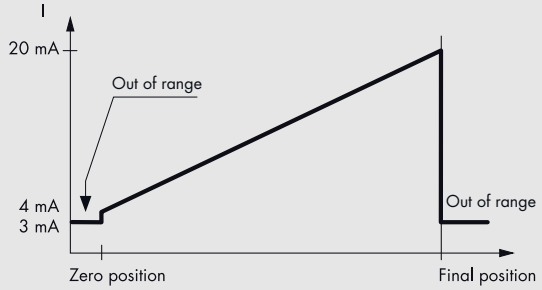


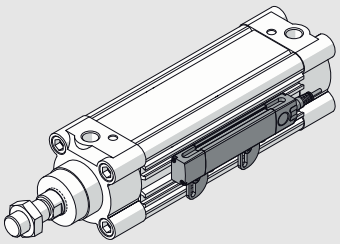
GRAPH OF THE VOLTAGE OR CURRENT ANALOGUE OUTPUT SIGNAL VALUE AND THE OUT-OF-RANGE VALUE





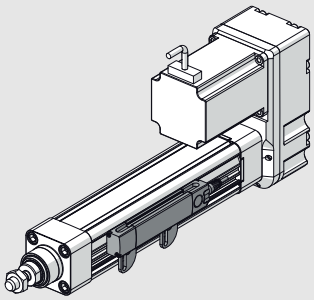
CHOICE OF POSITION SENSOR BASED ON THE ACTUATOR MEASURING STROKE

ISO 15552 TYPE A CYLINDERS



Ø 50 - Ø 63 - Ø 80 - Ø 100 - Ø 125	
Measuring stroke [mm]	**Position sensor model**
from 255 to 287	LTL-287
from 288 to 359	LTL-359
from 360 to 431	LTL-431
from 432 to 503	LTL-503

ELECTRIC CYLINDER SERIES ELEKTRO ISO 15552



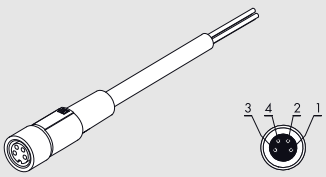
Ø 32 - Ø 50 - Ø 63	
Measuring stroke [mm]	**Position sensor model**
from 255 to 287	LTL-287
from 288 to 359	LTL-359
from 360 to 431	LTL-431
from 432 to 503	LTL-503

ORDERING CODE

Code	Description
W0950000478	LTL-287 Position sensor with M8 4-PIN 0.3 m connector
W0950000479	LTL-359 Position sensor with M8 4-PIN 0.3 m connector
W0950000480	LTL-431 Position sensor with M8 4-PIN 0.3 m connector
W0950000481	LTL-503 Position sensor with M8 4-PIN 0.3 m connector

ACCESSORIES

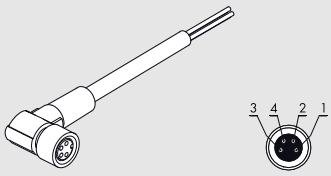
STRAIGHT M8 CONNECTORS



Pin	Cable colour
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009100	M8 4-pin connector – female, straight L = 2 m
0240009101	M8 4-pin connector – female, straight L = 5 m

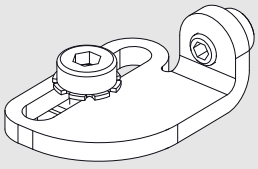
90° M8 CONNECTORS



Pin	Cable colour
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009102	M8 4-pin connector – female, 90° angle L = 2 m
0240009103	M8 4-pin connector – female, 90° angle L = 5 m

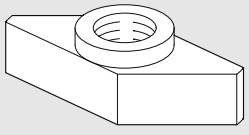
T-SLOT BRACKET



Code	Description
W0950000721	Bracket for mounting LTL on cylinder with T-slot

Bracket for fixing the LTL position sensor in the T-slot of the actuator.

SLOTTED FIXING PLATE WITH INSERTION FROM ABOVE



Code	Description	Weight [g]
0950003001	M4 T-slotted fixing plate	4

Note: Individually packed.

N.B. To be used with the T-slot bracket W0950000721 when the T-slot is not a through one (e.g. in cylinders series ELEKTRO ISO 15552).

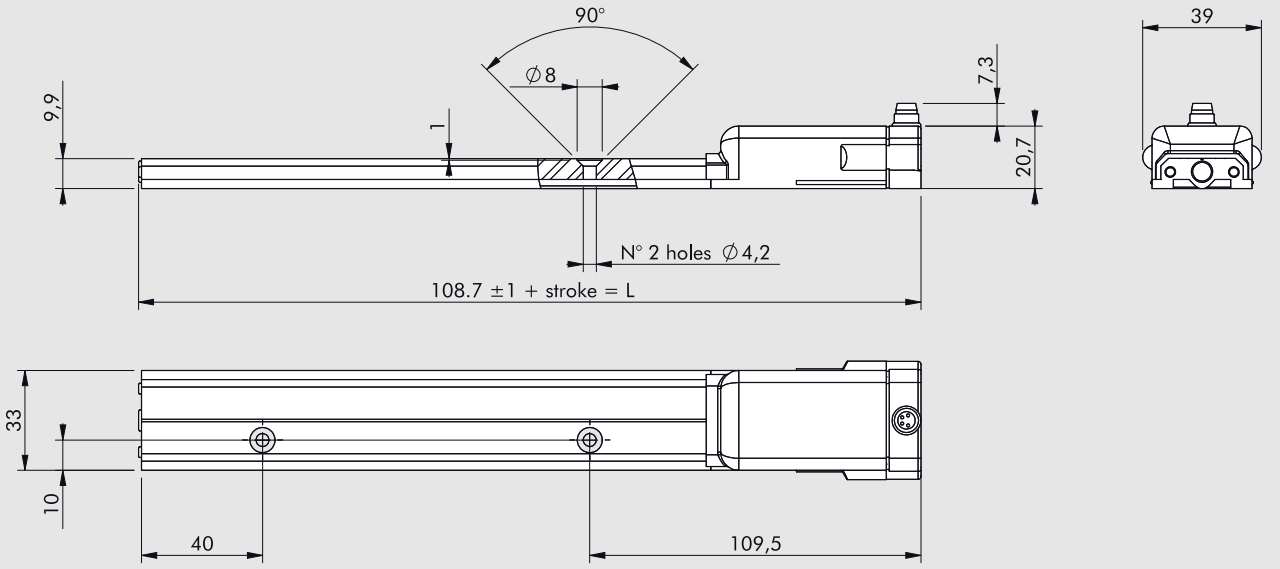
LTE POSITION SENSOR

The LTE is a in-line position sensor with an innovative magnetostrictive solution and no electric contact.
The absence of an electric contact on the slide eliminates the problem of wear and guarantees a virtually unlimited life. The position sensor is fixed in one of the sensor slots in the actuator liner by means of two screws. Actuators to which the position sensor is applied are standard and require no adaptation, they just have to be the magnetic version. The position sensor automatically detects the position of the magnets inside the cylinder.
The LTE is applied to ISO 15552 type A cylinders with the same stroke and the measuring length.
For longer strokes please contact our sales department.

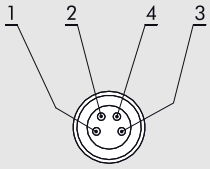
TECHNICAL DATA		
Measuring length	mm	150 - 200 - 250 - 300 - 350 - 400 - 450 - 500
Electrical connection		M8x1 – 4 pin
Sample time	ms	1 for measuring lengths up to 600 mm, 1.5 for greater lengths
DIN IEC68T2-27 shock test		100 g - 11 ms - single stroke
DIN IEC68T2-6 vibration test		12g / 10 ... 2000 Hz
Maximum displacement speed	m/s	≤ 10
Maximum acceleration	m/s^2	≤ 100
Resolution		Endless
Linearity*	mm	≤ ±0.2% f.s. (min ±1 mm)
Maximum repeatability	mm	≤ 0.05
Maximum hysteresis	mm	≤ 0.2
Operating temperature	°C	0 to +50
Storage temperature	°C	-40 to +100
Temperature coefficient		≤ ±0.01% f.s./°C (min 0.015 mm/°C)
Index of protection		IP 65
Spam		9 VDC ± 100 mV max
Voltage	V	24 ± 20%
Electrical zero	V	0.8
Maximum ripple voltage		1 Vpp
Output current consumption	mA	35
Output load	kΩ	≥ 10
Max. output value	V	12
Alarm output value	V	10.5
Electrical insulation	V	50
Polarity inversion protection		YES
Short-circuit protection		YES
Overload protection		YES

* In some applications, linearity may be higher than the value indicated.

DIMENSIONS AND ELECTRICAL CONNECTION



L = Total length



PIN	Colour	Function
1	Brown	Voltage +
2	White	Output
3	Blue	Voltage -
4	Black	Shield

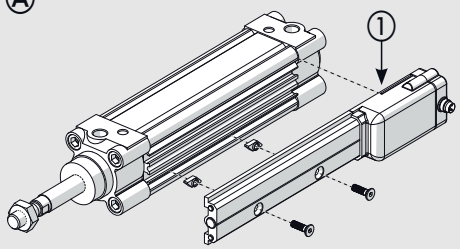
FIXING ON THE ACTUATOR AND START-UP

The position sensor can be fixed on the cylinder using either two M4 T-slot plates for vertical insertion + 2 M4x14 hexagon socket countersunk head screws (code W0950000469). If the cylinder head projects from the liner, position one or more spacers.
The installation procedure is as follows:

1. Insert either the fixing blocks or the plates in the T-slots in the cylinder (fig. A);
2. Mount the position sensor on the cylinder, aligning the reference mark a) with the end of the liner (Fig. A). Do up the screws loosely and retract the piston rod completely (Fig. B).
3. Connect the voltage or current analogue output, power on the position sensor and wait at least 1 second for the magnet orientation to be recognized.
4. Slide the position sensor along until the zero value reading is 0.8V.
5. Tighten the two M4x14 screws on the securing element inserted in the T-slot (Fig. C).

The end of the position sensor may project a certain amount from the end of the cylinder head, depending on the type of cylinder.

Ⓐ



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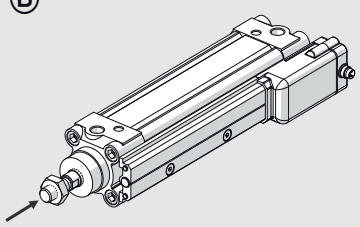

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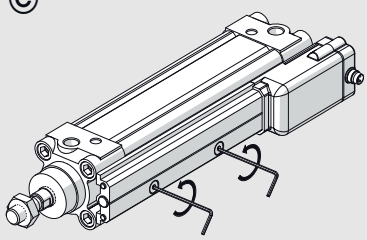
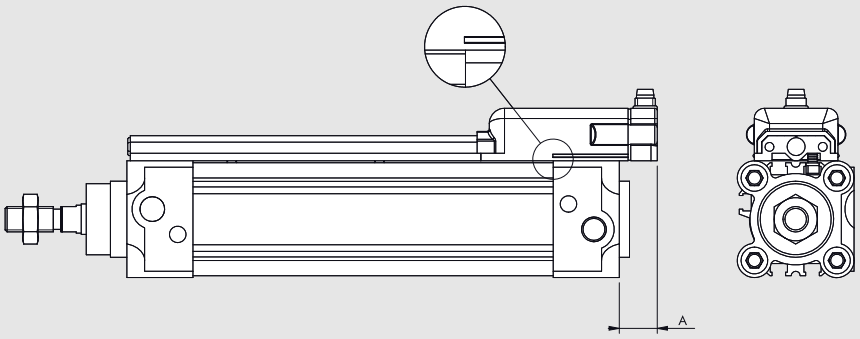


METAL WORK PNEUMATIC

PROJECTION OF POSITION SENSOR ON ISO 15552 TYPE A CYLINDERS

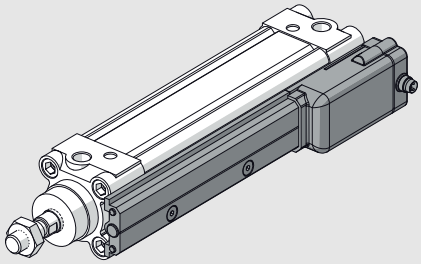


Bore [mm]	A [mm]
32	~ 16
40	~ 12
50	~ 12

N.B. Projection by a zero value equal to 0.8V

CHOICE OF POSITION SENSOR BASED ON THE ACTUATOR MEASURING STROKE

ISO 15552 TYPE A CYLINDERS



Ø 32 - Ø 40 - Ø 50	
Measuring stroke [mm]	Position sensor model
150	LTE-150
200	LTE-200
250	LTE-250
300	LTE-300
350	LTE-350
400	LTE-400
450	LTE-450
500	LTE-500

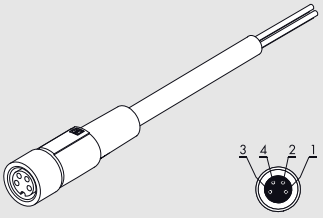
ORDERING CODE

Code	Description Metal Work	Description GEFRAN
W0950000482	LTE-150 position sensor	ONPP-A-S-0150-N
W0950000483	LTE-200 position sensor	ONPP-A-S-0200-N
W0950000484	LTE-250 position sensor	ONPP-A-S-0250-N
W0950000485	LTE-300 position sensor	ONPP-A-S-0300-N
W0950000486	LTE-350 position sensor	ONPP-A-S-0350-N
W0950000487	LTE-400 position sensor	ONPP-A-S-0400-N
W0950000488	LTE-450 position sensor	ONPP-A-S-0450-N
W0950000489	LTE-500 position sensor	ONPP-A-S-0500-N

NOTES

ACCESSORIES

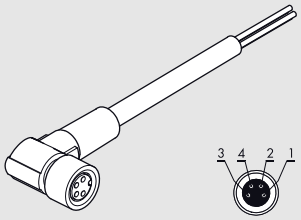
STRAIGHT M8 CONNECTORS



Pin	Cable colour
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009100	M8 4-pin connector – female, straight L = 2 m
0240009101	M8 4-pin connector – female, straight L = 5 m

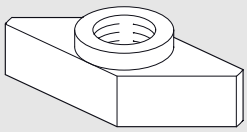
90° M8 CONNECTORS



Pin	Cable colour
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009102	M8 4-pin connector – female, 90° angle L = 2 m
0240009103	M8 4-pin connector – female, 90° angle L = 5 m

SLOTTED FIXING PLATE WITH INSERTION FROM ABOVE



Code	Description	Weight [g]
W0950000469	M4 T-slotted fixing plate	4

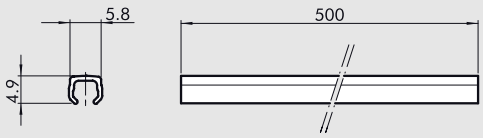
Note: 2 items plus 2 M4x14 screws per pack

Materials: Stainless steel plate and screws

NOTES

ACCESSORIES T-SLOT

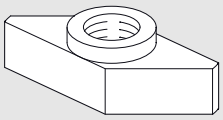
BAR FOR GROOVING



Code	Description
W0950000160	Bar for grooving L = 500 mm

Note: The code corresponds to 1 piece.

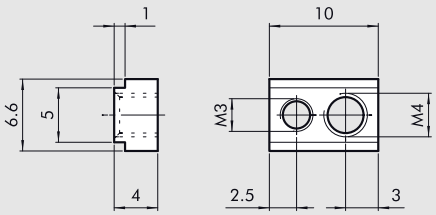
SLOTTED FIXING PLATE



Code	Description	Weight [g]
0950003001	M4 T-slotted fixing plate	1
0950003002	M3 T-slotted fixing plate	1

Note: Individually packed

SLOTTED FIXING PLATE



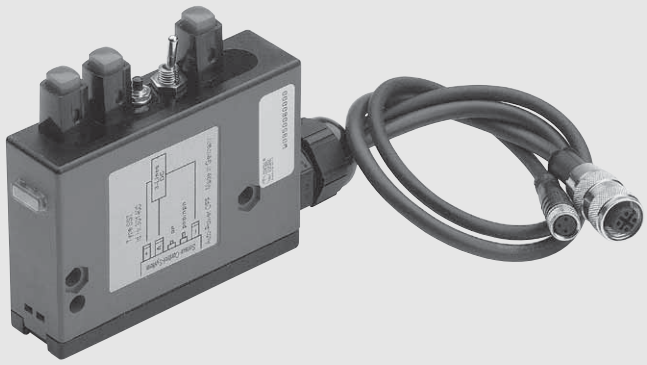
Code	Description	Weight [g]
0950003000	Fixing block	2

Note: Supplied complete with 1 M3 grub screw and 1 M4 grub screw

NOTES

SENSOR TESTER

This sensor tester features the following:
- a green light and acoustic signal indicating correct operation
- sensors can be checked without having to be disassembled
- M8 and M12 connections, and terminal board for direct connection to the wires
- PNP or NPN switching button
- 9V battery power supply
- automatic switch-off

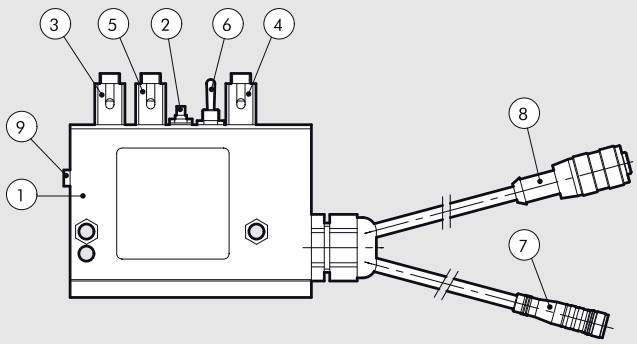


TECHNICAL DATA

Container material	PA 6.6 blue
Degree of protection	IP00
Connections	M8 and M12 plug-socket type with 40 cm cable
Additional connections	3 terminals for wire connection
Power supply	9V DC (battery type 6LR61)
Internal voltage	15V DC
Green light	tester switched on
Yellow light	sensor in operation
Red light	battery flat

COMPONENTS

① CONTAINER (PA 6.6 blue)
② START BUTTON
③ WIRE CONNECTION + (brown)
④ WIRE CONNECTION – (blue)
⑤ OUTPUT CONNECTION (black)
⑥ PNP/NPN SELECTOR
⑦ M8x1 CONNECTOR
⑧ M12x1 CONNECTOR
⑨ LED COVER

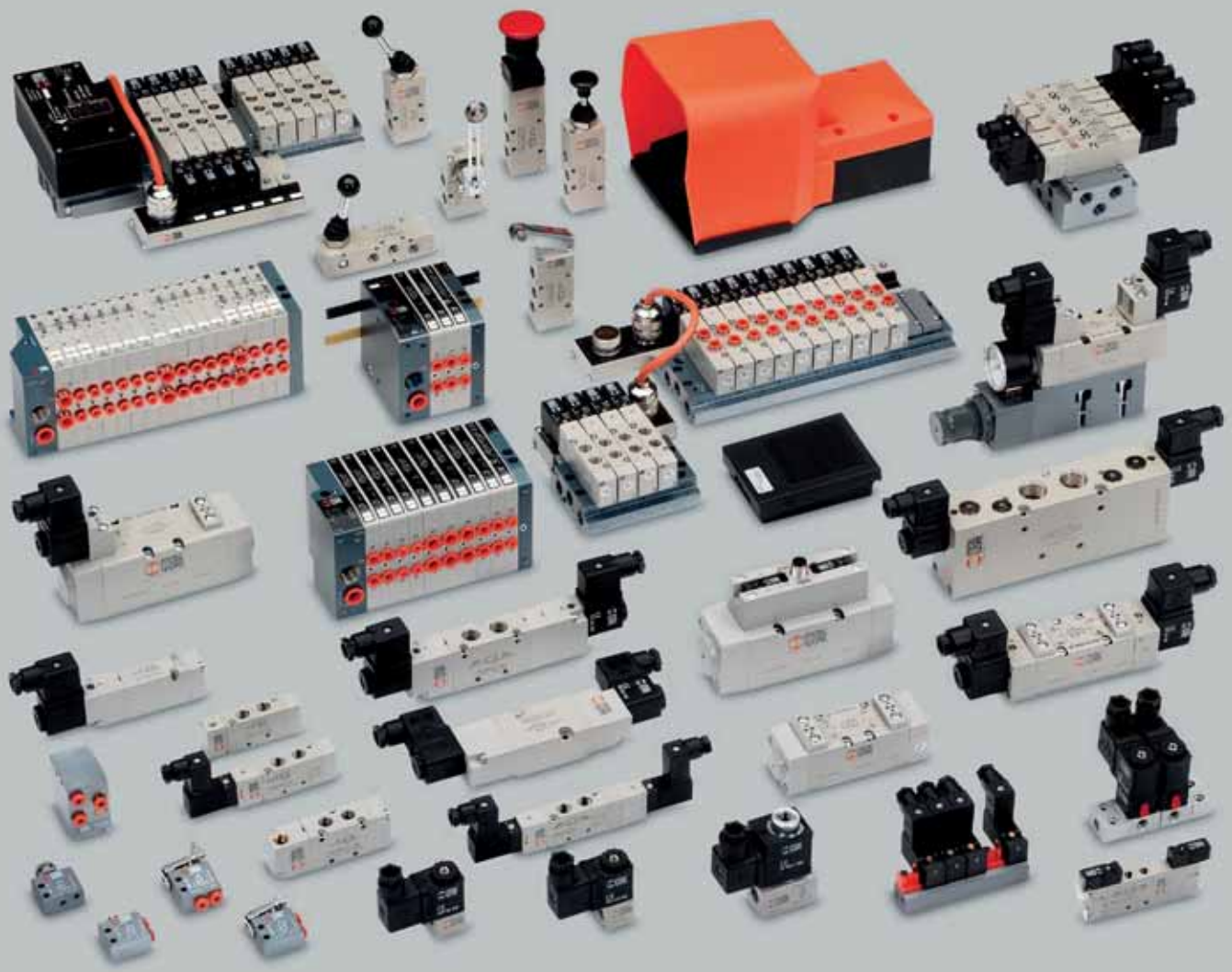


Code	Description	Dimension [mm]	Weight [g]
W0950060000	Sensor tester	63x88x24	192

METAL WORK PNEUMATIC

NOTES

METAL WORK PNEUMATIC



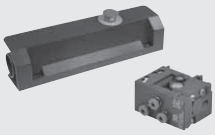
DISTRIBUTORS

- VALVES B1
- VALVES ISLANDS AND FIELDBUS B2
- PROCESS VALVES MULTIPLE FLUIDS B3

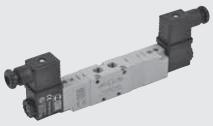
VALVES SUMMARY

- **MINIVALVES SERIES VME-1 MECHANICALLY/HAND OPERATED** B1.4

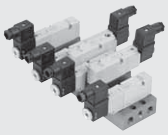
- **VALVES SERIES PEV PEDAL OPERATED** B1.8



- **TWO HAND SAFETY VALVE SERIE SAFE AIR®** B1.10

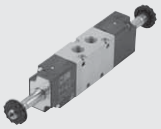


- **VALVES SERIES 70** B1.12



- **VALVES SERIES 70 ON BASE** B1.42

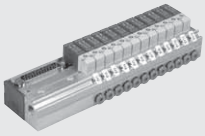
- **VALVES NAMUR** B1.47



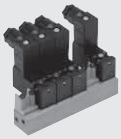
- **VALVES SERIES BASIC** B1.50

- **COILS AND CONNECTORS FOR SERIES 70, NAMUR AND SERIES BASIC VALVES** B1.54

- **10-mm SOLENOID VALVES SERIES PLT-10** B1.55



- **BASES FOR PLT-10 MULTIPLE CONNECTION** B1.58



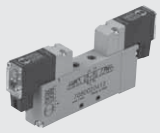
- **SOLENOID VALVES PIV.M 15-mm** B1.64

- **SOLENOID VALVES PIV ON BASE** B1.66

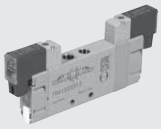
- **SOLENOID VALVES PIV IN LINE** B1.71

METAL WORK PNEUMATIC

- **SOLENOID VALVE CNOMO** B1.74

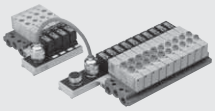


- **VALVES MINIMACH** B1.77



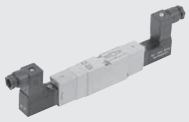
- **VALVES MACH 11** B1.82

- **VALVES MACH 16** B1.88



- **MULTIPLE CONNECTOR MACH 16** B1.95

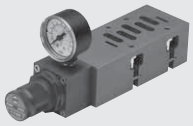
- **REDUCER WITH GAUGE FOR VALVES, SERIES RMV** B1.108



- **VALVES MACH 18, ISO 15407-1/VDMA 24563-02** B1.109

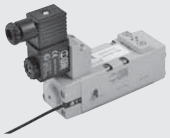
- **VALVES ISO 5599/1, SERIES IPV-ISV** B1.115

- **VALVE ISO 5599/1 SOLENOID/PNEUMATIC, SERIE ISV WITH M12 CONNECTOR** B1.123



- **SANDWICH REGULATORS FOR ISO 5599/1 BASES ISO 1-2** B1.131

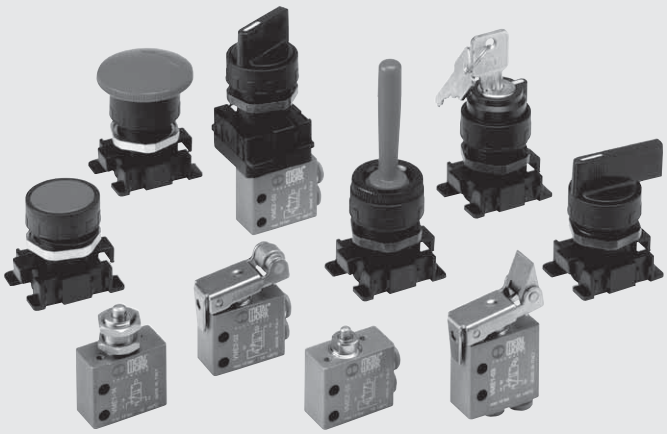
- **VALVES SERIES 70 SAFE AIR®** B1.132



- **VALVES ISO 5599/1 SERIE SAFE AIR®** B1.142

MINIVALVES, MECHANICALLY AND HAND OPERATED SERIES VME

- Minivalves with 3/2 NO NC poppet,
- Installation in any position
- Push-in fittings for pipe Ø 4 mm and M5 on the valve body
- Low actuation force
- Rapid, accurate signal
- Mechanical actuation
- The 2 places adapter allows manual actuation of 1 or 2 VME valves with manual Ø 22 panel actuators. Thus it is possible to obtain 3/2, 5/2, 5/3 open centre and 5/3 pressure centre pneumatic functions.
- On request, it is possible to place a NC-NO electric switch next to VME valve for mixed solenoid/pneumatic signals.

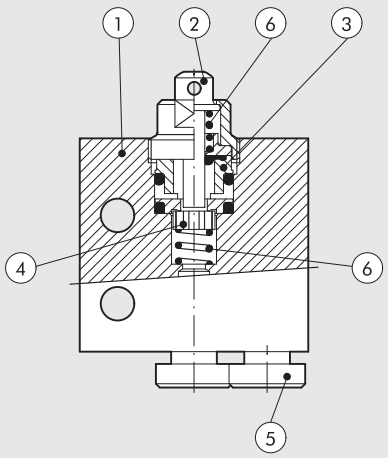


TECHNICAL DATA

Valve fitting port		Push-in fitting for pipe diam. 4 and M5 (axial or side)
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous
Type		With poppet
Versions		Mechanical and manual
Operators:		
• mechanical		With Plunger – Plunger for wall-mounting – Roller lever – Unidirectional roller lever
• manual		Depending on the type of actuation panel selected
Operating pressure	bar	0.5 to 10
Operating temperature range	°C	-10° to +60
Nominal diameter	mm	2.5
Conductance C	Nl/min · bar	16.5
Critical ratio b	bar/bar	0.03
Flow rate at 6 Bar ΔP 0.5 Bar	Nl/min	35
Flow rate at 6 Bar ΔP 1 Bar	Nl/min	60
Actuation force – Plunger at 6 Bar	N	8
Recommended lubricant		ISO and UNI FD22
Installation		In any position
Compatibility with oils		See **chapter Z1**

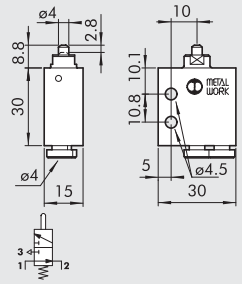
COMPONENTS

① VALVE BODY: Aluminium
② BUTTON: chemically nickel-plated brass
③ DISTANCE PLATES: Brass
④ GASKETS: NBR
⑤ PUSH-IN FITTING CARTRIDGES: stainless steel, brass and plastic
⑥ SPRINGS: stainless steel

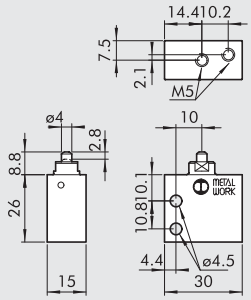


PLUNGER 3/2 NO - AXIAL FITTINGS

Ø 4



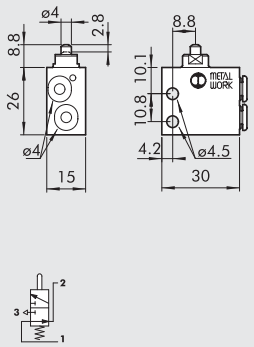
M5



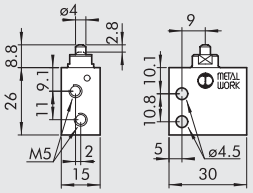
Code	Description	Weight [g]
W3501000101	VME1-10 NO Ø 4	42
W3501000110	VME1-16 NO M5	36

PLUNGER 3/2 NO - SIDE FITTINGS

Ø 4



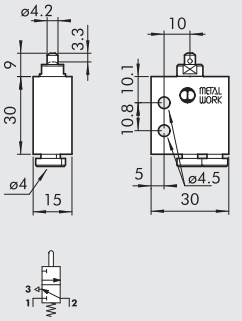
M5



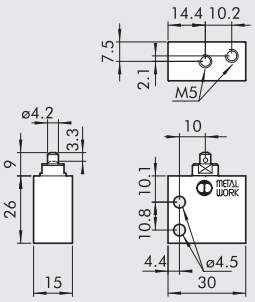
Code	Description	Weight [g]
W3501001100	VME2-00 NO Ø 4	34
W3501001110	VME2-10 NO M5	34

PLUNGER 3/2 NC - AXIAL FITTINGS

Ø 4



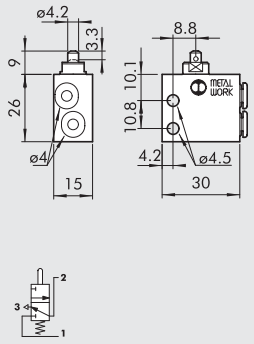
M5



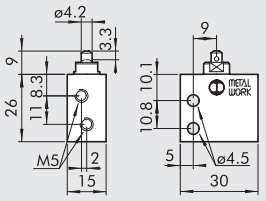
Code	Description	Weight [g]
W3501000100	VME1-01 NC Ø 4	42
W3501000111	VME1-11 NC M5	36

PLUNGER 3/2 NC - SIDE FITTINGS

Ø 4



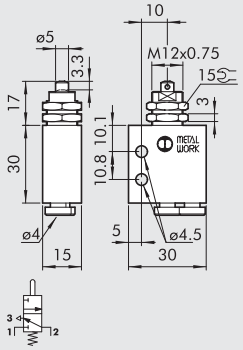
M5



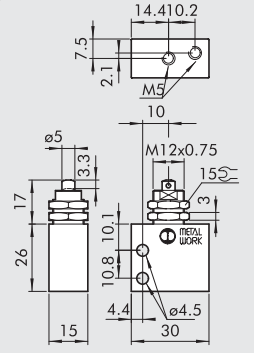
Code	Description	Weight [g]
W3501001101	VME2-01 NC Ø 4	34
W3501001111	VME2-11 NC M5	34

PLUNGER FOR WALL MOUNTING, 3/2 NC - AXIAL FITTINGS

Ø 4



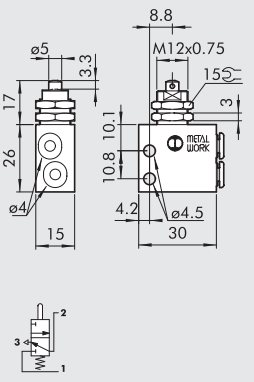
M5



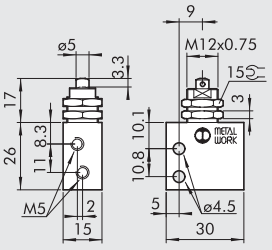
Code	Description	Weight [g]
W3501000400	VME1-04 NC Ø 4	54
W3501000411	VME1-14 NC M5	48

PLUNGER FOR WALL MOUNTING, 3/2 NC - SIDE FITTINGS

Ø 4



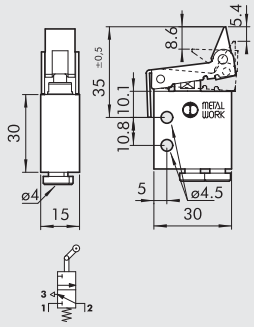
M5



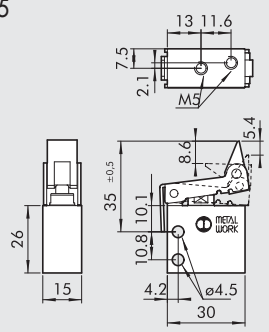
Code	Description	Weight [g]
W3501001401	VME2-04 NC Ø 4	46
W3501001411	VME2-14 NC M5	46

UNIDIRECTIONAL ROLLER LEVER, 3/2 NC - AXIAL FITTINGS

Ø 4



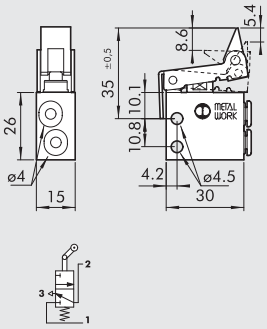
M5



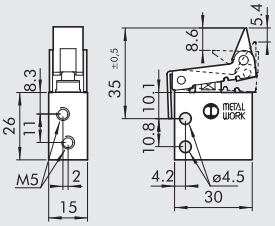
Code	Description	Weight [g]
W3501000300	VME1-03 NC Ø 4	60
W3501000311	VME1-13 NC M5	54

UNIDIRECTIONAL ROLLER LEVER, 3/2 NC - SIDE FITTINGS

Ø 4



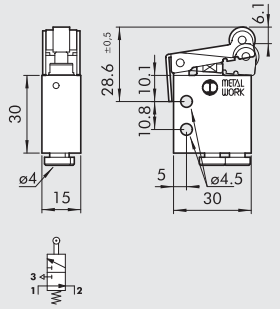
M5



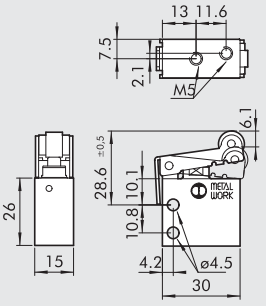
Code	Description	Weight [g]
W3501001301	VME2-03 NC Ø 4	52
W3501001311	VME2-13 NC M5	52

ROLLER LEVER, 3/2 NO - AXIAL FITTINGS

Ø 4



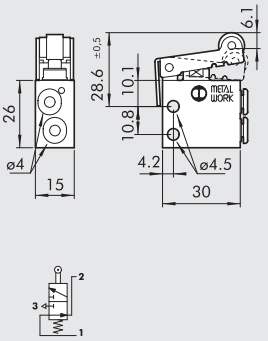
M5



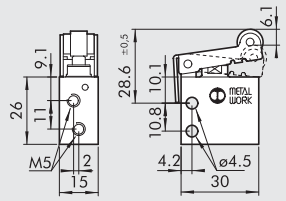
Code	Description	Weight [g]
W3501000201	VME1-05 NO Ø 4	58
W3501000210	VME1-15 NO M5	52

ROLLER LEVER, 3/2 NO - SIDE FITTINGS

Ø 4



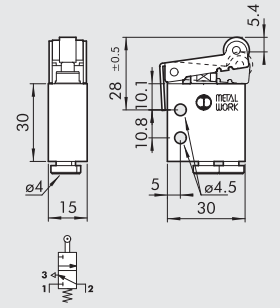
M5



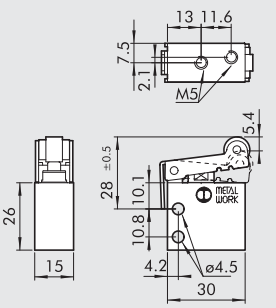
Code	Description	Weight [g]
W3501001200	VME2-05 NO Ø 4	50
W3501001210	VME2-15 NO M5	50

ROLLER LEVER, 3/2 NC - AXIAL FITTINGS

Ø 4



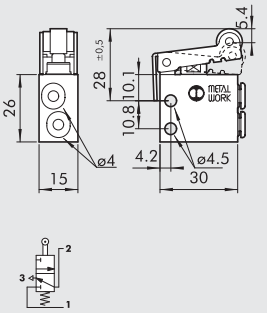
M5



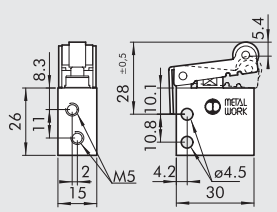
Code	Description	Weight [g]
W3501000200	VME1-02 NC Ø 4	56
W3501000211	VME1-12 NC M5	50

ROLLER LEVER, 3/2 NC - SIDE FITTINGS

Ø 4



M5



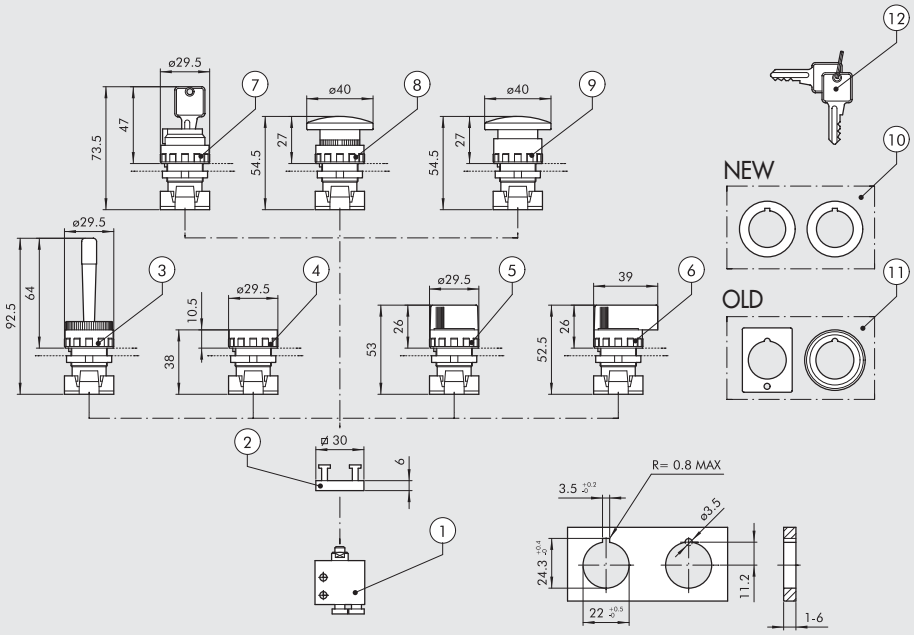
Code	Description	Weight [g]
W3501001201	VME2-02 NC Ø 4	52
W3501001211	VME2-12 NC M5	50

METAL WORK PNEUMATIC

MANUAL VME VALVES – ASSEMBLY DIAGRAM

NOTES:

- For 5/2 pneumatic operation, assemble a 3/2 NC plunger valve and a 3/2 NO one on the adapter.
- For 5/3 pneumatic operation with open centres, assemble two 3/2 NC plunger valves on the adapter.
- For 5/3 pneumatic operation with pressure centres, assemble two 3/2 NO plunger valves on the adapter.



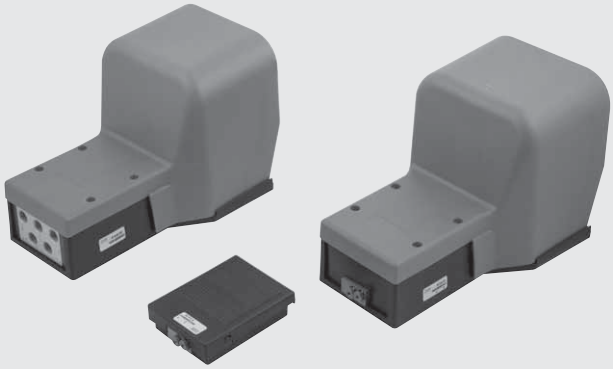
ORDERING CODES

Symbol	Reference	Code	Description	Weight [g]
	①	**W3501000100**	3/2 NC Axial fittings Ø 4	42
		W3501000111	3/2 NC Axial fittings M5	36
		W3501001101	3/2 NC Side fittings Ø 4	34
		W3501001111	3/2 NC Side fittings M5	34
	①	**W3501000101**	3/2 NO Axial fittings Ø 4	42
		W3501000110	3/2 NO Axial fittings M5	36
		W3501001100	3/2 NO Side fittings Ø 4	34
		W3501001110	3/2 NO Side fittings M5	34
	②	**0351000050**	2 places adaptor thickness 6.8 mm	5
	③	**W0351000015**	Red handler with horizontally pivoted lever	25
	④	**W0351000011**	Fat push button + 2 red/black coloured disks	15
			◆ Bistable fat push button without disk	
	⑤	**W0351000030**	Black selector short lever at 2 positions with return	20
		W0351000031	Black selector short lever at 2 positions	20
	⑤	**W0351000032**	Black selector short lever at 3 positions with return	20
		W0351000033	Black selector short lever at 3 positions	20
	⑥	**W0351000034**	Black selector long lever at 2 positions with return	26
		W0351000035	Black selector long lever at 2 positions	26
	⑥	**W0351000036**	Black selector long lever at 3 positions with return	26
		W0351000037	Black selector long lever at 3 positions	26
	⑦	**W0351000016**	2 positions key selector with extractable key in 2 positions	50
		W0351000018	2 positions key selector with extractable key in 0	50
	⑧	**W0351000013**	Red mushroom-head push button Ø 40	27
		W0351000017	Black mushroom-head push button Ø 40	27
	⑨	**W0351000014**	Red mushroom-head push button with lock Ø 40	29
	⑩	**W0351000049**	✚ Reducer from 30 to 22.5 mm	
	⑪	**W0351000050**	▲ Adapter for bore Ø 30 G2326	
	⑫	**W0351000021**	✚ Key for ESC selectors	
		W0351000056	Green disk for push button ④	

◆ It can't be supplied. As working replaced by selector with bistable short lever at 2 positions ⑤.
✚ Usable only with technopolymer body selectors.
▲ Usable only with metal body selectors.

VALVES SERIES PEV
PEDAL OPERATED

The valves series PEV with pedal are available in a wide range:
- 5/2 1/4" monostable and bistable with guarded pedal
- 3/2 M5 monostable, pedal not guarded
- 3/2 Ø 4 monostable, pedal not guarded
- 3/2 M5 in monostable and bistable configuration with guarded pedal
- 3/2 Ø 4 in monostable and bistable configuration with guarded pedal

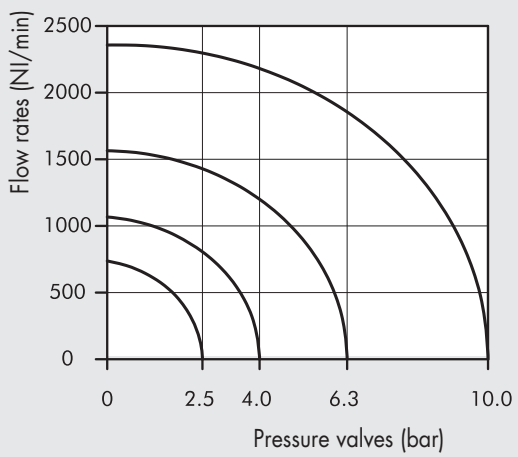


TECHNICAL DATA

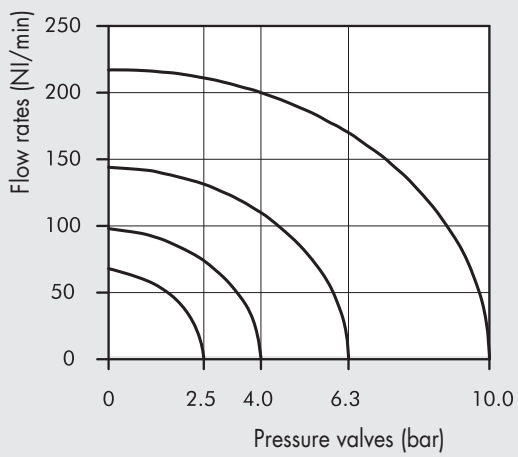
Valve fitting port		Ø 4	M5	1/4"
Type		Mono/ bistable guarded Monostable not guarded	Monostable not guarded Mono/ bistable guarded	Mono/ bistable guarded –
Operating pressure	bar	2.5 to 10		
	Mpa	0.25 to 1		
	psi	36 to 145		
Operating temperature range	°C	–10 + 60		
Nominal diameter	mm	2.5	2.5	7.5
Conductance C	Nl/min · bar	16.5	16.5	264.26
Critical ratio b	bar/bar	0.03	0.03	0.32
Flow rate at 6.3 bar ΔP 0.5 bar	Nl/min	60	60	640
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	95	95	840
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous		
Compatibility with oils		See **chapter Z1**		

FLOW CHARTS

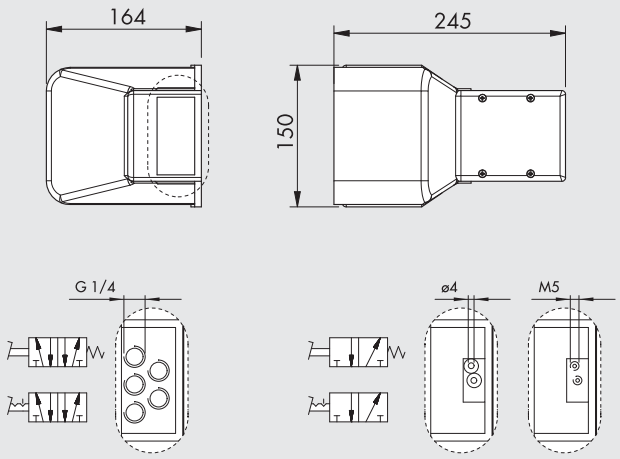
1/4"



M5/Ø 4 mm



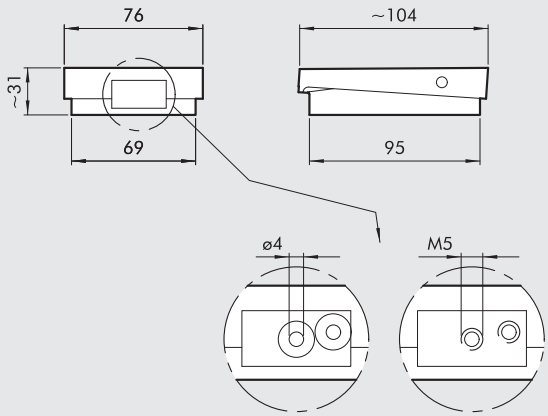
GUARDED PEDAL WITH VALVES 5/2 1/4" - 3/2 M5 - 3/2 Ø 4



Symbol	Code	Description	Abbrev.	Weight [g]
	W3120000001	5/2 - 1/4" monostable, guarded	PEV 35 PES PR	1027
	W3120000011	5/2 - 1/4" bistable, guarded ●	PEV 35 PEB PR	1035
	W3120000301	3/2 M5 monostable, guarded	PEV 03 PES PR	883
	W3120000321	3/2 Ø 4 monostable, guarded	PEV F3 PES PR	887
	W3120000331	3/2 M5 bistable, guarded ●	PEV 03 PEB PR	890
	W3120000311	3/2 Ø 4 bistable, guarded ●	PEV F3 PEB PR	914
	W3120000021	5/2 - 1/4" monostable, with mechanical block and guarden ■	PEV 35 PEC PR	1014

● The pedal-down position is maintained by a lever.
When the foot presses on the lever, the pedal releases and can rise.
■ When the foot presses on a locking lever, the pedal can be lowered.

NOT-GUARDED PEDAL WITH VALVES 3/2 M5 - 3/2 Ø 4



Symbol	Code	Description	Abbrev.	Weight [g]
	W3120000411	3/2 - M5 monostable, not guarded	PEV 03 PES WP	188
	W3120000401	3/2 Ø 4 monostable, not guarded	PEV F3 PES WP	192

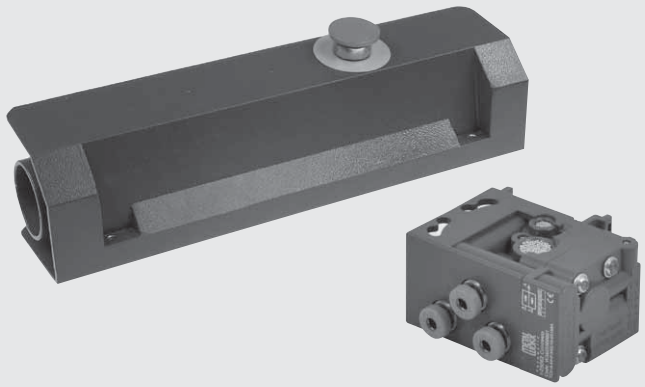
SYNOPTIC, SIZES AND VERSIONS

P E V	F	3	P E	C	W P
FAMILY	DIMENSIONS	FUNCTION	OPERATORS 14	RESETTING (12)	FURTHER DETAILS
PEV valve with pedal	3 1/4	3 3/2	PE pedal operated	S mechanical springs	WP not guarded
	0 M5	5 5/2		C mechanical block	PR guarded
	F Ø 4			B bistable	

TWO HAND SAFETY VALVE SERIES SAFE AIR®

The two hand safety valve generates an output signal only if two synchronised pneumatic input signals are received.
If one input signal is interrupted, the output signal is interrupted as well.
The most common application involves connecting a manual button-controlled valve to each of the inputs and using the output signal as a start-of-cycle control for a pneumatically-operated machine.

- The two hand safety valve can be secured with through screws or a DIN bar adaptor.
- The complete pushbutton panel includes the dual manual control valve, two manual pushbuttons, and an emergency stop valve, all housed in a metal box to be mounted on a wall or stand.
- The pushbutton housing is supplied on request for anyone wishing to get a personalised pneumatic connection or drill holes to secure the unit.



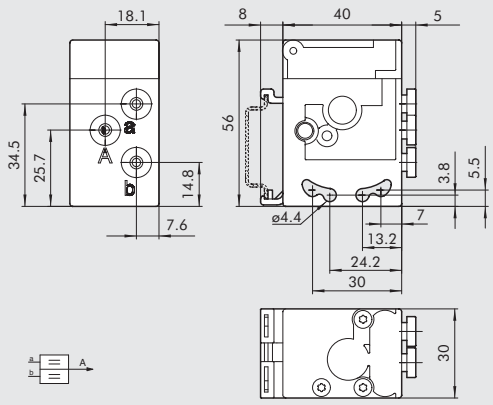
TECHNICAL DATA

Compressed air couplings	mm	Push-in fitting for Ø 4 pipe
Fluid		Filtered, unlubricated compressed air, max 50 µm
Version		Single-control – Complete pushbutton panel
Standard		• EN574 type IIIA, TÜV approvated according to 2006/42/EC
		Certified TÜV-A-MHF/MG18-00134 (code W3605000001)
		• Certified Bureau Veritas CV 002-03-2018 (code 0227700000)
Synchronisation, max. time between two signals	s	0.4
De-activation time, with pipe L = max 1000 mm	s	< 0.05
Actuation		pneuamtic
Reset		spring operated
Operating pressure	bar	2.5 to 8
Temperature range	°C	- 10 to +60
Nominal diameter	mm	2.7
Flow rate at 6 bar (0.6 Mpa - 87 psi) ΔP 1 bar (0.1MPa -1.45 psi)	Nl/min	85
Mounting position		In any direction
Compatibility with oils		See **chapter Z1**

TWO HAND SAFETY VALVE

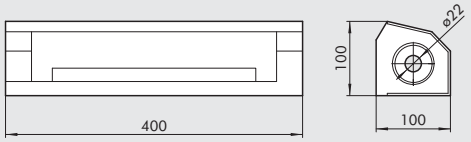
Code	Description
W3605000001	Two hand safety valve

Materials
Body: technopolymer
Internal parts: brass and technopolymer
Gaskets: NBR
Spring: alloy steel



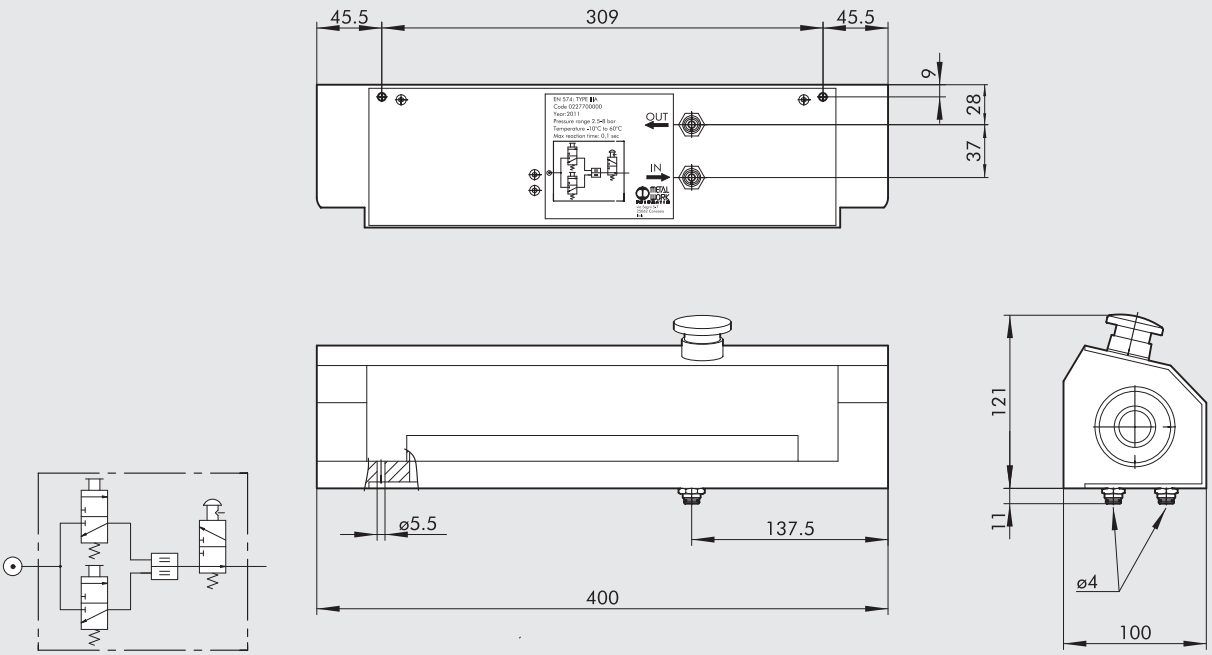
PUSHBUTTON HOUSING

Code	Description
W3120000212	Pushbutton housing



METAL WORK PNEUMATIC

COMPLETE PUSHBUTTON PANEL



Code	Description
0227700000	Complete pushbutton panel

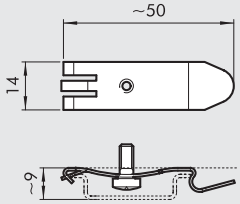
Materials
Pressure die-cast and painted aluminium alloy

MAIN COMPONENTS

Code	Description	Quantity
W3605000001	Dual manual safety valve	1
W0351000011	Monostable protected button - black disk	2
W0351000014	Emergency stop button	1
W3501000100	VME1-01 NC Ø 4	2
W3501001100	VME2-01 NO Ø 4	1
0351000050	Valve-button connecting base	3
2L11001	RL10 Ø 4	2

ACCESSORIES

CONNECTION BRACKETS ON THE BAR (DIN EN50022)

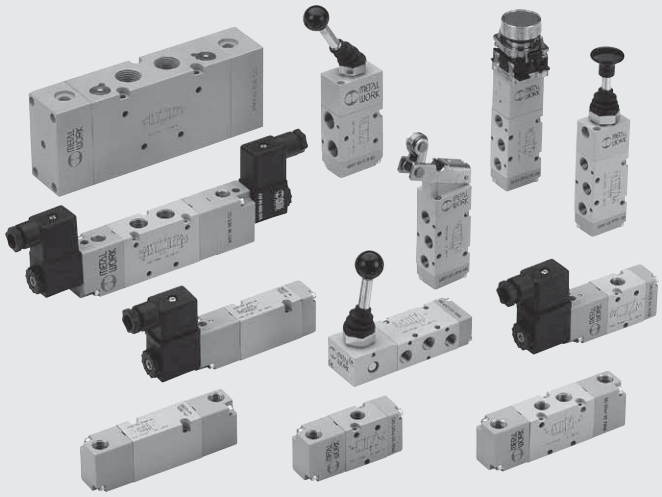


Code	Description
0227300600	Connection brackets on DIN bar

Individually packed

VALVES SERIES 70

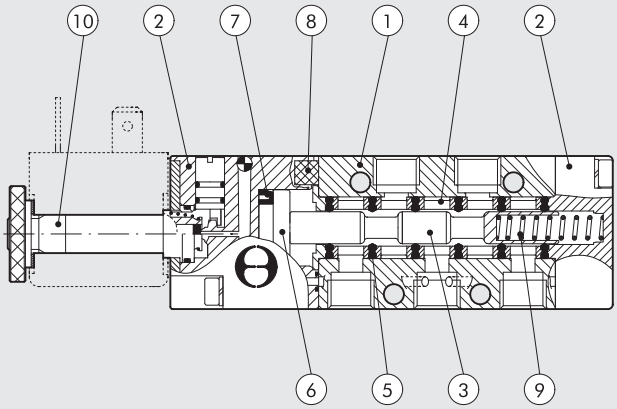
The Series 70 forms part of Metal Work's full range of traditional valves.
They are available in sizes 1/8", 1/4", 3/8" and 1/2", versions 3/2, 5/2, 5/3 and double 3/2, with mechanical, manual, pneumatic and electric drives.
They can be installed in line, onto a wall, on the cylinder (using a special bracket) or in series (on a multiple or modular base) to suit all possible applications.
These highly reliable valves comply with the main applicable standards, including Atex, ISO13489 and SIL, as stated in the documents and certificates available online.



TECHNICAL DATA		1/8"	1/4"	3/8"	1/2"
Thread on the valve ports		1/8"	1/4"	3/8"	1/2"
Operating pressure:					
• monostable	bar	2.5 to 10			
• bistable	bar	1 to 10			
• asserved	bar	vacuum to 10			
Minimum pilot pressure	bar	2.5			
Operating temperature range	°C	–10 to +60			
Nominal diameter	mm	5	7.5	13.3	15
Conductance C	Nl/min · bar	121.43	264.26	505.52	971.43
Critical ratio b	bar/bar	0.32	0.27	0.32	0.43
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	400	750	1560	3200
Flow rate at 6 bar ΔP 1 bar	Nl/min	550	1100	2150	4600
Installation		In any position (vertical assembly is not recommended for bistable valves subjected to vibration)			
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous			
Recommended lubricant		ISO and UNI FD 22			
Maximum coil nut torque	Nm	1			
Compatibility with oils		See **chapter Z1**			

COMPONENTS

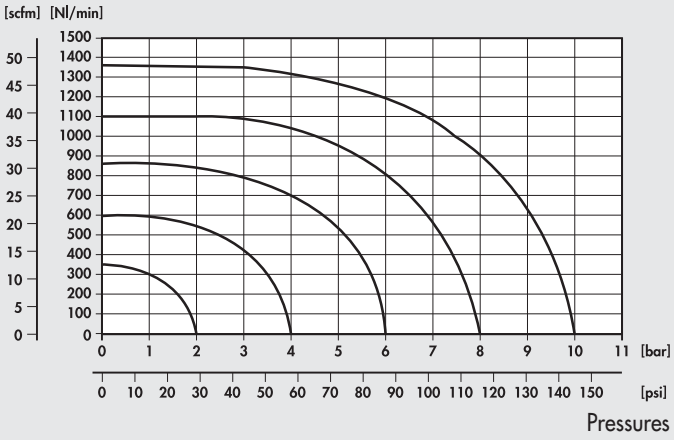
① VALVE BODY: Aluminium
② CONTROL/END CAP: plastic
③ SPOOL: chemically nickel-plated aluminium
④ DISTANCE PLATES: plastic
⑤ GASKETS: NBR
⑥ PISTONS: Hostaform®
⑦ PISTON GASKET: NBR
⑧ FILTER: sintered bronze
⑨ SPRINGS: special steel
⑩ OPERATOR: Brass pipe - Stainless steel core



FLOW CHARTS

VALVES SERIES 70, 1/8"

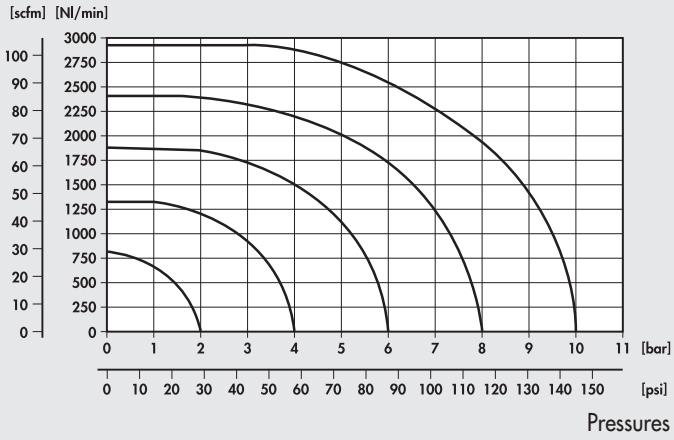
Flow rates



Pressures

VALVES SERIES 70, 1/4"

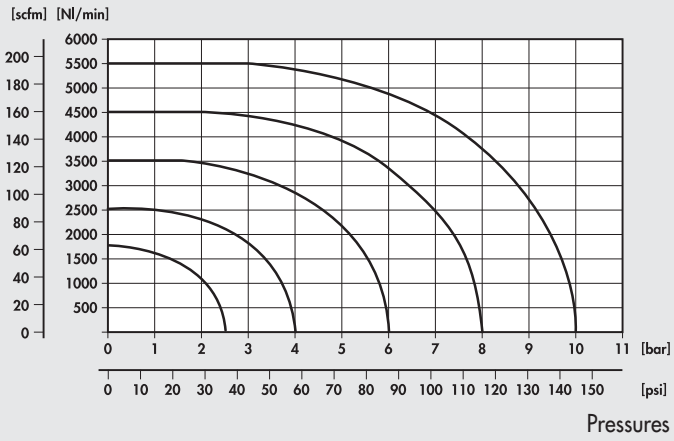
Flow rates



Pressures

VALVES SERIES 70, 3/8"

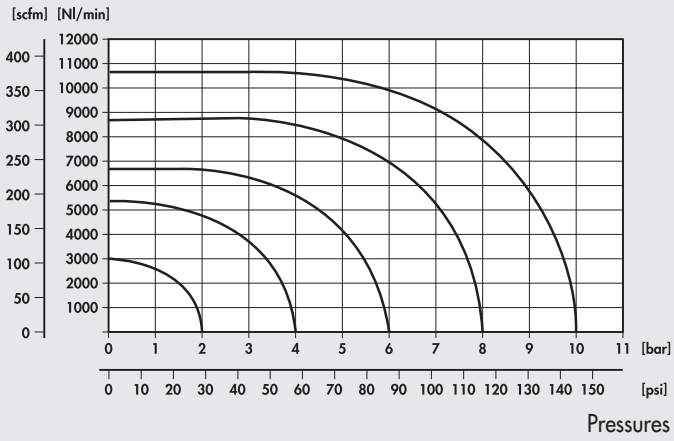
Flow rates



Pressures

VALVES SERIES 70, 1/2"

Flow rates

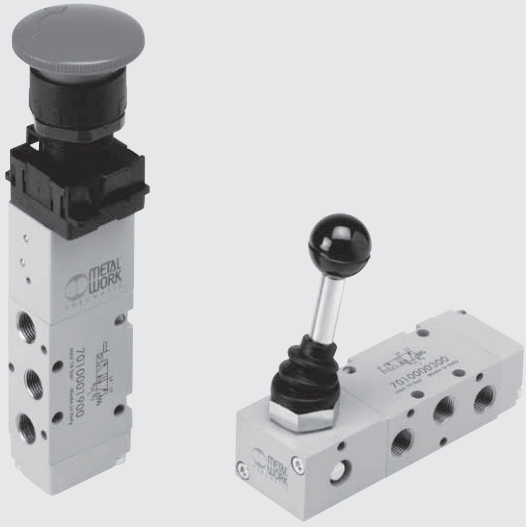


Pressures

NOTES

VALVES SERIES 70, HAND OPERATED

TECHNICAL DATA		1/8"	1/4"	1/2"
Operating pressure range:				
• version with direct control	bar		Vacuum to 10	
• pilot-assisted version	bar		2.5 to 10	
Operating temperature range	°C		-10 to +60	
Nominal diameter	mm	5	7.5	15
Conductance C	Nl/min · bar	121.43	264.26	971.43
Critical ratio b	bar/bar	0.32	0.27	0.43
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	400	750	3200
Flow rate at 6 bar ΔP 1 bar	Nl/min	550	1100	4600

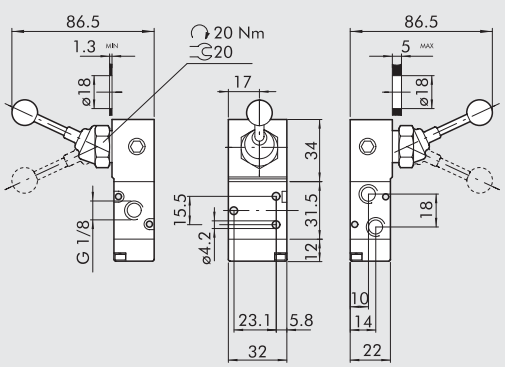


SYNOPTIC, SIZES AND VERSIONS

MAV	2	3	PP	S	NC
FAMILY	DIMENSIONS	FUNCTION	OPERATORS 14	RESETTING (12)	FURTHER DETAILS
MAV manual valves	**2** 1/8"	**3** 3/2	**PP** drawer	**A** pneumatic/ mechanical springs*	**NC** normally closed
	3 1/4"	**5** 5/2	**VL** axial lever	**S** mechanical springs	**NO** normally open
	4 1/2"	**6** 5/3	**LE** 90° lever	**B** bistable	**OO** no indication
		8 2 x 3/2	**BRE** arranged for manual panel actuators	**D** differential	**CC** closed centres
				O stable for 5/3	**OC** open centres
				*on demand	**PC** pressure centres

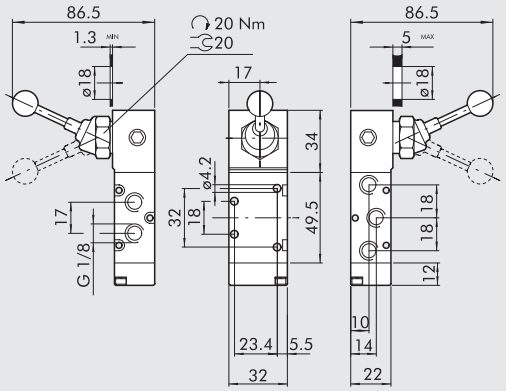
VALVES SERIES 70, HAND OPERATED, 1/8"

90° LEVER 3/2 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7010000100	MAV 23 LES NC	168
	7010000200	MAV 23 LEB OO	171

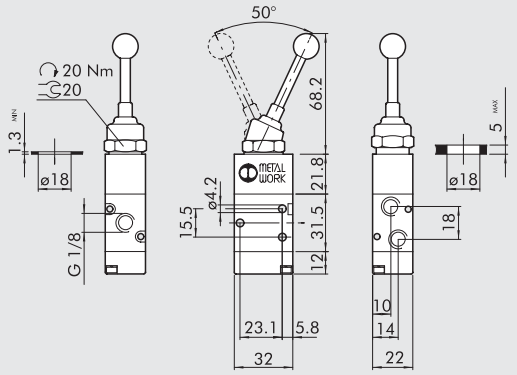
90° LEVER 5/2 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7010000300	MAV 25 LES OO	194
	7010000400	MAV 25 LEB OO	197

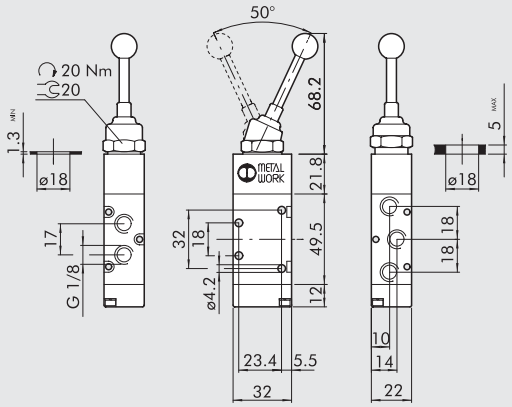
METAL WORK PNEUMATIC

FRONT LEVER 3/2, 1/8"



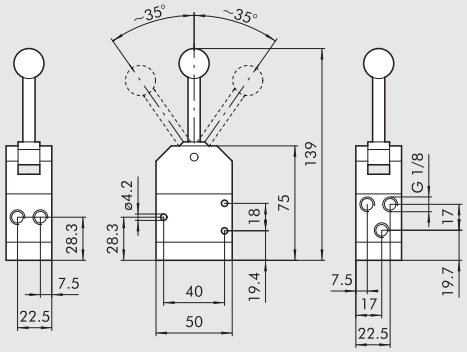
Symbol	Code	Abbrev.	Weight [g]
	7010001400	MAV 23 VLB OO	130

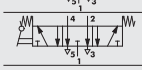
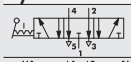
FRONT LEVER 5/2, 1/8"

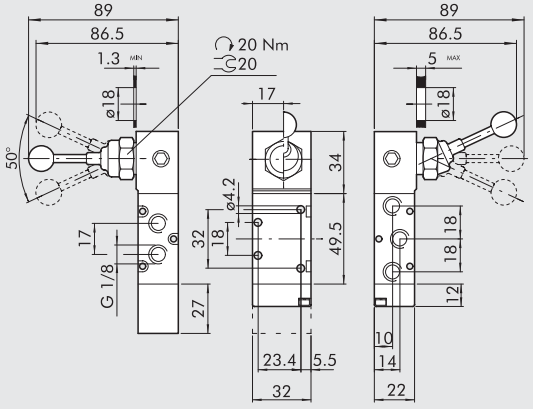


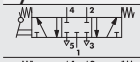
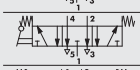
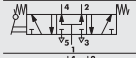
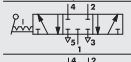
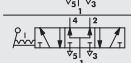
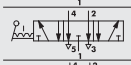
Symbol	Code	Abbrev.	Weight [g]
	7010001700	MAV 25 VLB OO	156

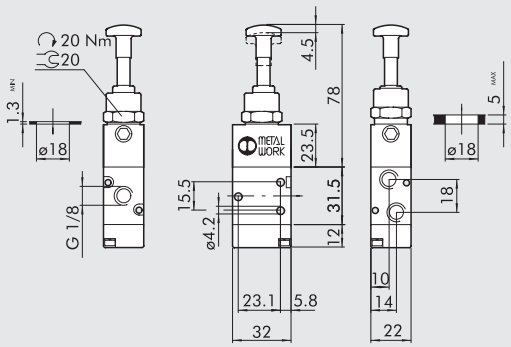
FRONT LEVER 5/3, 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7010001150	MAV 28 VLO OC	316
	7010001160	MAV 28 VLS OC	325

ANGULAR LEVER 5/3, 1/8"

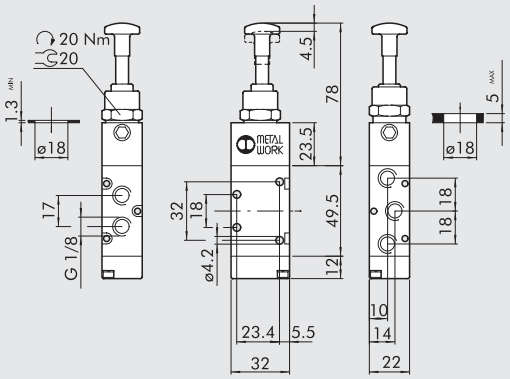


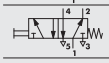
Symbol	Code	Abbrev.	Weight [g]
	7010001000	MAV 26 LES CC	242
	7010000900	MAV 26 LES OC	242
	7010001100	MAV 26 LES PC	242
	7010000500	MAV 26 LEO CC	194
	7010000600	MAV 26 LEO OC	194
	7010000700	MAV 26 LEO PC	194

DRAWER 3/2, 1/8"



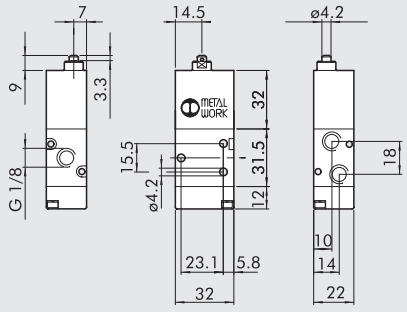
Symbol	Code	Abbrev.	Weight [g]
	7010001300	MAV 23 PPB OO	134
	7010001200	MAV 23 PPS NC	134

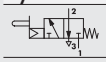
DRAWER 5/2, 1/8"



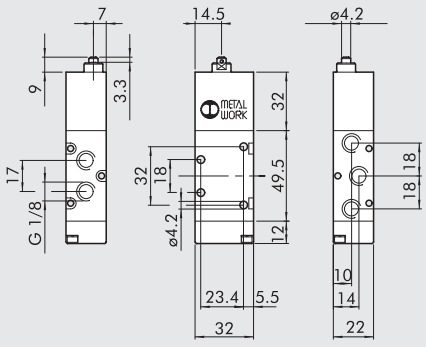
Symbol	Code	Abbrev.	Weight [g]
	7010001600	MAV 25 PPB OO	160
	7010001500	MAV 25 PPS OO	160

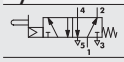
PILOT-ASSISTED PLUNGER 3/2 1/8" FOR PANEL ACTUATORS



Symbol	Code	Abbrev.	Weight [g]
	7010001800	MAV 23 BRE NC	124

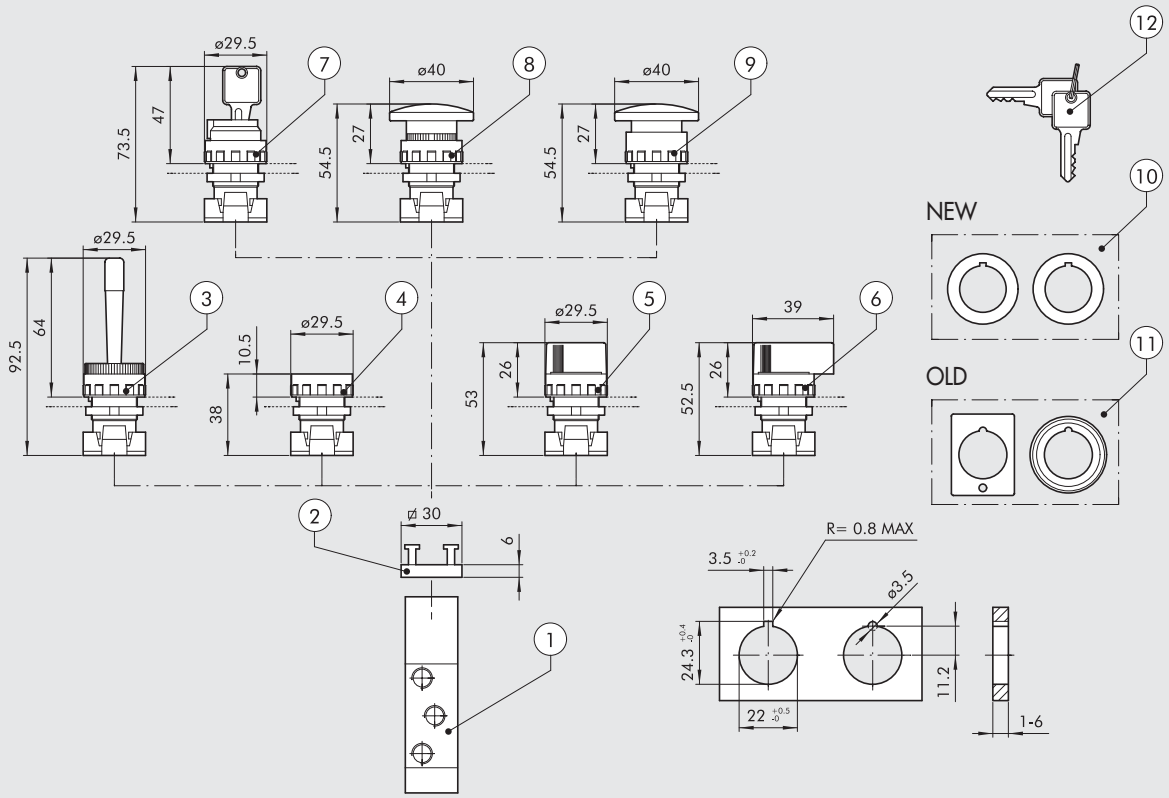
PILOT-ASSISTED PLUNGER 5/2 1/8" FOR PANEL ACTUATORS



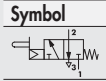
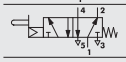
Symbol	Code	Abbrev.	Weight [g]
	7010001900	MAV 25 BRE OO	150

METAL WORK PNEUMATIC

ASSEMBLY DIAGRAM FOR PILOT-ASSISTED HAND-OPERATED VALVES SERIES 70 WITH PANEL ACTUATORS



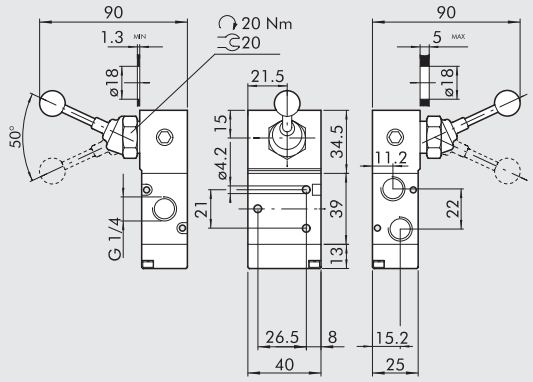
ORDERING CODES

Symbol	Reference	Code	Description	Weight [g]
	①	**7010001800**	Pilot-assisted plunger 3/2, 1/8"	124
	①	**7010001900**	Pilot-assisted plunger 5/2, 1/8"	150
	②	**0351000050**	2 places adaptor thickness 6.8 mm	5
	③	**W0351000015**	Red handler with horizontally pivoted lever	25
	④	**W0351000011**	Fat push button + 2 red/black coloured disks	15
			◆ Bistable fat push button without disk	
	⑤	**W0351000030**	Black selector short lever at 2 positions with return	20
		W0351000031	Black selector short lever at 2 positions	20
	⑤	**W0351000032**	Black selector short lever at 3 positions with return	20
		W0351000033	Black selector short lever at 3 positions	20
	⑥	**W0351000034**	Black selector long lever at 2 positions with return	26
		W0351000035	Black selector long lever at 2 positions	26
	⑥	**W0351000036**	Black selector long lever at 3 positions with return	26
		W0351000037	Black selector long lever at 3 positions	26
	⑦	**W0351000016**	2 positions key selector with extractable key in 2 positions	50
		W0351000018	2 positions key selector with extractable key in 0	50
	⑧	**W0351000013**	Red mushroom-head push button Ø 40	27
		W0351000017	Black mushroom-head push button Ø 40	27
	⑨	**W0351000014**	Red mushroom-head push button with lock Ø 40	29
	⑩	**W0351000049**	✚ Reducer from 30 to 22.5 mm	
	⑪	**W0351000050**	▲ Adapter for bore Ø 30 G2326	
	⑫	**W0351000021**	✚ Key for ESC selectors	
		W0351000056	Green disk for push button ④	

◆ It can't be supplied. As working replaced by selector with bistable short lever at 2 positions ⑤.
✚ Usable only with technopolymer body selectors.
▲ Usable only with metal body selectors.

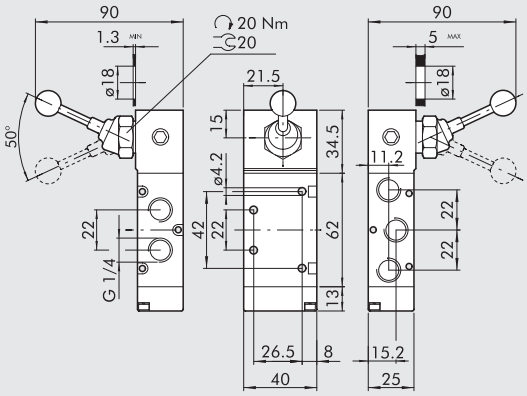
VALVES SERIES 70, HAND-OPERATED, 1/4"

90° LEVER 3/2, 1/4"



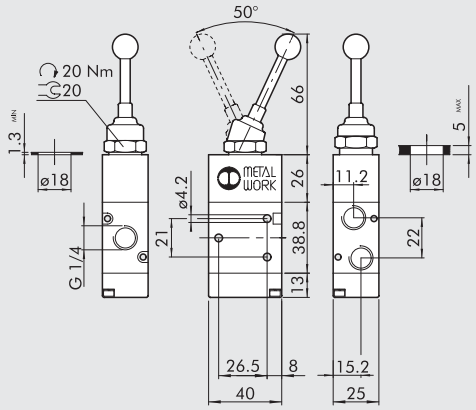
Symbol	Code	Abbrev.	Weight [g]
	7020000100	MAV 33 LES NC	244
	7020000200	MAV 33 LEB OO	244

90° LEVER 5/2, 1/4"



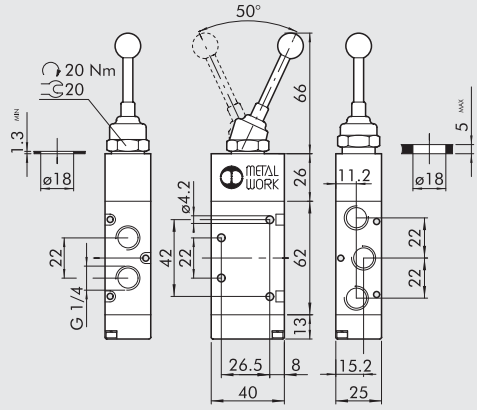
Symbol	Code	Abbrev.	Weight [g]
	7020000300	MAV 35 LES OO	290
	7020000400	MAV 35 LEB OO	290

FRONT LEVER 3/2, 1/4"



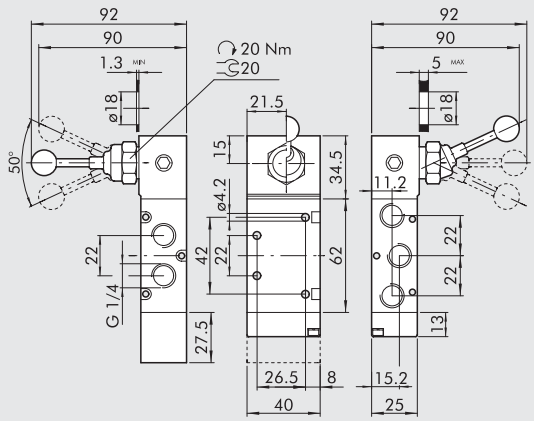
Symbol	Code	Abbrev.	Weight [g]
	7020001400	MAV 33 VLB OO	194

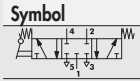
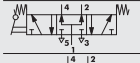
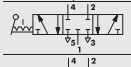
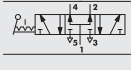
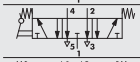
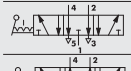
FRONT LEVER 5/2, 1/4"



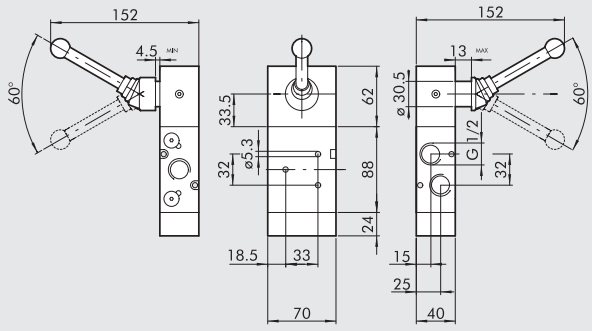
Symbol	Code	Abbrev.	Weight [g]
	7020001700	MAV 35 VLB OO	244

90° LEVER 5/3, 1/4"



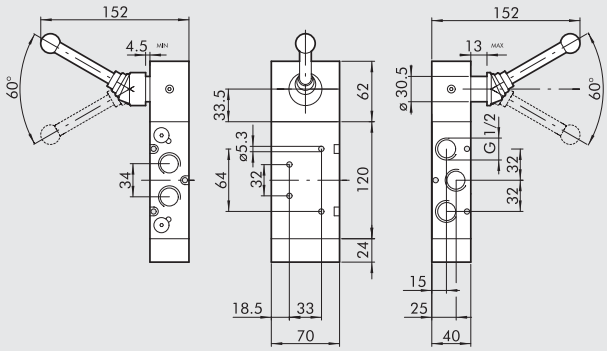
Symbol	Code	Abbrev.	Weight [g]
	7020001000	MAV 36 LES CC	354
	7020000900	MAV 36 LES OC	354
	7020001100	MAV 36 LES PC	354
	7020000500	MAV 36 LEO CC	288
	7020000600	MAV 36 LEO OC	288
	7020000700	MAV 36 LEO PC	288

VALVES SERIES 70, HAND OPERATED, 1/2"

90° LEVER 3/2, 1/2"



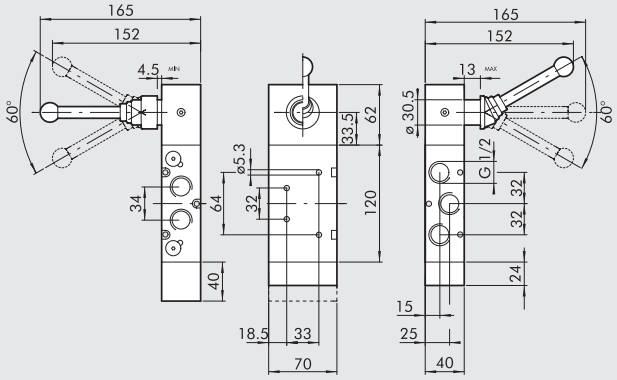
Symbol	Code	Abbrev.	Weight [g]
	7030000100	MAV 43 LES NC	1443
	7030000200	MAV 43 LEB OO	1435

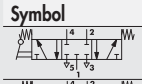
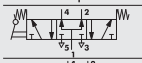
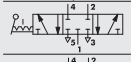
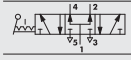
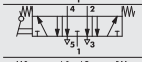
90° LEVER 5/2, 1/2"



Symbol	Code	Abbrev.	Weight [g]
	7030000300	MAV 45 LES OO	1588
	7030000400	MAV 45 LEB OO	1630

90° LEVER 5/3, 1/2"



Symbol	Code	Abbrev.	Weight [g]
	7030001000	MAV 46 LES CC	1810
	7030000900	MAV 46 LES OC	1800
	7030001100	MAV 46 LES PC	1800
	7030000500	MAV 46 LEO CC	1615
	7030000600	MAV 46 LEO OC	1605
	7030000700	MAV 46 LEO PC	1605

NOTES

VALVES SERIES 70, MECHANICALLY OPERATED, 1/8"

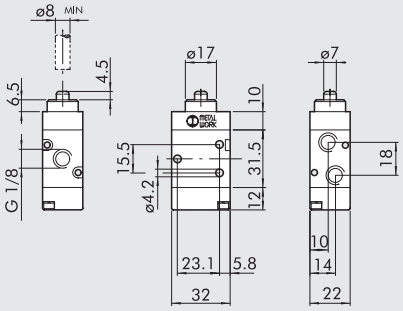
TECHNICAL DATA

Thread at valve ports		1/8"
Operation force at 6 bar:		
• version with direct control	N	50
• pilot-assisted version	N	6
Operating pressure:		
• version with direct control	bar	Vacuum to 10
• pilot-assisted version	bar	2.5 to 10
Operating temperature range	°C	-10 to +60
Nominal diameter	mm	5
Conductance C	Nl/min · bar	121.43
Critical ratio b	bar/bar	0.32
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	400
Flow rate at 6 bar ΔP 1 bar	Nl/min	550

SYNOPTIC, SIZES AND VERSIONS

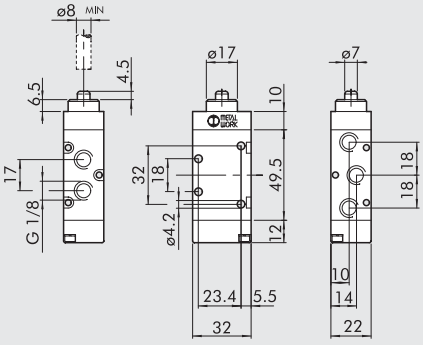
M E V	2	3	T A	S	N C
FAMILY	DIMENSIONS	FUNCTION	OPERATORS 14	RESETTING (12)	FURTHER DETAILS
MEV mechanically-operated valves	**2** 1/8"	**3** 3/2 **5** 5/2	**TA** plunger **BR** bidirectional roller **UR** unidirectional roller **TS** sensitive plunger **RS** sensitive roller **AS** sensitive aerial **LL** frontal roller lever	**S** mechanical springs **A** pneumatic/mechanical spring* *on demand	**NC** normally closed **OO** 5/2

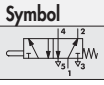
PLUNGER 3/2, 1/8"



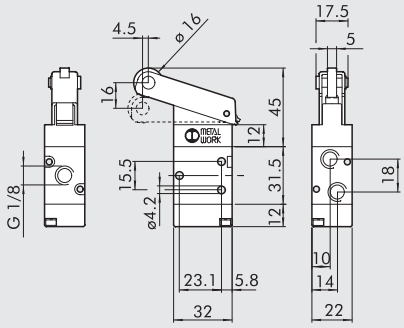
Symbol	Code	Abbrev.	Weight [g]
	7001000100	MEV 23 TAS NC	88

PLUNGER 5/2, 1/8"



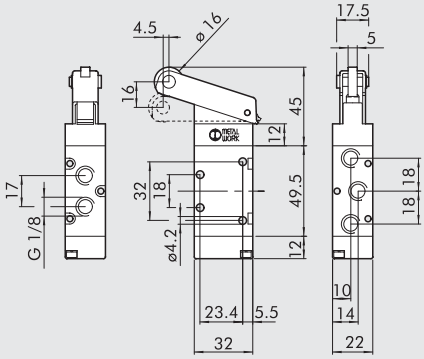
Symbol	Code	Abbrev.	Weight [g]
	7001000110	MEV 25 TAS OO	114

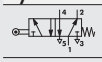
ROLLER LEVER 3/2, 1/8"



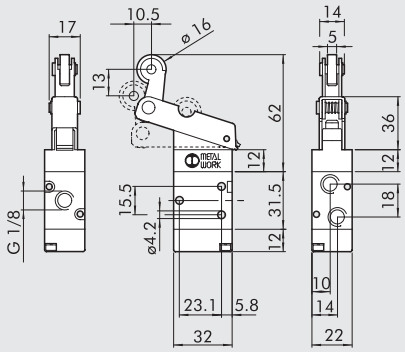
Symbol	Code	Abbrev.	Weight [g]
	7001000500	MEV 23 BRS NC	130

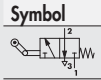
ROLLER LEVER 5/2, 1/8"



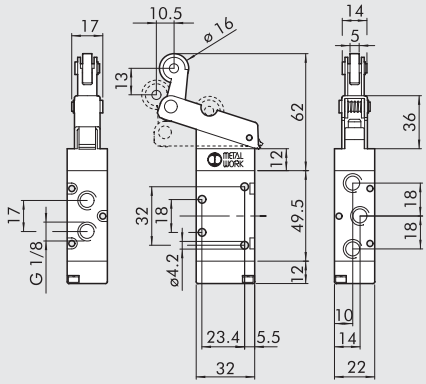
Symbol	Code	Abbrev.	Weight [g]
	7001000510	MEV 25 BRS OO	156

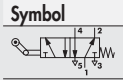
UNIDIRECTIONAL ROLLER 3/2, 1/8" LEVERS



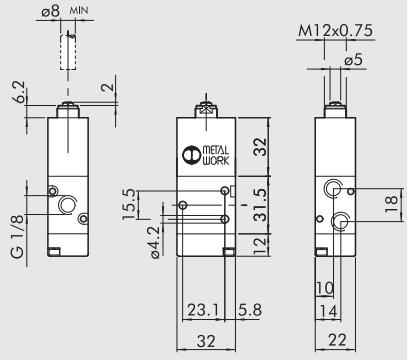
Symbol	Code	Abbrev.	Weight [g]
	7001000600	MEV 23 URS NC	136

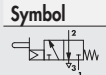
UNIDIRECTIONAL ROLLER 5/2, 1/8" LEVERS



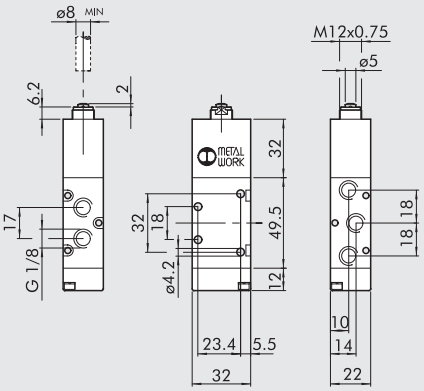
Symbol	Code	Abbrev.	Weight [g]
	7001000610	MEV 25 URS OO	162

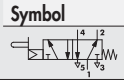
PILOT-ASSISTED PLUNGER 3/2 NC, 1/8"



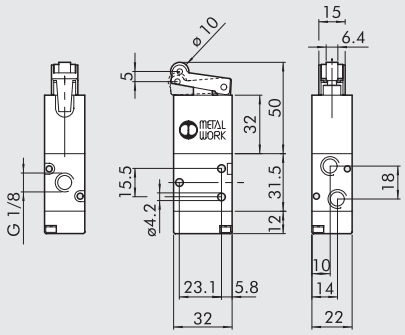
Symbol	Code	Abbrev.	Weight [g]
	7001000200	MEV 23 TSS NC	126

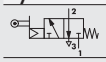
PILOT-ASSISTED PLUNGER 5/2, 1/8"



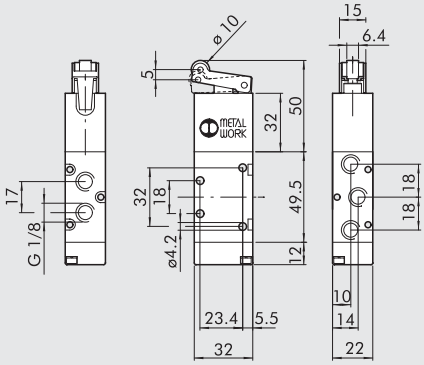
Symbol	Code	Abbrev.	Weight [g]
	7001000210	MEV 25 TSS OO	152

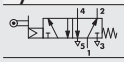
PILOT-ASSISTED ROLLER LEVER 3/2 NC, 1/8"



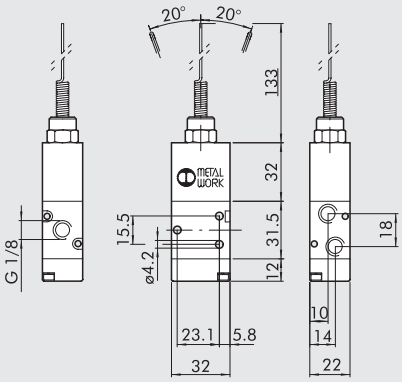
Symbol	Code	Abbrev.	Weight [g]
	7001000400	MEV 23 RSS NC	138

PILOT-ASSISTED ROLLER LEVER 5/2, 1/8"



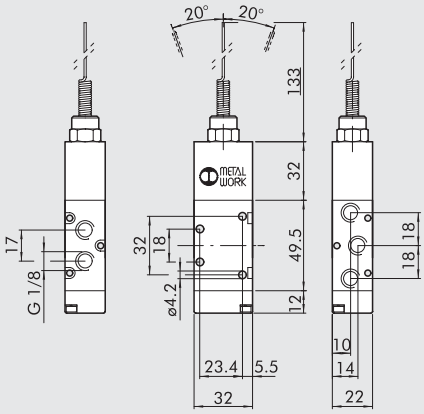
Symbol	Code	Abbrev.	Weight [g]
	7001000410	MEV 25 RSS OO	164

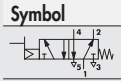
PILOT-ASSISTED AERIAL 3/2 NC, 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7001000700	MEV 23 ASS NC	142

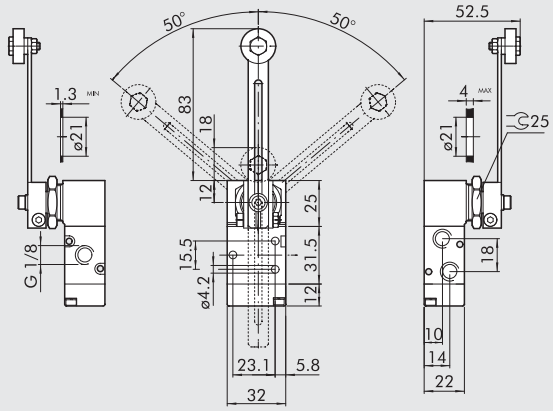
PILOT-ASSISTED AERIAL 5/2 NC, 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7001000710	MEV 25 ASS OO	168

ROLLER-LEVER 3/2 1/8"

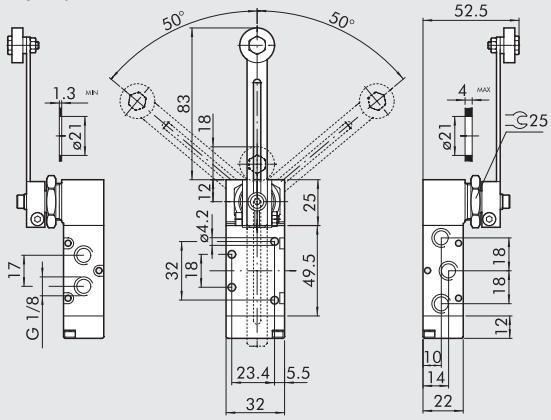
Operating torque: 0.5 Nm

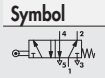


Symbol	Code	Abbrev.	Weight [g]
	7001000900	MEV 23 LLS NC	189

ROLLER-LEVER 5/2 1/8"

Operating torque: 0.5 Nm



Symbol	Code	Abbrev.	Weight [g]
	7001000910	MEV 25 LLS OO	216

VALVES SERIES 70, PNEUMATIC

TECHNICAL DATA		1/8"	1/4"	3/8"	1/2"
Operating pressure	bar	Vacuum to 10			
Minimum pilot pressure					
• monostable	bar	2.5			
• bistable	bar	1			
Operating temperature range	°C	-10 to +60			
Nominal diameter	mm	5	7.5	13.3	15
Conductance C	Nl/min · bar	121.43	264.26	505.52	971.43
Critical ratio b	bar/bar	0.32	0.27	0.32	0.43
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	400	750	1560	3200
Flow rate at 6 bar ΔP 1 bar	Nl/min	550	1100	2150	4600
TRA / TRR monostable at 6 bar	ms	6/15	7/15	5/28	16/46
TRA / TRR bistable at 6 bar	ms	7/7	7/7	13/13	16/16
Hand operation		-	-	-	*

* Monostable on valve body

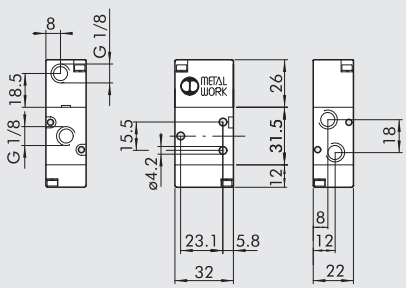
SYNOPTIC, SIZES AND VERSIONS

P N V	2	3	P N	S	N C
FAMILY	DIMENSIONS	FUNCTION	OPERATORS 14	RESETTING (12)	FURTHER DETAILS
PNV pneumatic valves	**2** 1/8"	**3** 3/2	**PN** pneumatic	**S** mechanical springs	**OO** 5/2
	3 1/4"	**5** 5/2		**B** bistable	**NC** normally closed
	C 3/8"	**6** 5/3		**D** differential	**NO** normally open
	4 1/2"	■ **8** 2-3/2		**O** stable for 5/3	**CC** closed centres
				◆ **A** pneumatic/mechanical spring	**OC** open centres
					PC pressure centres
					▲ **NC-NO** normally closed - normally open

■ Only available for size 1/8" and 1/4"
◆ On demand
▲ Only available for function 2-3/2

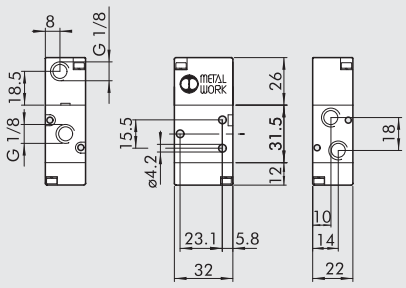
VALVES SERIES 70, PNEUMATIC, 1/8"

MONOSTABLE 3/2 NO, 1/8"



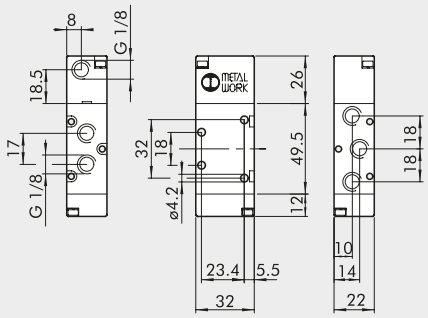
Symbol	Code	Abbrev.	Weight [g]
	7010010400	PNV 23 PNS NO	82

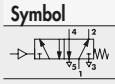
MONOSTABLE 3/2 NC, 1/8"



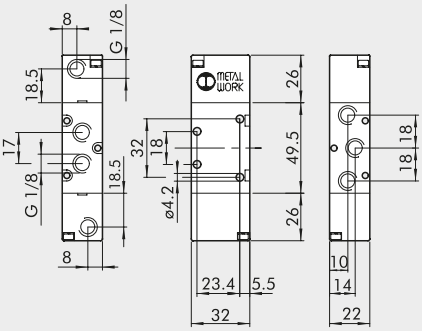
Symbol	Code	Abbrev.	Weight [g]
	7010010200	PNV 23 PNS NC	82

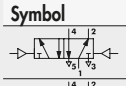
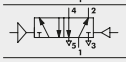
MONOSTABLE 5/2, 1/8"



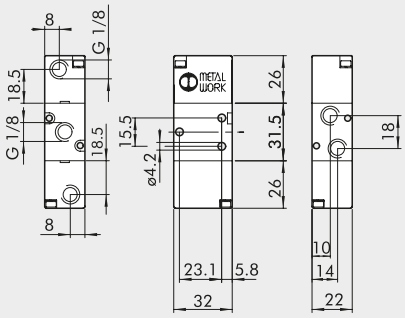
Symbol	Code	Abbrev.	Weight [g]
	7010011100	PNV 25 PNS OO	108

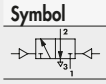
BISTABLE 5/2, 1/8"



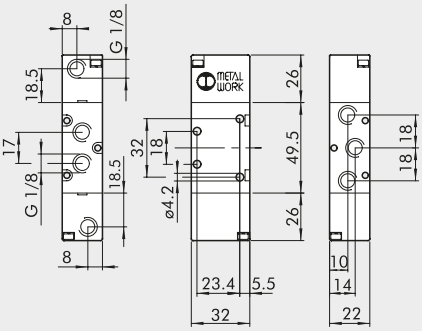
Symbol	Code	Abbrev.	Weight [g]
	7010011200	PNV 25 PNB OO	122
	7010011300	PNV 25 PND OO	128

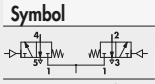
BISTABLE 3/2, 1/8"



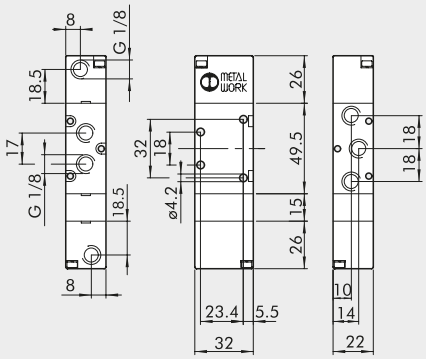
Symbol	Code	Abbrev.	Weight [g]
	7010010100	PNV 23 PNB OO	96

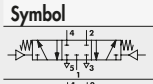
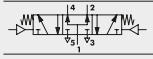
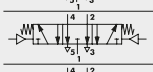
DOUBLE 3/2 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7010013100	PNV 28 PNS NC	136
	7010013200	PNV 28 PNS NO	136
	7010013300	PNV 28 PNS NC-NO	136

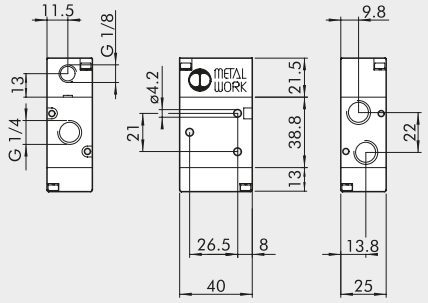
MONOSTABLE 5/3, 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7010012100	PNV 26 PNS CC	150
	7010012200	PNV 26 PNS OC	150
	7010012300	PNV 26 PNS PC	150

NOTES

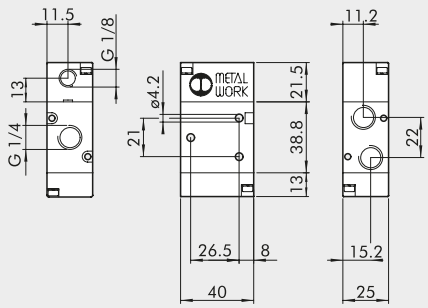
VALVES SERIES 70, PNEUMATIC, 1/4"

MONOSTABLE 3/2 NO, 1/4"



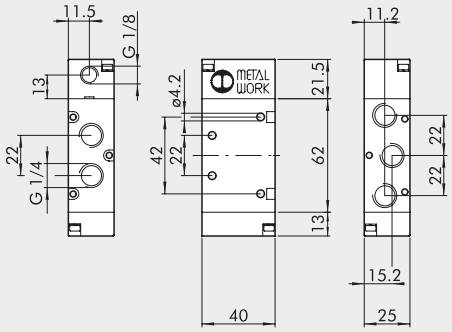
Symbol	Code	Abbrev.	Weight [g]
	7020010400	PNV 33 PNS NO	124

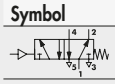
MONOSTABLE 3/2 NC, 1/4"



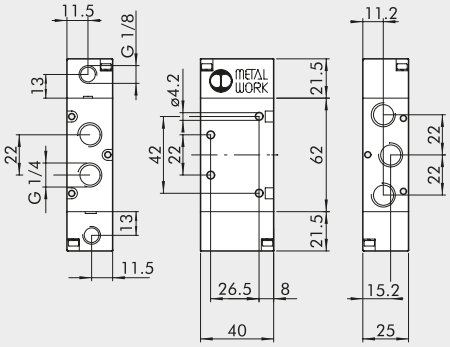
Symbol	Code	Abbrev.	Weight [g]
	7020010200	PNV 33 PNS NC	122

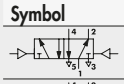
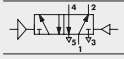
MONOSTABLE 5/2, 1/4"



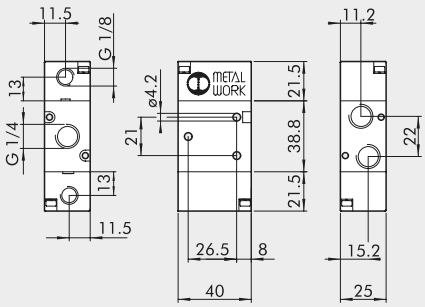
Symbol	Code	Abbrev.	Weight [g]
	7020011100	PNV 35 PNS OO	174

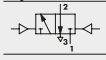
BISTABLE 5/2, 1/4"



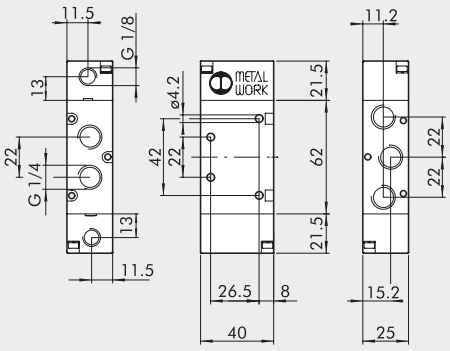
Symbol	Code	Abbrev.	Weight [g]
	7020011200	PNV 35 PNB OO	174
	7020011300	PNV 35 PND OO	198

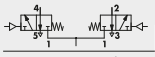
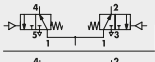
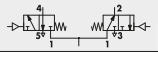
BISTABLE 3/2, 1/4"



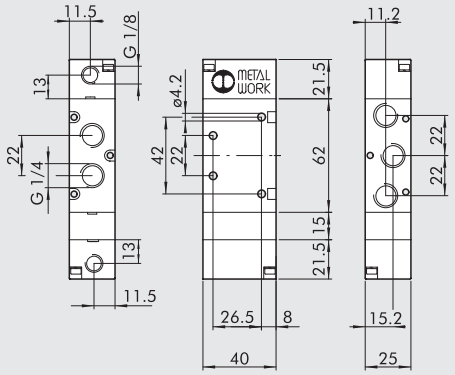
Symbol	Code	Abbrev.	Weight [g]
	7020010100	PNV 33 PNB OO	134

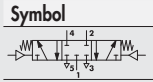
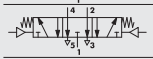
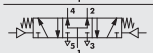
DOUBLE 3/2, 1/4"



Symbol	Code	Abbrev.	Weight [g]
	7020013100	PNV 38 PNS NC	223
	7020013200	PNV 38 PNS NO	223
	7020013300	PNV 38 PNS NC-NO	223

MONOSTABLE 5/3, 1/4"

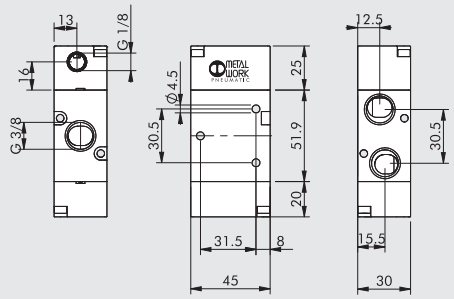


Symbol	Code	Abbrev.	Weight [g]
	7020012100	PNV 36 PNS CC	124
	7020012200	PNV 36 PNS OC	124
	7020012300	PNV 36 PNS PC	124

NOTES

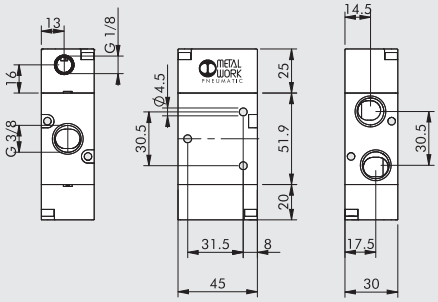
VALVES SERIES 70, PNEUMATIC, 3/8"

MONOSTABLE 3/2 NO, 3/8"



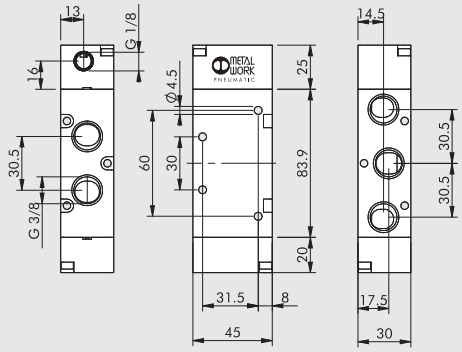
Symbol	Code	Abbrev.	Weight [g]
	7040010400	PNV C3 PNS NO	223

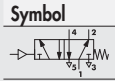
MONOSTABLE 3/2 NC, 3/2"



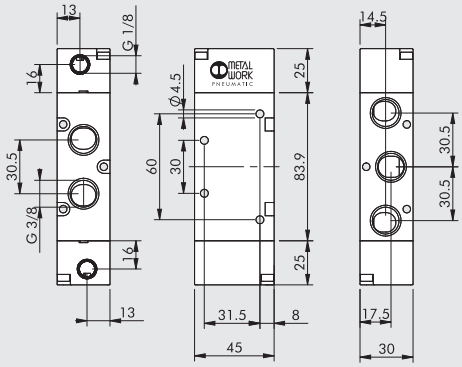
Symbol	Code	Abbrev.	Weight [g]
	7040010200	PNV C3 PNS NC	223

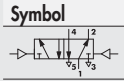
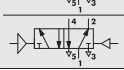
MONOSTABLE 5/2, 3/8"



Symbol	Code	Abbrev.	Weight [g]
	7040011100	PNV C5 PNS OO	329

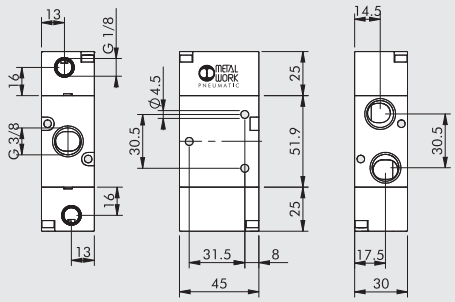
BISTABLE 5/2, 3/8"

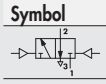


Symbol	Code	Abbrev.	Weight [g]
	7040011200	PNV C5 PNB OO	324
	7040011300	PNV C5 PND OO	360

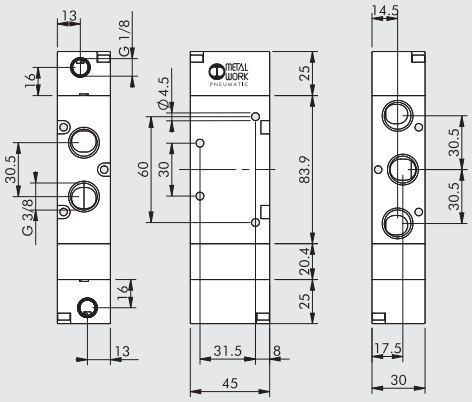
METAL WORK PNEUMATIC

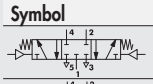
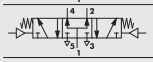
BISTABLE 3/2, 3/8"



Symbol	Code	Abbrev.	Weight [g]
	7040010100	PNV C3 PNB OO	230

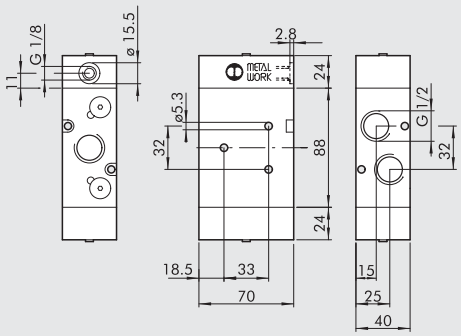
MONOSTABLE 5/3, 3/8"



Symbol	Code	Abbrev.	Weight [g]
	7040012100	PNV C6 PNS CC	411
	7040012200	PNV C6 PNS OC	409
	7040012300	PNV C6 PNS PC	409

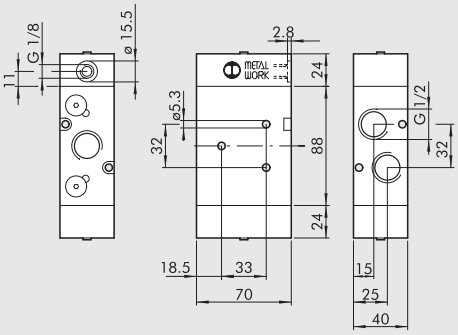
VALVES SERIES 70, PNEUMATIC, 1/2"

MONOSTABLE 3/2 NO, 1/2"



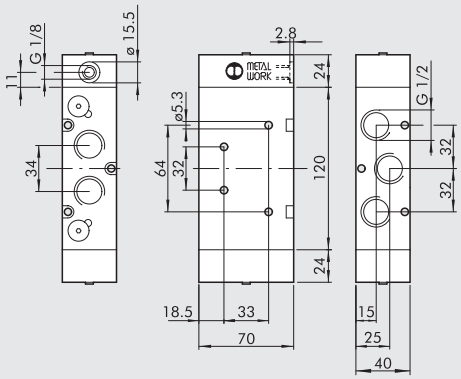
Symbol	Code	Abbrev.	Weight [g]
	7030010400	PNV 43 PNS NO	905

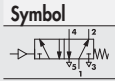
MONOSTABLE 3/2 NC, 1/2"



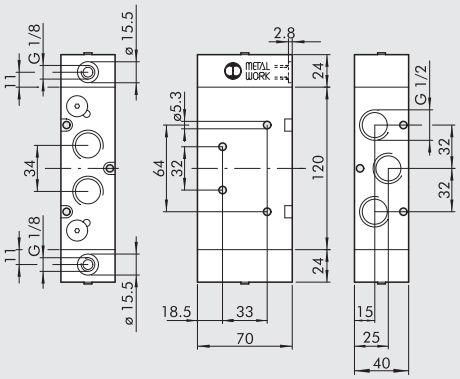
Symbol	Code	Abbrev.	Weight [g]
	7030010200	PNV 43 PNS NC	905

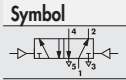
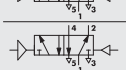
MONOSTABLE 5/2, 1/2"



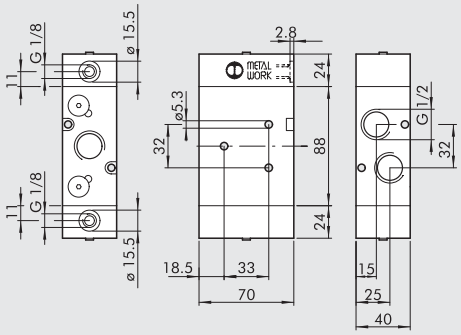
Symbol	Code	Abbrev.	Weight [g]
	7030011100	PNV 45 PNS OO	1090

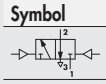
BISTABLE 5/2, 1/2"



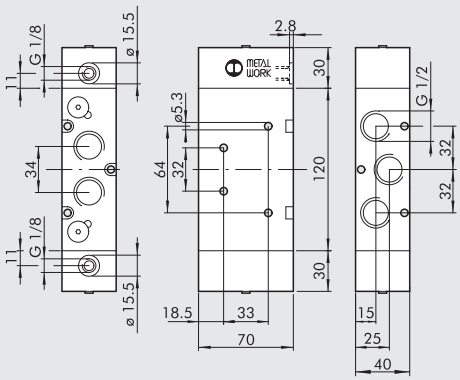
Symbol	Code	Abbrev.	Weight [g]
	7030011200	PNV 45 PNB OO	1077
	7030011300	PNV 45 PND OO	1090

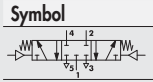
BISTABLE 3/2, 1/2"



Symbol	Code	Abbrev.	Weight [g]
	7030010100	PNV 43 PNB OO	921

MONOSTABLE 5/3, 1/2"



Symbol	Code	Abbrev.	Weight [g]
	7030012100	PNV 46 PNS CC	1200
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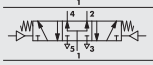
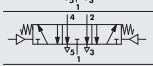
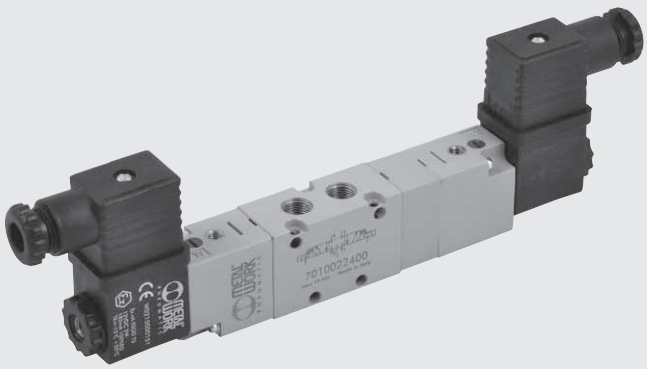
	7030012300	PNV 46 PNS PC	1196

NOTES

VALVES SERIES 70, SOLENOID/PNEUMATIC

TECHNICAL DATA		1/8"	1/4"	3/8"	1/2"
Operating pressure:					
• monostable	bar	2.5 to10			
• bistable	bar	1 to 10			
• asserved	bar	Vacuum to 10			
Minimum pilot pressure	bar	2.5			
Operating temperature range	°C	-10 to +60			
Nominal diameter	mm	5	7.5	13.3	15
Conductance C	Nl/min · bar	121.43	264.26	505.52	971.43
Critical ratio b	bar/bar	0.32	0.27	0.32	0.43
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	400	750	1560	3200
Flow rate at 6 bar ΔP 1 bar	Nl/min	550	1100	2150	4600
TRA / TRR monostable at 6 bar	ms	15/35	19/45	21/72	36/60
TRA / TRR bistable at 6 bar	ms	20/20	21/21	18/18	30/30
Coil voltage values		12; 24 VDC - 24; 110; 220V AC 50/60Hz			
Power		2 W (DC) 3.5VA (AC)			
Voltage tolerance	%	-10 to +15			
Insulation class		F 155			
Maximum coil nut torque	Nm	1			
Hand operation		Bistable			*

* Bistable on solenoid pilot. Monostable on valve body.



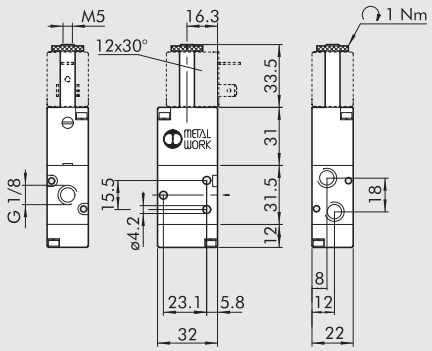
SYNOPTIC, SIZES AND VERSIONS

SOV FAMILY	2 DIMENSIONS	3 FUNCTION	SO OPERATORS 14	S RESETTING (12)	NC FURTHER DETAILS
SOV solenoid/ pneumatic	**2** 1/8"	**3** 3/2	**SO** solenoid	**S** mechanical springs	**NC** normally closed
	3 1/4"	**5** 5/2	**SE** solenoid assisted	**B** bistable	**NO** normally open
	C 3/8"	**6** 5/3		**D** differential	**CC** closed centres
	4 1/2"	■ **8** 2-3/2		**P** pneumatic	**OC** open centres
				◆ **A** pneumatic/mechanical spring	**PC** pressure centres
					OO 5/2
					▲ **NC-NO** normally closed - normally open

■ Only available for size 1/8" and 1/4"
◆ On demand
▲ Only available for function 2-3/2

VALVES SERIES 70, SOLENOID/PNEUMATIC-PILOT-ASSISTED SOLENOID/PNEUMATIC, 1/8"

MONOSTABLE 3/2 NO, 1/8"



Symbol	Code	Abbrev.	Weight [g]
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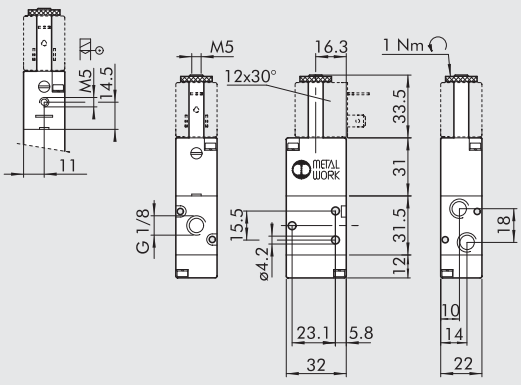
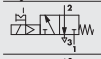
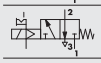
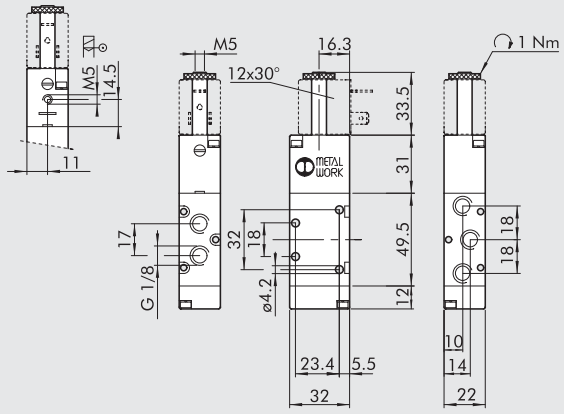
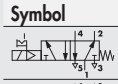
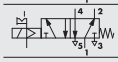
MONOSTABLE 3/2 NC, 1/8"



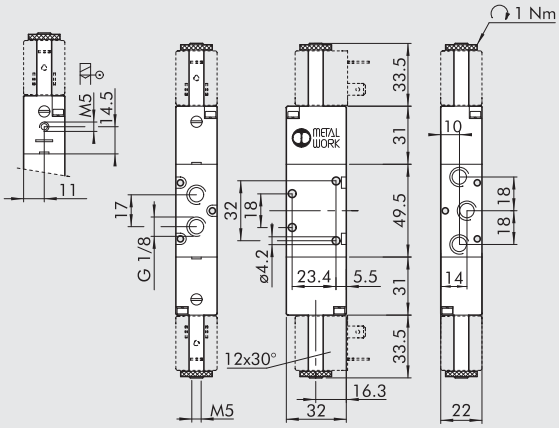
Symbol	Code	Abbrev.	Weight [g]
	**7010020200**	SOV 23 SOS NC	100
	**7010020500**	SOV 23 SES NC	100

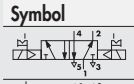
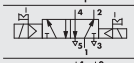
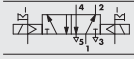
MONOSTABLE 5/2, 1/8"



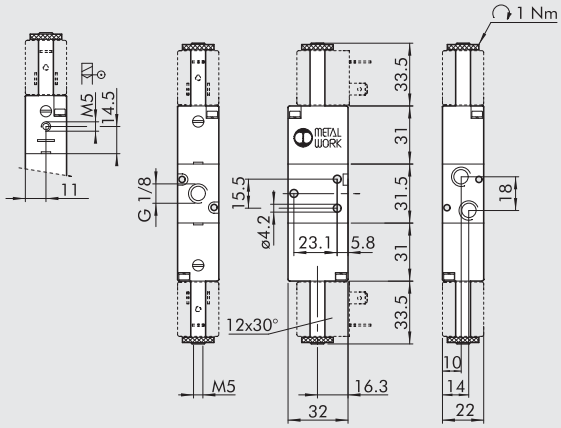
Symbol	Code	Abbrev.	Weight [g]
	7010021100	SOV 25 SOS OO	128
	7010021500	SOV 25 SES OO	129

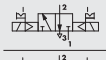
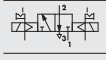
BISTABLE 5/2, 1/8"



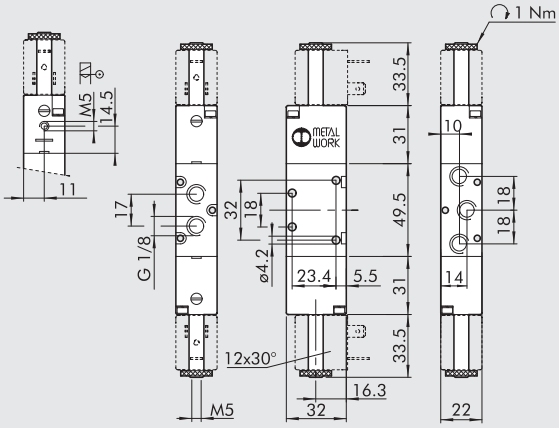
Symbol	Code	Abbrev.	Weight [g]
	7010021200	SOV 25 SOB OO	160
	7010021300	SOV 25 SOD OO	166
	7010021600	SOV 25 SEB OO	160

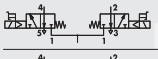
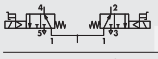
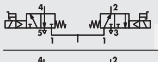
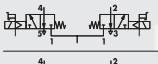
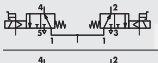
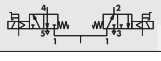
BISTABLE 3/2, 1/8"



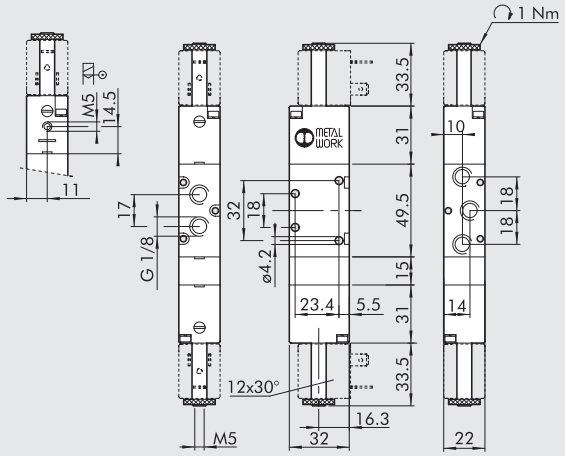
Symbol	Code	Abbrev.	Weight [g]
	7010020100	SOV 23 SOB OO	135
	7010020300	SOV 23 SEB OO	136

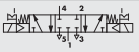
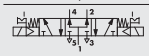
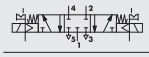
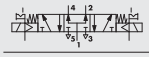
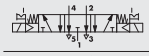
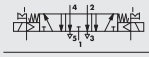
DOUBLE 3/2, 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7010023100	SOV 28 SOS NC	186
	7010023200	SOV 28 SOS NO	186
	7010023300	SOV 28 SOS NC-NO	186
	7010023400	SOV 28 SES NC	186
	7010023500	SOV 28 SES NO	186
	7010023600	SOV 28 SES NC-NO	186

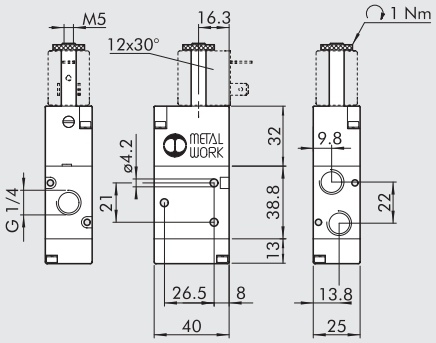
MONOSTABLE 5/3, 1/8”



Symbol	Code	Abbrev.	Weight [g]
	7010022100	SOV 26 SOS CC	190
	7010022200	SOV 26 SOS OC	190
	7010022300	SOV 26 SOS PC	190
	7010022400	SOV 26 SES CC	188
	7010022500	SOV 26 SES OC	188
	7010022600	SOV 26 SES PC	188

NOTES

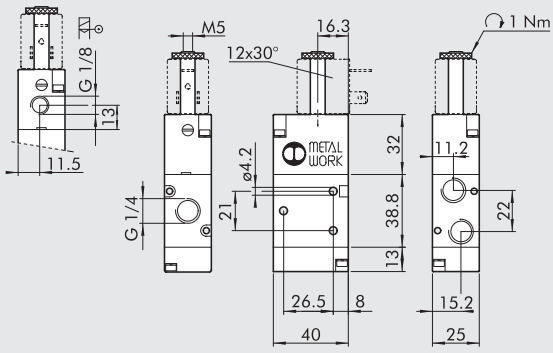
VALVES SERIES 70, SOLENOID/PNEUMATIC- PILOT-ASSISTED SOLENOID/ PNEUMATIC, 1/4”

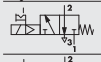
MONOSTABLE 3/2 NO, 1/4”



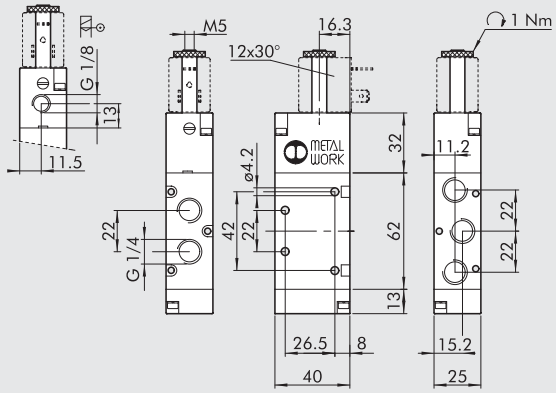
Symbol	Code	Abbrev.	Weight [g]
	7020020400	SOV 33 SOS NO	152

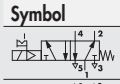
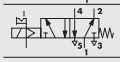
MONOSTABLE 3/2 NC, 1/4”



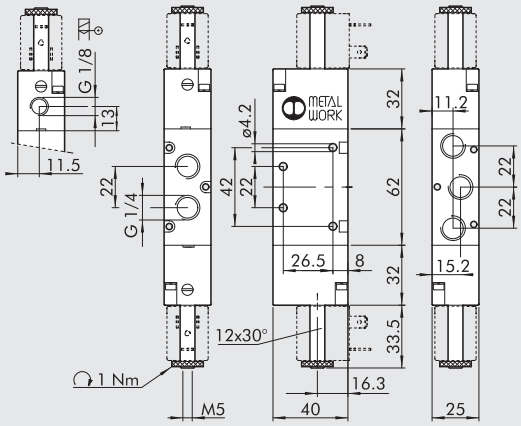
Symbol	Code	Abbrev.	Weight [g]
	7020020200	SOV 33 SOS NC	152
	7020020500	SOV 33 SES NC	152

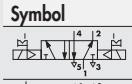
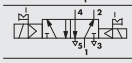
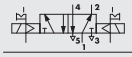
MONOSTABLE 5/2, 1/4"



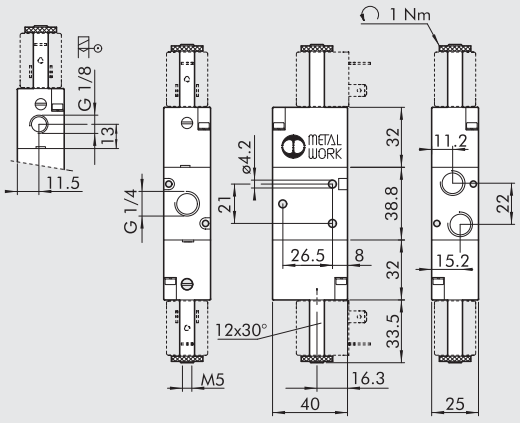
Symbol	Code	Abbrev.	Weight [g]
	**7020021100**	SOV 35 SOS OO	200
	**7020021500**	SOV 35 SES OO	200

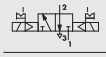
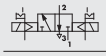
BISTABLE 5/2, 1/4"



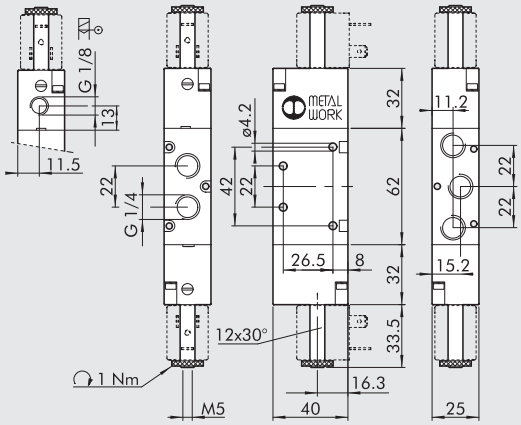
Symbol	Code	Abbrev.	Weight [g]
	**7020021200**	SOV 35 SOB OO	236
	**7020021300**	SOV 35 SOD OO	252
	**7020021600**	SOV 35 SEB OO	242

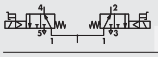
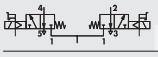
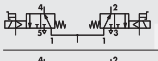
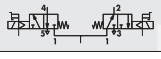
BISTABLE 3/2, 1/4"



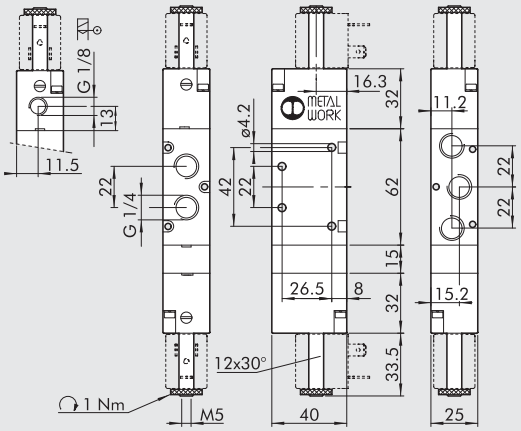
Symbol	Code	Abbrev.	Weight [g]
	**7020020100**	SOV 33 SOB OO	190
	**7020020300**	SOV 33 SEB OO	190

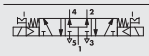
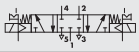
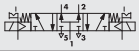
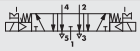
DOUBLE 3/2, 1/4"



Symbol	Code	Abbrev.	Weight [g]
	7020023100	SOV 38 SOS NC	286
	**7020023200**	SOV 38 SOS NO	286
	7020023300	SOV 38 SOS NC-NO	286
	**7020023400**	SOV 38 SES NC	286
	**7020023500**	SOV 38 SES NO	286
	**7020023600**	SOV 38 SES NC-NO	286

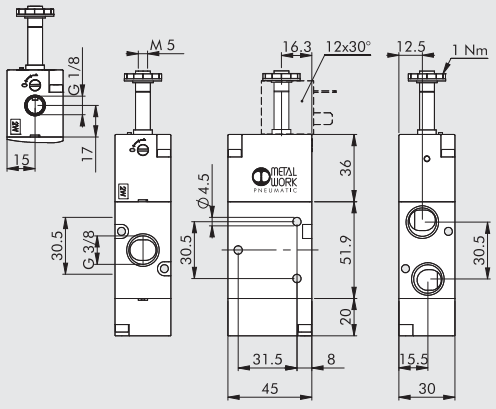
MONOSTABLE 5/3, 1/4"



Symbol	Code	Abbrev.	Weight [g]
	7020022100	SOV 36 SOS CC	274
	7020022200	SOV 36 SOS OC	274
	7020022300	SOV 36 SOS PC	274
	7020022400	SOV 36 SES CC	277
	7020022500	SOV 36 SES OC	277
	7020022600	SOV 36 SES PC	277

NOTES

VALVES SERIES 70, SOLENOID/PNEUMATIC-PILOT-ASSISTED SOLENOID/ PNEUMATIC, 3/8"

MONOSTABLE 3/2 NO, 3/8"



Symbol	Code	Abbrev.	Weight [g]
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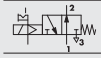
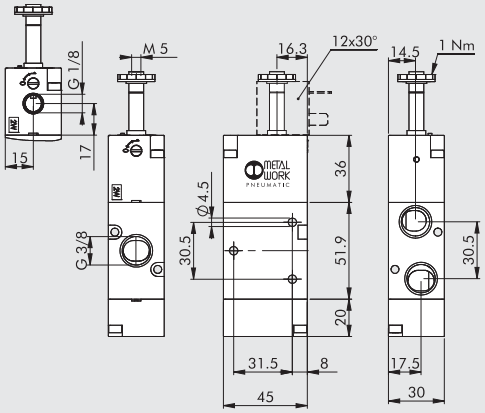
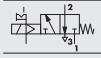
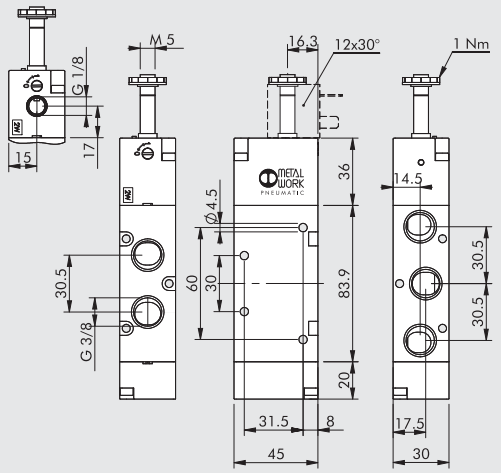
	7040020600	SOV C3 SES NO	255

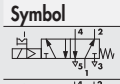
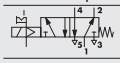
MONOSTABLE 3/2 NC, 3/8"



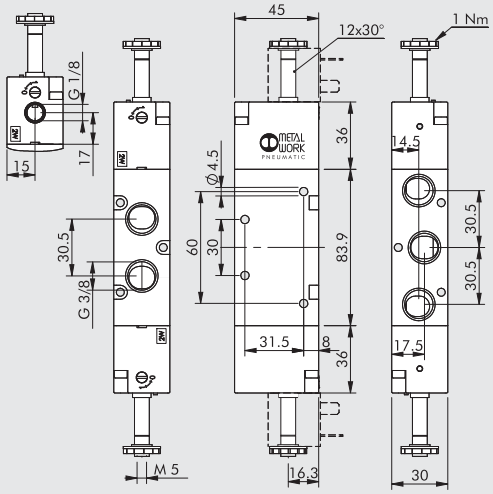
Symbol	Code	Abbrev.	Weight [g]
	7040020200	SOV C3 SOS NC	256
	7040020500	SOV C3 SES NC	255

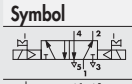
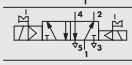
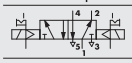
MONOSTABLE 5/2, 3/8"



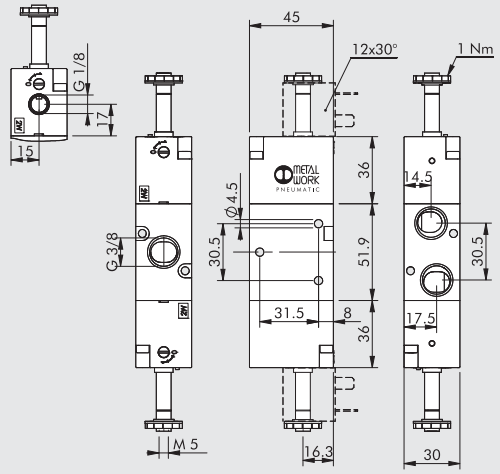
Symbol	Code	Abbrev.	Weight [g]
	7040021100	SOV C5 SOS OO	361
	7040021500	SOV C5 SES OO	361

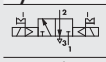
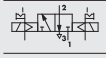
BISTABLE 5/2, 3/8"



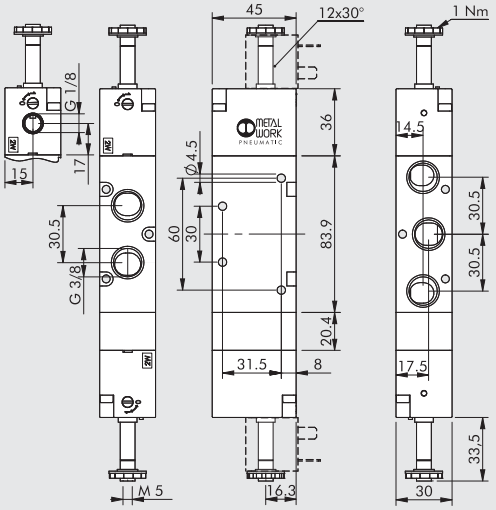
Symbol	Code	Abbrev.	Weight [g]
	7040021200	SOV C5 SOB OO	400
	7040021300	SOV C5 SOD OO	425
	7040021600	SOV C5 SEB OO	400

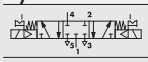
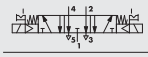
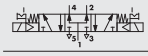
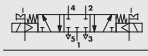
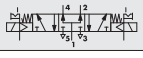
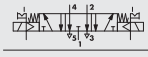
BISTABLE 3/2, 3/8"



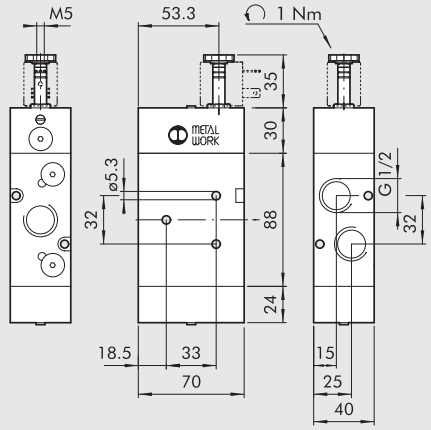
Symbol	Code	Abbrev.	Weight [g]
	7040020100	SOV C3 SOB OO	307
	7040020300	SOV C3 SEB OO	307

MONOSTABLE 5/3, 3/8"



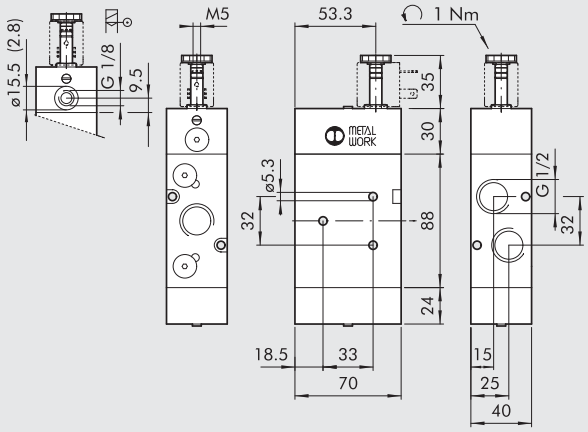
Symbol	Code	Abbrev.	Weight [g]
	7040022100	SOV C6 SOS CC	476
	7040022200	SOV C6 SOS OC	474
	7040022300	SOV C6 SOS PC	474
	7040022400	SOV C6 SES CC	476
	7040022500	SOV C6 SES OC	474
	7040022600	SOV C6 SES PC	474

VALVES SERIES 70, SOLENOID/PNEUMATIC-PILOT-ASSISTED SOLENOID/PNEUMATIC, 1/2"

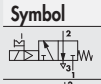
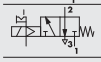
MONOSTABLE 3/2 NO, 1/2"



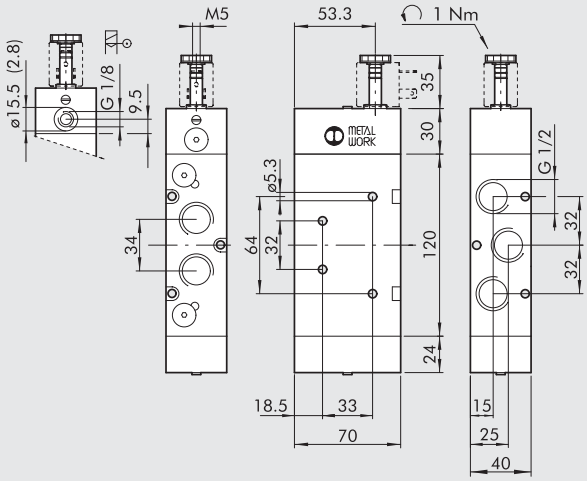
Symbol	Code	Abbrev.	Weight [g]
	7030020400	SOV 43 SOS NO	930

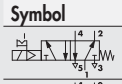
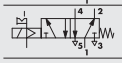
MONOSTABLE 3/2 NC, 1/2"



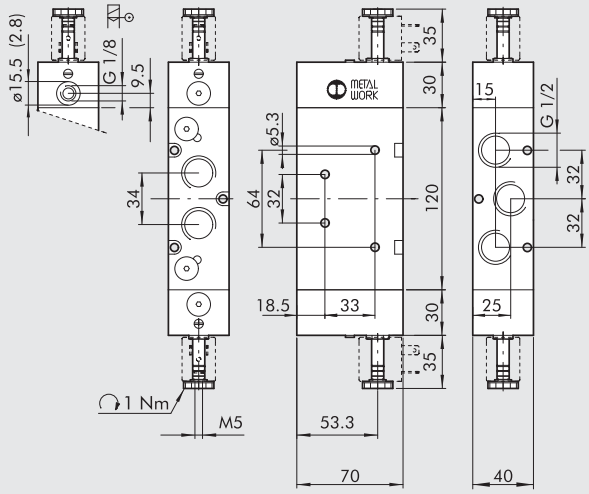
Symbol	Code	Abbrev.	Weight [g]
	7030020200	SOV 43 SOS NC	930
	7030020500	SOV 43 SES NC	923

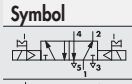
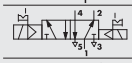
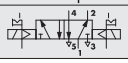
MONOSTABLE 5/2, 1/2"



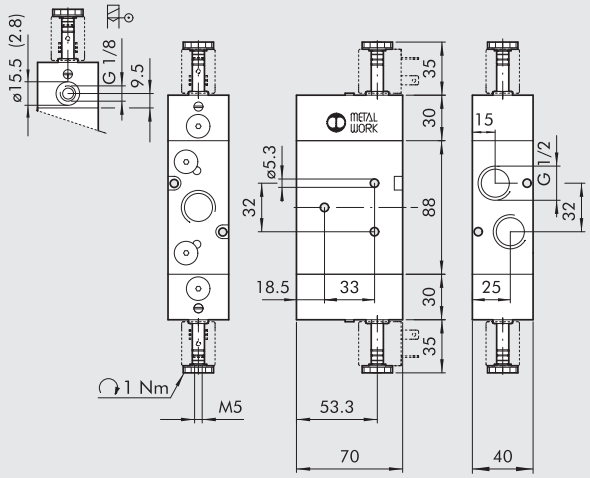
Symbol	Code	Abbrev.	Weight [g]
	7030021100	SOV 45 SOS OO	1120
	7030021500	SOV 45 SES OO	1113

BISTABLE 5/2, 1/2"



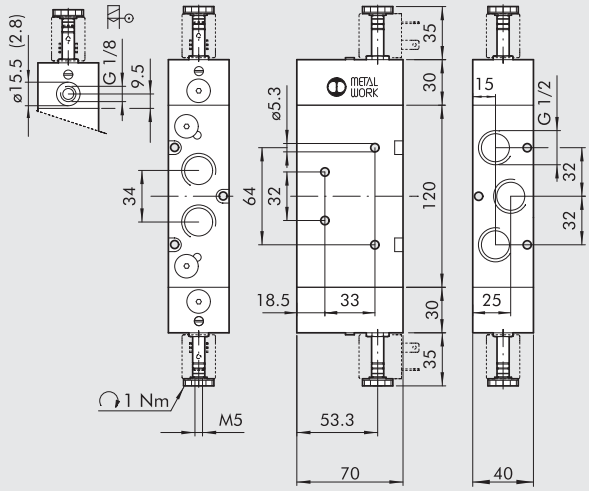
Symbol	Code	Abbrev.	Weight [g]
	7030021200	SOV 45 SOB OO	1140
	7030021300	SOV 45 SOD OO	1152
	7030021600	SOV 45 SEB OO	1127

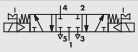
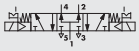
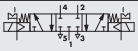
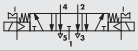
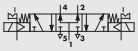
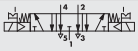
BISTABLE 3/2, 1/2"



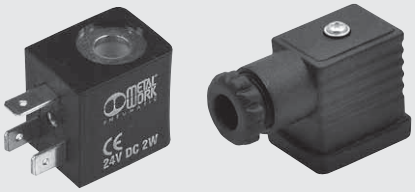
Symbol	Code	Abbrev.	Weight [g]
	7030020100	SOV 43 SOB OO	955
	7030020300	SOV 43 SEB OO	942

MONOSTABLE 5/3, 1/2"



Symbol	Code	Abbrev.	Weight [g]
	**7030022100**	SOV 46 SOS CC	1265
	7030022200	SOV 46 SOS OC	1265
	**7030022300**	SOV 46 SOS PC	1265
	**7030022400**	SOV 46 SES CC	1252
	**7030022500**	SOV 46 SES OC	1252
	**7030022600**	SOV 46 SES PC	1252

ACCESSORIES FOR SERIES 70 SOLENOID/PNEUMATIC VALVES

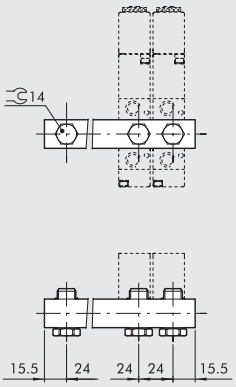
Refer to page **B1**.54 for coils and connectors



NOTES

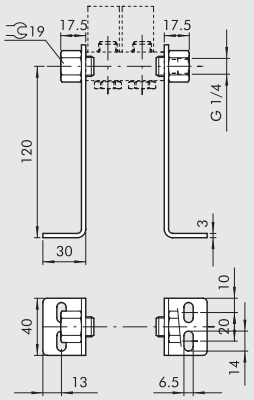
ACCESSORIES: 1/8 MANIFOLDS FOR SERIES 70 PNV-SOV AND SERIES BASIC VALVES

MANIFOLD WITH 2 TO 7 POSITIONS + FITTINGS



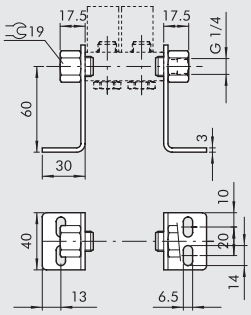
Code	Description	Weight [g]
0221000200	CSA-18-02	70
0221000300	CSA-18-03	99
0221000400	CSA-18-04	131
0221000500	CSA-18-05	162
0221000600	CSA-18-06	192
0221000700	CSA-18-07	229

BRACKET SET H120



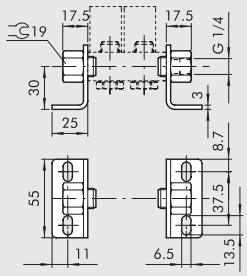
Code	Description	Weight [g]
0221000190	CSA-18-OO	309

BRACKET SET H60



Code	Description	Weight [g]
0221000191	CSA-18-OC	213

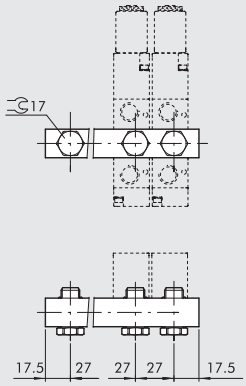
BRACKET SET H30



Code	Description	Weight [g]
0221000192	CSA-18-OE	181

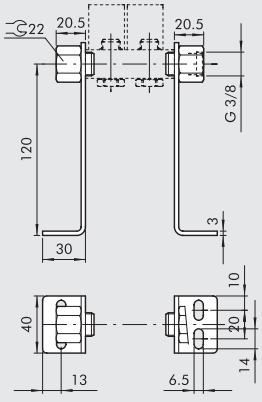
ACCESSORIES: 1/4 MANIFOLDS FOR SERIES 70 PNV-SOV AND SERIES BASIC VALVES

MANIFOLD WITH 2 TO 7 POSITIONS + FITTINGS



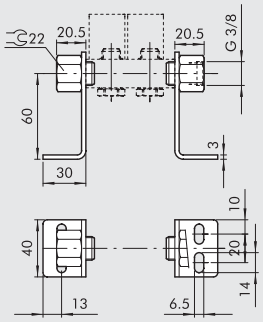
Code	Description	Weight [g]
0222000200	CSA-14-02	89
0222000300	CSA-14-03	131
0222000400	CSA-14-04	174
0222000500	CSA-14-05	213
0222000600	CSA-14-06	252
0222000700	CSA-14-07	328

BRACKET SET H120



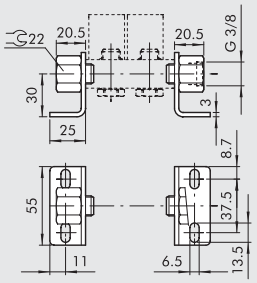
Code	Description	Weight [g]
0222000190	CSA-14-OO	338

BRACKET SET H60



Code	Description	Weight [g]
0222000191	CSA-14-OC	242

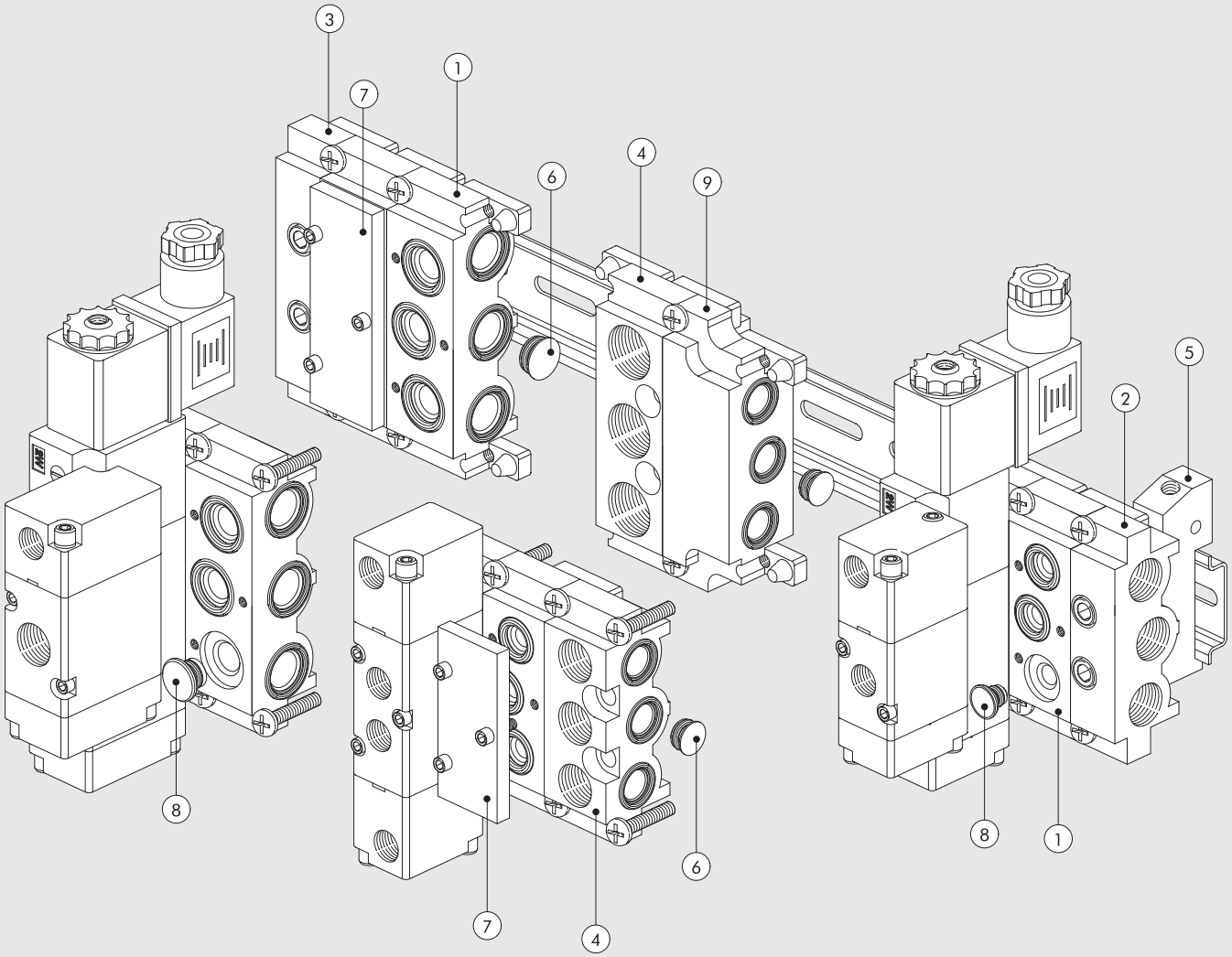
BRACKET SET H30



Code	Description	Weight [g]
0222000192	CSA-14-OE	209

ACCESSORIES: MANIFOLD BASES FOR SERIES 70 PNV-SOV AND SERIES BASIC VALVES

MODULAR BASES FOR SERIES 70 SOV-PNV VALVES

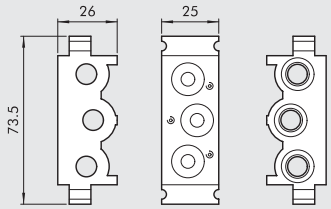


	1/8"	1/4"	
Reference	Code	Code	Description
①	0226004150	0226005150	Modular manifold base
②	0226004201	0226005201	End plate without OR
③	0226004200	0226005200	End plate with OR
④	0226004300	0226005300	Intermediate part for upper feed
⑤	0226004600	0226005600	Adapter for omega bar
⑥	0226004000	0226005000	Intermediate diaphragm
⑦	0226004500	0226005500	Blanking plate
⑧	0226004001	0226005001	3/2 cap
⑨	0226006600	–	Dimensional adapter

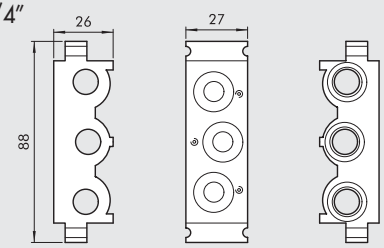
METAL WORK PNEUMATIC

① MODULAR BASE

1/8″



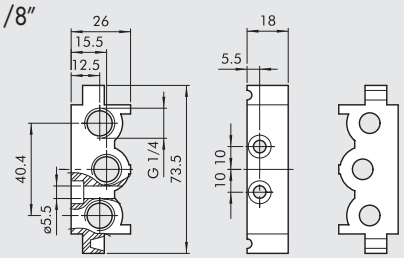
1/4″



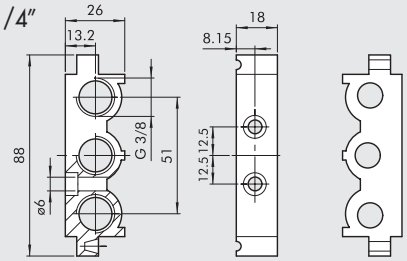
Code	Description	Weight [g]
0226004150	Comp. MANIFOLD 1/8″	110
0226005150	Comp. MANIFOLD 1/4″	131

② END PLATE WITHOUT OR

1/8″



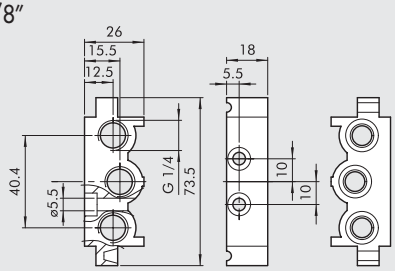
1/4″



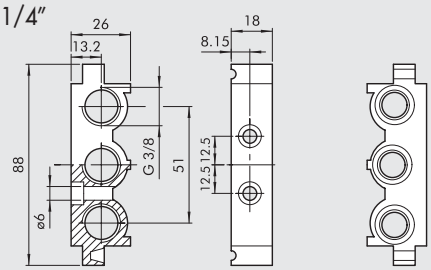
Code	Description	Weight [g]
0226004201	End plate without OR 1/8″	52
0226005201	End plate without OR 1/4″	57

③ END PLATE WITH OR

1/8″



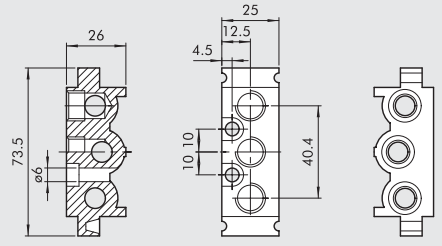
1/4″



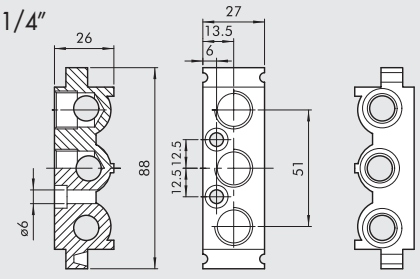
Code	Description	Weight [g]
0226004200	End plate with OR 1/8″	74
0226005200	End plate with OR 1/4″	80

④ INTERMEDIATE PART FOR UPPER FEED

1/8″



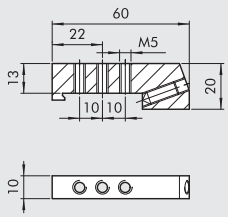
1/4″



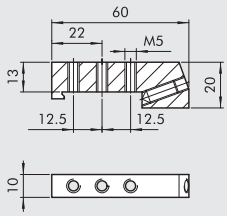
Code	Description	Weight [g]
0226004300	Intermediate part for upper feed 1/8″	93
0226005300	Intermediate part for upper feed 1/4″	109

⑤ ADAPTER FOR OMEGA BAR BASES (DIN EN 50022)

1/8″



1/4″

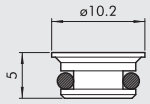


Code	Description	Weight [g]
0226004600	Adapter 1/8″	46
0226005600	Adapter 1/4″	46

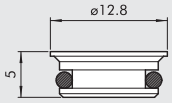
N.B.: Also for multiple bases

⑥ INTERMEDIATE DIAPHGRAM

1/8″



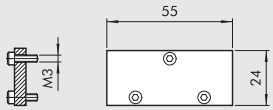
1/4″



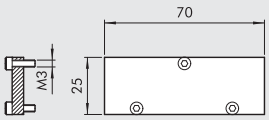
Code	Description	Weight [g]
0226004000	Intermediate diaphgram 1/8″	2
0226005000	Intermediate diaphgram 1/4″	3

⑦ BLANKING PLATE FOR UNUSED POSITIONS

1/8″



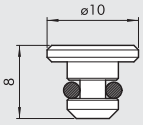
1/4″



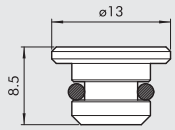
Code	Description	Weight [g]
0226004500	Comp. pcs 1/8″	23
0226005500	Comp. pcs 1/4″	29

⑧ PLUG FOR 3/2

1/8″

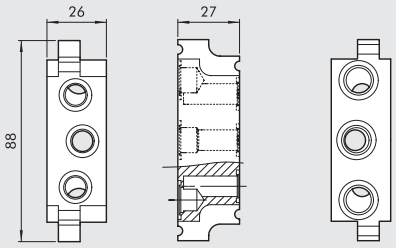


1/4″



Code	Description	Weight [g]
0226004001	Complete plug 3/2 1/8″	2
0226005001	Complete plug 3/2 1/4″	4

⑨ DIMENSIONAL ADAPTER 1/8″ – 1/4″

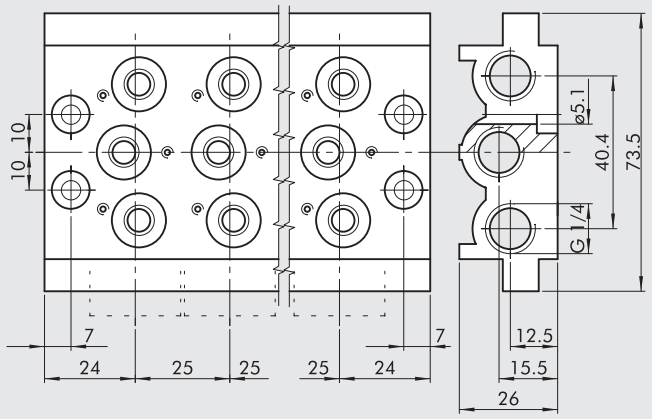


Code	Description	Weight [g]
0226006600	Comp. adapt. 1/8″, 1/4″	177

NOTES

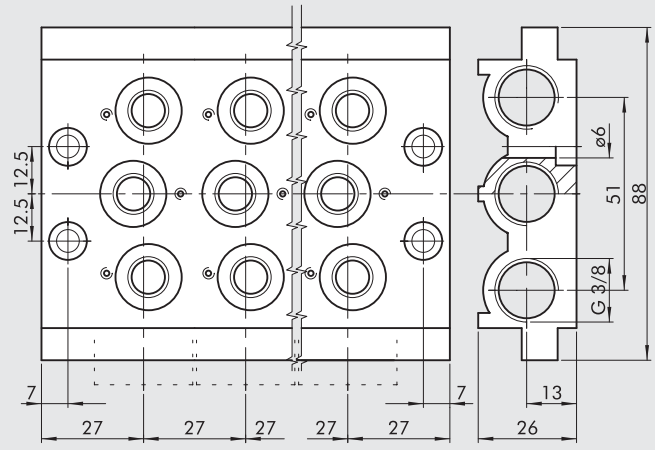
ACCESSORIES: MULTIPLE BASES FOR SERIES 70 PNV-SOV AND SERIES BASIC VALVES

MULTIPLE BASES 1/8"



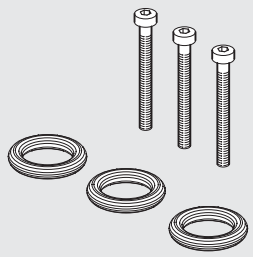
Code	Description	Abbrev.	Weight [g]
0223000201	2-position base	CVM-18-02	236
0223000301	3-position base	CVM-18-03	321
0223000401	4-position base	CVM-18-04	407
0223000501	5-position base	CVM-18-05	494
0223000601	6-position base	CVM-18-06	587
0223000701	7-position base	CVM-18-07	711
0223000801	8-position base	CVM-18-08	760
0223000901	9-position base	CVM-18-09	842
0223001001	10-position base	CVM-18-10	923

MULTIPLE BASES 1/4"



Code	Description	Abbrev.	Weight [g]
0224000201	2-position base	CVM-14-02	296
0224000301	3-position base	CVM-14-03	406
0224000401	4-position base	CVM-14-04	515
0224000501	5-position base	CVM-14-05	624
0224000601	6-position base	CVM-14-06	733
0224000701	7-position base	CVM-14-07	845
0224000801	8-position base	CVM-14-08	956
0224000901	9-position base	CVM-14-09	1055
0224001001	10-position base	CVM-14-10	1086

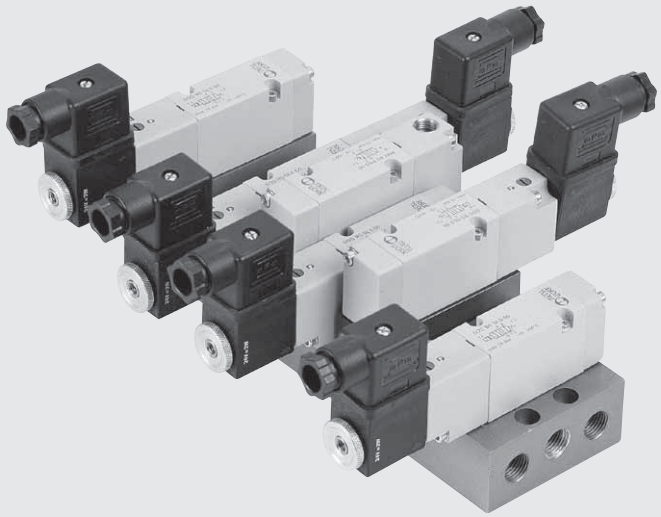
GASKET KIT



Code	Description	Weight [g]
0226004701	Gasket kit for 1/8" base	5
0226005701	Gasket kit for 1/4" base	5

VALVES SERIES 70 ON BASE

The series 70 valves on base, available in the air- and solenoid-actuated versions, is an excellent clean solution for use when it is necessary to intervene on the valves without disconnecting the pipes.
Here, the inlet, output and utility ports are in the base.

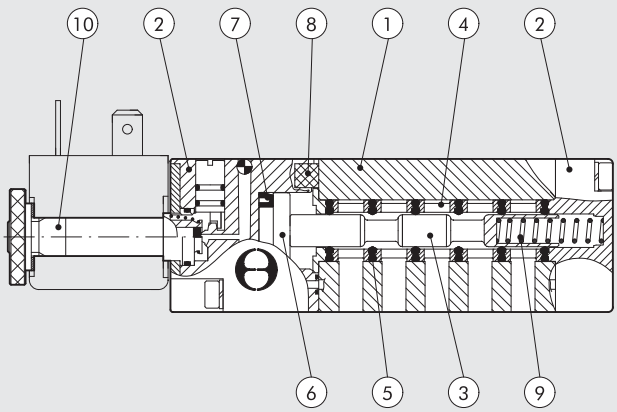


TECHNICAL DATA

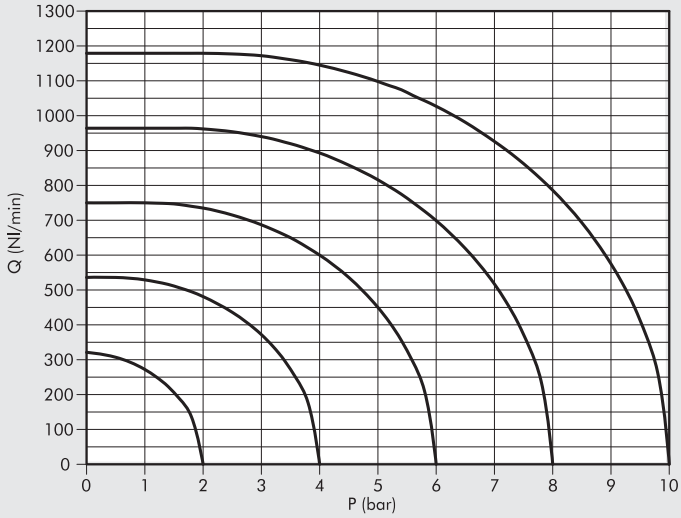
Operating pressure:		
• monostable	bar	2.5 to 10
• bistable	bar	1 to 10
• pilot-assisted	bar	Vacuum to 10
Minimum pilot pressure	bar	2.5
Operating temperature range	°C	-10 to +60
Nominal diameter	mm	5
Conductance C	Nl/min · bar	107.69
Critical ratio b	bar/bar	0.29
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	320
Flow rate at 6 bar ΔP 1 bar	Nl/min	450
Maximum torque coil nut	Nm	1

COMPONENTS

① VALVE BODY: Aluminium
② CONTROL/BASE: Hostaform®
③ SPOOL: chemically nickel-plated aluminium
④ DISTANCE PLATES: plastic
⑤ GASKETS: NBR
⑥ PISTONS: Hostaform®
⑦ PISTON GASKET: NBR
⑧ FILTER: sintered Bronze
⑨ SPRINGS: special steel
⑩ OPERATOR: Brass pipe – Stainless steel core

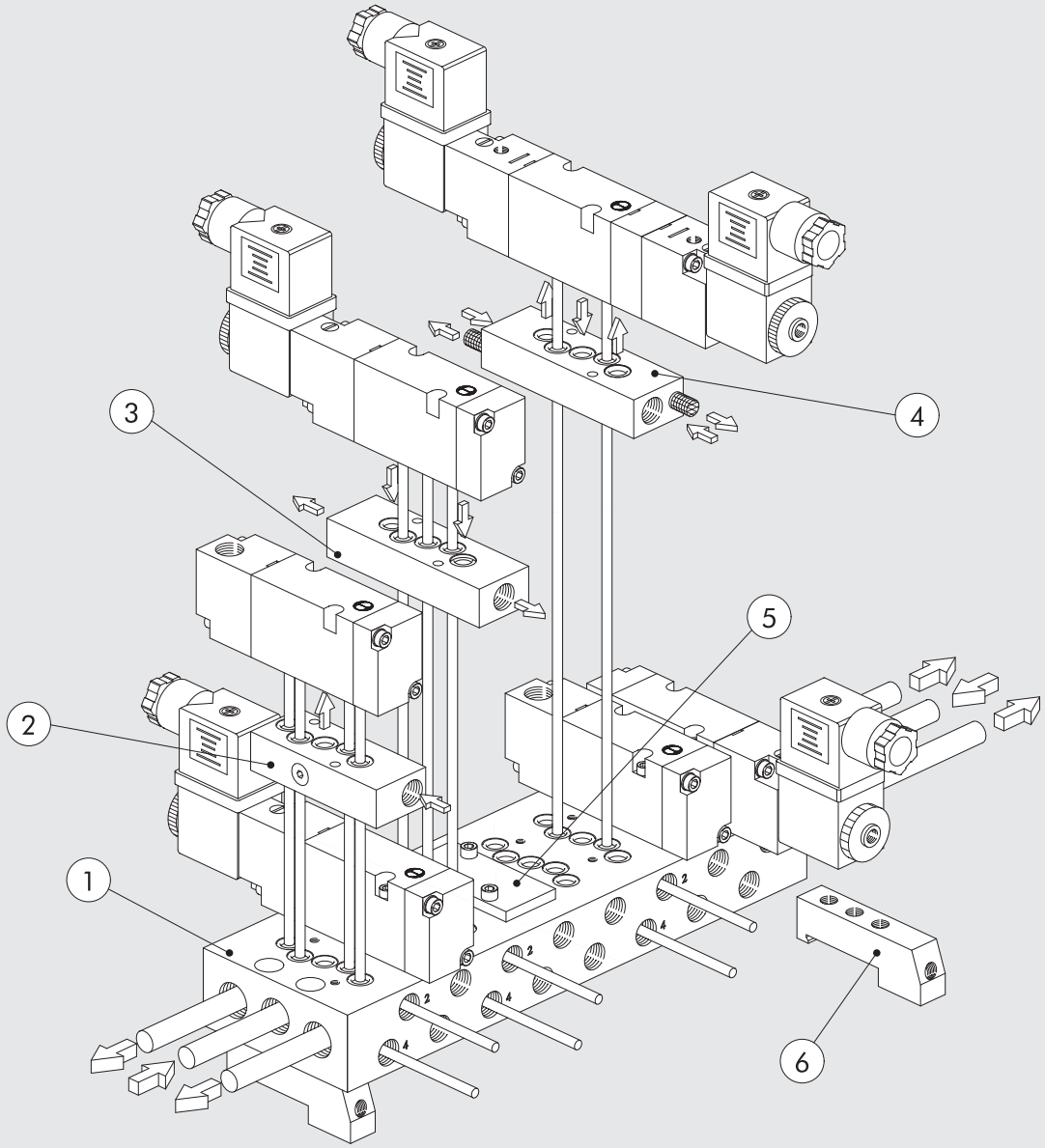


FLOW CHART



METAL WORK PNEUMATIC

MULTI-PURPOSE BASE FOR VALVES SERIES 70 ON BASE



Reference	Code	Description
①	**0223100201**	2-position base 1/8 on base
	0223100401	4-position base 1/8 on base
	0223100601	6-position base 1/8 on base
	0223100801	8-position base 1/8 on base
	0223101001	10-position base 1/8 on base
②	**0223106301**	Separate feed kit
③	**0223106303**	Exhaust regulation kit
④	**0223106302**	Exhaust feed kit
⑤	**0223106500**	Blanking plate
⑥	**0226004600**	Adapter for omega bar

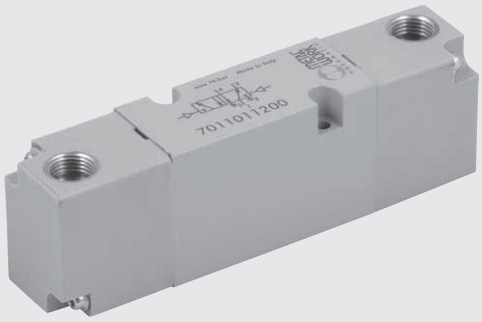
SYNOPTIC, SIZES AND VERSIONS

P N V FAMILY	B DIMENSIONS	5 FUNCTION	P N OPERATORS 14	S RESETTING (12)	O O FURTHER DETAILS
PNV pneumatic **SOV** elettro-pneumatic	**B** 1/8" on base	**5** 5/2 **6** 5/3	**PN** pneumatic **SO** solenoid **SE** solenoid assisted	**S** mechanical springs **B** bistable **D** differential	**OO** 5/2 **CC** closed centres **OC** open centres **PC** pressure centres

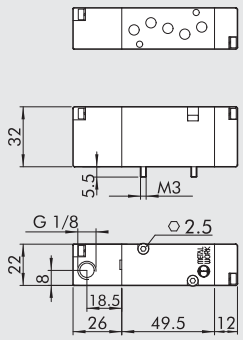
VALVES, SERIES 70, PNEUMATIC, ON BASE

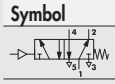
TECHNICAL DATA

Operating pressure	bar	Vacuum to 10
Minimum actuation pressure:		
• monostable	bar	2.5
• bistable	bar	1
Operating temperature range	°C	-10 to +60
Nominal diameter	mm	5
Conductance C	Nl/min · bar	107.69
Critical ratio b	bar/bar	0.29
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	320
Flow rate at 6 bar ΔP 1 bar	Nl/min	450
TRA / TRR monostable at 6 bar	ms	6/15
TRA / TRR bistable at 6 bar	ms	7/7

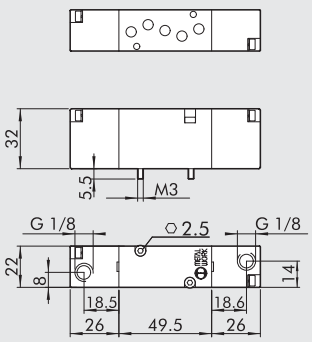


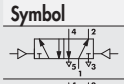
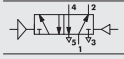
MONOSTABLE 5/2

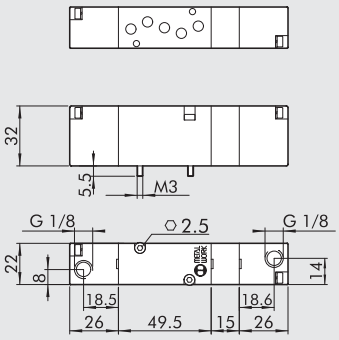


Symbol	Code	Abbrev.	Weight [g]
	7011011100	PNV B5 PNS OO	125

BISTABLE 5/2



Symbol	Code	Abbrev.	Weight [g]
	7011011200	PNV B5 PNB OO	136
	7011011300	PNV B5 PND OO	142

MONOSTABLE 5/3



Symbol	Code	Abbrev.	Weight [g]
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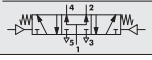
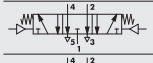
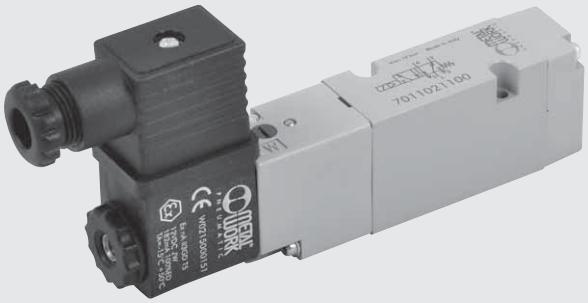
	7011012200	PNV B6 PNS OC	164
	7011012300	PNV B6 PNS PC	164

NOTES

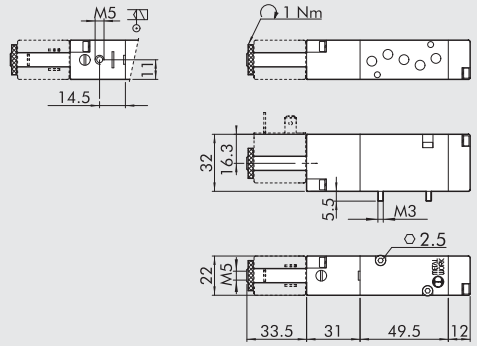
VALVES SERIES 70, SOLENOID/PNEUMATIC ON BASE

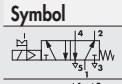
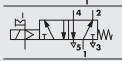
TECHNICAL DATA

Operating pressure:		
• monostable	bar	2.5 to 10
• bistable	bar	1 to 10
• pilot-assisted	bar	Vacuum to 10
Minimum pilot pressure	bar	2.5
Operating temperature range	°C	-10 to +60
Nominal diameter	mm	5
Conductance C	Nl/min · bar	107.69
Critical ratio b	bar/bar	0.29
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	320
Flow rate at 6 bar ΔP 1 bar	Nl/min	450
TRA / TRR monostable at 6 bar	ms	15 / 35
TRA / TRR bistable at 6 bar	ms	20 / 20
Electrical technical data		
Coil voltage values		12; 24VDC - 24; 110; 220VAC 50/60Hz
Power		2 W (DC) 3.5VA (AC)
Voltage tolerance	%	-10 to +15
Insulation class		F 155
Maximum coil nut torque	Nm	1

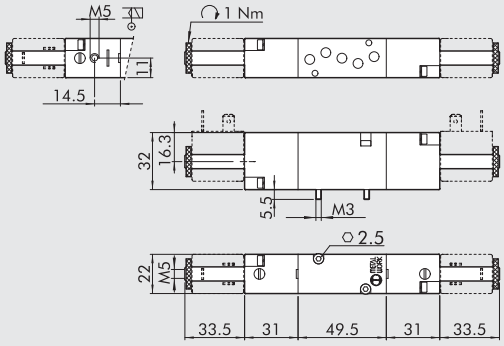


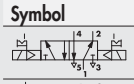
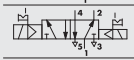
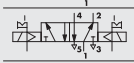
MONOSTABLE 5/2



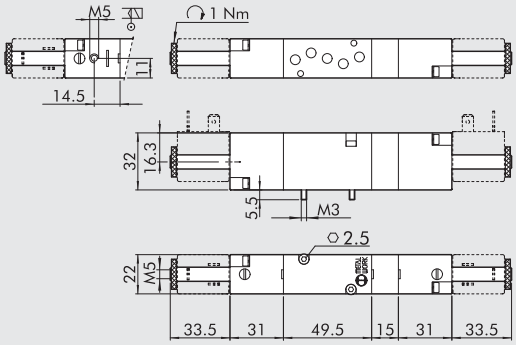
Symbol	Code	Abbrev.	Weight [g]
	**7011021100**	SOV B5 SOS OO	142
	**7011021500**	SOV B5 SES OO	143

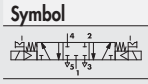
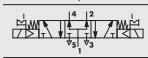
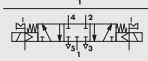
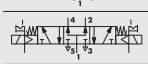
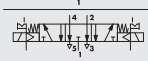
BISTABLE 5/2



Symbol	Code	Abbrev.	Weight [g]
	**7011021200**	SOV B5 SOB OO	174
	**7011021300**	SOV B5 SOD OO	180
	**7011021600**	SOV B5 SEB OO	174

MONOSTABLE 5/3

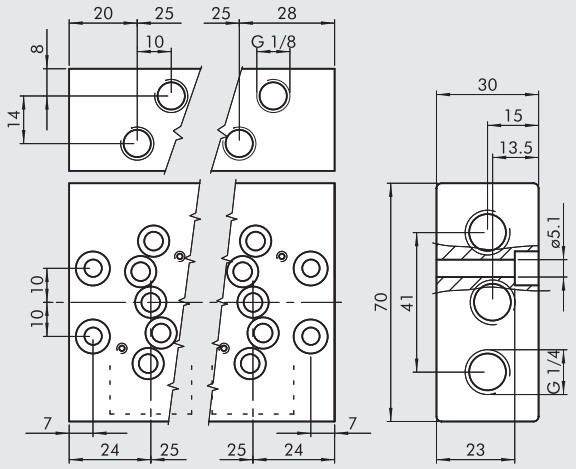


Symbol	Code	Abbrev.	Weight [g]
	**7011022100**	SOV B6 SOS CC	204
	7011022200	SOV B6 SOS OC	204
	**7011022300**	SOV B6 SOS PC	204
	**7011022400**	SOV B6 SES CC	202
	7011022500	SOV B6 SES OC	202
	**7011022600**	SOV B6 SES PC	202

ACCESSORIES

Refer to page **B1**.54 for coils and connectors

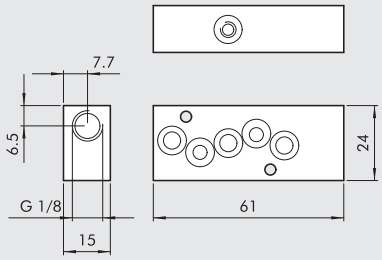
ACCESSORIES: MULTIPLE BASES

① MULTIPLE BASE



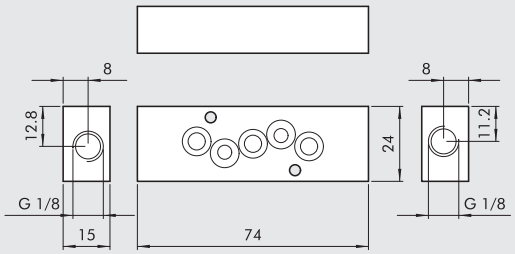
Code	Description	Weight [g]
0223100201	2-position base 1/8 on base	341
0223100401	4-position base 1/8 on base	591
0223100601	6-position base 1/8 on base	855
0223100801	8-position base 1/8 on base	1093
0223101001	10-position base 1/8 on base	1352

② SEPARATE FEED KIT



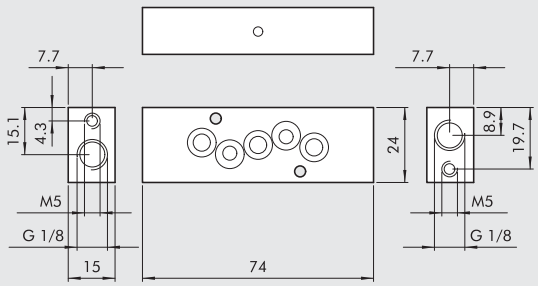
Code	Description	Weight [g]
0223106301	Separate feed kit 1/8	65

③ EXHAUST REGULATION KIT



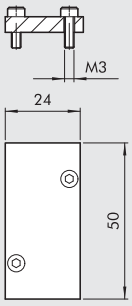
Code	Description	Weight [g]
0223106303	Exhaust regulation kit 1/8	75

④ EXHAUST FEED KIT



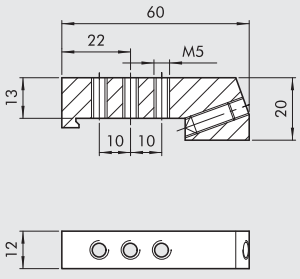
Code	Description	Weight [g]
0223106302	Exhaust feed kit 1/8	75

⑤ BLANKING PLATE



Code	Description	Weight [g]
0223106500	Blanking plate 1/8	15

⑥ ADAPTER FOR BAR OMEGA (DIN EN 50022)



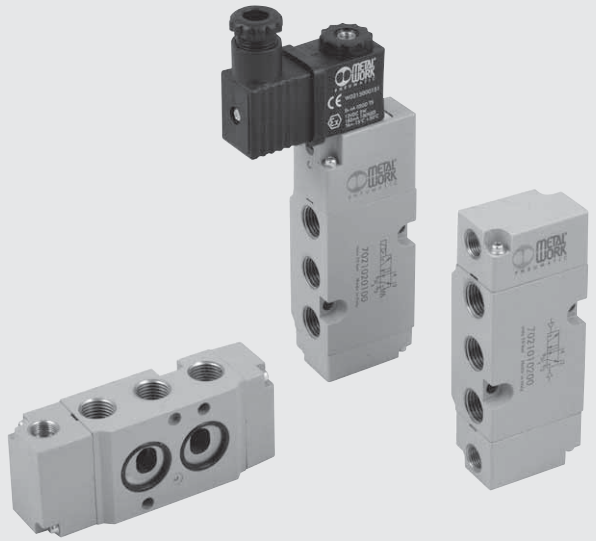
Code	Description	Weight [g]
0226004600	Adapter for bar omega 1/8"	46

VALVES NAMUR

METAL WORK PNEUMATIC

TECHNICAL DATA

Operating pressure:		
• monostable, electric	bar	2.5 to 10
• bistable, electric	bar	1to10
• pilot-assisted, electric	bar	Vacuum to 10
Minimum actuation pressure:		
• monostable, pneumatic	bar	2.5
• bistable, pneumatic	bar	1
Operating temperature range	°C	–10 to +60
Nominal diameter	mm	7.5
Conductance C	Nl/min · bar	264.26
Critical ratio b	bar/bar	0.27
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	750
Flow rate at 6 bar ΔP 1 bar (0.1 Mpa - 14.5 psi)	Nl/min	1100
Response time at 6 bar:		
• TRA/TRR monostable, pneumatic at 6 bar	ms	7 / 15
• TRA/TRR bistable, pneumatic at 6 bar	ms	7 / 7
• TRA/TRR monostable electric at 6 bar	ms	19 / 45
• TRA/TRR bistable electric at 6 bar	ms	21 / 21
Compatibility with oils		See **chapter Z1**

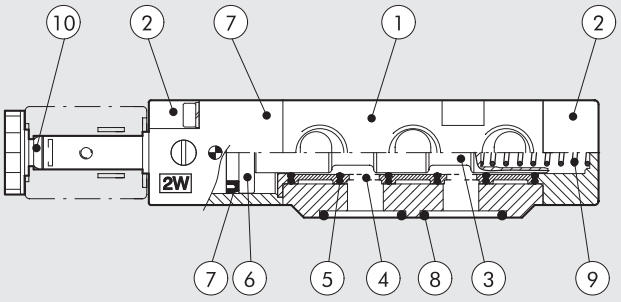


SYNOPTIC, SIZES AND VERSIONS

P N V	A	5	P N	S	O O
FAMILY	**DIMENSIONS**	**FUNCTION**	**OPERATORS 14**	**RESETTING (12)**	**FURTHER DETAILS**
PNV pneumatic	**A** NAMUR	**5** 5/2	**PN** pneumatic	**S** mechanical springs	**OO** 5/2
SOV electro-pneumatic		**4** 4/2	**SO** solenoid	**B** bistable	**NC** normally closed

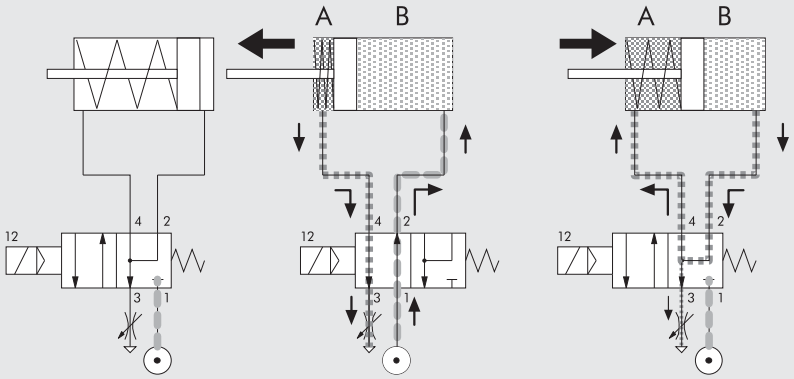
COMPONENTS

① VALVE BODY: Aluminium
② CONTROL/BASE: Hostaform®
③ SPOOL: chemically nickel-plated aluminium
④ DISTANCE PLATES: plastic
⑤ GASKETS: NBR nitrile rubber
⑥ PISTONS: Hostaform®
⑦ PISTON GASKET: NBR nitrile rubber
⑧ INTERFACE GASKETS: NBR nitrile rubber
⑨ SPRINGS: special steel
⑩ OPERATOR: Brass pipe – Stainless steel core

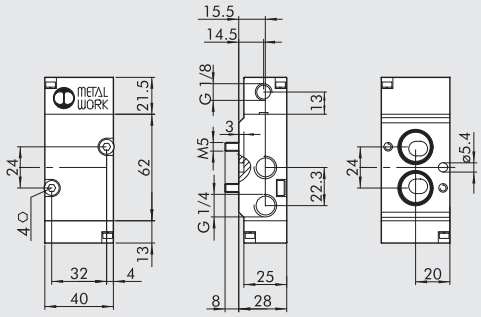


FUNCTIONING DIAGRAM 4/2 NAMUR VALVE

During the piston retraction stage, the air for chamber A is taken from the air leaving chamber B. This prevents the dirty air from getting in from the outside enviroment.

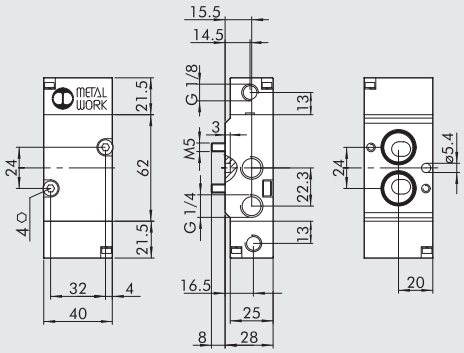


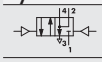
MONOSTABLE, PNEUMATIC 4/2



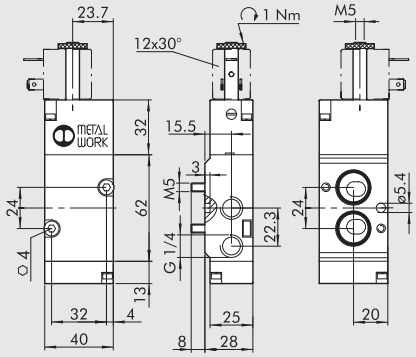
Symbol	Code	Abbrev.	Weight [g]
	7021010110	PNV A4 PNS NC	208

BISTABLE, PNEUMATIC 4/2



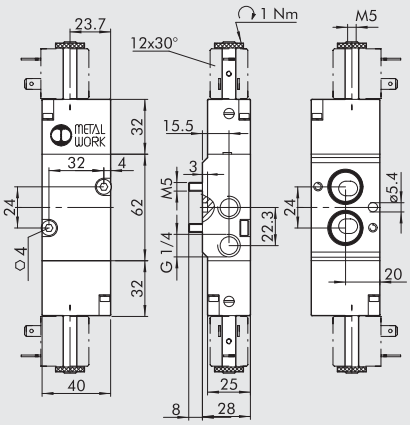
Symbol	Code	Abbrev.	Weight [g]
	7021010210	PNV A4 PNB OO	216

MONOSTABLE, SOLENOID/PNEUMATIC 4/2



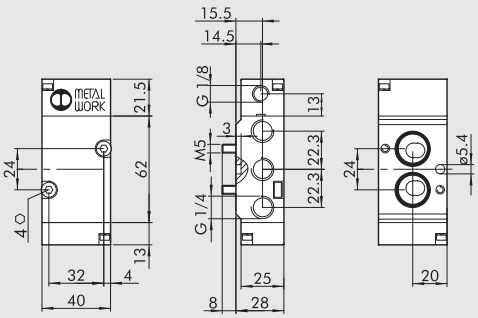
Symbol	Code	Abbrev.	Weight [g]
	7021020110	SOV A4 SOS NC	234

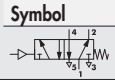
BISTABLE, SOLENOID/PNEUMATIC 4/2



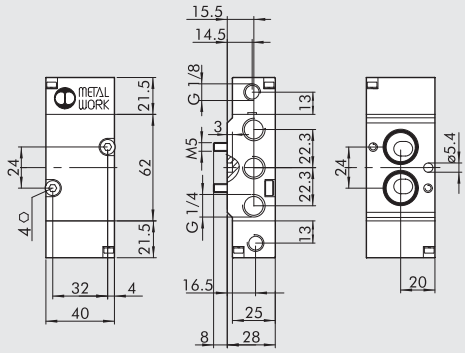
Symbol	Code	Abbrev.	Weight [g]
	7021020210	SOV A4 SOB OO	270

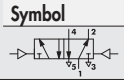
MONOSTABLE, PNEUMATIC 5/2



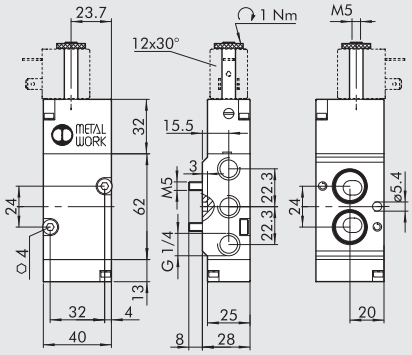
Symbol	Code	Abbrev.	Weight [g]
	7021010100	PNV A5 PNS OO	208

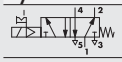
BISTABLE, PNEUMATIC 5/2



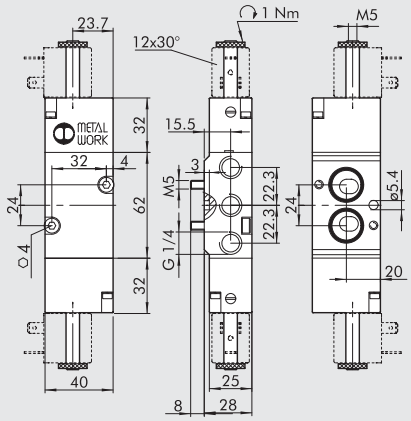
Symbol	Code	Abbrev.	Weight [g]
	7021010200	PNV A5 PNB OO	216

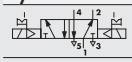
MONOSTABLE, SOLENOID/PNEUMATIC 5/2



Symbol	Code	Abbrev.	Weight [g]
	**7021020100**	SOV A5 SOS OO	234

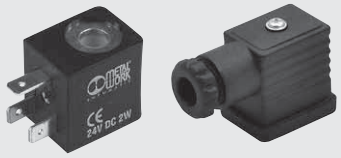
BISTABLE, SOLENOID/PNEUMATIC 5/2



Symbol	Code	Abbrev.	Weight [g]
	**7021020200**	SOV A5 SOB OO	270

ACCESSORIES FOR NAMUR VALVES SOV, SOLENOID/PNEUMATIC

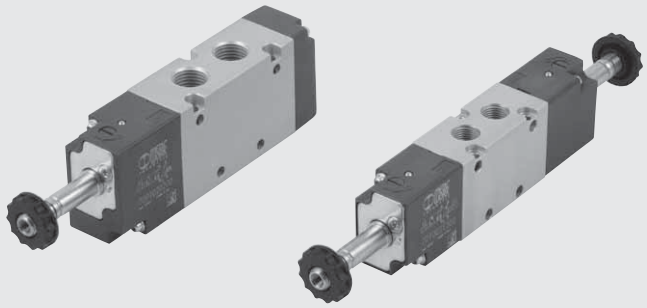
Refer to page **B1**.54 for coils and connectors



NOTES

VALVES SERIES BASIC

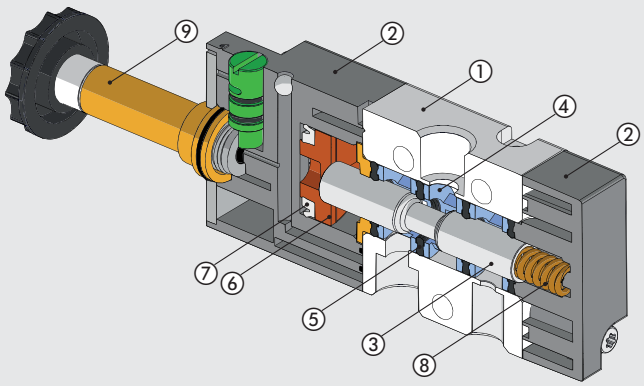
The valves in the BASIC series are a numerically-reduced selection of some types of the most commonly used solenoid valves.
They come in sizes 1/8" and 1/4" and in the 3/2 monostable, 5/2 monostable and 5/2 bistable versions.
Some production processes have been simplified, without affecting product quality and performance.
The body is made of anodized aluminium (without painting) and controls are in dark grey technopolymer.
BASIC valves can be assembled with accessories of other families of valves, in particular with 22 mm coils, a 8 mm hole and related connectors, modular bases, multiple bases and the multi-position connectors of the series 70 valves.



TECHNICAL DATA		1/8"	1/4"
Operating pressure:			
• monostable	bar	2.5 to 10	
• bistable	bar	1 to 10	
Operating temperature range	°C	–10 to +60	
Nominal diameter	mm	5	7.5
Conductance C	Nl/min · bar	121.43	264.26
Critical ratio b	bar/bar	0.32	0.27
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	400	750
Flow rate at 6 bar ΔP 1 bar	Nl/min	550	1100
TRA / TRR monostable at 6 bar	ms	15/35	19/45
TRA / TRR bistable at 6 bar	ms	20/20	21/21
Coil voltage values		12; 24 VDC - 24; 110; 220V AC 50/60Hz	
Power		2 W (DC) 3.5VA (AC)	
Voltage tolerance	%	-10 to +15	
Insulation class		F 155	
Maximum coil nut torque	Nm	1	
Hand operation		Bistable	
Installation		In any position (vertical assembly is not recommended for bistable valves subjected to vibration)	
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous	
Recommended lubricant		ISO and UNI FD 22	
Maximum coil nut torque	Nm	1	
Compatibility with oils		See **chapter Z1**	

COMPONENTS

① VALVE BODY: anodized aluminium
② CONTROL/END CAP: plastic
③ SPOOL: chemically nickel-plated aluminium
④ DISTANCE PLATES: plastic
⑤ GASKETS: NBR
⑥ PISTONS: Hostaform®
⑦ PISTON GASKET: NBR
⑧ SPRINGS: special steel
⑨ OPERATOR: Brass pipe - Stainless steel core

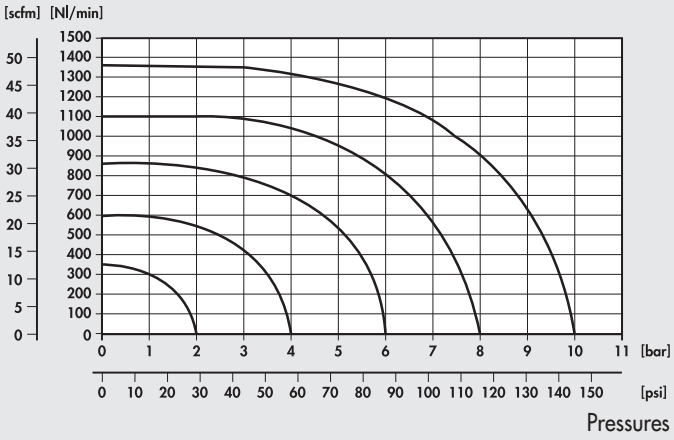


METAL WORK PNEUMATIC

FLOW CHARTS

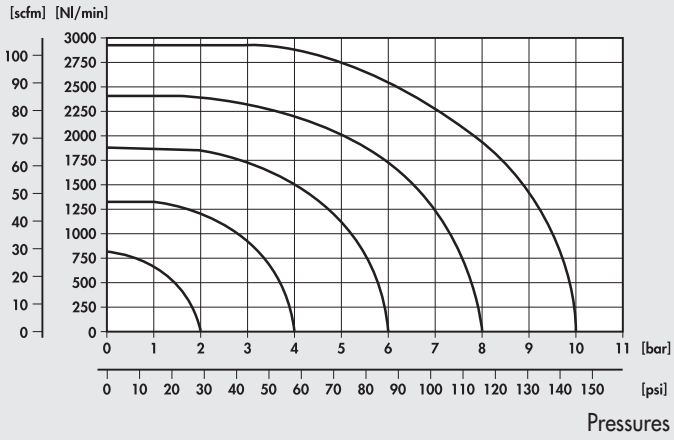
VALVES SERIES BASIC 1/8"

Flow rates



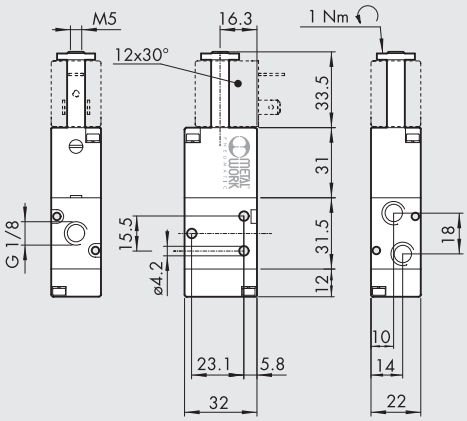
VALVES SERIES BASIC 1/4"

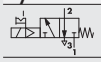
Flow rates



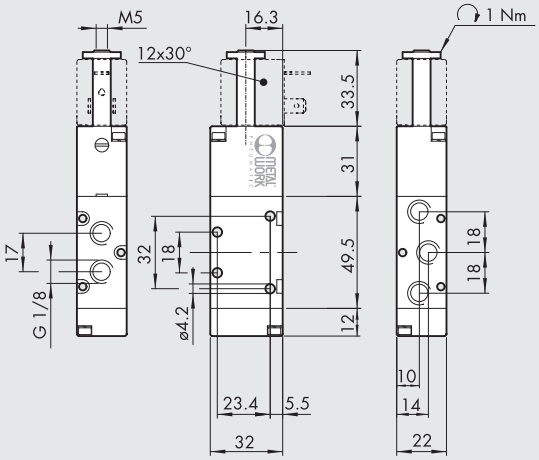
VALVES SERIES BASIC, 1/8"

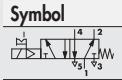
MONOSTABLE 3/2 NC 1/8"



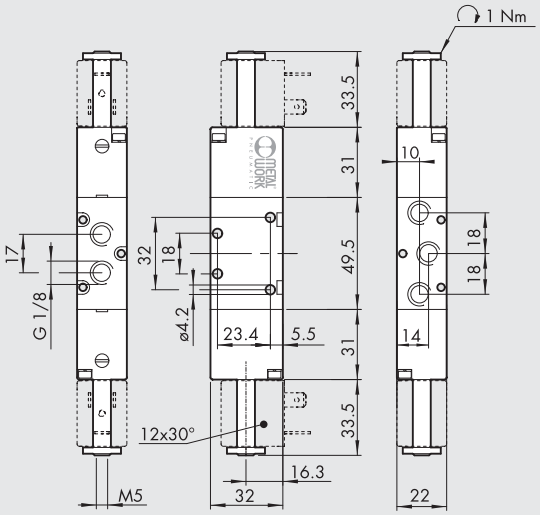
Symbol	Code	Abbrev.	Weight [g]
	7090020200	ELPN 1/8 3/2 MON NC	100

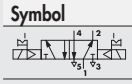
MONOSTABLE 5/2 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7090021100	ELPN 1/8 5/2 MON	128

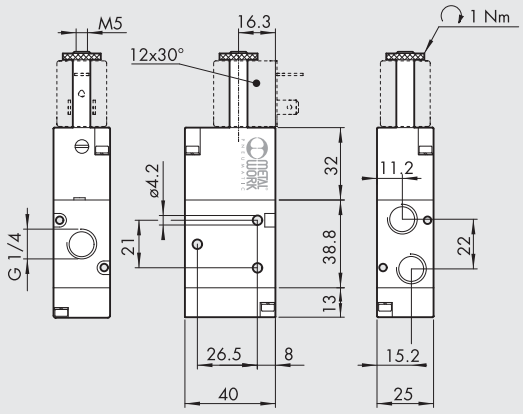
BISTABLE 5/2 1/8"



Symbol	Code	Abbrev.	Weight [g]
	7090021200	ELPN 1/8 5/2 BIS	160

VALVES SERIES BASIC, 1/4"

MONOSTABLE 3/2 NC 1/4"



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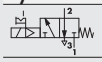
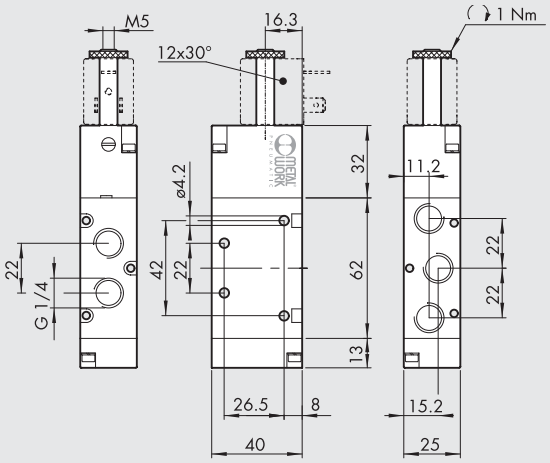
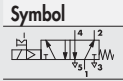
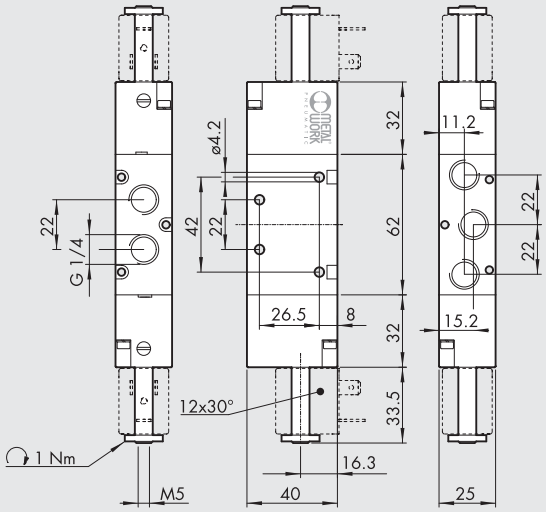
	7091020200	ELPN 1/4 3/2 MON NC	152

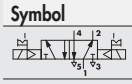
MONOSTABLE 5/2 1/4"



Symbol	Code	Abbrev.	Weight [g]
	7091021100	ELPN 1/4 5/2 MON	200

BISTABLE 5/2 1/4"



Symbol	Code	Abbrev.	Weight [g]
	7091021200	ELPN 1/4 5/2 BIS	236

ACCESSORIES

COILS AND CONNECTORS

Refer to page **B1**.54 for coils and connectors

MANIFOLDS

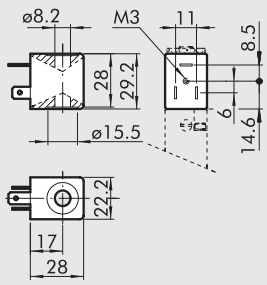
Refer to page **B1**.37 for manifolds

BASES

Refer to page **B1**.38 for bases

COILS AND CONNECTORS FOR SERIES 70, NAMUR AND SERIES BASIC VALVES

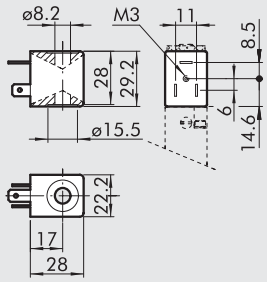
COILS SIDE 22 mm



- Voltage tolerance: -10% + 15%
- Insulation class: F155
- Degree of protection: IP65 DIN 40050 with connector
- Avoid prolonged exposure to atmospheric agents
- Coil temperature 100% ED: from 55°C to 20°C – Ambient temperature
- According to Atex 94/9 CE rule, group 2, category 3 GD

Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0215000151	Coil 22 Ø 8 BA 2W-12VDC	12Vcc	2W	2W
W0215000101	Coil 22 Ø 8 BA 2W-24VDC	24Vcc	2W	2W
W0215000111	Coil 22 Ø 8 BA 3.5VA-24VAC	24V 50/60Hz	5.3VA	3.5VA
W0215000121	Coil 22 Ø 8 BA 3.5VA-110VAC	110V 50/60Hz	5.3VA	3.5VA
W0215000131	Coil 22 Ø 8 BA 3.5VA-220VAC	220V 50/60Hz	5.3VA	3.5VA

"UL" AND "CSA" COILS 22 mm

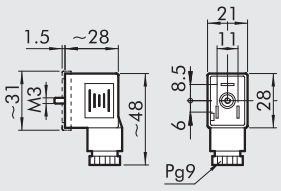


c UL us

- Voltage tolerance: –10% to + 15%
- Insulation class: F155
- Degree of protection: IP65 EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- Coil temperature 100% ED: 55°C at 20°C – Ambient temperature

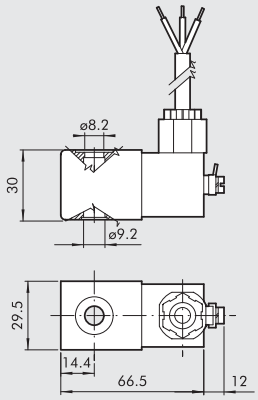
Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0215000251	Coil 22 Ø 8 BA 2W-12VDC UR	12Vcc	2W	2W
W0215000201	Coil 22 Ø 8 BA 2W-24VDC UR	24Vcc	2W	2W
W0215000211	Coil 22 Ø 8 BA 3.5VA-24VAC UR	24V 50/60Hz	5.3VA	3.5VA
W0215000221	Coil 22 Ø 8 BA 3.5VA-110VAC UR	110V 50/60Hz	5.3VA	3.5VA
W0215000231	Coil 22 Ø 8 BA 3.5VA-220VAC UR	220V 50/60Hz	5.3VA	3.5VA

CONNECTOR FOR COILS SIDE 22 mm



Code	Tipo	Colour	Ø Cable
W0970510011	Standard	Black	PG9
W0970510012	LED 24V	Transparent	PG9
W0970510013	LED 110V	Transparent	PG9
W0970510014	LED 220V	Transparent	PG9
W0970510015	LED + VDR 24V	Transparent	PG9
W0970510016	LED + VDR 110V	Transparent	PG9
W0970510017	LED + VDR 220V	Transparent	PG9
W0970510070	Atex II 2 GD	Black	PG9

KIT COIL EEXM



Code	Description
0227606913	Kit for coil 30 24VDC EEXMT5 cable 3 m
0227606915	Kit for coil 30 24VDC EEXMT5 cable 5 m
0227608013	Kit for coil 30 24VAC EEXMT5 cable 3 m
0227608015	Kit for coil 30 24VAC EEXMT5 cable 5 m
0227608023	Kit for coil 30 110VAC EEXMT5 cable 3 m
0227608025	Kit for coil 30 110VAC EEXMT5 cable 5 m
0227608033	Kit for coil 30 230VAC EEXMT5 cable 3 m
0227608035	Kit for coil 30 230VAC EEXMT5 cable 5 m

According to Atex 94/9 CE rule,
Ⓔx II 2G Ex mb IIC T4/T5 Gb
Ⓔx II 2D Ex tb IIIC T130/T95 °C IP66 Db

N.B.: It's not possible to mount valves having these coils on bases or on manifolds, because the width of 29.5 mm is higher than the distance between the valves. Special bases can be manufactured on request.

KIT COILS SIDE 22 IP65

Code	Description
0222100100	Kit for coils 22 - IP65

Improved IP65 protection, even after prolonged exposure to atmospheric agents.
Applicable to valves with a technopolymer control.

10-mm SOLENOID VALVES SERIES PLT-10

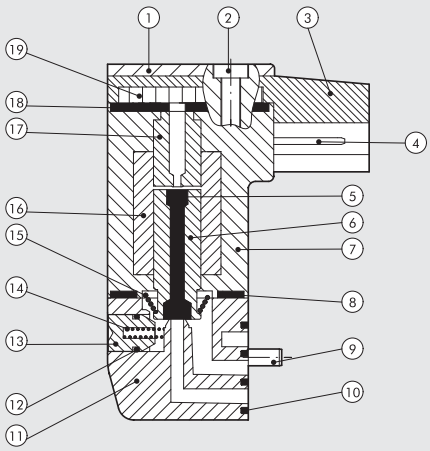
PLT-10 solenoid valves are the latest development in modern pneumatic design, where the main trends focus on miniaturisation, enhanced performance, reduced power and reliability.
Numerous versions are available, all with an ISO 15218 pneumatic interface. The power required to operate the PLT-10 has been greatly reduced, ranging from 0.3 to 0.8 Watts.
It is available with a LED indicating when it is active. Monostable manual control is also possible. None of the versions will get damaged if the polarity is accidentally inverted.

TECHNICAL DATA

Type		3/2 NC
Operating temperature range (Te)	°C	5 to 50
Fluid temperature (Tg)	°C	5 to 50
Fluid		Filtered, lubricated or unlubricated air
Operating life		Over 50 million cycles
Weight	g	12
Voltage tolerance	ΔV	± 10 %
Max operating frequency	f	30 Hz
Switching factor	ED	100 %
Insulation class		F155
Index of protection		IP51
Power connection		PLUG IN

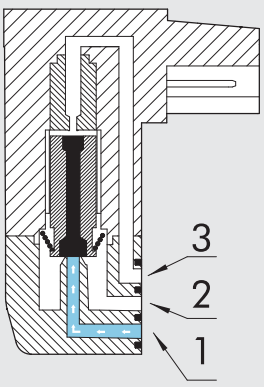
COMPONENTS

① TRANSPARENT COVER: PA612-transparent
② ASSEMBLY SCREWS: galvanized steel
③ COVER: PA66
④ PIN
⑤ MOBILE CORE OVER-STAMPING: FKM/FPM
⑥ MOBILE CORE: AISI 403F
⑦ COIL OVER-STAMPING: PA66
⑧ BODY-COIL GASKET: NBR70
⑨ ASSEMBLY SCREWS: galvanized steel
⑩ BODY GASKET: NBR
⑪ BODY: PA66
⑫ MANUAL GASKET: NBR (only for version with manual operated)
⑬ MANUAL CONTROL: AISI 303 (only for version with manual operated)
⑭ MANUAL SPRING: AISI 302 (only for version with manual operated)
⑮ SPRING: AISI 302
⑯ WINDING: PPS - Copper wire
⑰ FIXED CORE: AISI 430F
⑱ COIL-COVER GASKET: NBR
⑲ ELECTRONIC BOARD (only for version with electronic board)

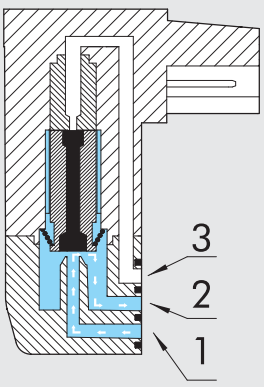


OPERATING CHART

DE-ENERGIZED



ENERGIZED



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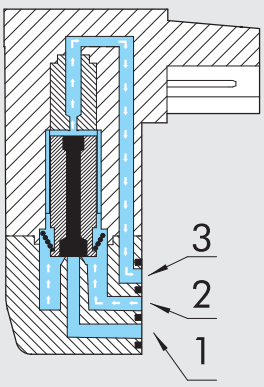
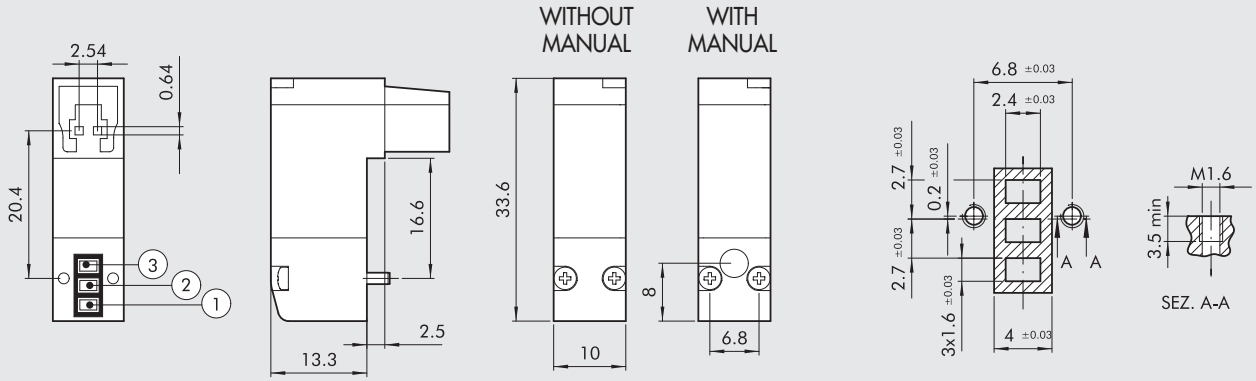
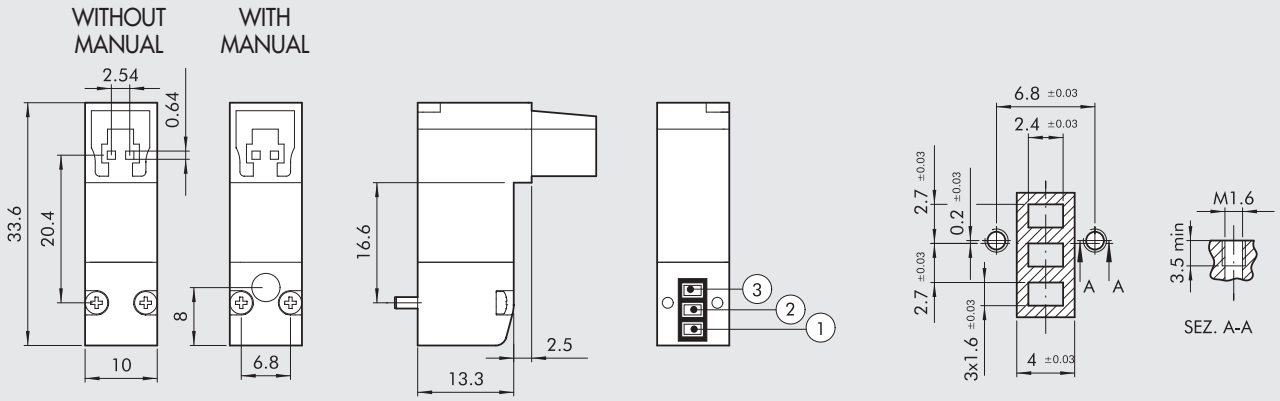


PLT-10 WITH BASE AND CONNECTION ON THE SAME SIDE



Version (3/2 NC)	Code	Manual	Voltage [Volt]	Power [Watt]	Through Ø [mm]	Operating press. [bar]	Flow rate at 6 ΔP=1 bar [Nl/min]	Tmax coil a 24VDC Te 20°C a ED100% [°C]	Weight [g]
Without LED	**722113330000**	without	12 VDC	0.7	0.6	3 ÷ 7	9	93	12
	722113330100	with	12 VDC	0.7	0.6	3 ÷ 7	9	93	12
	722113340000	without	24 VDC	0.7	0.6	3 ÷ 7	9	93	12
	722113340100	with	24 VDC	0.7	0.6	3 ÷ 7	9	93	12
With LED	**722113531000**	without	12 VDC	0.8	0.6	3 ÷ 7	9	93	12
	722113531100	with	12 VDC	0.8	0.6	3 ÷ 7	9	93	12
	722113541000	without	24 VDC	0.8	0.6	3 ÷ 7	9	93	12
	722113541100	with	24 VDC	0.8	0.6	3 ÷ 7	9	93	12
SPEED-UP e LED	**722116841000**	without	24 VDC	3/0.3	1.2	2 ÷ 7	16	51	12
	722116841100	with	24 VDC	3/0.3	1.2	2 ÷ 7	16	51	12
	722116941000	without	24 VDC	4.2/0.7	1.2	2 ÷ 7	30	51	12
	722116941100	with	24 VDC	4.2/0.7	1.2	2 ÷ 7	30	51	12

PLT-10 WITH BASE AND CONNECTION ON OPPOSITE SIDES



Version (3/2 NC)	Code	Manuale	Voltage [Volt]	Power [Watt]	Through Ø [mm]	Operating press. [bar]	Flow rate at 6 ΔP=1 bar [Nl/min]	Tmax coil a 24VDC Te 20°C a ED100% [°C]	Weight [g]
Without LED	**722213330000**	without	12 VDC	0.7	0.6	3 ÷ 7	9	93	12
	722213330100	with	12 VDC	0.7	0.6	3 ÷ 7	9	93	12
	722213340000	without	24 VDC	0.7	0.6	3 ÷ 7	9	93	12
	722213340100	with	24 VDC	0.7	0.6	3 ÷ 7	9	93	12
With LED	**722213531000**	without	12 VDC	0.8	0.6	3 ÷ 7	9	93	12
	722213531100	with	12 VDC	0.8	0.6	3 ÷ 7	9	93	12
	722213541000	without	24 VDC	0.8	0.6	3 ÷ 7	9	93	12
	722213541100	with	24 VDC	0.8	0.6	3 ÷ 7	9	93	12
SPEED-UP e LED	**722216841000**	without	24 VDC	3/0.3	1.2	2 ÷ 7	16	51	12
	722216841100	with	24 VDC	3/0.3	1.2	2 ÷ 7	16	51	12
	722216941000	without	24 VDC	4.2/0.7	1.2	2 ÷ 7	30	51	12
	722216941100	with	24 VDC	4.2/0.7	1.2	2 ÷ 7	30	51	12

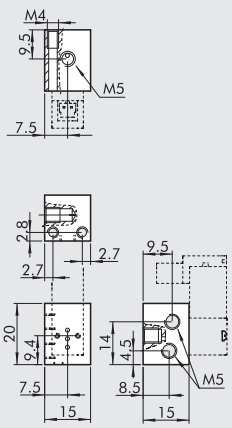
METAL WORK PNEUMATIC

KEY TO CODES

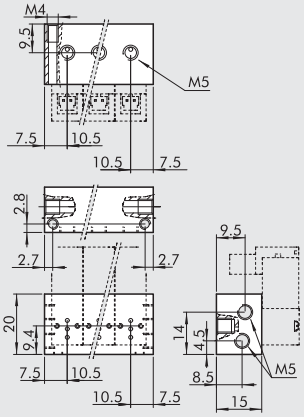
7 2 2	1	1	3	3	4	0	1	00
FAMILY	**POSITIONING**	**POWER CONNECTION**	**Ø THROUGH**	**POWER**	**VOLTAGE**	**LED**	**MANUAL CONTROL**	**VERSION**
Solenoid valves series "PLT-10"	**1** Base and connection on same side **2** Base and connection opposite sides	**1** Plug-in	**3** 0.6 mm **6** 1.2 mm	**3** 0.7 W **5** 0.8 W **8** 3/0.3 W **9** 4.2/0.7 W	**3** 12 VDC **4** 24 VDC	**0** - **1** LED	**0** - **1** manual monostable	**00** Standard

DIMENSIONS OF BASES FOR PLT-10

1 POSN.



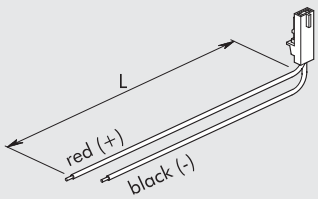
+ POSN.



Code	Description
W0400100101	Base 1 posn. for PLT-10
W0400100102	Base 2 posn. for PLT-10
W0400100103	Base 3 posn. for PLT-10
W0400100104	Base 4 posn. for PLT-10
W0400100105	Base 5 posn. for PLT-10
W0400100106	Base 6 posn. for PLT-10
W0400100107	Base 7 posn. for PLT-10
W0400100108	Base 8 posn. for PLT-10
W0400100109	Base 9 posn. for PLT-10
W0400100110	Base 10 posn. for PLT-10

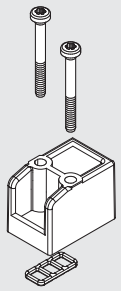
ACCESSORIES

PLUG-IN CONNECTOR



Code	Description
W0970512000	MACH 11 PLUG-IN connector L = 300

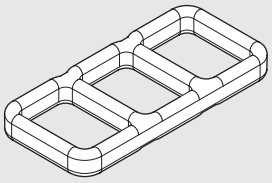
CAP FOR UNUSED POSITION



Code	Description	Weight [g]
W0400100200	Cap 10 mm	6

SPARE PARTS

INTERFACE GASKET



Code	Description
0226009701	PLT-10 GASKET

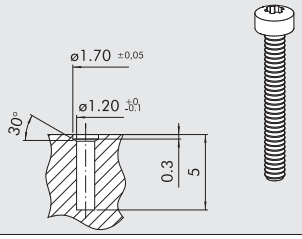
N.B. 50 for pack

STANDARD SECURING SCREW (FOR ALUMINIUM)

Code	Description
0226009702	PLT-10 screw for aluminium

N.B. 100 for pack

SECURING SCREWS FOR TECHNOPOLYMER



Code	Description
0226009703	Screw PLT-10 for technopol.

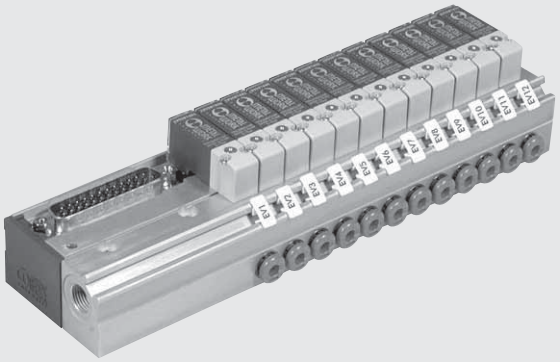
N.B. 100 for pack

When mounting on technopolymer bodies, use these screws instead of the ones supplied with the PLT-10.

ATTENTION: approximative dimensions for not added glass plastic materials It's always advisable to effect assembling tests.

BASES FOR PLT-10 MULTIPLE CONNECTION

Series PLT-10 solenoid valves can be mounted on bases complete with electrical and pneumatic connections, from 4 to 24 positions. The electric contacts of each valve are linked to a single multiple connector via a printed circuit board.
The connector has 9 pins or 25 pins, depending on the model and the number of valves that can be mounted. **Versions with 25-pin connectors can interface with standard field buses by means of Profibus-DP modules for Multimach (see page B2**.155).
The compressed-air supply is common to all the valves and can be provided on either side of the base by means of a 1/8" fitting.
Connection to the utilities is via automatic integrated cartridges for Ø 4 pipe.
The solenoid valve outlet is free, in a slot in the base.
The bases can be secured from above using M3 screws, or on a DIN bar using a bracket (see accessories).
The bases can mount various types of PLT-10 solenoid valves:
3/2 NC, 3/2 NO, with or without a manual actuator.
With this modular system, you can select the desired sequence of valves (NC, NO, blind) and change it at any time.

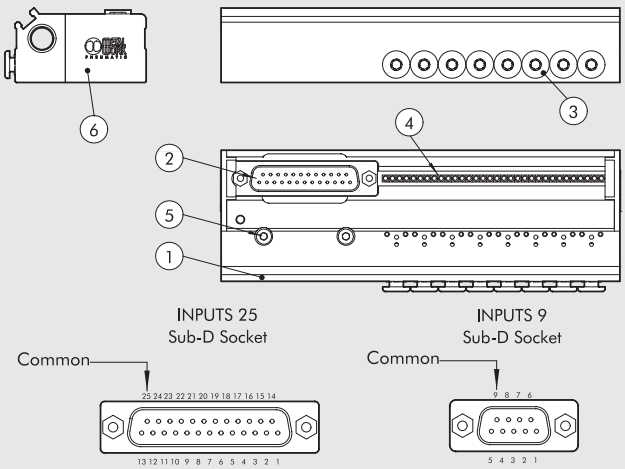


TECHNICAL DATA

Supply voltage		12 VDC or 24 VDC
Max input	W	0.7 per position for PLT-10 STD without LED
		0.9 per position for PLT-10 STD with LED
		3/0.3 per position for PLT-10 NC with Speed-up
		3/0.7 per position for PLT-10 NO with Speed-up
		4.2/0.7 per position for PLT-10 NC with Speed-up high flow
Valve actuation indicator		Led mounted on the PLT-10 (on versions of solenoid valve where envisaged)
Operating temperature range	°C	5 to 50
Protection degree (with valves and connectors mounted)		IP 40
Maximum number of mountable PLT-10s		24
Number of contacts		9, of which 1 common, for versions with 4 and 8 positions
		25, of which 1 common, for versions with 4, 8, 12, 16, 20, 24 positions

COMPONENTS

① Anodized aluminium base
② Multi-pin electrical connector
③ Automatic integrated cartridges for Ø 4 pipe
④ Electrical connectors for PLT-10 solenoid valves mounted on printed circuit board
⑤ Securing screw
⑥ Technopolymer cover



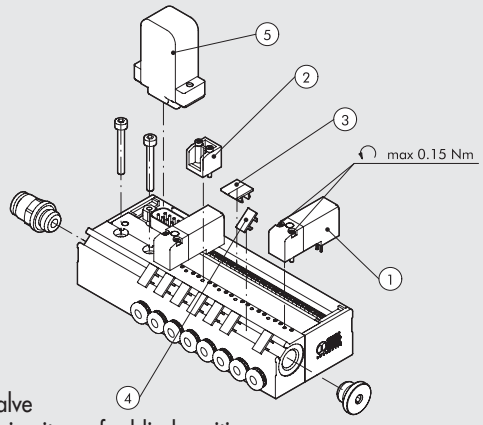
CONNECTION DIAGRAM

25 PIN		9 PIN	
Position of electrical contact	**Nr° PLT**	**Position of electrical contact**	**Nr° PLT**
1	PLT1	**1**	PLT1
2	PLT2	**2**	PLT2
3	PLT3	**3**	PLT3
4	PLT4	**4**	PLT4
5	PLT5	**5**	PLT5
6	PLT6	**6**	PLT6
7	PLT7	**7**	PLT7
8	PLT8	**8**	PLT8
9	PLT9	**9**	COMMON (-)
10	PLT10		
11	PLT11		
12	PLT12		
13	PLT13		
14	PLT14		
15	PLT15		
16	PLT16		
17	PLT17		
18	PLT18		
19	PLT19		
20	PLT20		
21	PLT21		
22	PLT22		
23	PLT23		
24	PLT24		
25	COMMON (-)		

Pilot numbering from left to right, starting from the position closest to the connection.

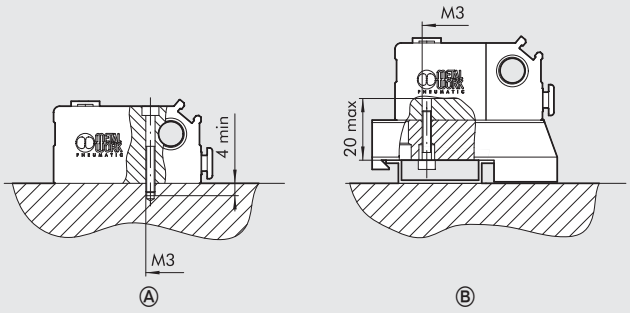
METAL WORK PNEUMATIC

ASSEMBLY OF SOLENOID VALVES AND ACCESSORIES



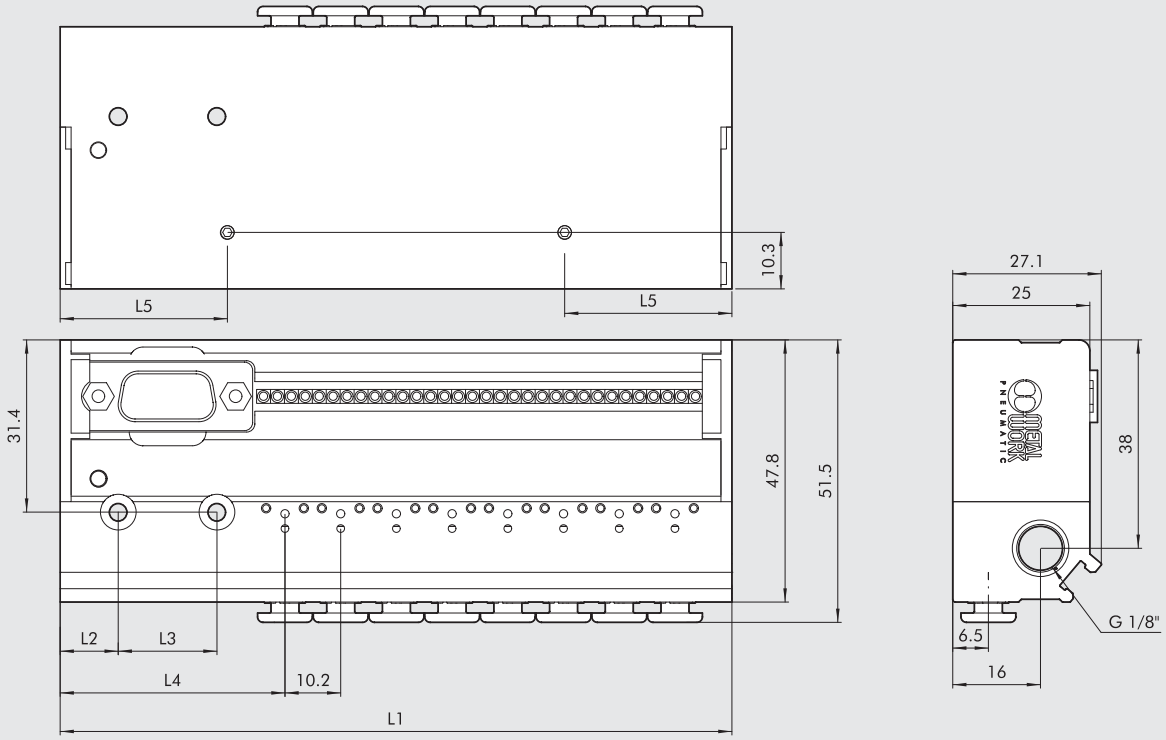
① Solenoid valve
② Pneumatic circuit cap for blind position
③ Electric circuit cap for blind position
(use two identification labels)
④ Identification label
⑤ Electrical connector

HOW TO SECURE THE BASE



Ⓐ From above using M3 screws
Ⓑ On a DIN bar, using the bracket and screws provided
The bases come with the rear holes plugged by provided dowels.

CODES AND DIMENSIONS FOR BASES 9 AND 25 PINS

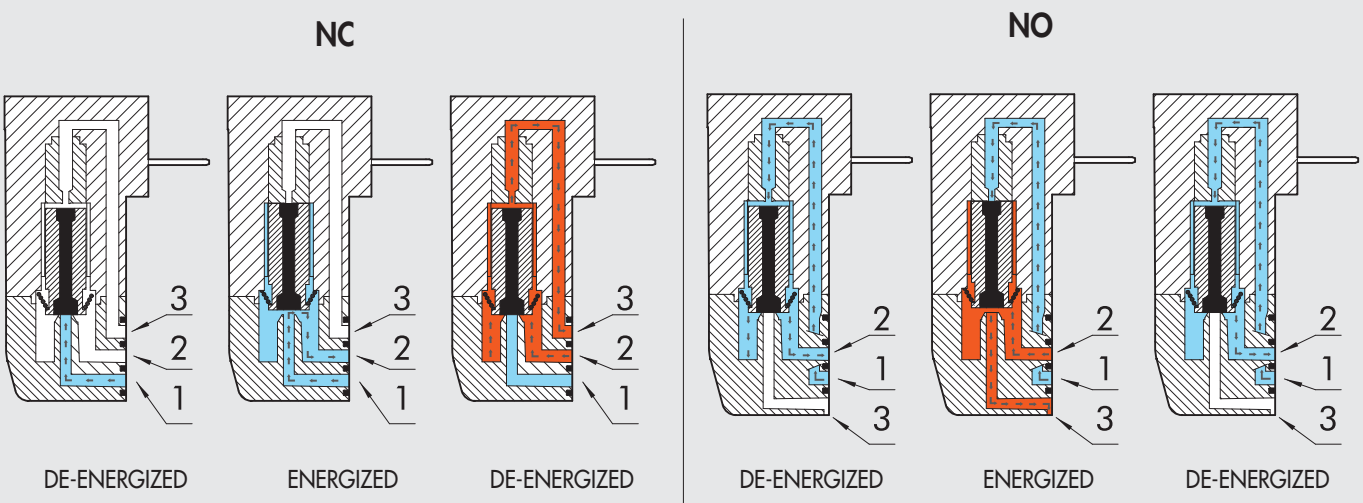


Code	Description	N° of PINS	N° of positions	L1	L2	L3	L4	L5	Weight [g]
0210040004	4-posn. base PLT 10 9-PIN mult conn.	9	4	81.9	10.6	18	41	19.6	160
0210040008	8-posn. base PLT 10 9-PIN mult conn.	9	8	122.5	10.6	18	41	19.6	235
0210240004	4-posn. base PLT 10 25-PIN mult conn.	25	4	104.8	15.5	30	63.9	30.5	210
0210240008	8-posn. base PLT 10 25-PIN mult conn.	25	8	145.4	15.5	30	63.9	30.5	280
0210240012	12-posn. base PLT 10 25-PIN mult conn.	25	12	186	15.5	30	63.9	30.5	355
0210240016	16-posn. base PLT 10 25-PIN mult conn.	25	16	226.6	15.5	30	63.9	30.5	430
0210240020	20-posn. base PLT 10 25-PIN mult conn.	25	20	267.2	15.5	30	63.9	30.5	500
0210240024	24-posn. base PLT 10 25-PIN mult conn.	25	24	307.8	15.5	30	63.9	30.5	575

PLT-10 FOR MULTIPLE ELECTRIC CONNECTION

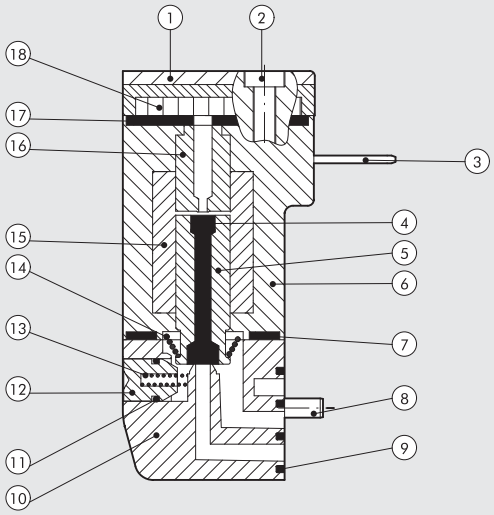
TECHNICAL DATA		NC	NO
Type		3/2 NC ed NO	
Operating temperature range (Te)	°C	5 to 50	
Fluid temperature (Tg)	°C	5 to 50	
Fluid		Filtered, lubricated or unlubricated air	
Operating life		Over 50 million cycles	
Weight	g	12	
Voltage tolerance	ΔV	± 10 %	
Max operating frequency	f	30 Hz	
Switching factor	ED	100 %	
Insulation class		F155	
Degree of protection		IP 51	IP 50

OPERATING CHART



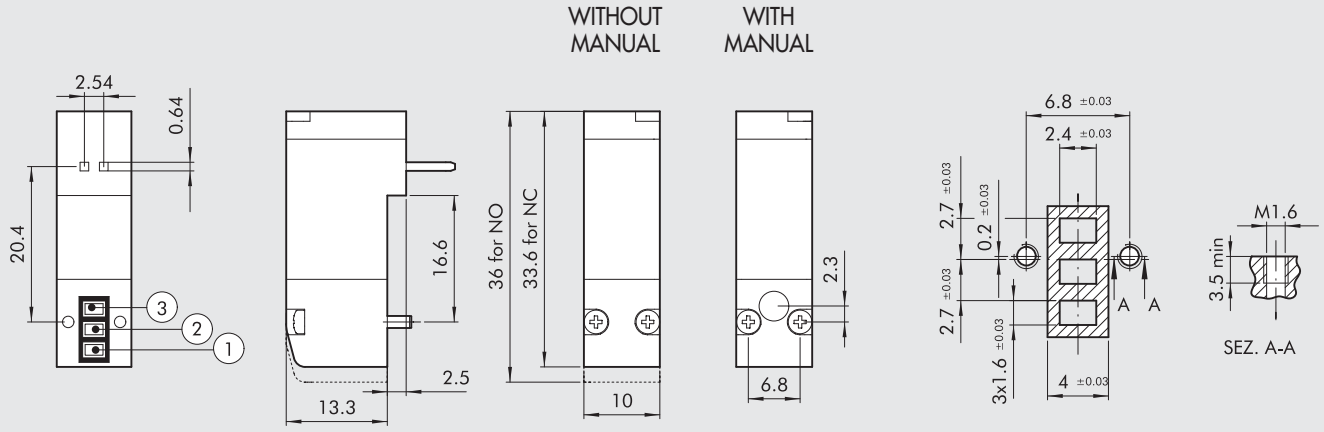
COMPONENTS

① TRANSPARENT COVER: PA612-transparent
② ASSEMBLY SCREWS: galvanized steel
③ PIN
④ MOBILE CORE OVER-STAMPING: FKM/FPM
⑤ MOBILE CORE: AISI 403F
⑥ COIL OVER-STAMPING: PA66
⑦ BODY-COIL GASKET: NBR70
⑧ ASSEMBLY SCREWS: galvanized steel
⑨ BODY GASKET: NBR
⑩ BODY: PA66
⑪ MANUAL GASKET: NBR (only for version with manual operated)
⑫ MANUAL CONTROL: AISI 303 (only for version with manual operated)
⑬ MANUAL SPRING: AISI 302 (only for version with manual operated)
⑭ SPRING: AISI 302
⑮ WINDING: PPS - Copper wire
⑯ FIXED CORE: AISI 430F
⑰ COIL-COVER GASKET: NBR
⑱ ELECTRONIC BOARD (only for version with electronic board)



METAL WORK PNEUMATIC

PLT-10 NC-NO FOR MULTIPLE ELECTRIC CONNECTION



Version (3/2 NC)	Code	Manual	Voltage [Volt]	Power [Watt]	Ø Through [mm]	Operating pressure [bar]	Flow rate at 6 ΔP=1 bar [Nl/min]	T Max coil T at 24VDC Te 20°C a ED100% [°C]	Weight [g]
Without LED	**722123330000**	without	12 VDC	0.7	0.6	3 to 7	9	93	12
	722123330100	with	12 VDC	0.7	0.6	3 to 7	9	93	12
	722123340000	without	24 VDC	0.7	0.6	3 to 7	9	93	12
	722123340100	with	24 VDC	0.7	0.6	3 to 7	9	93	12
With LED	**722123531000**	without	12 VDC	0.8	0.6	3 to 7	9	93	12
	722123531100	with	12 VDC	0.8	0.6	3 to 7	9	93	12
	722123541000	without	24 VDC	0.8	0.6	3 to 7	9	93	12
	722123541100	with	24 VDC	0.8	0.6	3 to 7	9	93	12
SPEED-UP and LED	**722126841000**	without	24 VDC	3/0.3	1.2	2 to 7	16	51	12
	722126841100	with	24 VDC	3/0.3	1.2	2 to 7	16	51	12
	722126941000	without	24 VDC	4.2/0.7	1.2	2 to 7	30	51	12
	722126941100	with	24 VDC	4.2/0.7	1.2	2 to 7	30	51	12

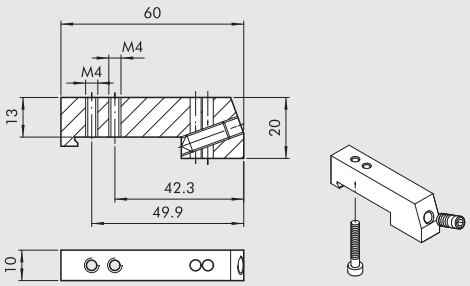
Version (3/2 NO)	Code	Manual	Voltage [Volt]	Power [Watt]	Ø Through [mm]	Operating pressure [bar]	Flow rate at 6 ΔP=1 bar [Nl/min]	T Max coil T at 24VDC Te 20°C a ED100% [°C]	Weight [g]
SPEED-UP and LED	**722126841010**	without	24 VDC	3/0.7	1.0	2 to 7	14	51	12
	722126841110	with	24 VDC	3/0.7	1.0	2 to 7	14	51	12

KEY TO CODES

7 2 2	1	2	3	3	4	0	1	0	0
FAMILY	**POSITIONING**	**POWER CONNECTION**	**Ø THROUGH**	**POWER**	**VOLTAGE**	**LED**	**MANUAL CONTROL**	**VERSION**	
Solenoid valves series "PLT-10"	**1** Base and connection on same side	**2** for multiple base	**3** 0.6 mm **6** 1.2 mm	**3** 0.7 W **5** 0.8 W **8** 3/0.3 W for NC 3/0.7 W for NO **9** 4.2/0.7 W	**3** 12 VDC **4** 24 VDC	**0** - **1** LED	**0** - **1** manual monostable	**0** NC **1** NO	**0** Standard

ACCESSORIES

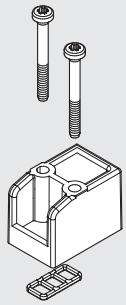
CONNECTION BRACKETS ON BAR OMEGA (DIN EN 50022)



Code	Description	Weight [g]
0227301610	Connection brackets on din BAR for bases PLT-10	30

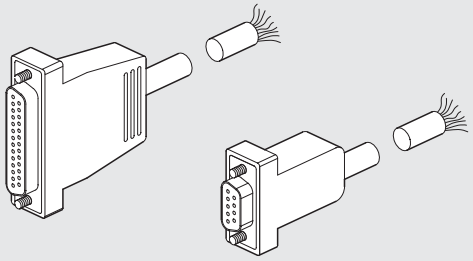
Supplied complete with one M3x20 screws and one M6 grub screw
Individually packed

CAP FOR UNUSED POSITION



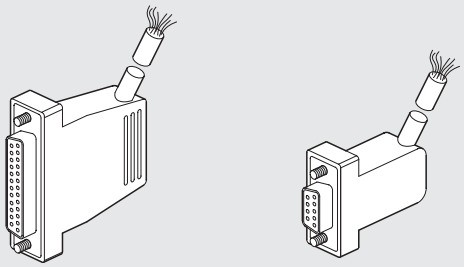
Code	Description	Weight [g]
W0400100200	Cap 10 mm	6

STRAIGHT PRE-WIRED CONNECTOR KIT



Code	Description	Weight [g]
0226900100	Connector + 9-wire axial cable L = 1 m	90
0226900250	Connector + 9-wire axial cable L = 2.5 m	220
0226900500	Connector + 9-wire axial cable L = 5 m	434
0226920100	Connector + 25-wire axial cable L = 1 m	132
0226920250	Connector + 25-wire axial cable L = 2.5 m	320
0226920500	Connector + 25-wire axial cable L = 5 m	636

PRE-WIRED 90° CONNECTOR

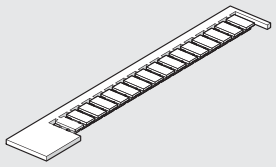


Code	Description	Weight [g]
0226910100	Connector + 9-wire 90° cable L = 1 m	90
0226910250	Connector + 9-wire 90° cable L = 2.5 m	220
0226910500	Connector + 9-wire 90° cable L = 5 m	434
0226930100	Connector + 25-wire 90° cable L = 1 m	132
0226930250	Connector + 25-wire 90° cable L = 2.5 m	320
0226930500	Connector + 25-wire 90° cable L = 5 m	636

WIRING DIAGRAM FOR PRE-WIRED PLUG CONNECTORS

25 PIN						9 PIN	
Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire
1	blue/black	10	brown/white	19	yellow/black	1	green/black
2	red/brown	11	red/orange	20	white	2	white
3	white/black	12	light blue	21	blue/white	3	blue/black
4	red/blue	13	yellow/white	22	brown	4	blue
5	black/orange	14	yellow	23	green/white	5	yellow/black
6	yellow/red	15	red/green	24	red	6	yellow
7	black/brown	16	orange	25	green/black	7	red/black
8	white/red	17	orange/white			8	green
9	red/black	18	green			9	white/black

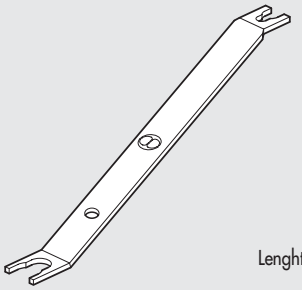
IDENTIFICATION PLATE KIT



Code	Description	Weight [g]
0226107000	Identification plate kit	30

Comes in 16-pc. packs

R17 - PIPE RELEASE SPANNER



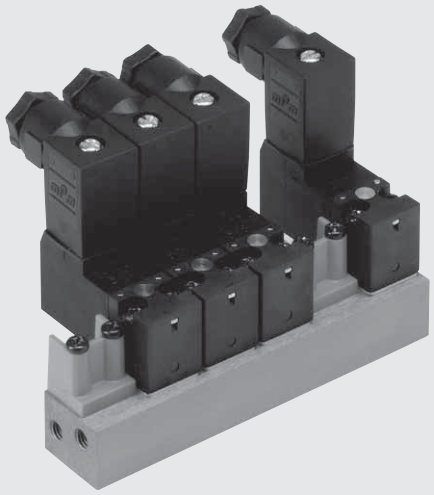
Lenght = 140 mm

Code	Description	Ø Pipe
2L17001	RL17	from Ø 3 to Ø 10

NOTES

SOLENOID VALVES PIV.M 15-mm

- 3/2 NC/NO direct control microvalves
- Possible assembly on single and multiple bases
- Monostable manual actuation as standard
- Assembly in any position
- Operation with filtered lubricated or unlubricated air
- Maximum ambient temperature: 50°C
- Low power absorption



TECHNICAL DATA

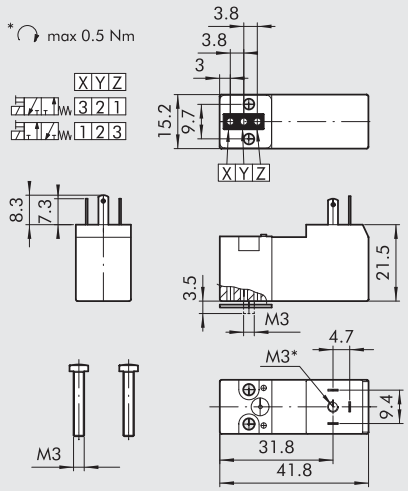
Voltage tolerance	%	–10 to +15
Alternating current frequency (AC)	Hz	50/60
Max operating frequency	Hz	30
Solenoid rating		100% ED
Response time	ms	~ 10
Type of protection		IP 65 EN 60529
Power connection		9.4 mm micro centre distance
Insulation class		155
Ambient temperature	°C	–10 to + 50
Fluid temperature	°C	–10 to + 50
Fluid		Filtered lubricated or unlubricated air
Operating life		100 million cycles
Materials		Body: PPS
		Spring: 302 stainless steel
		FKM/FPM gaskets
Weight	g	30
Manual control		Monostable
Assembly position		In any position

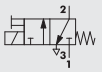
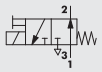
SYNOPTIC, SIZES AND VERSIONS

P I V	1	3	M	0	1	N C
FAMILY	AIR HOLE	NUMBER OF WAYS	DIMENSIONS	THREAD	VERSION	FURTHER DETAILS
	1 1 mm	**3** 3 ways	**M** 15 x 15	**0** on base	**1** 24 VDC	**NC** normally closed
	3 1.1 mm				**3** 24 VAC	**NO** normally open
	6 1.5 mm				**5** 110 VAC	
					7 220 VAC	

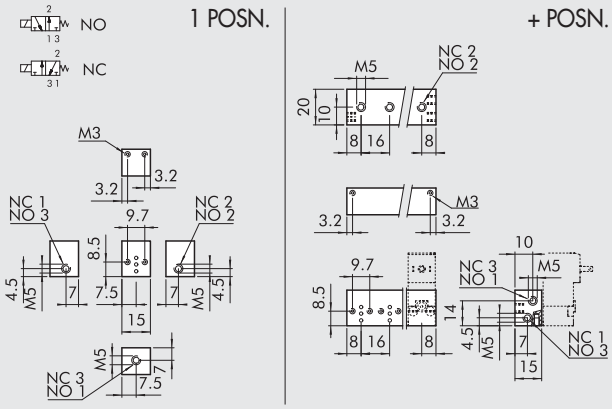
METAL WORK PNEUMATIC

PIV.M STD DIMENSIONS



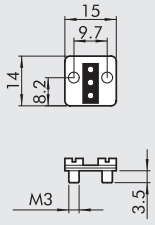
Symbol	Code	Description	Voltage [Volt]	Flow rate [Watt]	Air Ø [mm]	kv Factor	Operating press. [bar]
	W4015001000	PIV33M01 NC	24VDC	2.5W	1.1	0.42	0 to 10
	W4015001010	PIV33M03 NC	24VAC	2W - 3VA	1.1	0.42	0 to 10
	W4015001020	PIV33M05 NC	110VAC	2W - 3VA	1.1	0.42	0 to 10
	W4015001030	PIV33M07 NC	220VAC	2W - 3VA	1.1	0.42	0 to 10
	W4015001100	PIV63M01 NC	24VDC	2.5W	1.5	0.55	0 to 6
	W4015001110	PIV63M03 NC	24VAC	2W - 3VA	1.5	0.55	0 to 6
	W4015001120	PIV63M05 NC	110VAC	2W - 3VA	1.5	0.55	0 to 6
	W4015001130	PIV63M07 NC	220VAC	2W - 3VA	1.5	0.55	0 to 6
	W4015002000	PIV13M01 NO	24VDC	2.5W	1	0.33	0 to 6
	W4015002010	PIV13M03 NO	24VAC	2W - 3VA	1	0.33	0 to 6
	W4015002020	PIV13M05 NO	110VAC	2W - 3VA	1	0.33	0 to 6
	W4015002030	PIV13M07 NO	220VAC	2W - 3VA	1	0.33	0 to 6

MULTIPLE BASE FOR PIV.M



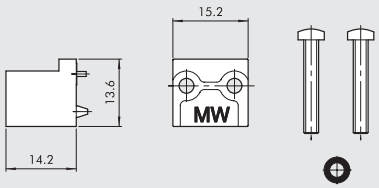
Code	Description	Abbrev.	Weight [g]
W0400101001	Single base 1 position	B5001	6
W0400101002	Multiple base 2 positions	B5002	24
W0400101003	Multiple base 3 positions	B5003	34
W0400101004	Multiple base 4 positions	B5004	46
W0400101005	Multiple base 5 positions	B5005	58
W0400101006	Multiple base 6 positions	B5006	70
W0400101007	Multiple base 7 positions	B5007	82
W0400101008	Multiple base 8 positions	B5008	98
W0400101009	Multiple base 9 positions	B5009	106
W0400101010	Multiple base 10 positions	B5010	114

END PLUG - UNUSED POSITION



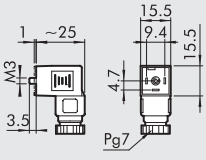
Code	Description	Weight [g]
W0400102000	End plug	6

END PLUG - PORT 1



Code	Description	Weight [g]
W0400102002	End plug – port 1	4

MICRO ELECTRIC CONNECTOR 15 mm



Code	Colour	Type
W0970500011	Black	Standard
W0970500012	Transparent	LED 24V
W0970500013	Transparent	LED 110V
W0970500015	Transparent	LED + VDR 24V
W0970500016	Transparent	LED + VDR 110V

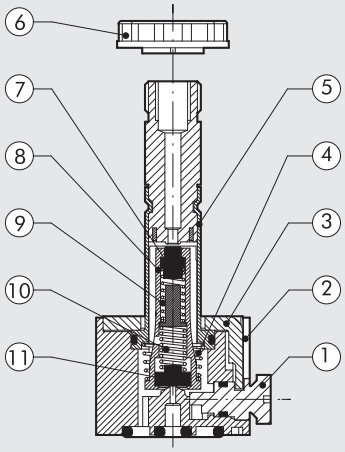
SOLENOID VALVES PIV ON BASE

- PIV.I - PIV.T and PIV.B solenoid valves
- Assembly on base
- Bistable manual actuation
- Normally closed/normally open solenoid valves 2/2 – 3/2
- Installation in any position
- Particularly suitable for high operating frequencies and low response times

TECHNICAL DATA		PIV.I ON BASE	PIV.T ON BASE	PIV.B ON BASE
Absorption		5W - 5VA	3.8W - 6.5VA	10W - 13VA
Voltage available		12-24 VDC / 24-110-220 VAC	24VDC / 24-110-220 VAC	24VDC / 24-110-220 VAC
		50/60 Hz	50/60 Hz	50/60 Hz
Voltage tolerance	%	–10 to +15	–10 to +15	–10 to +15
Max operating frequency	Hz	30	30	15
Solenoid rating	%	100	100	100
Response time	ms	8 to 15	8 to 15	10 to 15
Type of protection		IP 65	IP 65	IP 65
Type of coil		Coil side 22 Ø 8	Coil side 22 Ø 9	Coil side 30
		DIN 43650	DIN 43650	DIN 43650
Insulation class		155	155	155
Ambient temperature	°C	–15 to 50	–15 to 50	–15 to 50
Fluid temperature	°C	–15 to 50	–15 to 50	–15 to 50
Fluid		Filtered lubricated	Filtered lubricated	Filtered lubricated
		or unlubricated air	or unlubricated air	or unlubricated air
Woking life		25 million cycles	25 million cycles	–
Weight	g	80 to 120 (according to the version)	85	250
Maximum coil nut torque	Nm	1	1	1

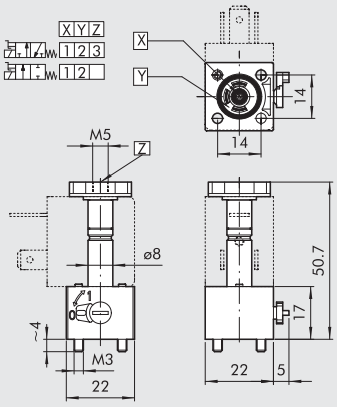
COMPONENTS

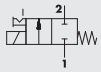
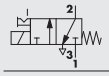
① Manual control: technopolymer
② Body: technopolymer
③ Sleeve locking plate
④ Spring: stainless steel
⑤ Sleeve: brass OT 58
⑥ Ring nut for coil fixing
⑦ Gasket: NBR
⑧ Mobile core
⑨ Spring: stainless steel
⑩ Spring: stainless steel
⑪ Gasket: NBR



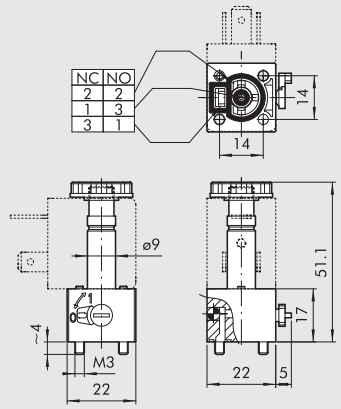
METAL WORK PNEUMATIC

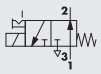
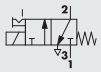
PIV.I VALVES, OPERATOR Ø 8, ON BASE



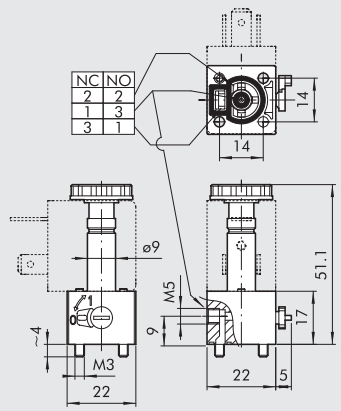
Symbol	Code	Description	Air hole Ø [mm]	kv Factor	Max oper. pressure [bar] DC 5W	AC 5VA
	W4018000200	PIV42I0S NC	1.2	0.65	10	10
	W4018000300	PIV72I0S NC	1.6	1	8	8
	W4018001200	PIV43I0S NC	1.2	0.65	10	10
	W4018001300	PIV73I0S NC	1.6	1	8	8

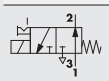
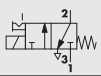
PIV.T VALVES, OPERATOR Ø 9, ON BASE



Symbol	Code	Description	Air hole Ø [mm]	kv Factor	Pressure range [bar] DC 3.8W	AC 6.5VA
	W4025002101	PIV73T0B NO	1.6	0.75	0.5 to 7	0.5 to 7
	W4025002301	PIV83T0B NO	1.8	0.85	0.5 to 6.5	0.5 to 6.5
	W4025002100	PIV73T0B NC	1.6	0.8	0.5 to 10	0.5 to 10
	W4025002300	PIV83T0B NC	1.8	1	0.5 to 8	0.5 to 8

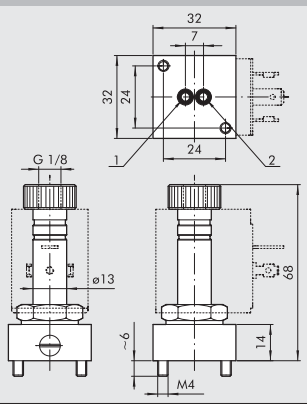
PIV.T VALVES, OPERATOR Ø 9, ON BASE WITH CONVEYED EXHAUST

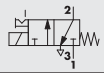


Symbol	Code	Description	Air hole Ø [mm]	kv Factor	Pressure range [bar] DC 3.8W	AC 6.5VA
	W4025002001	PIV73T00 NO	1.6	0.75	0.5 to 7	0.5 to 7
	W4025002501	PIV83T00 NO	1.8	0.85	0 to 6	0.5 to 6.5
	W4025002000	PIV73T00 NC	1.6	0.8	0.5 to 10	0.5 to 10
	W4025002500	PIV83T00 NC	1.8	1	0.5 to 8	0.5 to 8

PIV.B VALVES, OPERATOR Ø 13, ON BASE

NORMALLY CLOSED



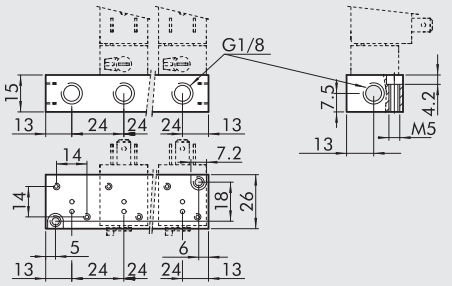
Symbol	Code	Description	Air hole Ø [mm]	kv Factor	Max oper. pressure [bar] DC 10W	AC 13VA
	W4026003000	PIVY3B0S NC	2.4	2.2	8	10

SYNOPTIC, SIZES AND VERSIONS

P I V FAMILY	7 AIR HOLE	3 NUMBER OF WAYS	T CONNECTION	0 THREAD	O VERSION	N C FURTHER DETAILS
	4 1.2 mm **7** 1.6 mm **8** 1.8 mm **Y** 2.4 mm	**2** 2 ways **3** 3 ways	**I** 22x22 operator Ø 8 **T** 22x22 operator Ø 9 **B** 30x30 operator Ø 13	**0** on base	**O** on base with conveyed exhaust **B** on base **S** standard	**NC** normally closed **NO** normally open

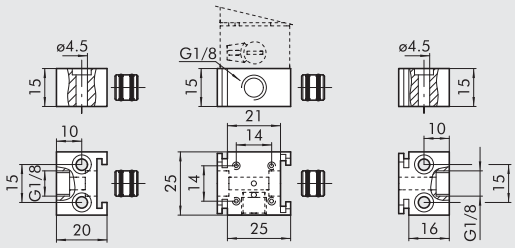
ACCESSORIES

MULTIPLE BASES FOR PIV.I SOLENOID VALVES, OPERATOR Ø 8



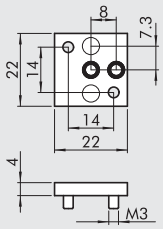
Code	Description	Abbrev.	Weight [g]
W0400111101	Base 1 position	EB 6001	22
W0400111102	Base 2 positions	EB 6002	50
W0400111103	Base 3 positions	EB 6003	76
W0400111104	Base 4 positions	EB 6004	102
W0400111105	Base 5 positions	EB 6005	128
W0400111106	Base 6 positions	EB 6006	154
W0400111107	Base 7 positions	EB 6007	180
W0400111108	Base 8 positions	EB 6008	206
W0400111109	Base 9 positions	EB 6009	232
W0400111110	Base 10 positions	EB 6010	258

MANIFOLD BASES FOR PIV.I SOLENOID VALVES, OPERATOR Ø 8



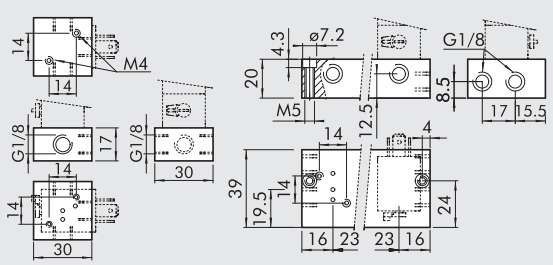
Code	Description	Abbrev.	Weight [g]
W0400111200	Manifold base	EB 8000 I	24
W0400111201	LH end plate	EB 8000 TI	17
W0400111202	RH end plate	EB 8000 T2	15

BLANKING PLATE FOR PIV.I PIV.T VALVES, UNUSED POSITION



Code	Description	Abbrev.	Weight [g]
W0400112000	Unused position	B 6000	5

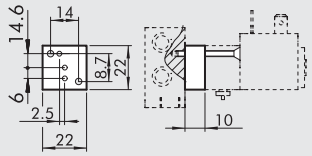
MULTIPLE BASES FOR PIV.T SOLENOID VALVES, OPERATOR Ø 9



Code	Description	Abbrev.	Weight [g]
W0400101101	Base 1 position	19001	36
W0400101102	Base 2 positions	19002	104
W0400101103	Base 3 positions	19003	148
W0400101104	Base 4 positions	19004	192
W0400101105	Base 5 positions	19005	236
W0400101106	Base 6 positions	19006	280
W0400101107	Base 7 positions	19007	324
W0400101108	Base 8 positions	19008	368
W0400101109	Base 9 positions	19009	452
W0400101110	Base 10 positions	19010	456

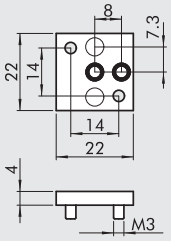
METAL WORK PNEUMATIC

NC/NO ADAPTER FOR PIV.T VALVES



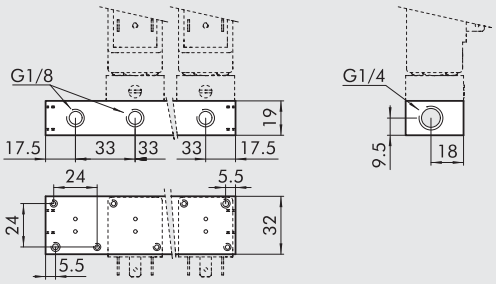
Code	Description	Abbrev.	Weight [g]
W0400101190	NC/NO adapter	I-9000	15

BASE BLANKING PLATE FOR PIV.T VALVES, UNUSED POSITIONS



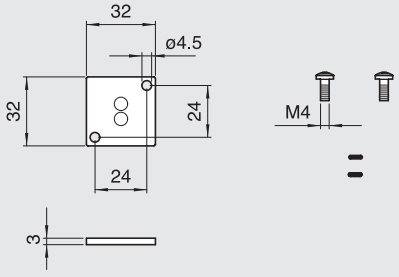
Code	Description	Abbrev.	Weight [g]
W0400112000	Blanking plate	B6000	5

MULTIPLE BASES FOR PIV.B VALVES



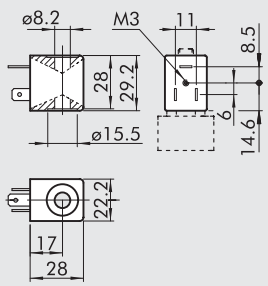
Code	Description	Abbrev.	Weight [g]
W0400101201	Base 1 position	B4001	42
W0400101202	Base 2 positions	B4002	94
W0400101203	Base 3 positions	B4003	142
W0400101204	Base 4 positions	B4004	188
W0400101205	Base 5 positions	B4005	234
W0400101206	Base 6 positions	B4006	280
W0400101207	Base 7 positions	B4007	326
W0400101208	Base 8 positions	B4008	372
W0400101209	Base 9 positions	B4009	418

BASE BLANKING PLATE FOR PIV.B VALVES, UNUSED POSITIONS



Code	Description	Weight [g]
W0400112001	Blanking plate	14

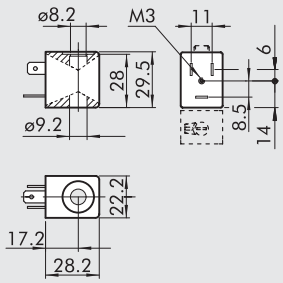
COILS, SIDE 22 mm FOR PIV.I SOLENOID VALVES, OPERATOR Ø 8



- Voltage tolerance: –10 to +15%
- Insulation class: F155
- Degree of protection: IP65 – EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents.
- Maximum coil temperature at 100% use: 70°C at 20° ambient temperature
- According to Atex 94/9 CE rule, group 2, category 3 GD

Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0215000051	Coil 22 Ø 8 5W-12VDC	12Vcc	5W	5W
W0215000001	Coil 22 Ø 8 5W-24VDC	24Vcc	5W	5W
W0215000011	Coil 22 Ø 8 5VA-24VAC	24V 50/60Hz	8VA	5VA
W0215000021	Coil 22 Ø 8 5VA-110VAC	110V 50/60Hz	8VA	5VA
W0215000031	Coil 22 Ø 8 5VA-220VAC	220V 50/60Hz	8VA	5VA

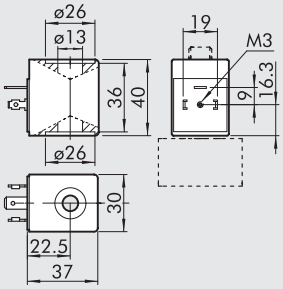
COILS, SIDE 22 mm FOR PIV.T SOLENOID VALVES, OPERATOR Ø 9



- Voltage tolerance: –10 to +15%
- Insulation class: F155
- Degree of protection: IP65 – EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- Maximum coil temperature at 100% use: 70°C at 20° ambient temperature
- According to Atex 94/9 CE rule, group 2, category 3 GD

Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0216000001	Coil 22 Ø9 3.8W-24VDC	24Vcc	3.8W	3.8W
W0216000011	Coil 22 Ø9 6.5VA-24VAC	24V 50/60Hz	9VA	6.5VA
W0216000021	Coil 22 Ø9 6.5VA-110VAC	110V 50/60Hz	9VA	6.5VA
W0216000031	Coil 22 Ø9 6.5VA-220VAC	220V 50/60Hz	9VA	6.5VA

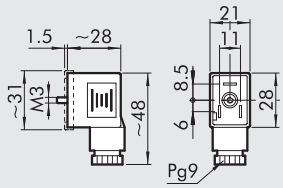
COILS, SIDE 30 mm FOR PIV.B SOLENOID VALVES



- Voltage tolerance: –10 to +15%
- Insulation class: M180
- Degree of protection: IP65 – EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- According to Atex 94/9 CE rule, group 2, category 3 GD

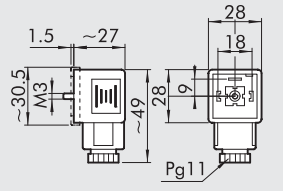
Code	Abbrev.	Nominal voltage	Power absorption (average power input)
W0216001001	Coil 30 Ø13 10W-24VDC	24Vcc	10W
W0216001011	Coil 30 Ø13 13VA-24VAC	24V 50/60Hz	13VA
W0216001021	Coil 30 Ø13 13VA-110VAC	110V 50/60Hz	13VA
W0216001031	Coil 30 Ø13 13VA-220VAC	220V 50/60Hz	13VA

CONNECTORS, SIDE 22 mm FOR PIV.I-PIV.T



Code	Type	Colour	Ø Cable
W0970510011	Standard	Black	PG9
W0970510012	LED 24V	Transparent	PG9
W0970510013	LED 110V	Transparent	PG9
W0970510014	LED 220V	Transparent	PG9
W0970510015	LED + VDR 24V	Transparent	PG9
W0970510016	LED + VDR 110V	Transparent	PG9
W0970510017	LED + VDR 220V	Transparent	PG9
W0970510070	Atex II 2 GD	Black	PG9

CONNECTORS, SIDE 30 mm FOR PIV.B

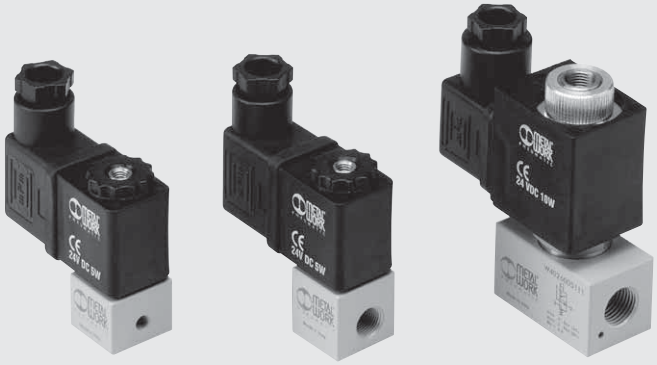


Code	Type	Colour	Ø Cable
W0970520033	Standard	Black	PG11
W0970520034	LED 24V	Transparent	PG11
W0970520035	LED 110V	Transparent	PG11
W0970520036	LED 220V	Transparent	PG11
W0970520037	LED + VDR 24V	Transparent	PG11
W0970520038	LED + VDR 110V	Transparent	PG11
W0970520039	LED + VDR 220V	Transparent	PG11

SOLENOID VALVES PIV IN LINE

METAL WORK PNEUMATIC

- PIV.I – PIV.B in-line solenoid valves
- Threaded ports: M5, G1/8", G1/4"
- 2/2 – 3/2 solenoid valves - normally closed/normally open
- Installation in any position
- Particularly suitable for high operating frequencies and low response times.

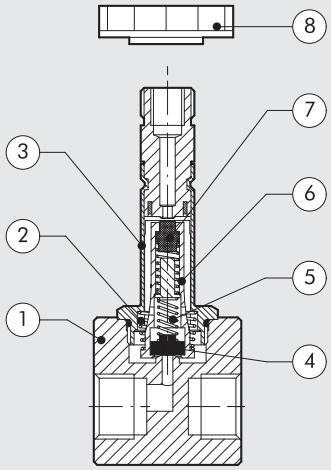


TECHNICAL DATA		PIV.I IN LINE	PIV.B IN LINE
Absorption		5W to 5VA	10W - 13VA
Voltage available		12; 24VDC - 24; 110; 220VAC 50/60Hz	24VDC - 24; 110; 220VAC 50/60 Hz
Voltage tolerance	%	–10 to 15	–10 to 15
Max operating frequency	Hz	30	15
Solenoid rating	%	100	100
Response time	ms	8 to 15	10 to 15
Type of protection		IP 65	IP 65
Type of coil		Coil side 22 Ø 8 DIN 43650	Coil side 30 DIN 43650
Insulation class		155	155
Ambient temperature	°C	–15 to 50	–15 to 50
Fluid temperature	°C	–15 to 50	–15 to 50
Fluid		Filtered lubricated or unlubricated air	Filtered lubricated or unlubricated air
Working life		25 million cycles	–
Weight		35 to 40 (depending on version)	130
Maximum coil/nut torque	Nm	1	1

Note on use:
The 2/2 NC and 2/2 NO valves work only with inlet pressure ≥ outlet pressure.

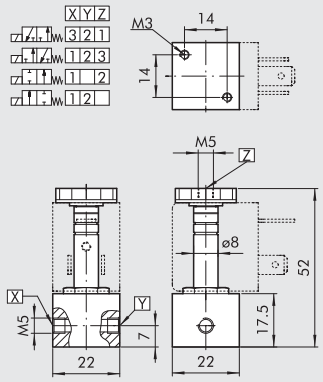
COMPONENTS

① Body: aluminium
② Springs: steel
③ Sleeve
④ Gasket: NBR
⑤ Springs: steel
⑥ Mobile core
⑦ Gasket: FKM/FPM
⑧ Coil locking ring

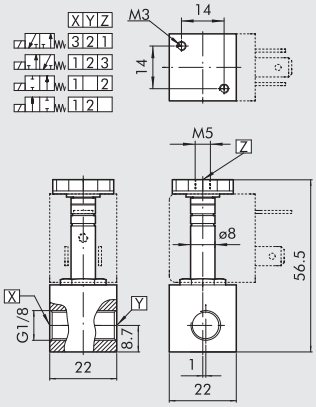


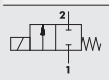
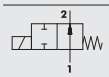
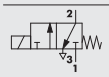
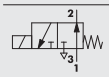
PIV.I VALVES, OPERATOR Ø 8 mm, IN LINE – M5 – 1/8"

M5

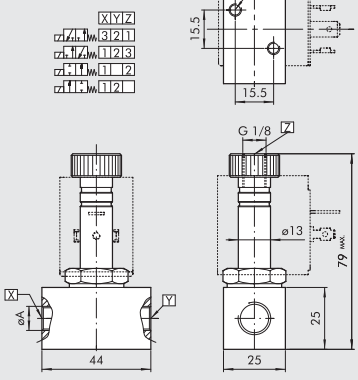


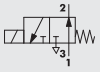
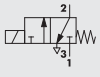
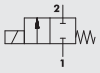
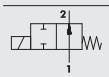
1/8"



Symbol	Code	Description	Input thread	Air hole Ø [mm]	kv Factor	Max oper. pressure [bar] DC 5W	Max oper. pressure [bar] AC 5VA
	**W4017000100**	PIV42I5S NC	M5	1.2	0.65	30	30
	W4017001300	PIV92I8S NC	G1/8"	2.4	2	6	7
	W4017001100	PIV42I8S NC	G1/8"	1.2	0.65	30	30
	W4017001200	PIV72I8S NC	G1/8"	1.6	1.2	15	14
	**W4017000101**	PIV72I5S NO	M5	1.4	0.8	10	10
	W4017001201	PIV72I8S NO	G1/8"	1.4	0.8	10	10
	**W4017003100**	PIV43I5S NC	M5	1.2	0.65	10	10
	W4017004100	PIV43I8S NC	G1/8"	1.2	0.65	10	10
	W4017004200	PIV73I8S NC	G1/8"	1.6	1	6.5	6.5
	**W4017004201**	PIV73I8S NO	G1/8"	1.4	0.7	6	7

PIV.B VALVES, OPERATOR Ø 13, IN LINE



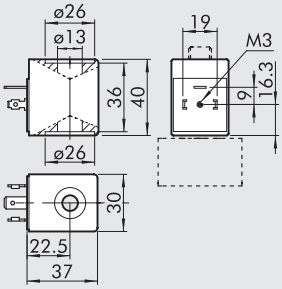
Symbol	Code	Description	Input thread	Ø Air hole [mm]	kv Factor	Max oper. pressure [bar] DC 10W	Max oper. pressure [bar] AC 13VA
	**W4026005001**	PIV73B8S NO	G1/8"	1.6	1.2	6	12
	W4026005101	PIV73B4S NO	G1/4"	1.6	1.2	6	12
	W4026005111	PIV93B4S NO	G1/4"	2.4	2	3	4
	**W4026005010**	PIV93B8S NC	G1/8"	2.4	2.8	8	10
	W4026005020	PIVW3B8S NC	G1/8"	3	4	5.5	6
	W4026005000	PIV73B8S NC	G1/8"	1.6	1.4	14	17
	W4026005100	PIV73B4S NC	G1/4"	1.6	1.4	14	17
	W4026005110	PIV93B4S NC	G1/4"	2.4	2.8	8	8
	W4026005120	PIVW3B4S NC	G1/4"	3	4	5.5	6
	**W4026004000**	PIV92B4S NC	G1/4"	2.4	3	15	30
	W4026004010	PIVX2B4S NC	G1/4"	4	7	6	12
	W4026004020	PIVZ2B4S NC	G1/4"	6	9	1.5	5
	**W4026004001**	PIV92B4S NO	G1/4"	2.4	2.6	13	15

SYNOPTIC, SIZES AND VERSIONS

P I V FAMILY	7 AIR HOLE	2 NUMBER OF WAYS	B CONNECTION	4 THREAD	S VERSION	N C FURTHER DETAILS
	4 1.2 mm **7** 1.6 mm **9** 2.4 mm **W** 3 mm **X** 4 mm **Z** 6 mm	**2** 2 ways **3** 3 ways	**I** 22 x 22 operator Ø 8 **B** 30 x 30 operator Ø 13	**5** M5 **4** G1/4" **8** G1/8"	**S** standard	**NC** normally closed **NO** normally open

ACCESSORIES

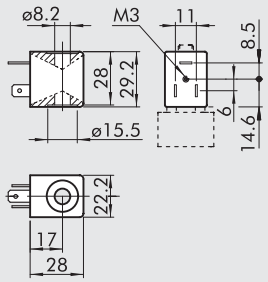
COIL, SIDE 30 mm - FOR PIV.B SOLENOID VALVES



- Voltage tolerance: –10 to +15%
- Insulation class: M180
- Degree of protection: IP65 – EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- According to Atex 94/9 CE rule, group 2, category 3 GD

Code	Abbrev.	Nominal voltage	Absorption (average)
W0216001001	Coil 30 Ø13 10W-24VDC	24Vcc	10W
W0216001011	Coil 30 Ø13 13VA-24VAC	24V 50/60Hz	13VA
W0216001021	Coil 30 Ø13 13VA-110VAC	110V 50/60Hz	13VA
W0216001031	Coil 30 Ø13 13VA-220VAC	220V 50/60Hz	13VA

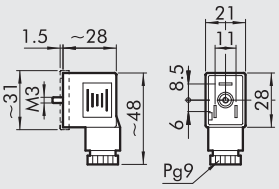
COIL, SIDE 22 mm - FOR PIV.I SOLENOID VALVES



- Voltage tolerance: –10 to +15%
- Insulation class: F155
- Degree of protection: IP65 – EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- Maximum temperature of coil at 100% use: 70°C at 20° ambient temperature
- According to Atex 94/9 CE rule, group 2, category 3 GD

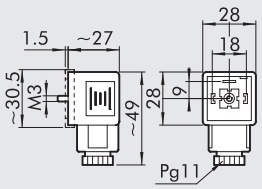
Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0215000051	Coil 22 Ø8 5W-12VDC	12Vcc	5W	5W
W0215000001	Coil 22 Ø8 5W-24VDC	24Vcc	5W	5W
W0215000011	Coil 22 Ø8 5VA-24VAC	24V 50/60Hz	8VA	5VA
W0215000021	Coil 22 Ø8 5VA-110VAC	110V 50/60Hz	8VA	5VA
W0215000031	Coil 22 Ø8 5VA-220VAC	220V 50/60Hz	8VA	5VA

CONNECTOR, SIDE 22 mm



Code	Type	Colour	Ø Cable
W0970510011	Standard	Black	PG9
W0970510012	LED 24V	Transparent	PG9
W0970510013	LED 110V	Transparent	PG9
W0970510014	LED 220V	Transparent	PG9
W0970510015	LED + VDR 24V	Transparent	PG9
W0970510016	LED + VDR 110V	Transparent	PG9
W0970510017	LED + VDR 220V	Transparent	PG9
W0970510070	Atex II 2 GD	Black	PG9

CONNECTOR, SIDE 30 mm



Code	Type	Colour	Ø Cable
W0970520033	Standard	Black	PG11
W0970520034	LED 24V	Transparent	PG11
W0970520035	LED 110V	Transparent	PG11
W0970520036	LED 220V	Transparent	PG11
W0970520037	LED + VDR 24V	Transparent	PG11
W0970520038	LED + VDR 110V	Transparent	PG11
W0970520039	LED + VDR 220V	Transparent	PG11

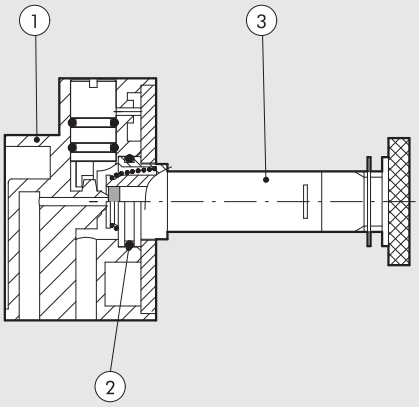
SOLENOID VALVE CNOMO

Solenoid valve to CNOMO 060580.
- 3/2 version normally closed
- Bistable and monostable manual actuation
- Assembly on manifold base

TECHNICAL DATA

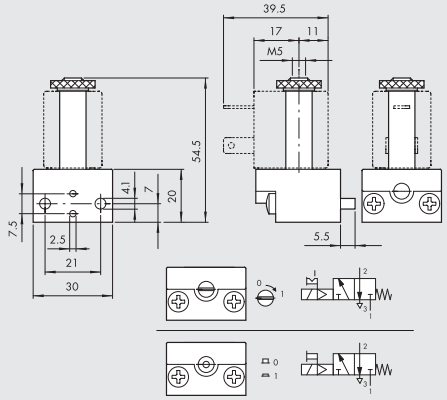
Operating pressure	bar	Max 10
Operating temperature range	°C	–10 to 60
Solenoid rating		100% ED
Fluid		Filtered lubricated or unlubricated air
System		With poppet
Nominal flow rate	Nl/min	40
TRA/TRR at 6 bar	ms	22/32
Maximum coil nut torque	Nm	1

COMPONENTS



① VALVE BODY: HOSTAFORM®
② GASKETS: NBR
③ OPERATOR: Brass pipe – Stainless steel core

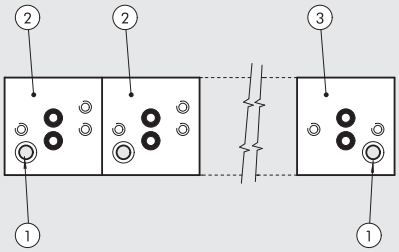
DIMENSIONS



Code	Description
9453920	Cnomo 3/2 with monostable manual actuation
9453922	Cnomo 3/2 with bistable manual actuation

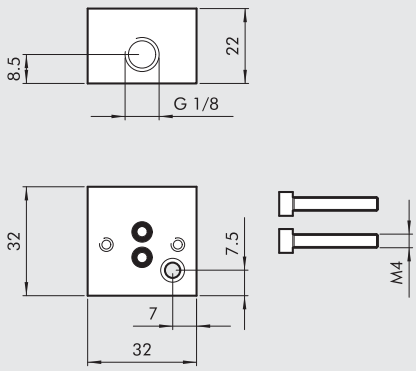
MODULAR CONFIGURATION OF CNOMO BASES

① Two fixing screws (included in input kit)
② CNOMO manifold base kit
③ CNOMO manifold base input kit



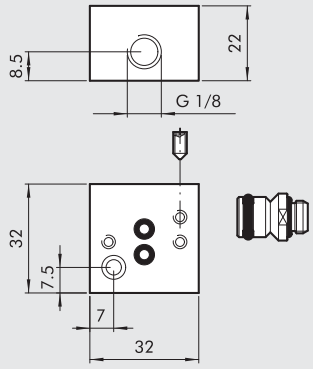
ACCESSORIES

CNOMO MANIFOLD BASE INPUT KIT



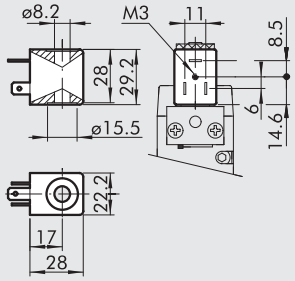
Code	Description
0227000200	Cnomo manifold base input kit

CNOMO MANIFOLD BASE KIT



Code	Description
0227000150	Cnomo manifold base kit

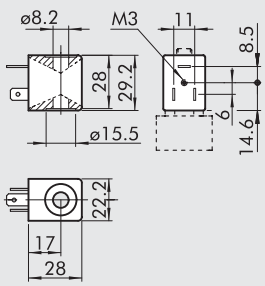
COILS SIDE 22 mm



- Voltage tolerance: –10% to + 15%
- Insulation class: F155
- Degree of protection: IP65 EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- Coil temperature 100% ED: 55°C at 20°C – Ambient temperature
- According to Atex 94/9 CE rule, group 2, category 3 GD

Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0215000151	Coil 22 Ø 8 BA 2W-12VDC	12Vcc	2W	2W
W0215000101	Coil 22 Ø 8 BA 2W-24VDC	24Vcc	2W	2W
W0215000111	Coil 22 Ø 8 BA 3.5VA-24VAC	24V 50/60Hz	5.3VA	3.5VA
W0215000121	Coil 22 Ø 8 BA 3.5VA-110VAC	110V 50/60Hz	5.3VA	3.5VA
W0215000131	Coil 22 Ø 8 BA 3.5VA-220VAC	220V 50/60Hz	5.3VA	3.5VA

"UL" AND "CSA" COILS 22 mm

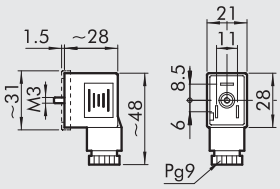


- Voltage tolerance: –10% to + 15%
- Insulation class: F155
- Degree of protection: IP65 EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- Coil temperature 100% ED: 55°C at 20°C – Ambient temperature

Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0215000251	Coil 22 Ø 8 BA 2W-12VDC UR	12Vcc	2W	2W
W0215000201	Coil 22 Ø 8 BA 2W-24VDC UR	24Vcc	2W	2W
W0215000211	Coil 22 Ø 8 BA 3.5VA-24VAC UR	24V 50/60Hz	5.3VA	3.5VA
W0215000221	Coil 22 Ø 8 BA 3.5VA-110VAC UR	110V 50/60Hz	5.3VA	3.5VA
W0215000231	Coil 22 Ø 8 BA 3.5VA-220VAC UR	220V 50/60Hz	5.3VA	3.5VA

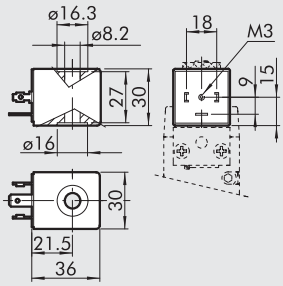
c UL us

CONNECTOR FOR COILS SIDE 22 mm



Code	Type	Colour	Ø Cable
W0970510011	Standard	Black	PG9
W0970510012	LED 24V	Transparent	PG9
W0970510013	LED 110V	Transparent	PG9
W0970510014	LED 220V	Transparent	PG9
W0970510015	LED + VDR 24V	Transparent	PG9
W0970510016	LED + VDR 110V	Transparent	PG9
W0970510017	LED + VDR 220V	Transparent	PG9
W0970510070	Atex II 2 GD	Black	PG9

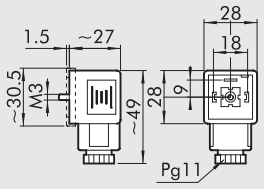
COILS, SIDE 30 mm



- Electric contact DIN 43650 Shape A - ISO 4400
- Voltage tolerance: −10% to +10%
- Insulation class: F155
- Degree of protection: IP65 EN 60529 with connector
- Solenoid rating: 100% ED
- Maximum coil temperature at 100% ED use 70°C at 20° ambient temperature

Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0210010100	Coil 30 Ø8 2W-24VDC	24Vcc	5W	2W
W0210011100	Coil 30 Ø8 3.5VA-24VAC	24V 50/60Hz	10VA	3.5VA
W0210012100	Coil 30 Ø8 3.5VA-110VAC	110V 50/60Hz	10VA	3.5VA
W0210013100	Coil 30 Ø8 3.5VA-220VAC	220V 50/60Hz	10VA	3.5VA

CONNECTOR ON SIDE 30 mm



Code	Type	Colour	Ø Cable
W0970520033	Standard	Black	PG11
W0970520034	LED 24V	Transparent	PG11
W0970520035	LED 110V	Transparent	PG11
W0970520036	LED 220V	Transparent	PG11
W0970520037	LED + VDR 24V	Transparent	PG11
W0970520038	LED + VDR 110V	Transparent	PG11
W0970520039	LED + VDR 220V	Transparent	PG11

NOTES

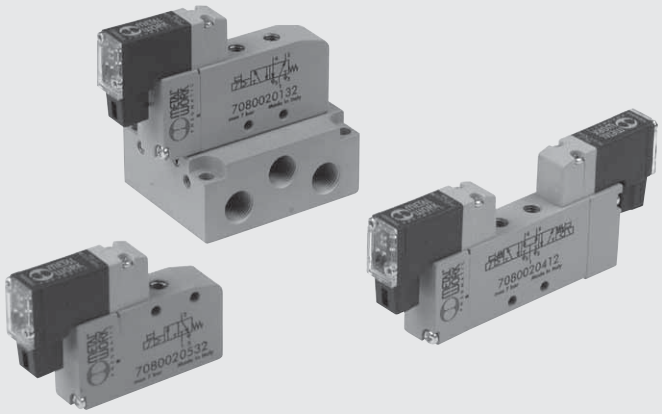
VALVES MINIMACH

METAL WORK PNEUMATIC

Space-saving valve, ideal for in industrial automation applications.
Made according to the well-proven design of the Mach series, the MINIMACH has a painted aluminium body to ensure extra sturdiness and reliable operation in even the harshest of environments.
The internal seals are made of FKM/FPM and are compatible with all oils used in compressors.
The pneumatic couplings are M5 threaded, allowing the user to choose the diameter, type and angle of the fitting.
The valve can be mounted in line or on a panel or multiple-port base.
The following versions are available:

- 3/2 normally open or normally closed
- 5/2 monostable or bistable
- 5/3 closed centres, open centres, pressure centres.

Electropneumatic actuation with a 24V DC pilot.

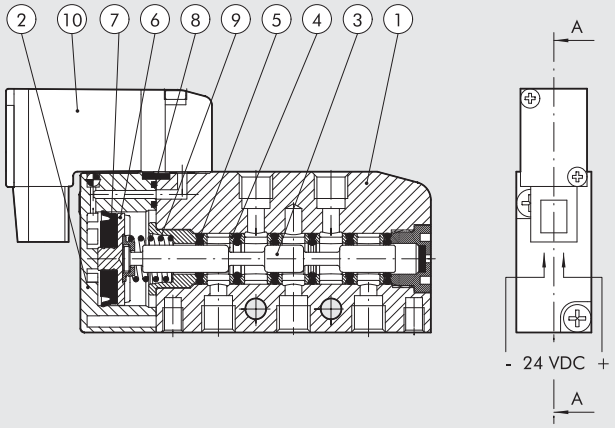


TECHNICAL DATA

Valve port thread		M5
Type of actuation		electric-pneumatic
Maximum external diameter of fittings	mm	Ø 11
Operating temperature range	°C	-10 to +60
	°F	14 to +140
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous
Pressure range	MPa	0.3 to 0.7
	bar	3 to 7
	psi	44 to 102
Flow rate at 6 bar ΔP 1 3/2	Nl/min	140
Flow rate at 6 bar ΔP 1 5/2	Nl/min	170
Flow rate at 6 bar ΔP 1 5/3	Nl/min	80
Voltage range		24 VDC ± 10%
Power	W	0.9
Solenoid rating		100% ED
Manual operator		Monostable
TRA/TRR 3/2 at 6 bar	ms	8/23
TRA/TRR 5/2 monostable at 6 bar	ms	8/30
TRA/TRR 5/2 bistable at 6 bar	ms	15/15
TRA/TRR 5/3 at 6 bar	ms	9/30
Insulation class		F155
Degree of protection		IP 51
Installation		In any position. As for the bistable ones, if subject to vibration, the vertical assembly is not advisable
Compatibility with oils		See **chapter Z1**

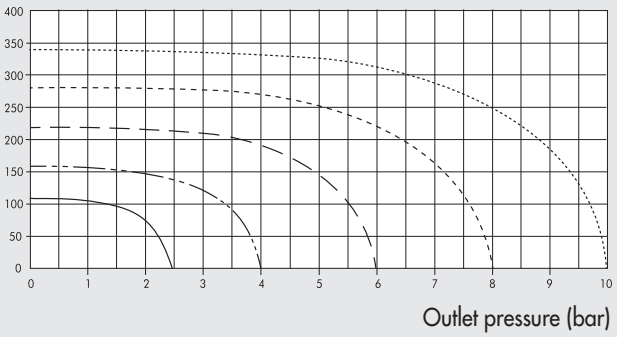
COMPONENTS

① VALVE BODY: chemically nickel-plated aluminium
② CONTROL/END CAP: Hostaform®
③ SPOOL: chemically nickel-plated aluminium
④ DISTANCE PLATES: tecnopolymer
⑤ GASKETS: FKM-FPM
⑥ PISTONS: Hostaform®
⑦ PISTON GASKET: Polyurethane
⑧ FILTER: sintered bronze
⑨ SPRINGS: special steel
⑩ PILOT: with integrated coil



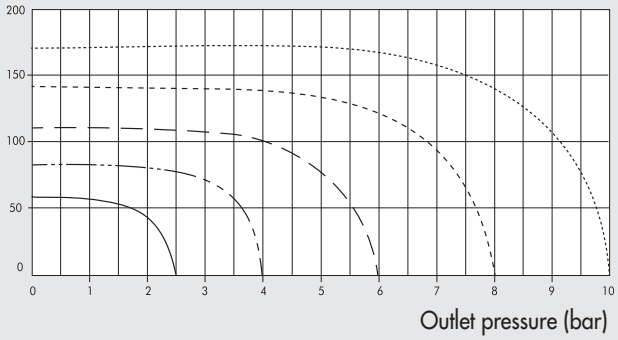
FLOW CHART

Flow rates (Nl/min)



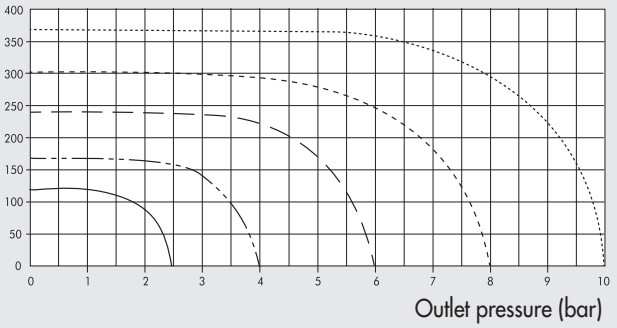
3/2

Flow rates (Nl/min)



5/3

Flow rates (Nl/min)

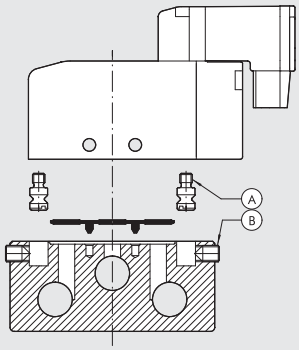


5/2

HOW TO FIX THE VALVE TO THE BASE

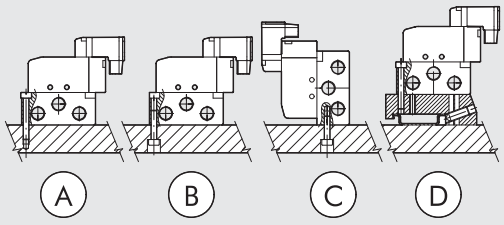
Proceed as follows:
1. screw the pins Ⓐ onto the valve
2. secure them with the ready-mounted grub screws Ⓑ on the base (0.5 Nm max)

IMPORTANT
To secure properly, press the valve down onto the base while tightening the two grub screws.
Do not tighten one grub screw completely before starting to tighten the other.



HOW TO FIX THE BASE

Ⓐ From the top using M4 screws
Ⓑ From below using M5 screws
Ⓒ From the side using M4 screws
Ⓓ From the top on the DIN bar via the M4 screws and bracket code 0225004600 (using 1 screw per bracket)

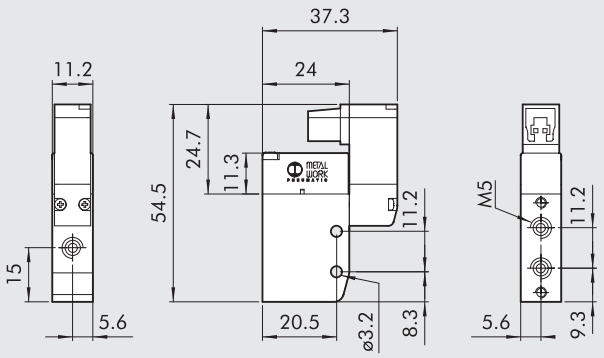


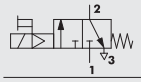
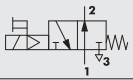
SYNOPTIC, SIZES AND VERSIONS

M S V	0	5	S O	B	O O	2 4 V D C
FAMILY	DIMENSIONS	FUNCTION	OPERATORS 14	RESETTING (12)	FURTHER DETAILS	
MSV minivalves solenoid	**0** M5	**3** 3/2 **5** 5/2 **6** 5/3	**SO** solenoid	**B** bistable **S** mechanical springs	**NC** normally closed **NO** normally open **OO** 5/2 standard **CC** closed centres **OC** open centres **PC** pressure centres	24VDC

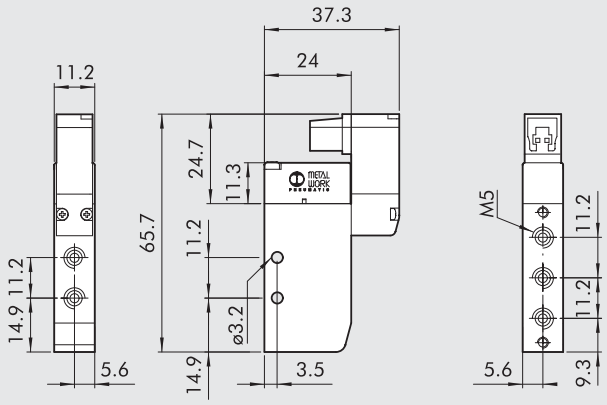
MINIMACH VALVES SOLENOID-PNEUMATIC

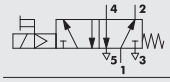
MONOSTABLE 3/2



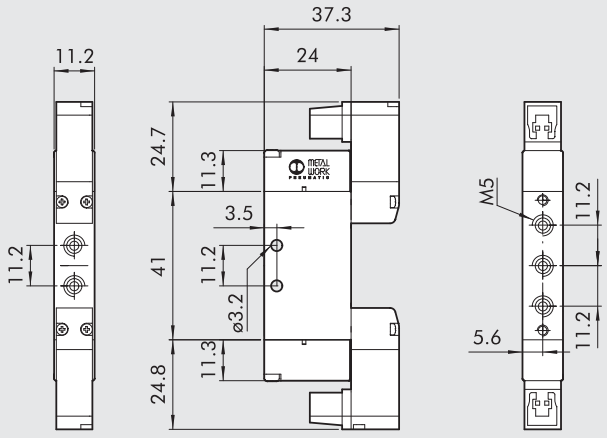
Symbol	Code	Abbrev.	Weight [g]
	**7080020532**	MSV 03 SOS NC 24VDC	36.2
	**7080020632**	MSV 03 SOS NO 24VDC	36.2

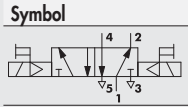
MONOSTABLE 5/2



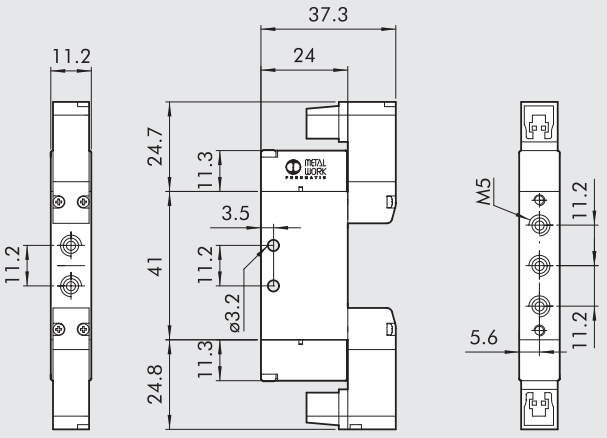
Symbol	Code	Abbrev.	Weight [g]
	**7080020132**	MSV 05 SOS OO 24VDC	43.3

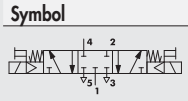
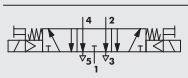
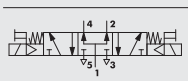
BISTABLE 5/2



Symbol	Code	Abbrev.	Weight [g]
	**7080020112**	MSV 05 SOB OO 24VDC	57

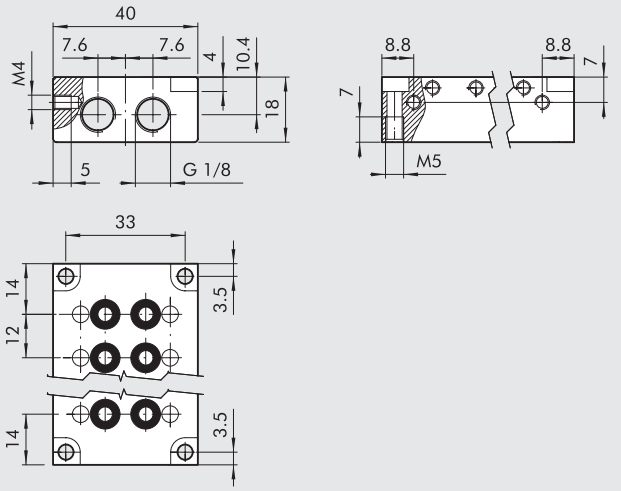
MONOSTABLE 5/3



Symbol	Code	Abbrev.	Weight [g]
	**7080020212**	MSV 06 SOS CC 24VDC	57
	**7080020312**	MSV 06 SOS OC 24VDC	57
	**7080020412**	MSV 06 SOS PC 24VDC	57

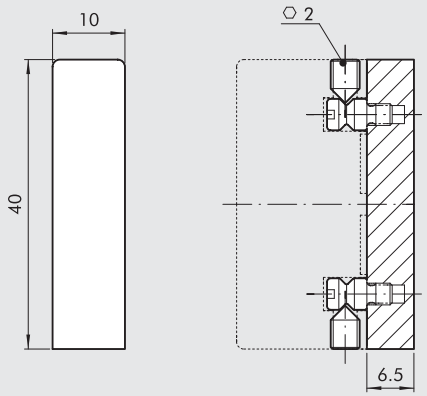
ACCESSORIES: MULTIPLE BASE

3/2 MULTIPLE BASE



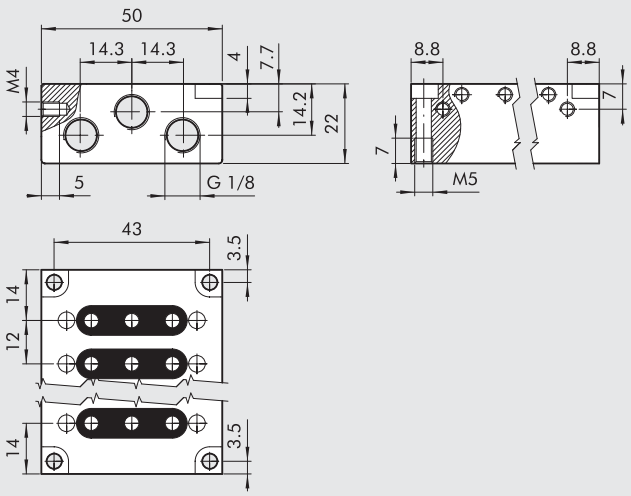
Code	Description	Position	Weight [g]
0225010201	Base 2 posn. for 3/2 valves Minimach	2	60
0225010401	Base 4 posn. for 3/2 valves Minimach	4	99
0225010601	Base 6 posn. for 3/2 valves Minimach	6	135
0225010801	Base 8 posn. for 3/2 valves Minimach	8	178

BLANKING PLATE FOR 3/2 VALVES



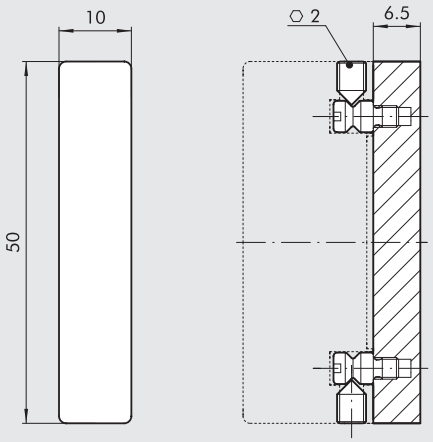
Code	Description	Weight [g]
0226009500	Blanking plate for 3/2 bases Minimach	9.5

5/2 - 5/3 MULTIPLE BASE



Code	Description	Position	Weight [g]
0225020201	Base 2 posn. for 5/2-5/3 valves Minimach	2	95
0225020401	Base 4 posn. for 5/2-5/3 valves Minimach	4	154
0225020601	Base 6 posn. for 5/2-5/3 valves Minimach	6	211
0225020801	Base 8 posn. for 5/2-5/3 valves Minimach	8	270

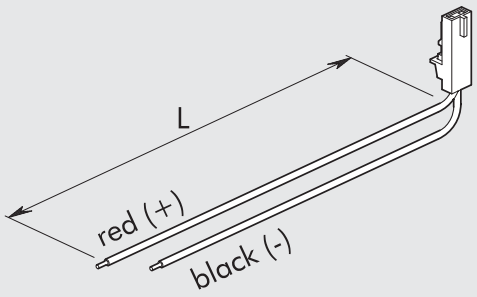
BLANKING PLATE FOR 5/2 - 5/3 VALVES



Code	Description	Weight [g]
0226009501	Blanking plate for 5/2-5/3 bases Minimach	11

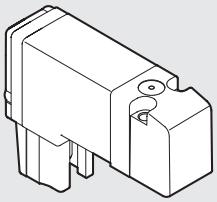
METAL WORK PNEUMATIC

PLUG-IN CONNECTOR



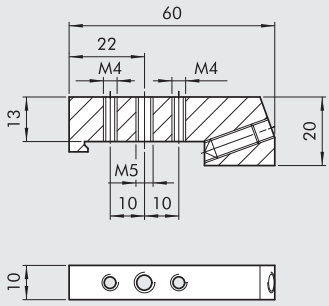
Code	Description
W0970512000	Plug-in connector for MACH 11 L = 300

PLUG-IN PILOT



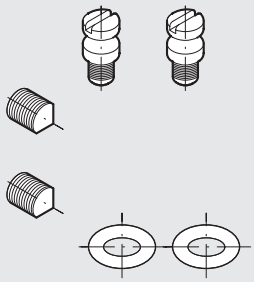
Code	Description
722113541100	PLT-10 722113541100

ADAPTER FOR BAR OMEGA (DIN EN 50022)



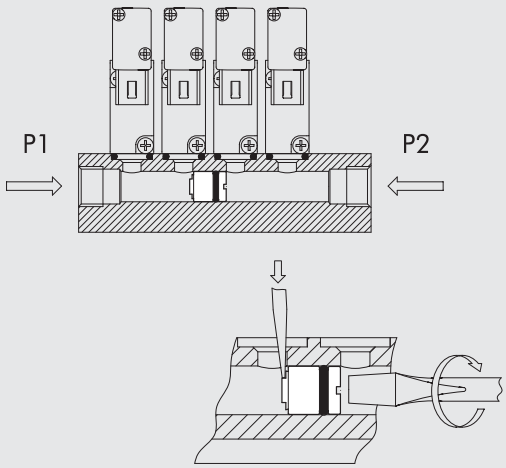
Code	Description	Weight [g]
0225004600	Adapter for bar omega	46

KIT OF SPARE GASKET BASES FOR 3/2 VALVES



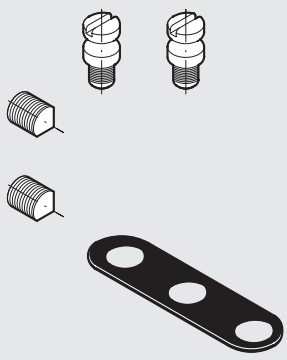
Code	Description	Weight [g]
0226009000	Kit of spare gasket bases for 3/2 valves	2.5

INTERMEDIATE DIAPHRAGM



Code	Description	Weight [g]
0226009010	Multiple base diaphragm	3.5

KIT OF SPARE GASKET BASES FOR 5/2 - 5/3 VALVES



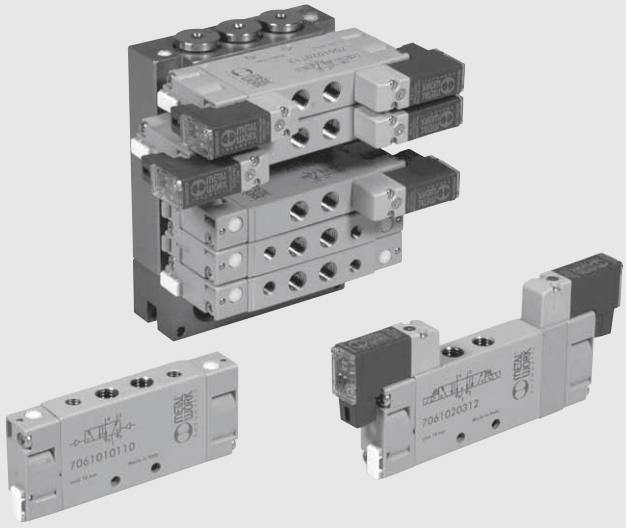
Code	Description	Weight [g]
0226009001	Kit of spare gasket bases for 5/2-5/3 valves	2.5

VALVES MACH 11

The Mach 11 in-line valves with M7 threaded connection come in the following versions:
- 5/2 monostable and bistable
- 5/3 with closed, open or pressure centres.

Control:
- pneumatic
- solenoid/pneumatic 24 V

With an exceptional compact design only 11 mm wide, and excellent high performance, these valves can be used in numerous applications in industrial automation.

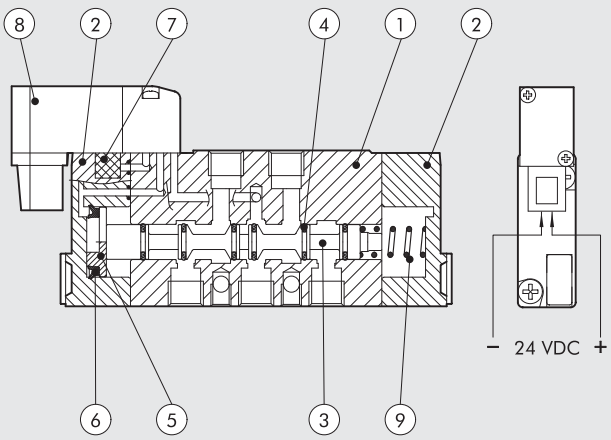


TECHNICAL DATA

Valve port thread		M7		
Pilot thread		M5		
Maximum external diameter of fittings	mm	Pneumatic: M7 = Ø 11 - M5 = Ø 9 - Electric: M7 - M5 = Ø 11		
Operating temperature range	°C	-10 to +60		
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous		
Screw for valve wall-mounting		M3		
Flow rate at 6 bar ΔP 1 bar	Nl/min	400		
Pressure range	bar	**Electric**	**Electric pilot-assisted**	**Pneumatic**
		monostable: 2 to 7	pilot pressure: 2 to 7	monostable control pres.values: 2 to 10
		bistable: 2 to 7	valve: vacuum to 10	bistable control pres. values: 1 to 10
		5/3: 2 to 7		control pressure 5/3: 2 to 10
				valve: vacuum to 10
Voltage range		24 VDC ± 10%	24 VDC ± 10%	-
Power	W	0.9	0.9	-
Insulation class		F155	F155	-
Degree of protection		IP 51	IP 51	-
Solenoid rating		100% ED	100% ED	-
TRA/TRR monostable at 6 bar	ms	10 / 45	10 / 45	4 / 9
TRA/TRR bistable at 6 bar	ms	22 / 22	22 / 22	4 / 4
TRA/TRR 5/3 monostable at 6 bar	ms	22 / 22	22 / 22	4 / 4
Compatibility with oils		See **chapter Z1**		

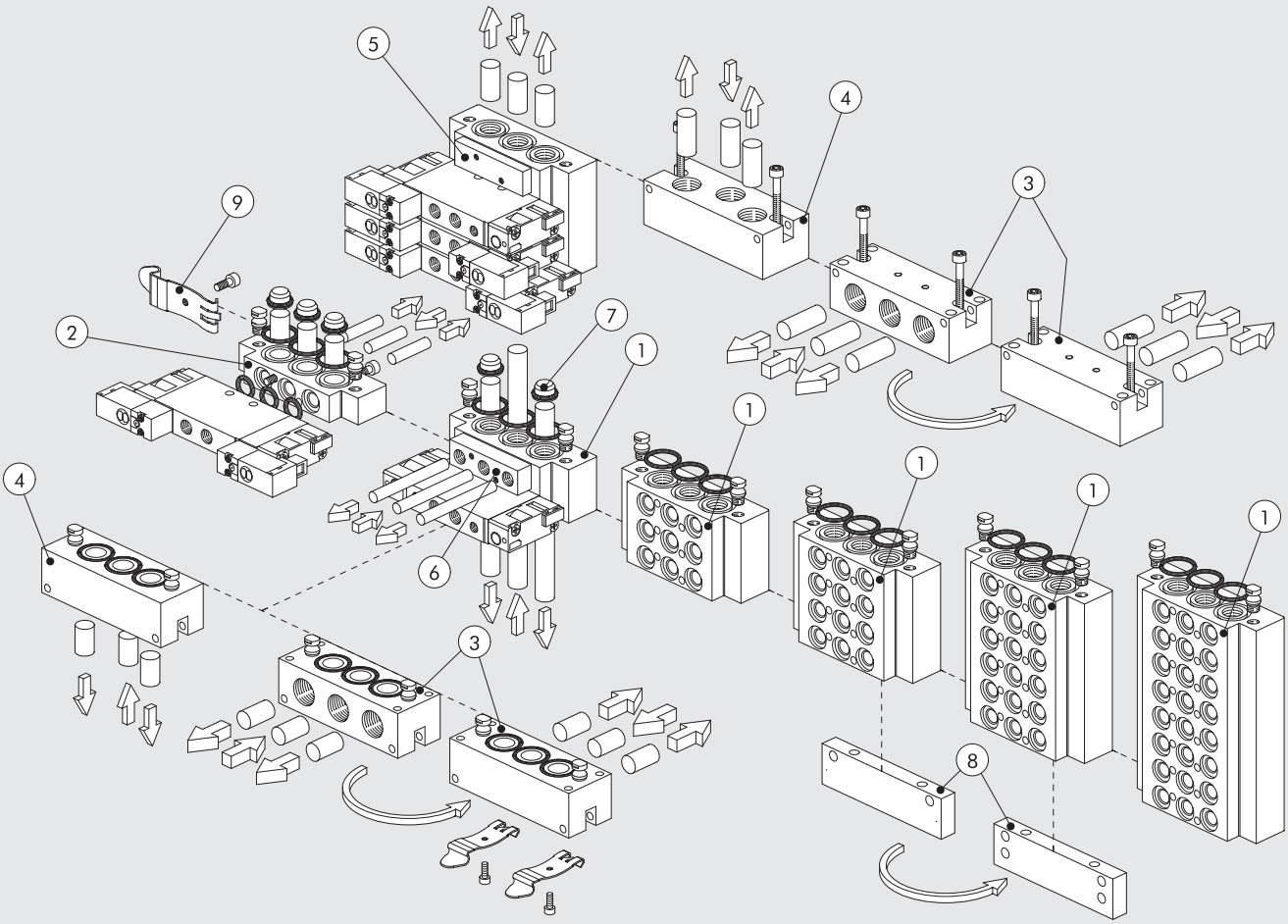
COMPONENTS

① VALVE BODY: Aluminium
② CONTROL/BASE: Hostaform®
③ SPOOL: Aluminium
④ GASKETS: Polyurethane
⑤ PISTONS: Hostaform®
⑥ PISTON GASKET: Polyurethane
⑦ FILTER: sintered bronze
⑧ PILOT: with integrated coil
⑨ SPRINGS: special steel
⑩ REMOVABLE IDENTIFICATION PLATE

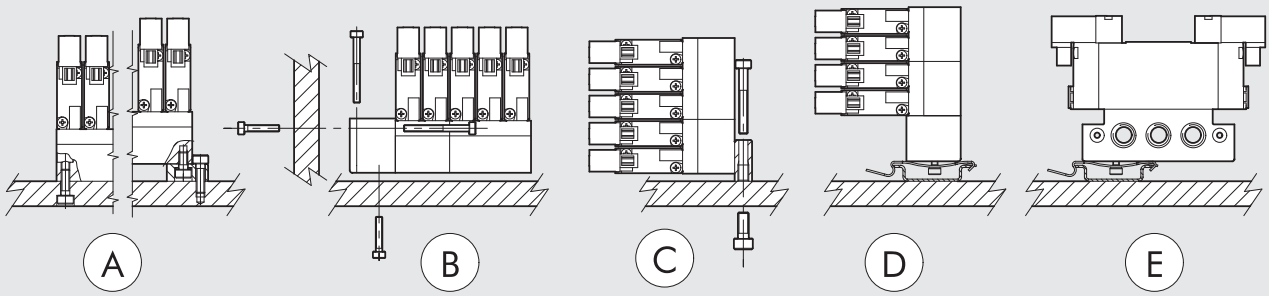


METAL WORK PNEUMATIC

MODULARITY



HOW TO FIX THE BASE

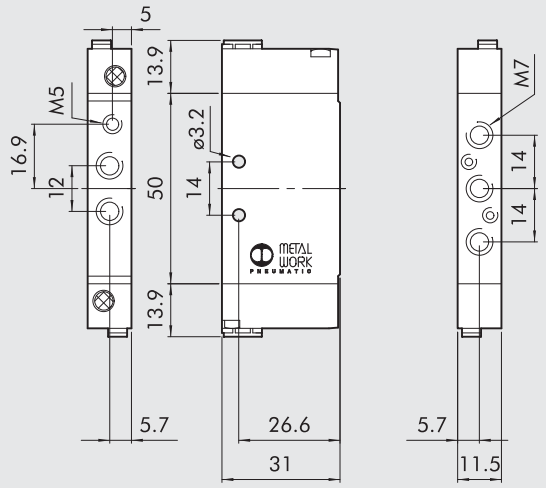


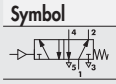
SYNOPTIC, SIZES AND VERSIONS

M S V	1	5	S O	B	O O	2 4 V D C
FAMILY	**DIMENSIONS**	**FUNCTION**	**OPERATORS 14**	**RESETTING (12)**	**FURTHER DETAILS**	
MSV mini-solenoid valve	**1** M7	**5** 5/2	**SO** solenoid	**B** bistable	**OO** 5/2 standard	24VDC
MPV mini-pneumatic valve		**6** 5/3	**SE** solenoid assisted	**S** mechanical springs	**CC** closed centres	
			PN pneumatic		**OC** open centres	
					PC pressure centres	

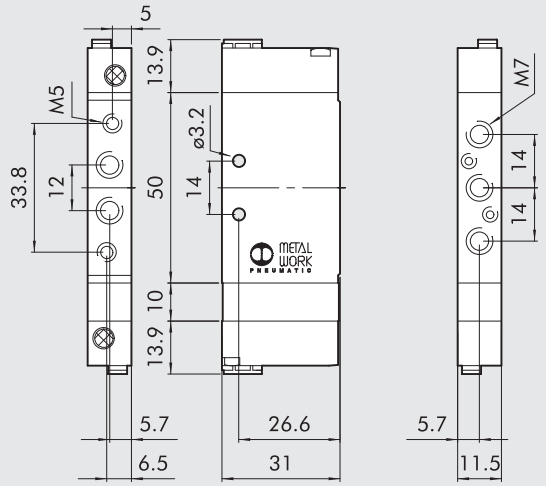
VALVES MACH 11, PNEUMATIC

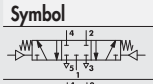
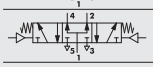
MONOSTABLE 5/2



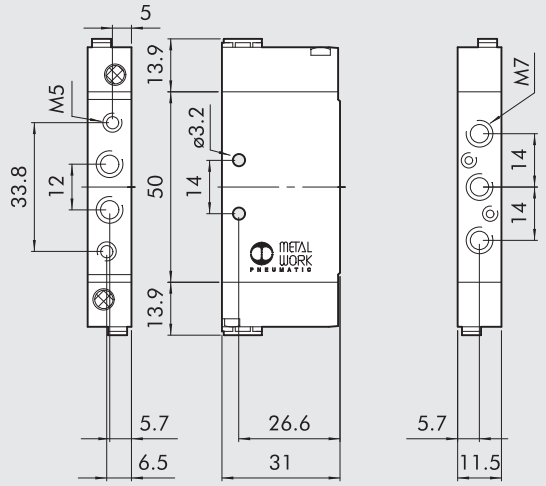
Symbol	Code	Abbrev.	Weight [g]
	7061010130	MPV 15 PNS OO	52

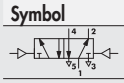
MONOSTABLE 5/3



Symbol	Code	Abbrev.	Weight [g]
	7061010210	MPV 16 PNS CC	62
	7061010310	MPV 16 PNS OC	62
	7061010410	MPV 16 PNS PC	62

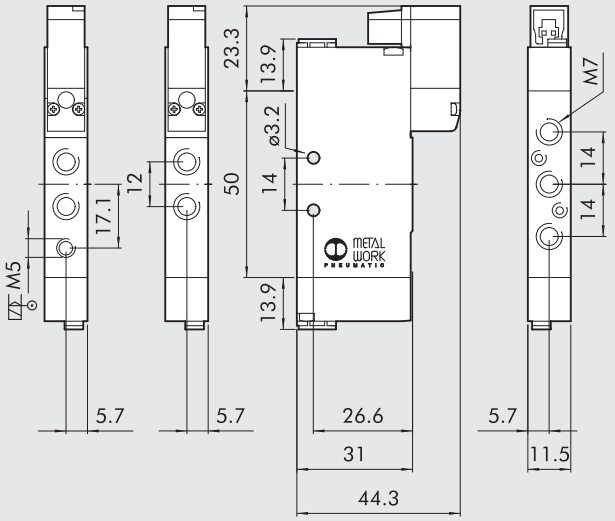
BISTABLE 5/2

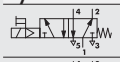
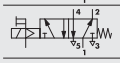


Symbol	Code	Abbrev.	Weight [g]
	7061010110	MPV 15 PNB OO	52

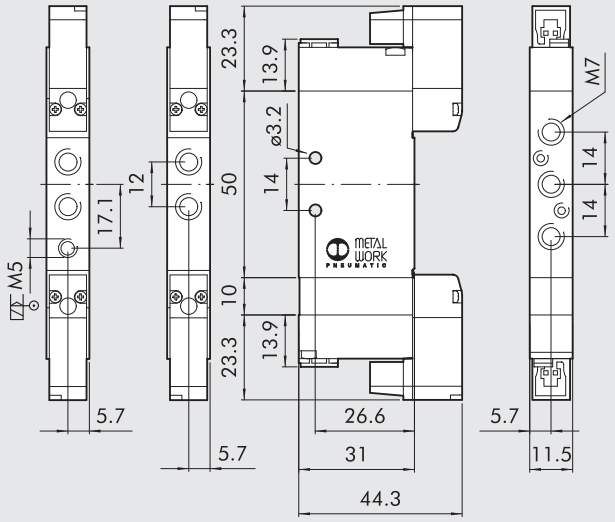
VALVES MACH 11, SOLENOID-PNEUMATIC

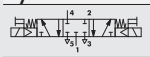
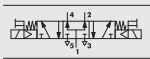
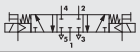
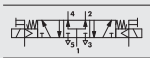
MONOSTABLE 5/2



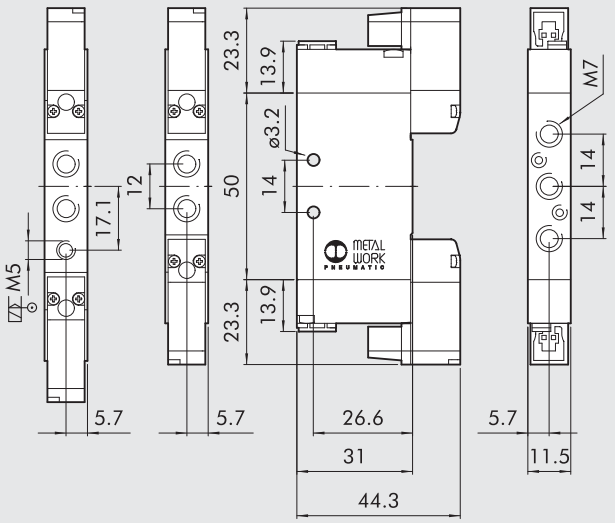
Symbol	Code	Abbrev.	Weight [g]
	7061020132	MSV 15 SOS OO 24VDC	60
	7061030132	MSV 15 SES OO 24VDC	60

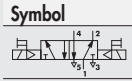
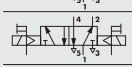
MONOSTABLE 5/3



Symbol	Code	Abbrev.	Weight [g]
	7061020212	MSV 16 SOS CC 24VDC	82
	7061020312	MSV 16 SOS OC 24VDC	82
	7061020412	MSV 16 SOS PC 24VDC	82
	7061030212	MSV 16 SES CC 24VDC	82
	7061030312	MSV 16 SES OC 24VDC	82
	7061030412	MSV 16 SES PC 24VDC	82

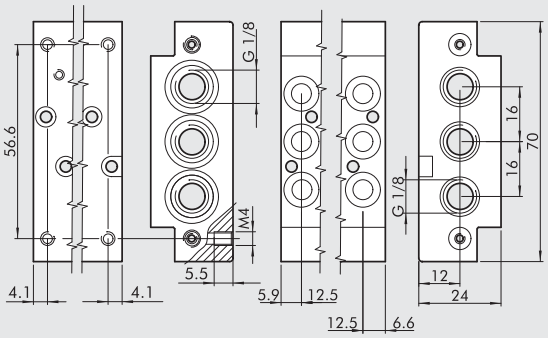
BISTABLE 5/2



Symbol	Code	Abbrev.	Weight [g]
	7061020112	MSV 15 SOB OO 24 VDC	72
	7061030112	MSV 15 SEB OO 24 VDC	88

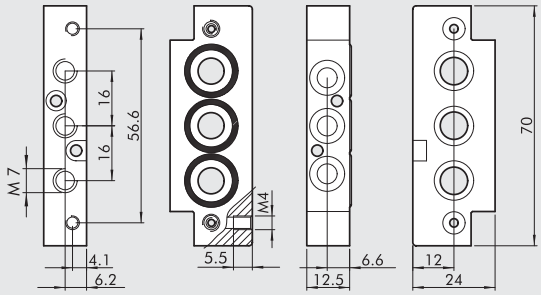
ACCESSORIES: MANIFOLD BASES

① MULTIPLE MANIFOLD BASE



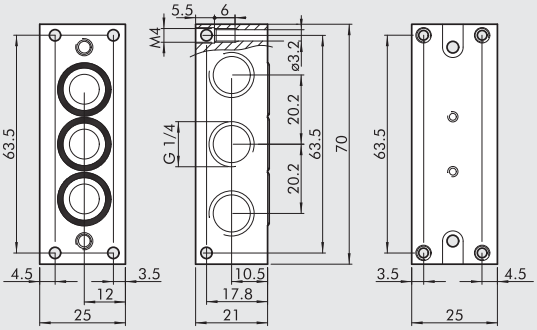
Code	Description	Weight [g]
0227400201	Base, 2 posn. for Mach 11	94
0227400301	Base, 3 posn. for Mach 11	140
0227400401	Base, 4 posn. for Mach 11	186
0227400601	Base, 6 posn. for Mach 11	282
0227400801	Base, 8 posn. for Mach 11	378

② SEPARATE FEED MANIFOLD BASE



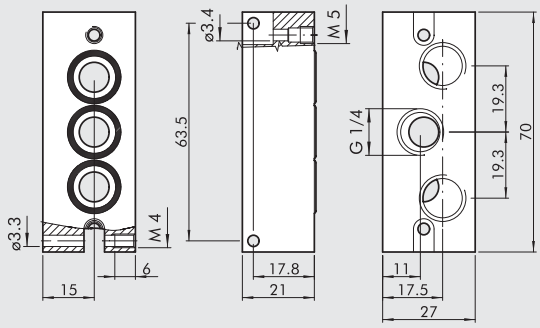
Code	Description	Weight [g]
0227400200	Separate feed manifold base for Mach 11	44

③ 90° END PLATE



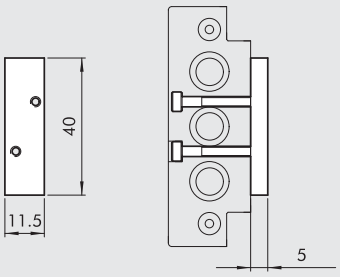
Code	Description	Weight [g]
0227400101	90° end plate 1/4 Mach 11	82

④ STRAIGHT END PLATE



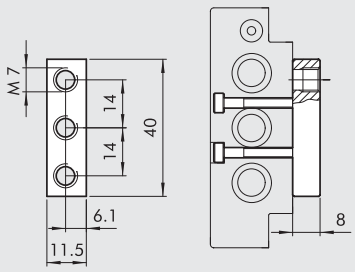
Code	Description	Weight [g]
0227400100	Straight end plate 1/4 for Mach 11	93

⑤ BLANKING PLATE



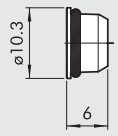
Code	Description	Weight [g]
0227400500	Blanking plate for Mach 11	13

⑥ FEED BLOCK



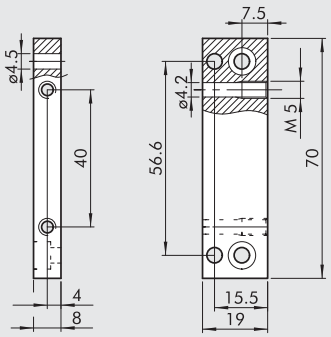
Code	Description	Weight [g]
0227400503	M7 feed block for Mach 11	11

⑦ DIAPHRAGM



Code	Description	Weight [g]
0227400000	Diaphragm for Mach 11 bases	3

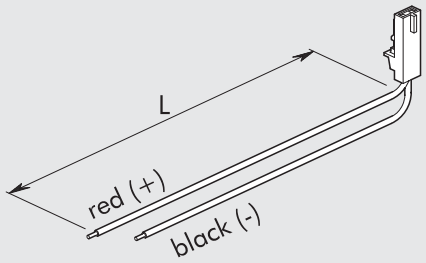
⑧ BASE FIXING PLATE



Code	Description	Weight [g]
0227400504	Fixing plate for Mach 11 bases	28

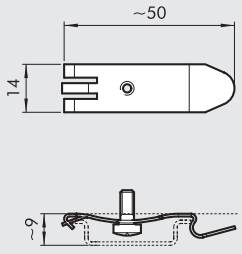
ACCESSORIES

PLUG-IN CONNECTOR



Code	Description
W0970512000	Plug-in connector for Mach 11 L = 300

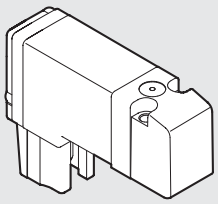
⑨ CONNECTION BRACKET ON BAR OMEGA (DIN EN 50022)



Code	Description
0227300600	Connection bracket on DIN bar

SPARE PARTS

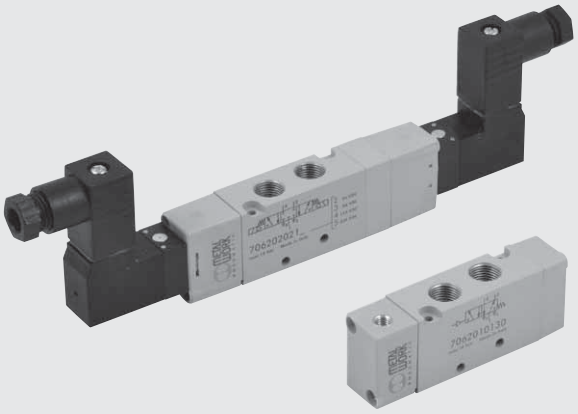
PLUG-IN PILOT



Code	Description
722113541100	PLT-10 722113541100

VALVES MACH 16

Available in size 1/8" only, versions 5/2 and 5/3 and with pneumatic and solenoid actuation. The Mach 16 valve is a typical small size valve, only 16 mm wide, with excellent performance 750 Nl/min flow rate at 6 bar ΔP 1 bar.
The valve can be used in line, on a panel or on a base (multiple or manifold)
The Mach design is the result of the miniaturisation concept with the same durability, sturdiness and reliability.

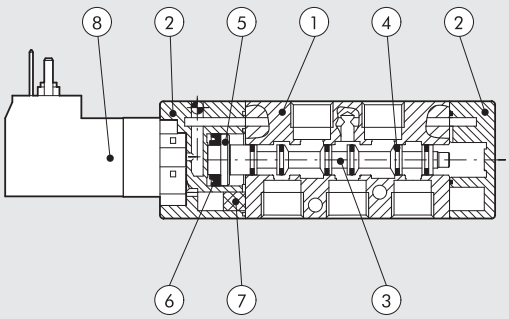


TECHNICAL DATA

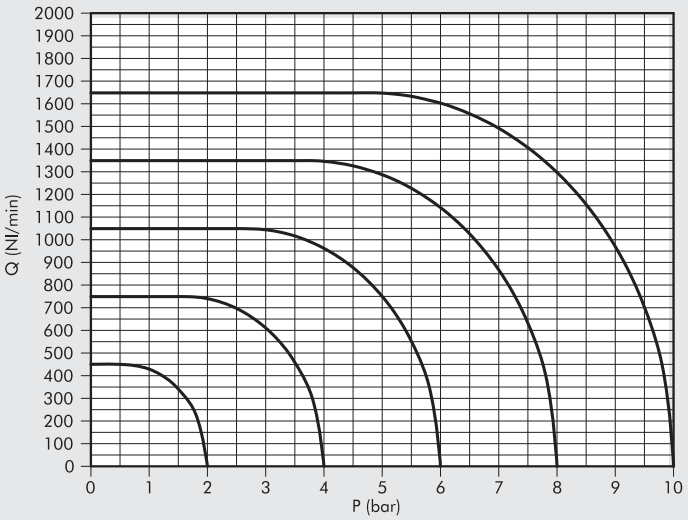
Valve port thread		1/8"
Type of control		M5 pneumatic actuation - Solenoid/pneumatic operation with integrated coil
Maximum outer diameter of gaskets for ports 1 - 3 - 5	mm	15
Maximum outer diameter for ports 2 - 4	mm	15
Operating temperature range	°C	-10 to +60
Minimum pressure pilot-pneumatic controls	bar	Monostable with pneumatic spring: see picture on page **B1**.90
	bar	1.6 bar for monostable valves – mechanical spring
	bar	1 bar for bistable valves – 1.9 bar for valves 5/3
Operating pressure	bar	vacuum -10
Fluid		Filtered lubricated or unlubricated air lubrication, if used, must be continuous
Recommended lubricant		ISO e UNI FD22
Solenoid pilot		Integrated coil DIN 43650 C shape
Manual		Monostable on solenoid pilot (with bistable manual valve on request)
Number of ways in base		1-3-5 and pilot exhaust
Screws for wall-mounting single valve		2 screws M3
Screws for base-mounting valve		2 screws M2.5x30
Installation		In any position (vertical assembly is not recommended for bistable valves subjected to vibration)
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	540
Flow rate at 6 bar ΔP 1 bar	Nl/min	750
Conductance C	Nl/min · bar	149.8
Critical ratio b	bar/bar	0.525
Compatibility with oils		See **chapter Z1**

COMPONENTS

① VALVE BODY: Aluminium
② CONTROL/BASE: Hostaform®
③ SPOOL: Aluminium
④ GASKETS: Polyurethane
⑤ PISTONS: Hostaform®
⑥ PISTON GASKET: Polyurethane
⑦ INTERFACE GASKETS: NBR nitrile rubber
⑧ PILOT: with integrated coil

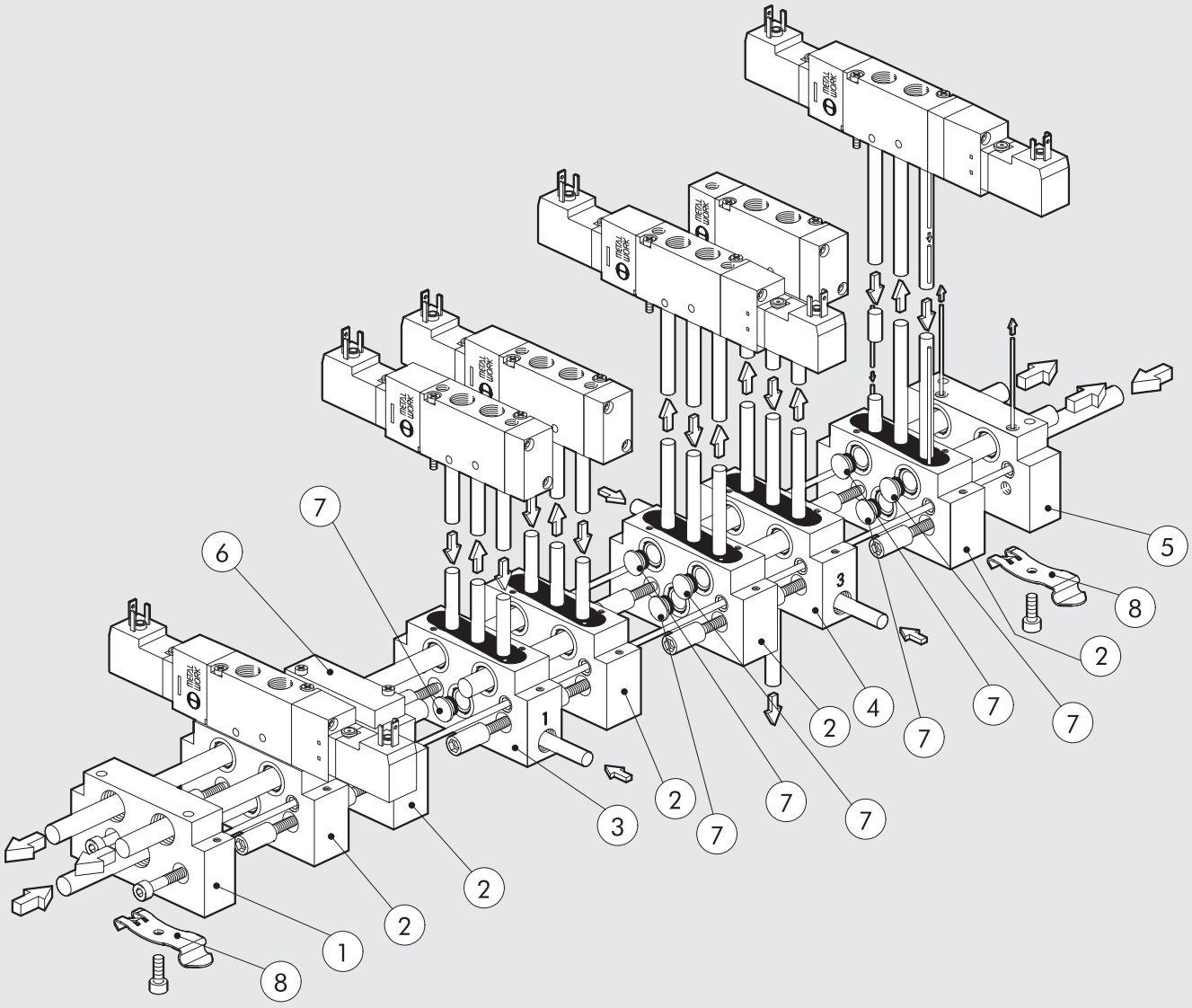


FLOW CHART



METAL WORK PNEUMATIC

MANIFOLD BASES



Reference	Code	Description
①	**0227100201**	M16/VDMA Input end-plate kit
②	**0227100150**	M16 manifold base kit
③	**0227100301**	M16 separate feed manifold base kit
④	**0227100302**	M16 exhaust feed manifold base kit
⑤	**0227100200**	M16/VDMA output end-plate kit
⑥	**0225004500**	M16 blanking plate
⑦	**0227100000**	Intermediate diaphragm
⑧	**0227300600**	Connection bracket on DIN-bar

SYNOPTIC, SIZES AND VERSIONS

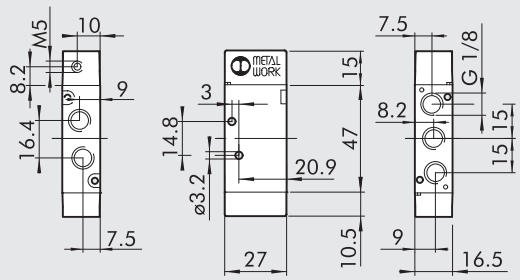
M S V	2	5	S O	B	O O	2 4 V D C
FAMILY	**DIMENSIONS**	**FUNCTION**	**OPERATORS 14**	**RESETTING 12**	**FURTHER DETAILS**	**VOLTAGE**
MSV solenoid/pneumatic	**2** 1/8"	**5** 5/2	**SO** solenoid/pneumatic	**P** pneumatic spring	**OO** 5/2	24VDC
MPV pneumatic		**6** 5/3	**SE** solenoid pilot	**S** mechanical springs	**CC** closed centres	24VAC
			PN pneumatic	**B** bistable	**OC** open centres	110VAC
					PC pressure centres	220VAC

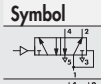
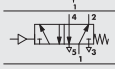
VALVES MACH 16 MPV, PNEUMATIC

TECHNICAL DATA

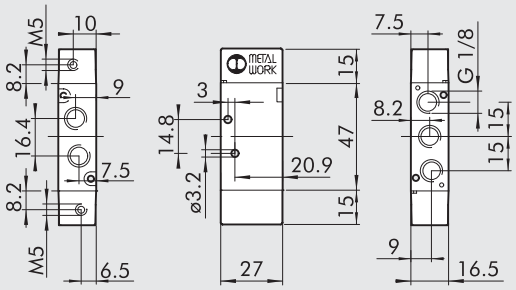
Operating pressure	bar	Vacuum to10
Minimum operating pressure:	bar	
• monostable with pneumatic spring		see graph
• monostable with mechanical spring		1.6
• monostable 5/3		1.9
• bistable		1
Conductance C	Nl/min · bar	149.8
Critical ratio b	bar/bar	0.525
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	540
Flow rate at 6 bar ΔP 1 bar	Nl/min	750
Repositioning response times at 6 bar:		
• monostable	ms	4
• bistable	ms	4
Repositioning response times at 6 bar:		
• monostable	ms	8.4
• bistable	ms	4

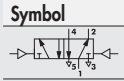
MONOSTABLE 5/2



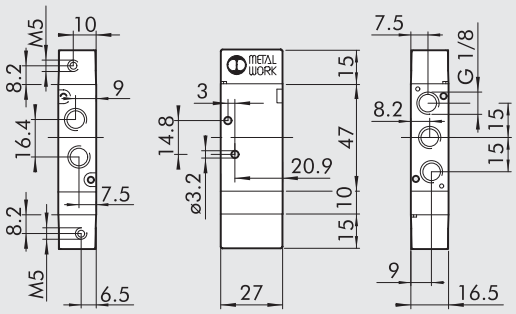
Symbol	Code	Abbrev.	Weight [g]
	**7062010100**	MPV 25 PNP OO	60
	**7062010130**	MPV 25 PNS OO	61

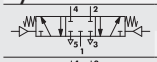
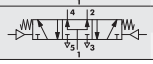
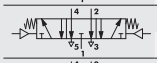
BISTABLE 5/2

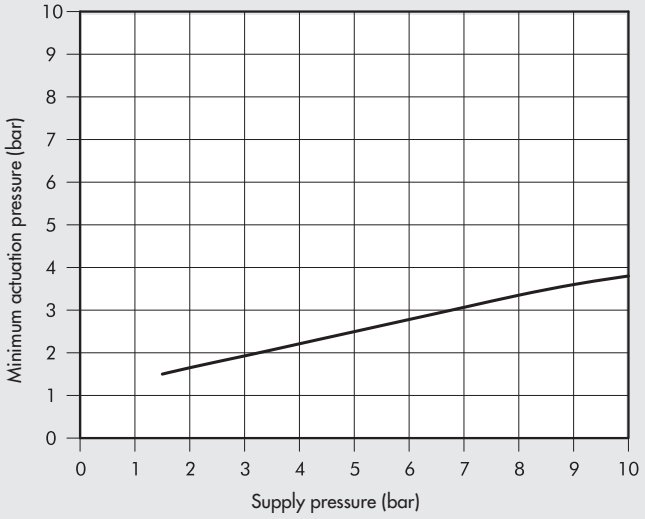


Symbol	Code	Abbrev.	Weight [g]
	**7062010110**	MPV 25 PNB OO	62

MONOSTABLE 5/3



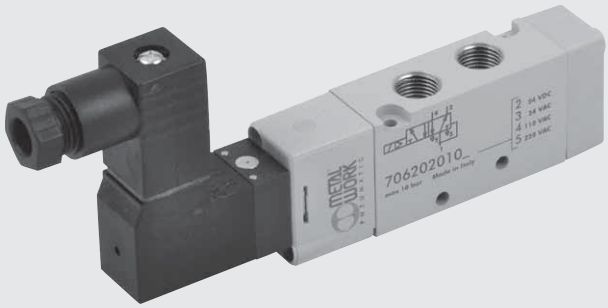
Symbol	Code	Abbrev.	Weight [g]
	**7062010210**	MPV 26 PNS CC	73
	7062010310	MPV 26 PNS OC	73
	**7062010410**	MPV 26 PNS PC	73

OPERATING PRESSURE



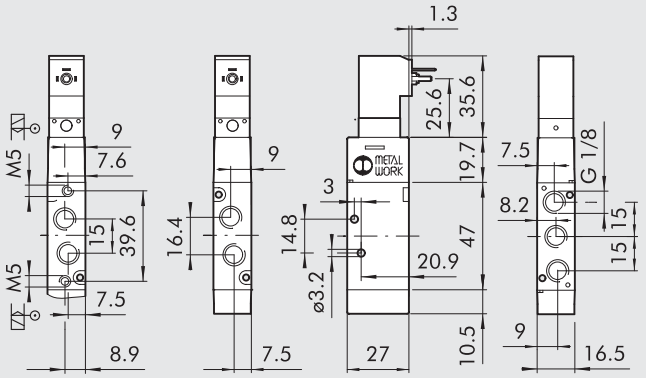
VALVES MACH 16 MPV, SOLENOID/PNEUMATIC

TECHNICAL DATA

Operating pressure:	bar	
• monostable		1.9 to10
• bistable		1 to10
• pilot-assisted		Vacuum to10
Minimum pilot pressure	bar	2
Operating temperature range	°C	-10 to +60
Conductance C	Nl/min · bar	149.8
Critical ratio b	bar/bar	0.525
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	540
Flow rate at 6 bar ΔP 1 bar	Nl/min	750
TRA / TRR monostable at 6 bar	ms	12 / 26
TRA / TRR bistable at 6 bar	ms	21 / 21
Type of operation: Manual		monostable on the solenoid pilot (also with bistable manual valve on request)
Pilot with integrated coil		24 VDC - 24 VAC - 110 VAC - 220 VAC
Power	W	1
Voltage tolerance		-10% to +15%
Insulation class		F 155
Degree of protection		IP 65 EN60529 with connector
Solenoid rating		100% ED
Electrical contacts		DIN 43650 C shape

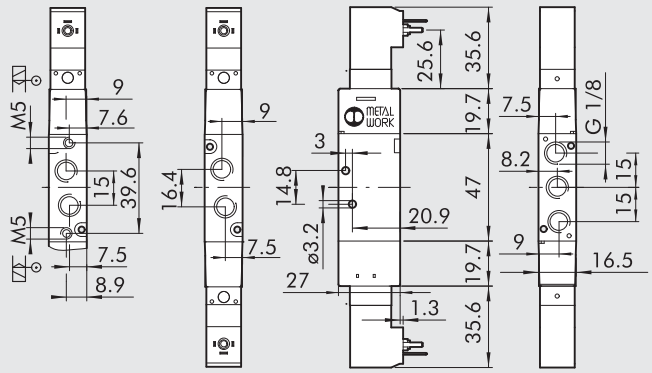


MONOSTABLE 5/2



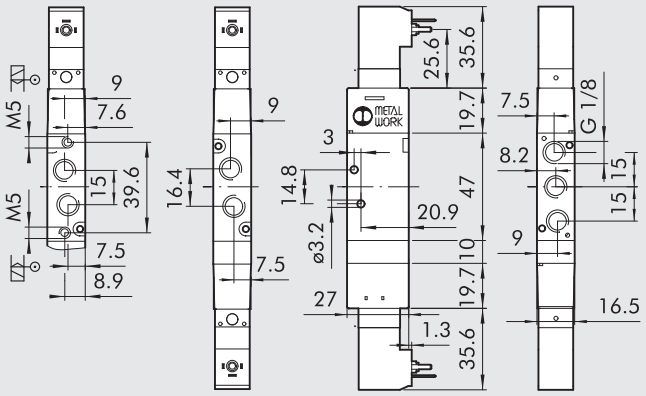
Symbol	Code	Abbrev.	Weight [g]
	7062020102	MSV 25 SOP OO 24VDC	92
	7062020103	MSV 25 SOP OO 24VAC	92
	7062020104	MSV 25 SOP OO 110VAC	92
	7062020105	MSV 25 SOP OO 220VAC	92
	7062020132	MSV 25 SOS OO 24VDC	93
	7062020133	MSV 25 SOS OO 24VAC	93
	7062020134	MSV 25 SOS OO 110VAC	93
	7062020135	MSV 25 SOS OO 220VAC	93
	7062030132	MSV 25 SES OO 24VDC	93
	7062030133	MSV 25 SES OO 24VAC	93
	7062030134	MSV 25 SES OO 110VAC	93
	7062030135	MSV 25 SES OO 220VAC	93

BISTABLE 5/2



Symbol	Code	Abbrev.	Weight [g]
	7062020112	MSV 25 SOB OO 24VDC	124
	7062020113	MSV 25 SOB OO 24VAC	124
	7062020114	MSV 25 SOB OO 110VAC	124
	7062020115	MSV 25 SOB OO 220VAC	124
	7062030112	MSV 25 SEB OO 24VDC	125
	7062030113	MSV 25 SEB OO 24VAC	125
	7062030114	MSV 25 SEB OO 110VAC	125
	7062030115	MSV 25 SEB OO 220VAC	125

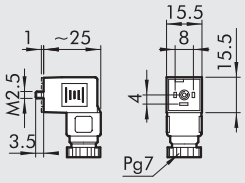
MONOSTABLE 5/3



Symbol	Code	Abbrev.	Weight [g]
	7062020212	MSV 26 SOS CC 24VDC	142
	7062020213	MSV 26 SOS CC 24VAC	142
	7062020214	MSV 26 SOS CC 110VAC	142
	7062020215	MSV 26 SOS CC 220VAC	142
	7062020312	MSV 26 SOS OC 24VDC	142
	7062020313	MSV 26 SOS OC 24VAC	142
	7062020314	MSV 26 SOS OC 110VAC	142
	7062020315	MSV 26 SOS OC 220VAC	142
	7062020412	MSV 26 SOS PC 24VDC	142
	7062020413	MSV 26 SOS PC 24VAC	142
	7062020414	MSV 26 SOS PC 110VAC	142
	7062020415	MSV 26 SOS PC 220VAC	142
	7062030212	MSV 26 SES CC 24VDC	143
	7062030213	MSV 26 SES CC 24VAC	143
	7062030214	MSV 26 SES CC 110VAC	143
	7062030215	MSV 26 SES CC 220VAC	143
	7062030312	MSV 26 SES OC 24VDC	143
	7062030313	MSV 26 SES OC 24VAC	143
	7062030314	MSV 26 SES OC 110VAC	143
	7062030315	MSV 26 SES OC 220VAC	143
	7062030412	MSV 26 SES PC 24VDC	143
	7062030413	MSV 26 SES PC 24VAC	143
	7062030414	MSV 26 SES PC 110VAC	143
	7062030415	MSV 26 SES PC 220VAC	143

ACCESSORIES FOR VALVES MACH 16 MSV, SOLENOID/PNEUMATIC

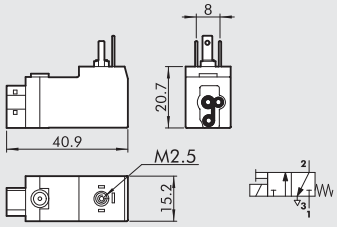
CONNECTOR 15 mm SHAPE C TO DIN 43650



Code	Description
W0970501021	Connector 15 mm shape C DIN 43650
W0970501022	Connector 15 mm shape C DIN 43650 LED 24V
W0970501025	Connector 15 mm shape C DIN 43650 LED+VDR 24V

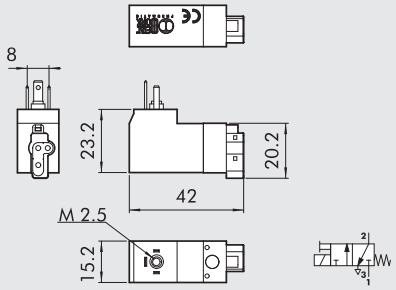
SPARE PARTS FOR VALVES MACH 16 MSV, SOLENOID/PNEUMATIC

COIL MACH 16 (OLD)



Code	Description
W4015101000	In-line pilot M16 24VDC
W4015101010	In-line pilot M16 24VAC 50/60 HZ
W4015101020	In-line pilot M16 110VAC 50/60 HZ
W4015101030	In-line pilot M16 220VAC 50/60 HZ

COIL MACH 16 (NEW)

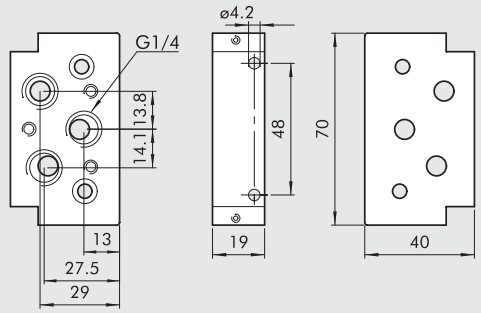


Code	Description
W4015301000	In-line pilot M16 24VDC
W4015301010	In-line pilot M16 24VAC 50/60 HZ
W4015301020	In-line pilot M16 110VAC 50/60 HZ
W4015301030	In-line pilot M16 220VAC 50/60 HZ

N.B.: if the pilot to be replaced bears the writing **CE**, you have to order among the NEW pilots, otherwise order among the OLD pilots

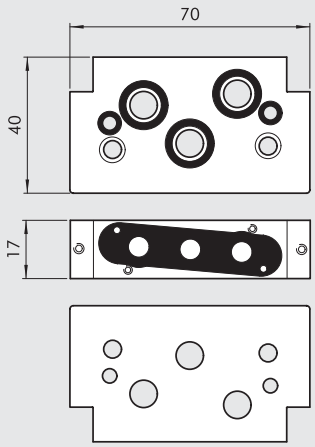
MANIFOLD BASES FOR VALVES MACH 16

① MACH 16 INPUT END-PLATE



Code	Description	Weight [g]
0227100201	Input end-plate kit M16/VDMA	125

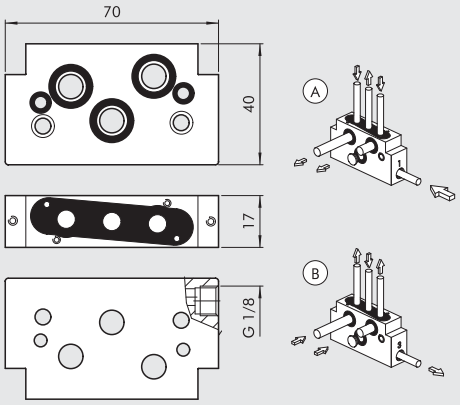
② MACH 16 MANIFOLD BASE



Code	Description	Weight [g]
0227100150	Manifold base kit M16	121

③ MACH 16 SEPARATE FEED MANIFOLD BASE

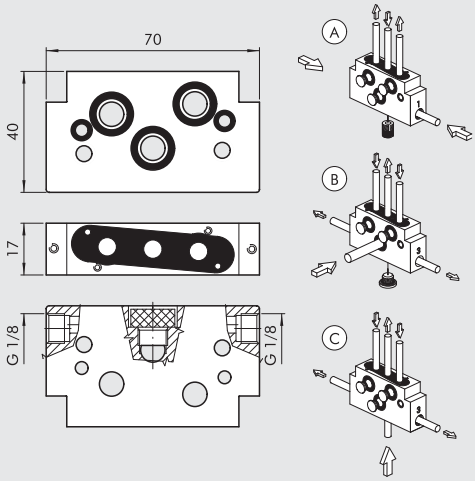
Ⓐ Separate feed
Ⓑ Separate exhaust



Code	Description	Weight [g]
0227100301	Manifold base kit-separate feed M16	119

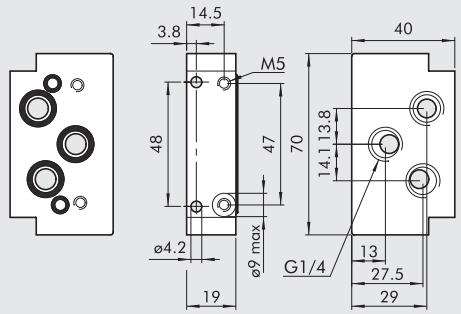
④ MACH 16 EXHAUST FEED MANIFOLD BASE

Ⓐ Exhaust feed
Ⓑ Separate exhausts
Ⓒ Separate feed/exhausts



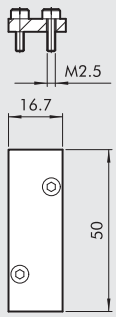
Code	Description	Weight [g]
0227100302	Manifold base kit-exhaust feed M16	113

⑤ MACH 16 OUTPUT END-PLATE



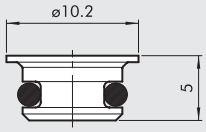
Code	Description	Weight [g]
0227100200	Output end-plate kit M16/VDMA	122

⑥ BLANKING PLATE – UNUSED POSITION



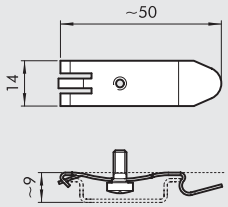
Code	Description	Weight [g]
0225004500	Accessories - blanking plate for Mach 16	18

⑦ INTERMEDIATE DIAPHRAGM



Code	Description	Weight [g]
0227100000	Intermediate diaphragm	1

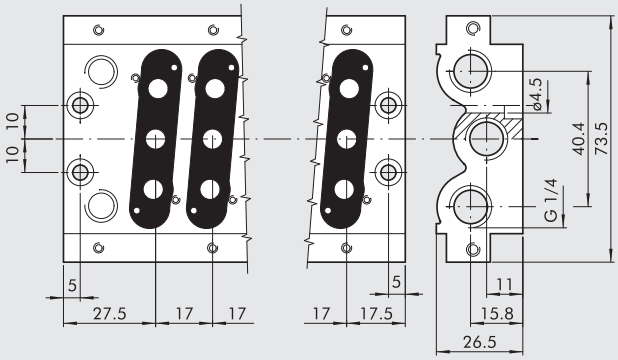
⑧ CONNECTION BRACKET ON BAR OMEGA (DIN EN 50022)



Code	Description	Weight [g]
0227300600	Connection bracket on DIN bar	7

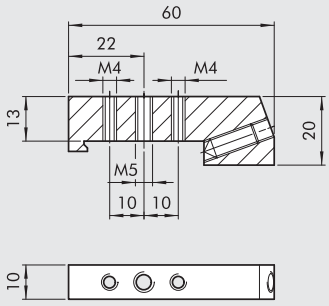
MULTIPLE BASES FOR VALVES MACH 16

MULTIPLE BASE FOR MACH 16



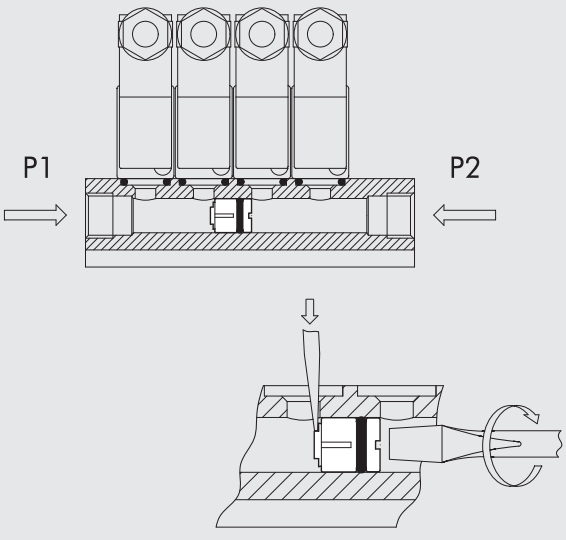
Code	Description	N° of positions	Weight [g]
0225000201	Base CVM.PN-08-02-0-000	2	180
0225000401	Base CVM.PN-08-04-0-000	4	286
0225000601	Base CVM.PN-08-06-0-000	6	390
0225000801	Base CVM.PN-08-08-0-000	8	500
0225001001	Base CVM.PN-08-10-0-000	10	613
0225001201	Base CVM.PN-08-12-0-000	12	706

ADAPTER FOR BAR OMEGA (DIN EN 50022)



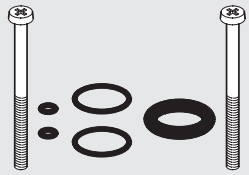
Code	Description	Weight [g]
0225004600	Omega-adapter Mach 16	46

INTERMEDIATE DIAPHRAGM



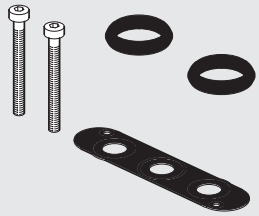
Code	Description	Weight [g]
0227100001	Acc. multiple base diaphragm	6

GASKET KIT (FOR OLD BASES)



Code	Description	Weight [g]
0226007001	M16 multiple base gasket kit	5

KIT OF SPARE INTEGRATED GASKET



Code	Description	Weight [g]
0226007003	M16 multiple base gasket kit	5

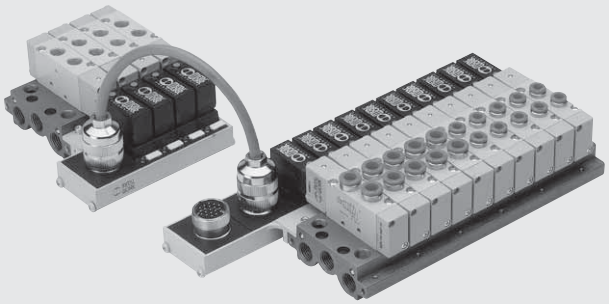
MULTIPLE CONNECTORS MACH 16

METAL WORK PNEUMATIC

Mach 16 valves can be mounted on bases with pneumatic or electrical connection.
The electric contacts of the individual valves are connected by means of a printed circuit board in a sealed conduit to a single connection point suitable for up to 16 controls.
The number 16 was chosen because the number of outputs of most PLC output boards is 16 or a multiple of it.
The system has numerous alternatives and variants for a wide range of requirements:

- Base for monostable or bistable valves.
- Connection via a multiple connector or wired cable.
- Supply of individual parts or ready prepared bases or complete valve units
- The configuration can be modified at any time to convert bases for monostable valves into bases for bistable valves.
- The return cable can be used to connect two monostable valve units to a single multiple connector.

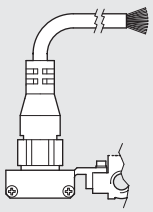
All versions are certified for electromagnetic compatibility and hence they bear the CE mark. The system is prearranged for mounting a slave for field buses, which can be added at any time. Valve units with multiple pneumatic/electrical connection are supplied complete with valves and are tested.
System modularity means that the valve sequence can be ordered to meet your own requirements (see key to codes).



TECHNICAL DATA

Supply voltage		24VDC - 24VAC
Maximum absorption		50 mA for each position
Valve actuation indicator		Yellow LED
Protection		Fuse
Operating temperature range	°C	-10 to +60
Degree of protection with valves mounted		IP65
Insulation class		In compliance with IEC 664-1and VDE 0110 Group C
Electromagnetic compatibility		In compliance with EEC 366/89
Maximum number of solenoid valves which can be applied		16
n° of contacts		19, 16 of which for solenoid valves, 2 common and 1 earth
Pre-wired version		
Cable length	m	5
n° of wires		19, 16 of which for solenoid valves, 2 common and 1 earth
Wire section	mm^2	0.22
Shielding		Tin plated – covering 80 to 90%
Cable		Outer oil-proof and flame-proof PVC sheath
Cable outside diameter	mm	8.5

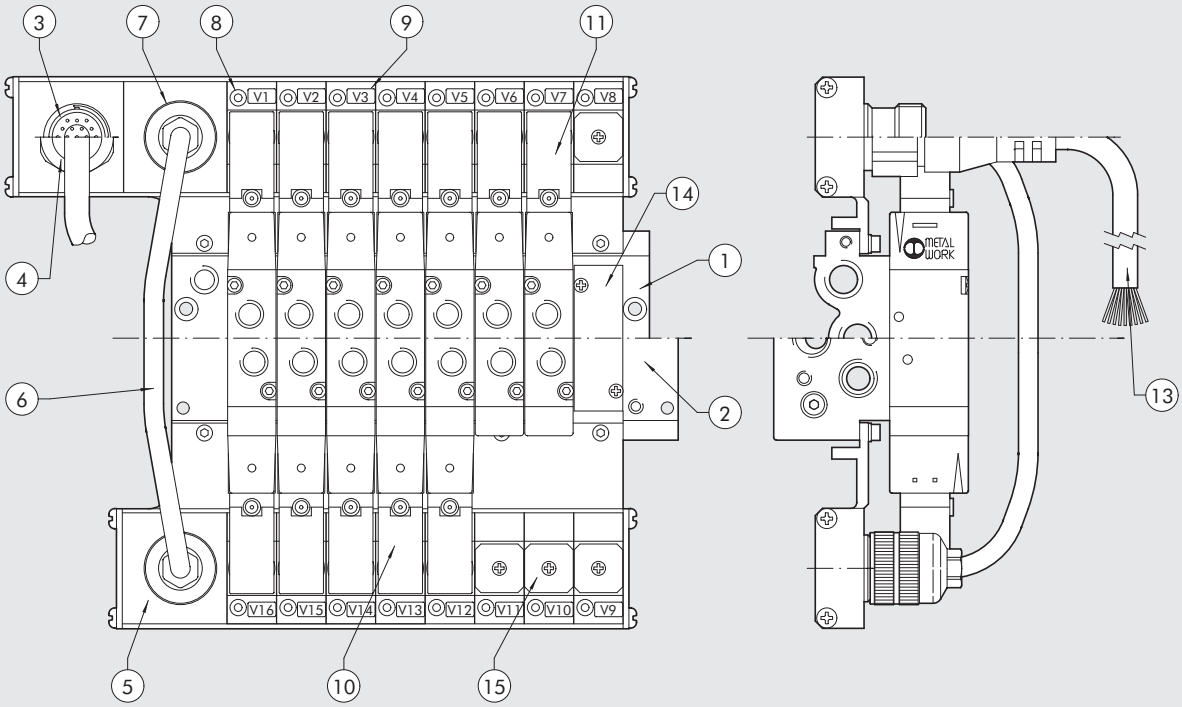
WIRING DIAGRAM FOR VERSION WITH CONNECTOR



Position of electrical contact	Colour of the corresponding wire
V1	Green /black
V2	Yellow
V3	White/black
V4	Blue
V5	Red
V6	Yellow/black
V7	White
V8	Brown/red
V9	Red/white
V10	Red/black
V11	Green/red
V12	Blue/red
V13	Brown
V14	Orange/black
V15	Orange
V16	Blue/black
GROUND	Yellow/red
– COM	Brown/black
– COM	Green

NOTES

COMPONENTS



① Multiple base: extruded anodised aluminium
② Modular base: anodised aluminium
③ Main assembly, version with connector
④ Main assembly, pre-wired version
⑤ Secondary unit/additional secondary unit
⑥ 10-wire return cable
⑦ Socket for 10-wire return cable
⑧ LED (LED on = Solenoid valve energised)
⑨ Identification label (for writing on)
⑩ Bistable solenoid valve MACH 16
⑪ Monostable solenoid valve MACH 16
⑬ 19-wire cable for pre-wired version
⑭ Blanking plate - pneumatic position: anodised aluminium
⑮ Small blanking plate - electric connector: painted aluminium

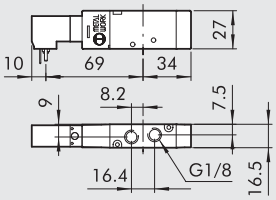
SYNOPTIC, SIZES AND VERSIONS

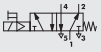
A	0 8	B	W C 5	0 8	M M V L	2 4 V D C
FAMILY	**NO. OF POSITIONS**			**SIZE**		**VOLTAGE**
A multiple base for solenoid/pneumatic connection Mach 16	**04** 4 posn.	**M** electrical connection only for monostable valves	**MCN** electrical connection	**08** G 1/8"	**M** MSV 25 SMS OO	24VDC
B manifold base for Mach 16 solenoid/pneumatic connection	**06** 6 posn.	**B** electrical connection for bistable valves	**WC5** pre-wired cable 5 m		**V** MSV 25 SCS OO	24VAC
	08 8 posn.		**ACM** additional connection for monostable battery		**L** MSV 25 SMP OO	
	10 10 posn.				**J** MSV 25 SMB OO	
	12 12 posn.				**K** MSV 25 SCB OO	
					G MSV 26 SMS CC	
					O MSV 26 SCS CC	
					E MSV 26 SMS OC	
					F MSV 26 SCS OC	
					B MSV 26 SMS PC	
					C MSV 26 SCS PC	
					A blanking plate	
					D intermediate diaphragm	

N.B.: The valve insertion order inside the descriptive key is the following, starting from the connector, from the left towards the right: the first left square corresponds to the first valve close to the connector on the base. There are 12 squares available for the description: if you order a base with less than 12 positions, complete by placing a 0 in the remaining boxes.

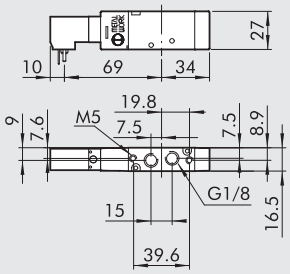
MACH 16 VALVES FOR MULTIPLE CONNECTOR

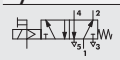
Ⓜ MONOSTABLE 5/2, SOLENOID/PNEUMATIC - MECHANICAL SPRING



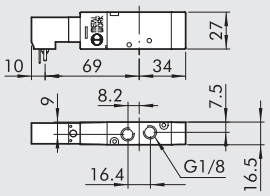
Symbol	Code	Description	Weight [g]
	7062040132	MSV 25 SMS OO 24VDC	92
	7062040133	MSV 25 SMS OO 24VAC	92

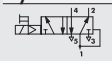
Ⓥ MONOSTABLE 5/2, SOLENOID/PNEUMATIC, PILOT-ASSISTED - MECHANICAL SPRING



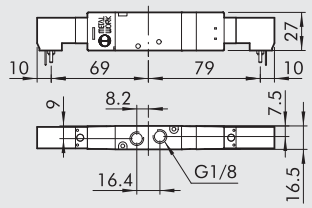
Symbol	Code	Description	Weight [g]
	7062060132	MSV 25 SCS OO 24VDC	93
	7062060133	MSV 25 SCS OO 24VAC	93

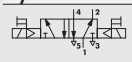
Ⓛ MONOSTABLE 5/2, SOLENOID/PNEUMATIC - PNEUMATIC SPRING



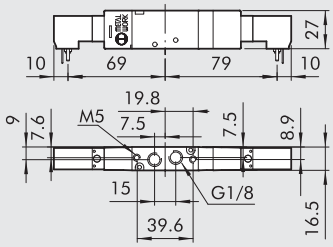
Symbol	Code	Description	Weight [g]
	7062040102	MSV 25 SMP OO 24VDC	93
	7062040103	MSV 25 SMP OO 24VAC	93

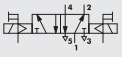
Ⓙ BISTABLE 5/2, SOLENOID/PNEUMATIC



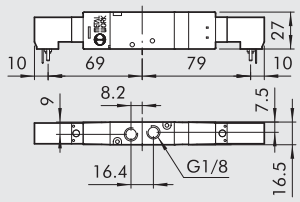
Symbol	Code	Description	Weight [g]
	**7062040112**	MSV 25 SMB OO 24VDC	139
	7062040113	MSV 25 SMB OO 24VAC	139

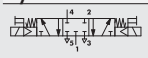
Ⓚ BISTABLE 5/2, SOLENOID/PNEUMATIC, PILOT-ASSISTED



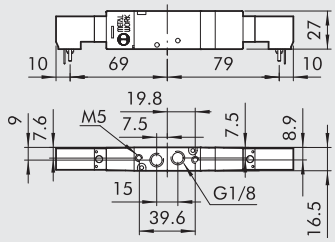
Symbol	Code	Description	Weight [g]
	**7062060112**	MSV 25 SCB OO 24VDC	140
	7062060113	MSV 25 SCB OO 24VAC	140

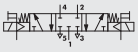
Ⓖ MONOSTABLE 5/3, SOLENOID/PNEUMATIC - CLOSED CENTRES



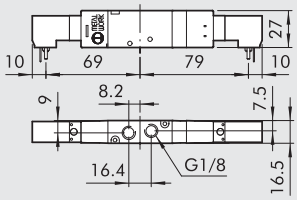
Symbol	Code	Description	Weight [g]
	**7062040212**	MSV 26 SMS CC 24VDC	142
	7062040213	MSV 26 SMS CC 24VAC	142

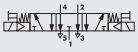
Ⓞ MONOSTABLE 5/3, SOLENOID/PNEUMATIC, PILOT-ASSISTED - CLOSED CENTRES



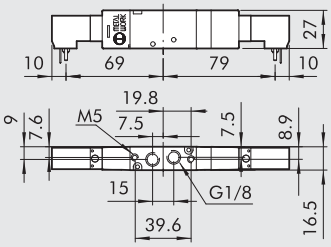
Symbol	Code	Description	Weight [g]
	**7062060212**	MSV 26 SCS CC 24VDC	143
	7062060213	MSV 26 SCS CC 24VAC	143

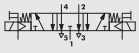
Ⓔ MONOSTABLE 5/3 SOLENOID/PNEUMATIC - OPEN CENTRES



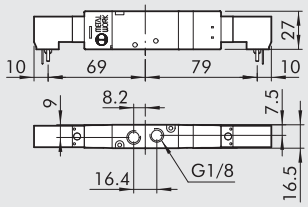
Symbol	Code	Description	Weight [g]
	**7062040312**	MSV 26 SMS OC 24VDC	142
	7062040313	MSV 26 SMS OC 24VAC	142

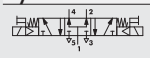
Ⓕ MONOSTABLE 5/3 SOLENOID/PNEUMATIC, PILOT-ASSISTED - OPEN CENTRES



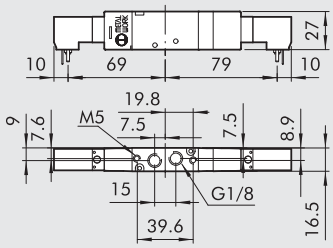
Symbol	Code	Description	Weight [g]
	**7062060312**	MSV 26 SCS OO 24VDC	143
	7062060313	MSV 26 SCS OO 24VAC	143

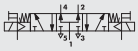
Ⓑ MONOSTABLE 5/3, SOLENOID/PNEUMATIC - PRESSURE CENTRES



Symbol	Code	Description	Weight [g]
	**7062040412**	MSV 26 SMS PC 24VDC	142
	7062040413	MSV 26 SMS PC 24VAC	142

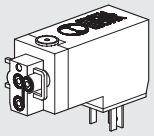
Ⓒ MONOSTABLE 5/3, SOLENOID/PNEUMATIC, PILOT-ASSISTED - PRESSURE CENTRES



Symbol	Code	Description	Weight [g]
	**7062060412**	MSV 26 SCS PC 24VDC	143
	7062060413	MSV 26 SCS PC 24VAC	143

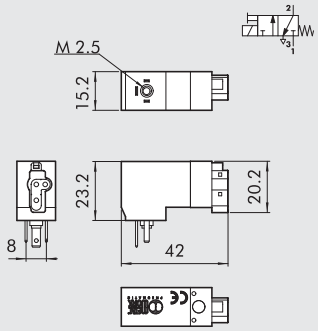
SPARE PARTS

COIL MACH 16 (OLD)



Code	Description
W4015201000	Pilot – multiple connection 24VDC
W4015201010	Pilot – multiple connection 24VAC

COIL MACH 16 (NEW)

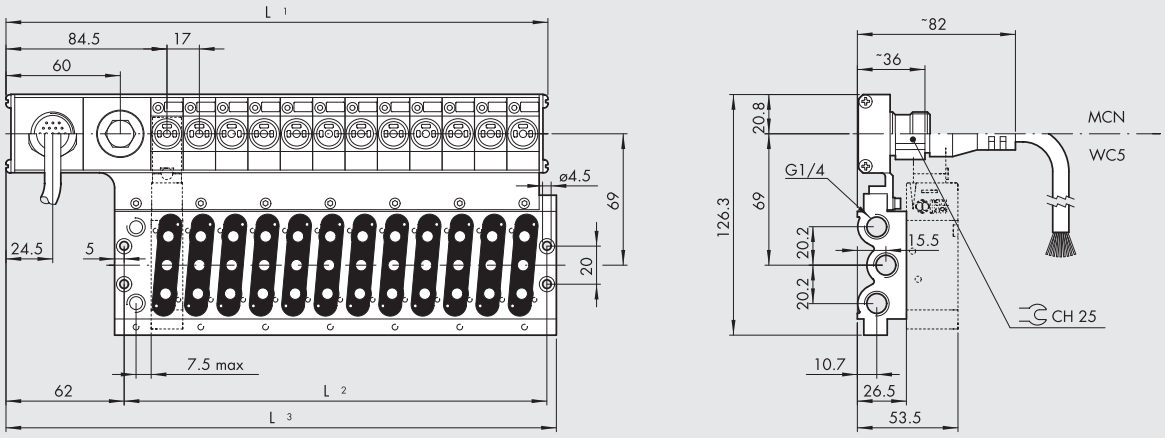


Code	Description
W4015401000	In-line pilot 24VDC
W4015401010	In-line pilot 24VAC 50/60 Hz

N.B.: if the pilot to be replaced bears the writing **CE**, you have to order among the NEW pilots, otherwise order among the OLD pilots.

BASES WITH MULTIPLE CONNECTION

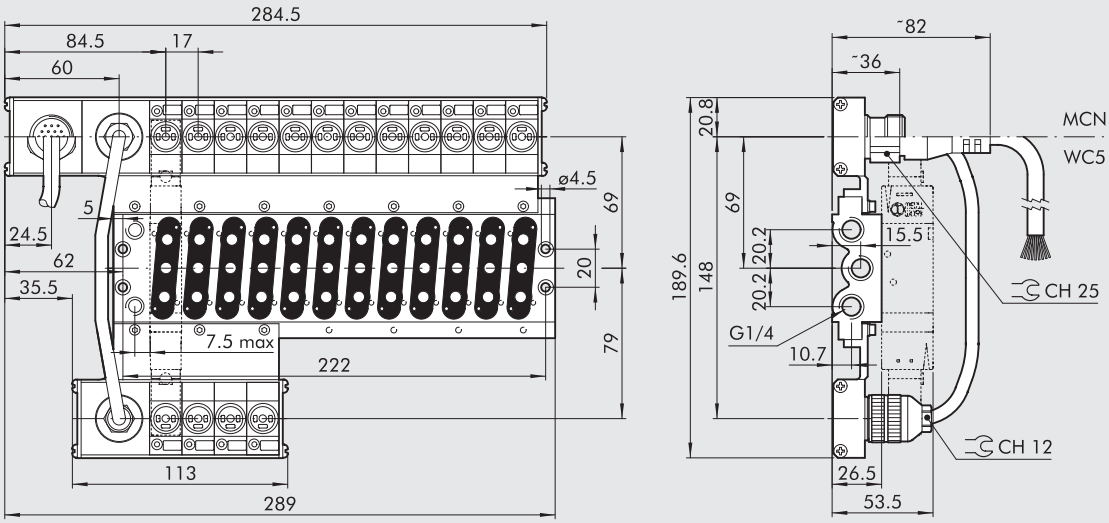
MONOSTABLE SOLENOID/PNEUMATIC BASE WITH 4, 6, 8, 10, 12 POSITIONS



	Pos.-Nr.	L1	L2	L3	Description	Code 24VDC	Code 24VAC	Weight [g]
With multiple connector	4	148.5	86	153	CVM EP 08 04 M MCN	**0225100401**	**0225110401**	504
	6	182.5	120	187	CVM EP 08 06 M MCN	**0225100601**	**0225110601**	644
	8	216.5	154	221	CVM EP 08 08 M MCN	**0225100801**	**0225110801**	784
	10	250.5	188	255	CVM EP 08 10 M MCN	**0225101001**	**0225111001**	924
	12	284.5	222	289	CVM EP 08 12 M MCN	**0225101201**	**0225111201**	1264
With pre-wired cable	4	148.5	86	153	CVM EP 08 04 M WC5	**0225400401**	**0225410401**	3642
	6	182.5	120	187	CVM EP 08 06 M WC5	**0225400601**	**0225410601**	3781
	8	216.5	154	221	CVM EP 08 08 M WC5	**0225400801**	**0225410801**	3923
	10	250.5	188	255	CVM EP 08 10 M WC5	**0225401001**	**0225411001**	4070
	12	284.5	222	289	CVM EP 08 12 M WC5	**0225401201**	**0225411201**	4195

. . . . . : • 24VDC = direct current
• 24VAC = alternating current

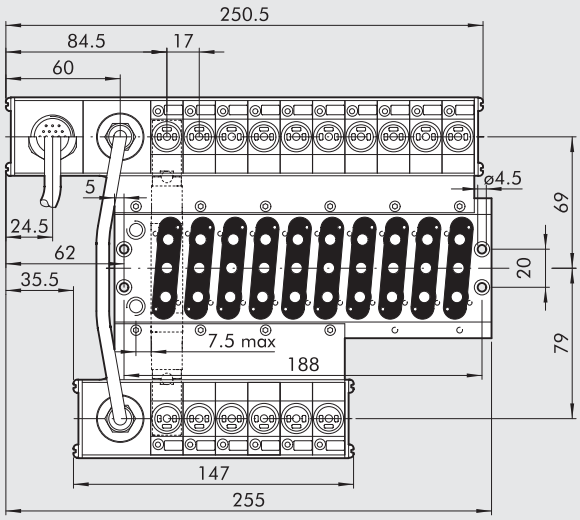
BISTABLE SOLENOID/PNEUMATIC BASE WITH 12 POSITIONS

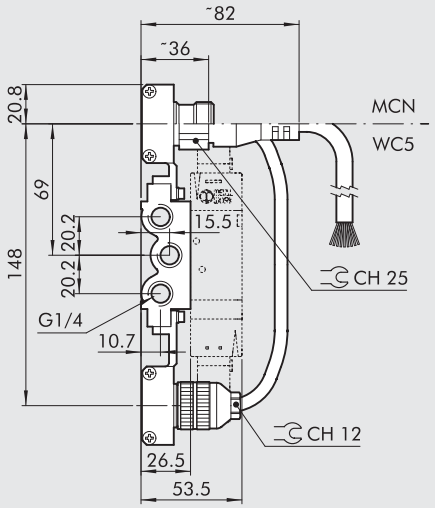


	Pos.-Nr.	Description	Code 24VDC	Code 24VAC	Weight [g]
With multiple connector	12	CVM EP 08 12 B MCN	**0225201201**	**0225211201**	1315
With pre-wired cable	12	CVM EP 08 12 B WC5	**0225501201**	**0225511201**	4700

. . . . . : • 24VDC = direct current
• 24VAC = alternating current

BISTABLE SOLENOID/PNEUMATIC BASE WITH 10 POSITIONS

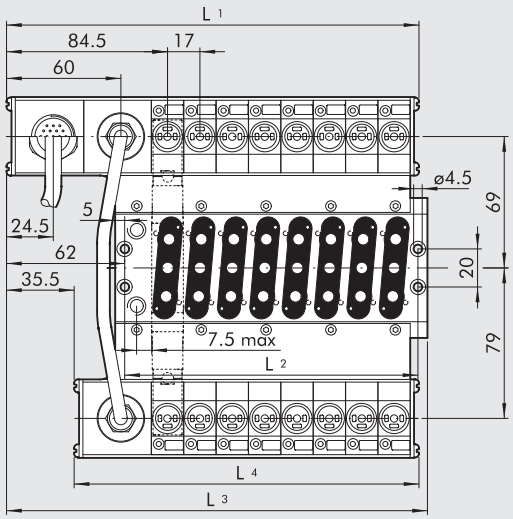


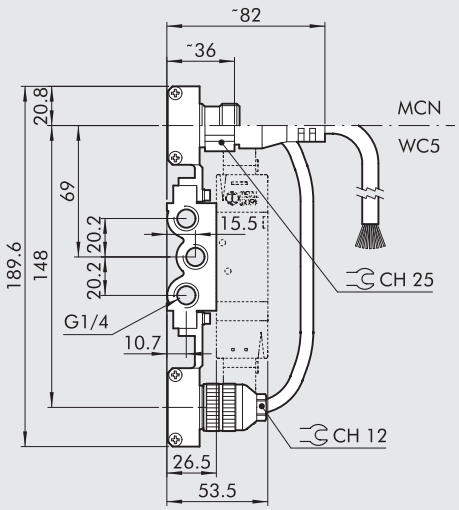


	Pos.-Nr.	Description	Code 24VDC	Code 24VAC	Weight [g]
With multiple connector	10	CVM EP 08 10 B MCN	**0225201001**	**0225211001**	1245
With pre-wired cable	10	CVM EP 08 10 B WC5	**0225501001**	**0225511001**	4600

. . . . . : • 24VDC = direct current
• 24VAC = alternating current

BISTABLE SOLENOID/PNEUMATIC BASE WITH 4, 6, 8 POSITIONS



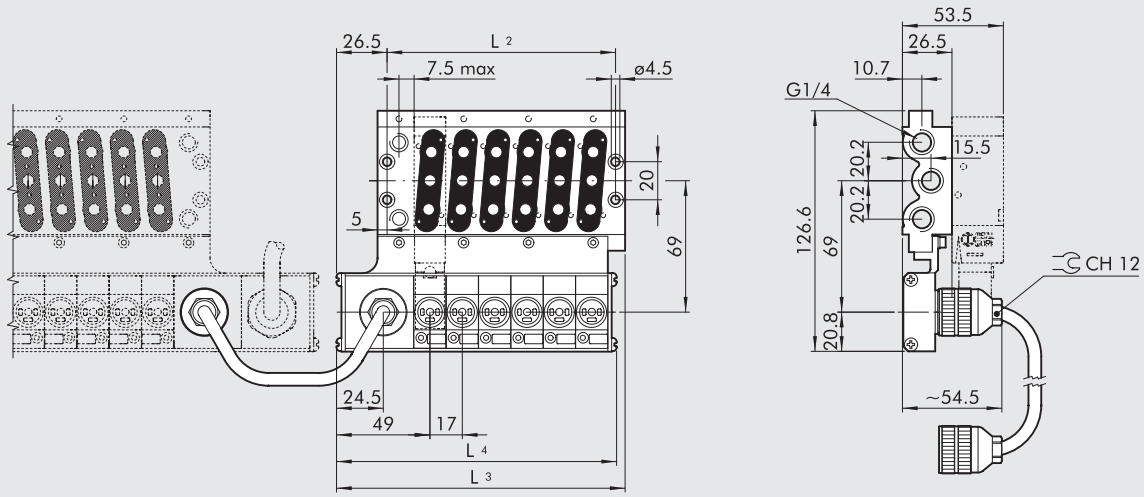


	Pos.-Nr.	L1	L2	L3	L4	Description	Code 24VDC	Code 24VAC	Weight [g]
With multiple connector	4	148.5	86	153	113	CVM EP 08 04 B MCN	**0225200401**	**0225210401**	770
	6	182.5	120	187	147	CVM EP 08 06 B MCN	**0225200601**	**0225210601**	965
	8	216.5	154	221	181	CVM EP 08 08 B MCN	**0225200801**	**0225210801**	1200
With pre-wired cable	4	148.5	86	153	113	CVM EP 08 04 B WC5	**0225500401**	**0225510401**	3910
	6	182.5	120	187	147	CVM EP 08 06 B WC5	**0225500601**	**0225510601**	4086
	8	216.5	154	221	181	CVM EP 08 08 B WC5	**0225500801**	**0225510801**	4264

. . . . . : • 24VDC = direct current
• 24VAC = alternating current

METAL WORK PNEUMATIC

ADDITIONAL MONOSTABLE SOLENOID/PNEUMATIC BASE WITH 4, 6, 8 POSITIONS



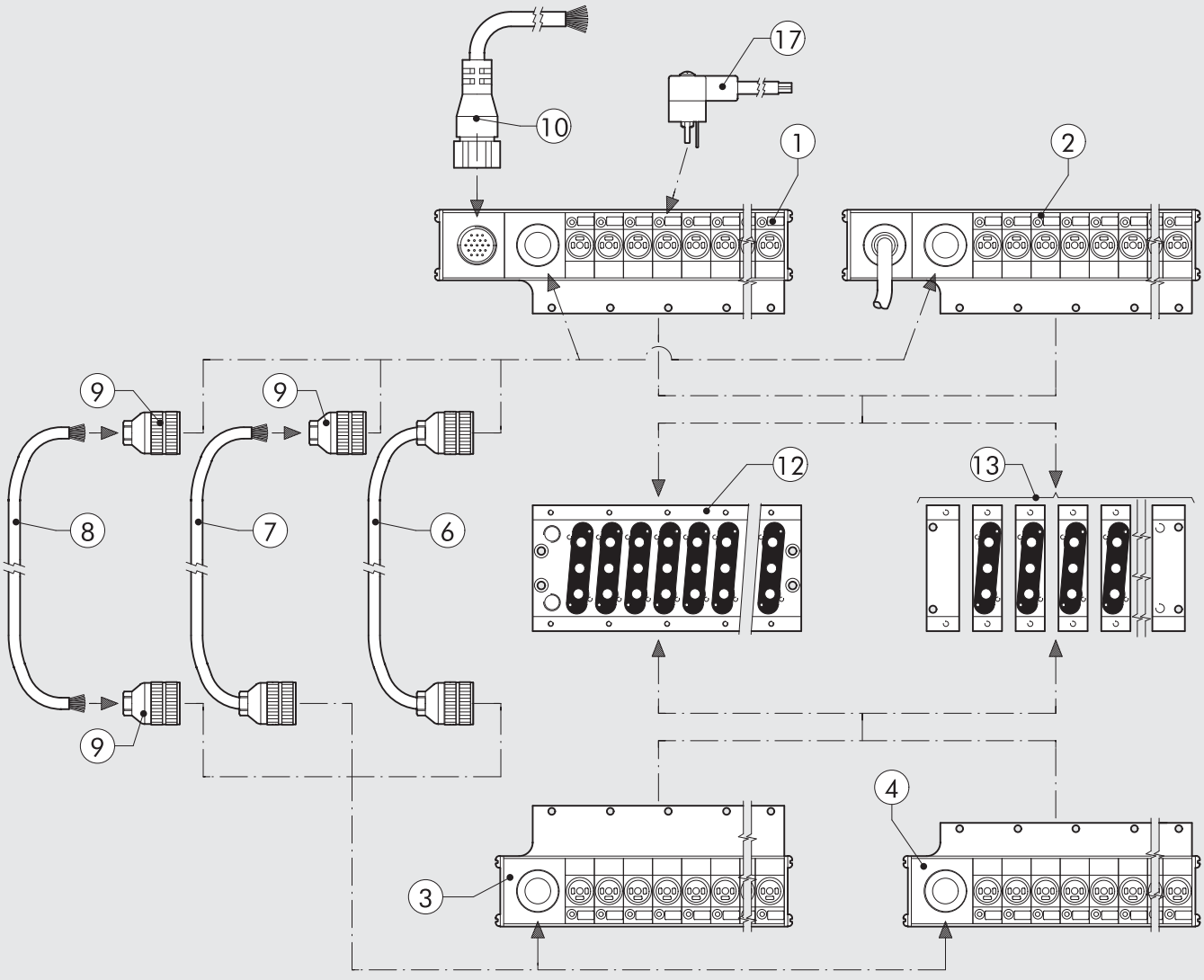
Pos.-Nr.	L2	L3	L4	Description	Code 24VDC	Code 24VAC	Weight [g]
4	86	117.5	113	CVM EP 08 04 M ACM	**0225300401**	**0225310401**	500
6	120	151.5	147	CVM EP 08 06 M ACM	**0225300601**	**0225310601**	640
8	154	185.5	181	CVM EP 08 08 M ACM	**0225300801**	**0225310801**	780

. . . . . : • 24VDC = direct current
• 24VAC = alternating current

NOTES

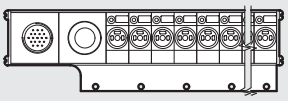
MODULAR MULTIPLE CONNECTOR KIT

It is possible to buy the various assembly kits separately, to obtain a wide range of customised applications.
The main units of the version with connector ① or the pre-wired version ② can easily be assembled with the multiple base ⑫ or the modular manifold base ⑬. The manifold base allows particular circuits on the individual valves (feed from exhaust outlets, pressure differentiation, etc.)
Likewise, on the other side it is also simple to mount the secondary unit ③. This possibility is very interesting because it allows you to convert a base for monostable valves into a base for bistable valves.
If you fit an additional secondary unit ④ on a base, you obtain an additional solenoid base that can be connected by means of return cables to a main base for monostable valves. The only thing to remember is that in all cases the total number of positions (connection to solenoid valve coil) must not exceed sixteen.
The 10 pin return cable ⑥ is used when a main unit and a secondary unit, or only one additional secondary unit, are mounted together on the multiple (or manifold) base. It has to be connected to the sockets shown in the diagram.
For different requirements, it is also possible to have return cables with a connector at one end only ⑦, or just the 10-wire cable ⑧.
These types are available in different lengths. A 10-wire connector kit ⑨ is also available if you need to complete the wiring.
In the version with a connector, the piloting of the entire assembled base is assigned to the 19-wire connector complete with cable ⑩ which is available in various lengths.
The male connector ⑰ allows the free electrical connection of the multiple connector to be used, in order to control the valves placed in the system or to control the bistable valves by a monostable multiple electrical connection base.



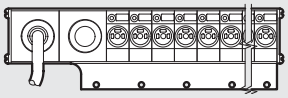
METAL WORK PNEUMATIC

① MAIN KIT - VERSION WITH CONNECTOR



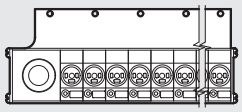
Code	Description	Weight [g]
0226500401	Main multiple connection kit, 4 positions 24VDC	245
0226510401	Main multiple connection kit, 4 positions 24VAC	245
0226500601	Main multiple connection kit, 6 positions 24VDC	280
0226510601	Main multiple connection kit, 6 positions 24VAC	280
0226500801	Main multiple connection kit, 8 positions 24VDC	308
0226510801	Main multiple connection kit, 8 positions 24VAC	308
0226501001	Main multiple connection kit, 10 positions 24VDC	344
0226511001	Main multiple connection kit, 10 positions 24VAC	344
0226501201	Main multiple connection kit, 12 positions 24VDC	396
0226511201	Main multiple connection kit, 12 positions 24VAC	396

② MAIN MULTIPLE PRE-WIRED CONNECTION KIT



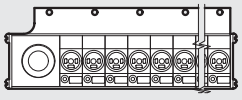
Code	Description	Weight [g]
0226400401	Pre-wired multiple main connector kit, 4 positions 24VDC	3350
0226410401	Pre-wired multiple main connector kit, 4 positions 24VAC	3350
0226400601	Pre-wired multiple main connector kit, 6 positions 24VDC	3400
0226410601	Pre-wired multiple main connector kit, 6 positions 24VAC	3400
0226400801	Pre-wired multiple main connector kit, 8 positions 24VDC	3423
0226410801	Pre-wired multiple main connector kit, 8 positions 24VAC	3423
0226401001	Pre-wired multiple main connector kit, 10 positions 24VDC	3460
0226411001	Pre-wired multiple main connector kit, 10 positions 24VAC	3460
0226401201	Pre-wired multiple main connector kit, 12 positions 24VDC	3490
0226411201	Pre-wired multiple main connector kit, 12 positions 24VAC	3490

③ SECONDARY KIT



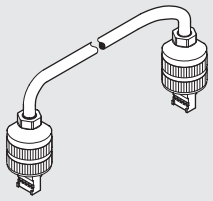
Code	Description	Weight [g]
0226200401	Multiple secondary connector kit, 4 positions 24VDC	166
0226210401	Multiple secondary connector kit, 4 positions 24VAC	166
0226200601	Multiple secondary connector kit, 6 positions 24VDC	210
0226210601	Multiple secondary connector kit, 6 positions 24VAC	210
0226200801	Multiple secondary connector kit, 8 positions 24VDC	257
0226210801	Multiple secondary connector kit, 8 positions 24VAC	257

④ ADDITIONAL SECONDARY KIT



Code	Description	Weight [g]
0226300401	Multiple secondary connector kit, 4 positions 24VDC	158
0226310401	Multiple secondary connector kit, 4 positions 24VAC	158
0226300601	Multiple secondary connector kit, 6 positions 24VDC	199
0226310601	Multiple secondary connector kit, 6 positions 24VAC	199
0226300801	Multiple secondary connector kit, 8 positions 24VDC	243
0226310801	Multiple secondary connector kit, 8 positions 24VAC	243

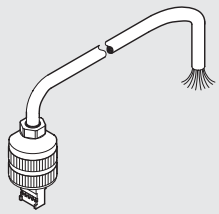
⑥ 10-WIRE RETURN CABLE



Code	Description
0226150022	10-whire return cable L = 22 cm
022615....	10-whire return cable

....Length in cm
Please contact our sales offices

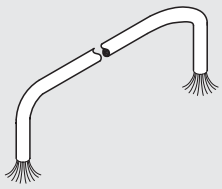
⑦ 10-WIRE RETURN CABLE - ONE END WITH CONNECTOR



Code	Description
022613....	10-wire return cable - one end with connector

....Length in cm
Please contact our sales offices

⑧ CABLE WITH 10 CONNECTORS



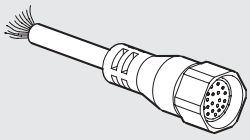
Code	Description
0226107201	10-wires cable

Please specify the desired length in metres

⑨ 10-WIRE CONNECTOR KIT

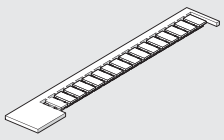
Code	Description
0226170002	10-wire connector kit

⑩ 19-WIRE CABLE, ONE END WITH CONNECTOR



Code	Description
0226140250	19-wire cable, one end with connector L = 2.5 m
0226140500	19-wire cable, one end with connector L = 5 m
0226141000	19-wire cable, one end with connector L = 10 m
0226141500	19-wire cable, one end with connector L = 15 m
0226142000	19-wire cable, one end with connector L = 20 m
0226143000	19-wire cable, one end with connector L = 30 m

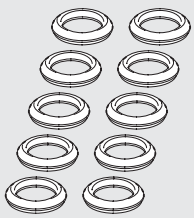
⑫ SET OF IDENTIFICATION PLATES



Code	Description
0226107000	Set of identification plates

Package: 16 pieces

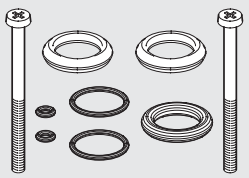
⑬ ELECTRIC CONTACT GASKETS



Code	Description
0226107001	Set of electric contact gaskets

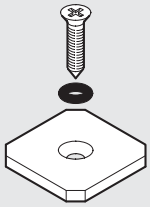
Package: 10 pieces

⑭ SET OF MULTIPLE BASE GASKETS



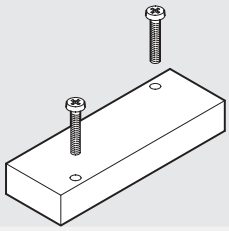
Code	Description
0226007001	Set of M16 multiple base gaskets

⑮ ELECTRIC CONNECTION BLANKING PLATE



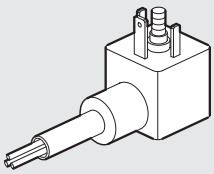
Code	Description
0225004502	Mach 16 electric connection blanking plate

⑯ BASE BLANKING PLATE



Code	Description
0225004500	Mach 16 base blanking plate

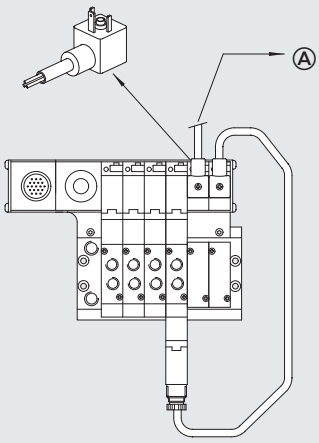
⑰ MALE CONNECTOR



Code	Description
W0970504021	Male connector 2 mm

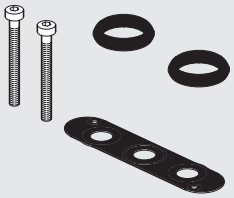
Max power for each position = 5W
Max total power of multiple connector = 36W

Example of a male connector



SOV 1/8″
SOV 1/4″
SOV 1/2″
SOV on base
MACH 16
MACH 18
ISO 1 – ISO 2
PIV valves
APR: progressive starter
V3V: circuit switching valve

⑱ KIT OF MULTIPLE BASE GASKETS

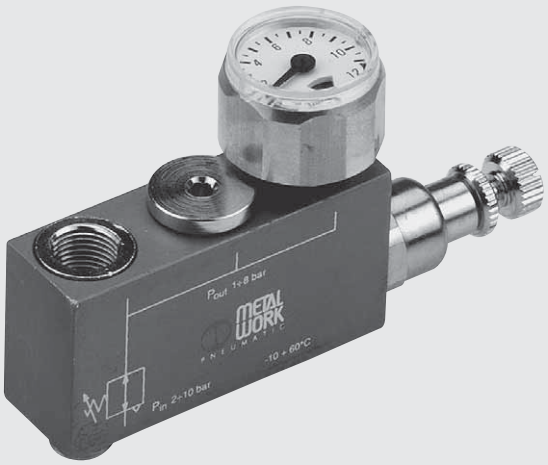


Code	Description
0226007003	Kit of M16 multiple base integrate gaskets

NOTES

REDUCER WITH GAUGE FOR VALVES, SERIES RMV

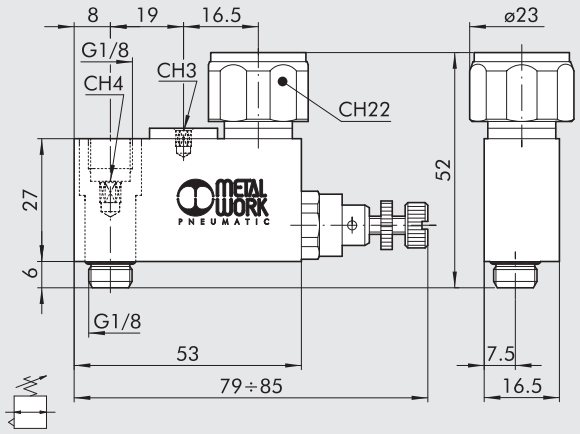
The RMV-series miniature pressure regulator with pressure gauge for valves is specifically conceived for mounting on the outlets of valves with a 1/8" port. With limited cross dimension, it can be fitted to a series of small valves.
The body is 16.5 mm wide and fits exactly on the valves of the Mach 16 series for multiple electrical connection.
Using the RMV, it is possible to differentiate the pressure of each single output of the valves. For example, if you mount it on port 2 and not on port 4, the pressure can be reduced on port 2 only. If you mount one for each port, the pressure on port 2 will differ from that on port 4, which in turn is less than the feed pressure (outlet 1).
There are three 1/8" threaded RMV ports that are pneumatically connected in parallel. A small pressure gauge is mounted in one port; another port is plugged by an A7-type fitting and a third can take a fitting.
The user, however, can decide whether the layout of components is to be modified or not. He might, for example, decide to mount three fittings to create a three-port reduced-pressure distributor.



TECHNICAL DATA

Threaded input connection		1/8" male
Threaded output connection		1/8" female
Regulation range	bar	1 to 8
	MPa	0.1 to 0.8
	psi	14.5 to 116
Input pressure	bar	2 to 10
	MPa	0.2 to 1
	psi	29 to 145
Flow rate at 6.3 bar (0.63 MPa - 91 psi) ΔP 1 bar	Nl/min	140
Flow rate at free exhaust at 6.3 bar (0.63 MPa - 91 psi)	Nl/min	360
Fluid		Filtered lubricated or unlubricated air
Maximum temperature at 10 bar (1 MPa - 145 psi)	°C	-10 to +60
	°F	+14 to + 140
Assembly position		On valves
Use instructions		The pressure must always be regulated in increasing values

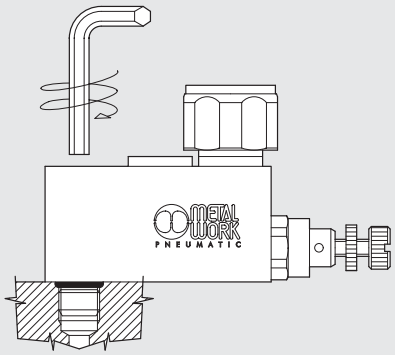
DIMENSIONES



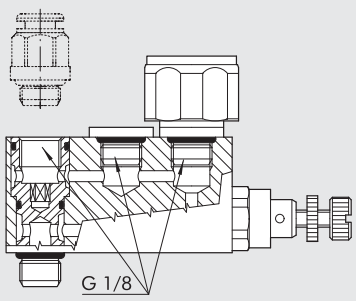
Code	Description
9061601	RMV 1/8"

APPLICATIONS - ASSEMBLY

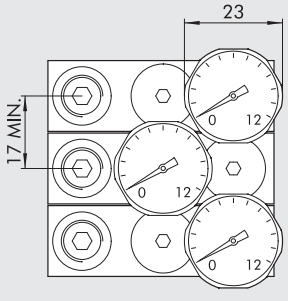
Fixing the reducer onto the valve



3 outputs with G1/8" thread

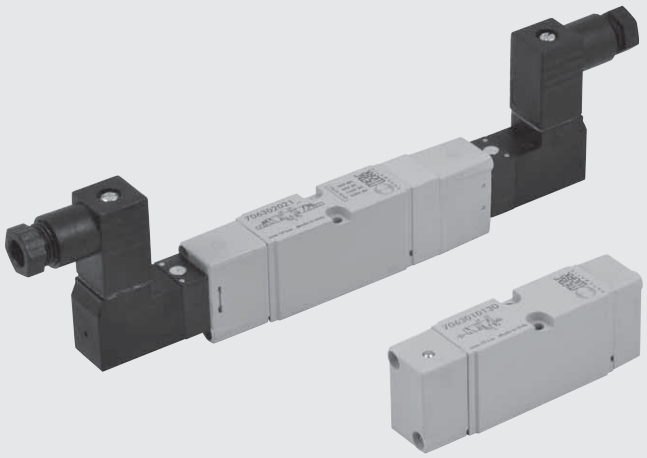


When mounting on valve units, with a pitch of less than 23 mm, alternate the gauge positions



VALVES MACH 18, ISO 15407-1/VDMA 24563-02

Mach 18 valve is manufactured according to the ISO 1507-1 standard, which in turn absorbs the VDMA 24563-02 rule. It comes in 5-way versions with 2 and 3 positions with solenoid or pneumatic actuation.

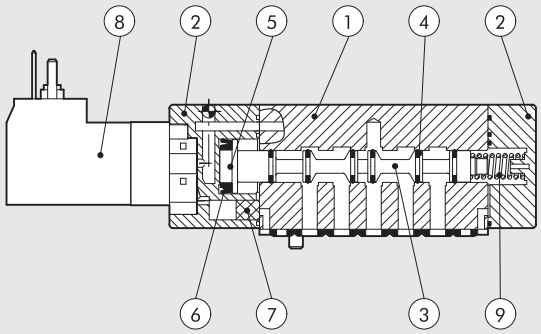


TECHNICAL DATA

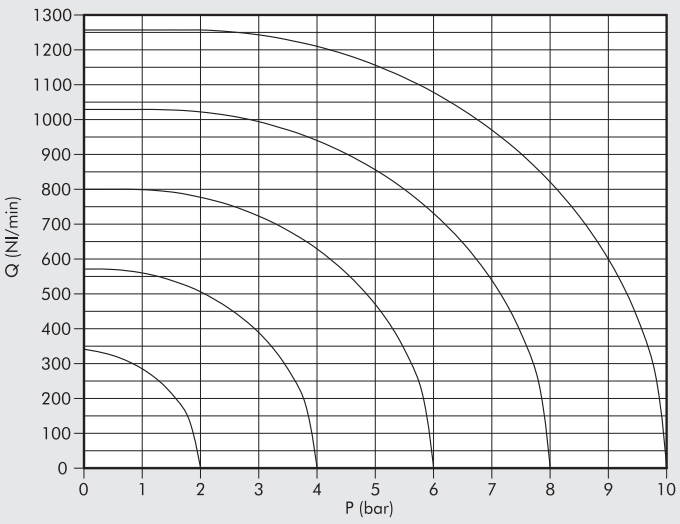
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous
Operating pressure:	bar	
• monostable		1.5 to 10
• monostable 5/3		Vacuum to 10 pneumatic/1.9 to 10 solenoid/pneumatic
• bistable		Vacuum to 10 pneumatic/1 to 10 solenoid/pneumatic
• pilot-assisted		Vacuum to 10
Minimum pilot pressure	bar	2 to 10
Operating temperature range	°C	-10 to +60
Conductance C	Nl/min · bar	114.86
Critical ratio b	bar/bar	0.25
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	340
Flow rate at 6 bar ΔP 1 bar	Nl/min	470
Installation		In any position (vertical assembly is not recommended for bistable valves subjected to vibration)
Assembly		On manifold bases
Recommended lubricant		ISO and UNI FD 22
Solenoid pilot		Integrated coil to DIN 43650 C-shape
Manual		Monostable on solenoid pilot (with manual monostable on request)
Compatibility with oils		See **chapter Z1**

COMPONENTS

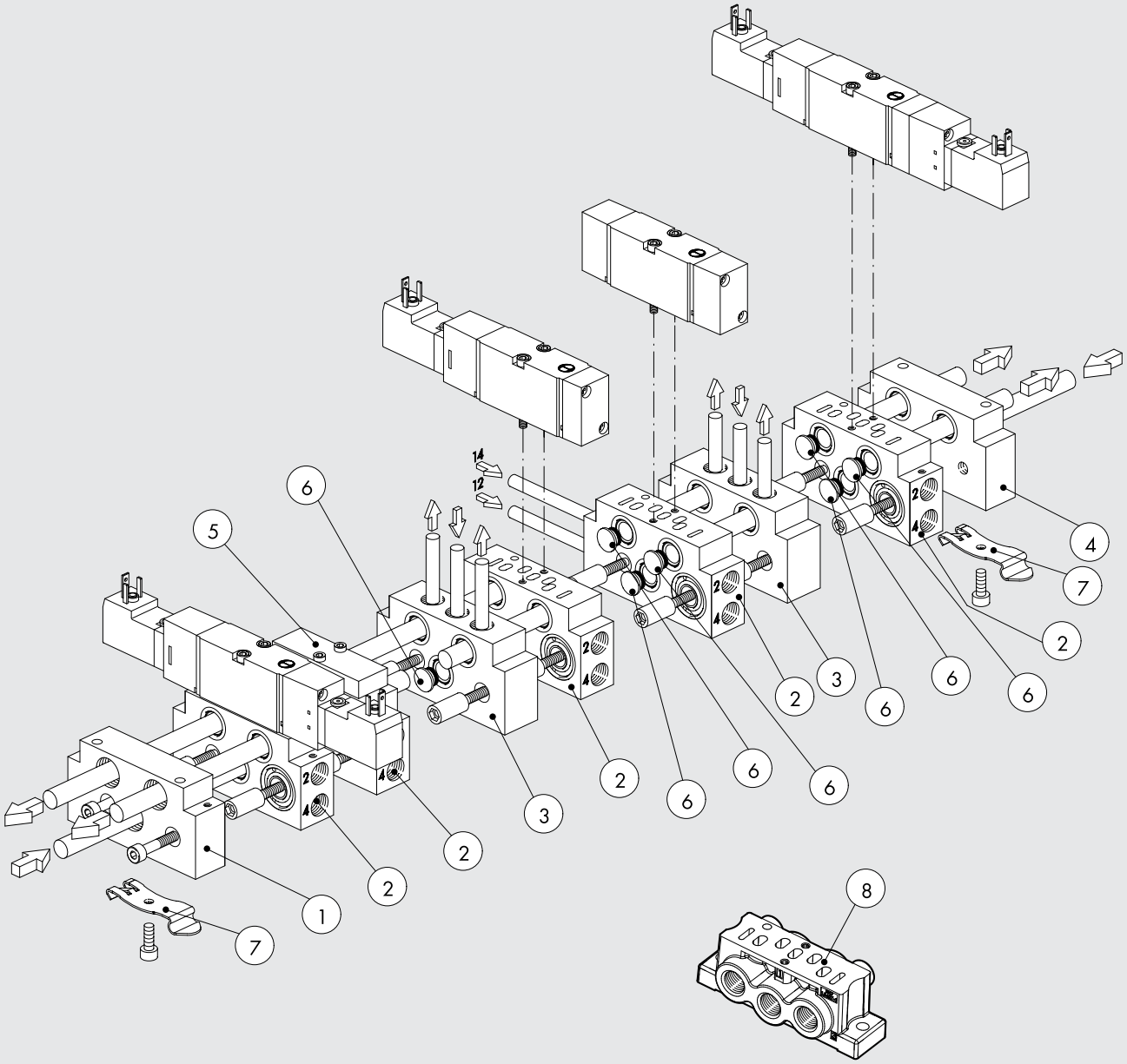
① VALVE BODY: Aluminium
② CONTROL/END CAP: Hostaform®
③ SPOOL: Aluminium
④ GASKETS: Polyurethane
⑤ PISTONS: Hostaform®
⑥ PISTON GASKET: Polyurethane
⑦ FILTER: sintered bronze
⑧ PILOT: with integrated coil
⑨ SPRINGS: special steel



FLOW CHART



MODULARITY



Reference	Code	Description
①	**0227100201**	ISO 15407-1 input end plate kit
②	**0227200150**	ISO 15407-1 manifold side base kit
③	**0227200300**	ISO 15407-1 intermediate bases
④	**0227100200**	ISO 15407-1 output end plate kit
⑤	**0227200500**	ISO 15407-1 blanking plate
⑥	**0227100000**	Intermediate diaphragm
⑦	**0227300600**	Connection bracket on DIN bar
⑧	**0227200800**	ISO 15407-1 individual base kit

SYNOPTIC, SIZES AND VERSIONS

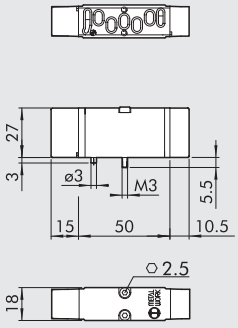
M S V	D	5	S O	S	O O	2 4 V D C
FAMILY	**DIMENSIONS**	**FUNCTION**	**OPERATORS 14**	**RESETTING (12)**	**FURTHER DETAILS**	**VOLTAGE**
MSV solenoid/pneumatic	**D** ISO 15407-1/ VDMA 24563-02	**5** 5/2	**SO** solenoid/pneumatic	**S** mechanical springs	**OO** 5/2	24VDC
MPV pneumatic		**6** 5/3	**SE** solenoid-pilot-assisted	**B** bistable	**CC** closed centres	24VAC
			PN pneumatic		**OC** open centres	110VAC
					PC pressure centres	220VAC

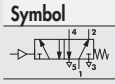
MACH 18 ISO 15407-1/VDMA 24563-02
MPV PNEUMATIC

TECHNICAL DATA

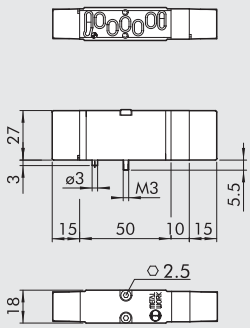
Operating pressure:	bar	Vacuum to10
Minimum operating pressure:	bar	
• monostable		1.5
• monostable 5/3		1.9
• bistable		1
Conductance C	Nl/min · bar	114.86
Critical ratio b	bar/bar	0.25
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	340
Flow rate at 6 bar ΔP 1 bar	Nl/min	470
Actuation response times at 6 bar:	ms	
• monostable		4
• bistable		4
Repositioning response times at 6 bar	ms	
• monostable		8.4
• bistable		4
Operating temperature range	°C	-10 + 60

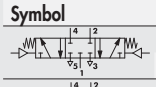
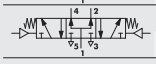
MONOSTABLE 5/2



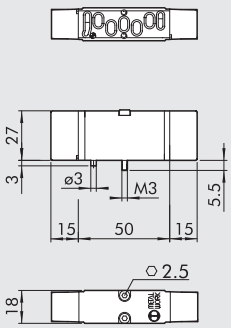
Symbol	Code	Abbrev.	Weight [g]
	7063010130	MPV D5 PNS OO	80

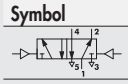
MONOSTABLE 5/3



Symbol	Code	Abbrev.	Weight [g]
	7063010210	MPV D6 PNS CC	93
	7063010310	MPV D6 PNS OC	93
	7063010410	MPV D6 PNS PC	93

BISTABLE 5/2



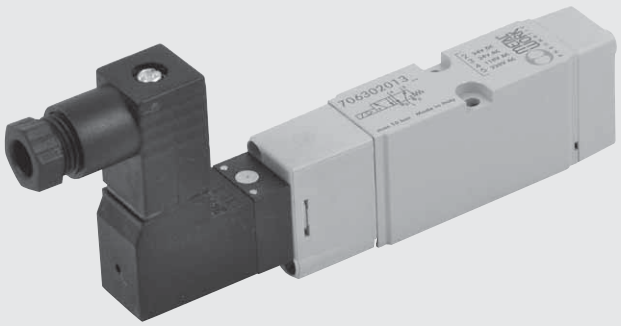
Symbol	Code	Abbrev.	Weight [g]
	7063010110	MPV D5 PNB OO	78

NOTES

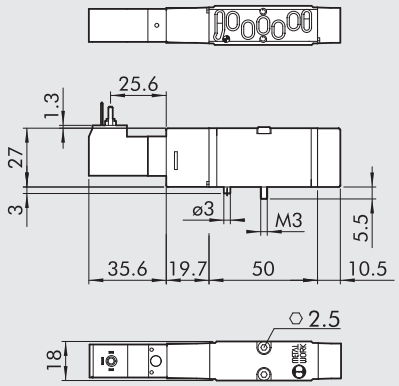
MACH 18 ISO 15407-1/VDMA 24563-02
SOLENOID/PNEUMATIC MSV

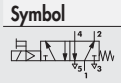
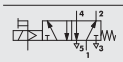
TECHNICAL DATA

Operating pressure:	bar	
• monostable		1.5 to 10
• monostable 5/3		1.9 to 10
• bistable		1 to 10
• pilot-assisted		Vacuum to 10
Minimum pilot pressure	bar	2
Operating temperature range	°C	-10 to +60
Conductance C	Nl/min · bar	114.86
Critical ratio b	bar/bar	0.25
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	340
Flow rate at 6 bar ΔP 1 bar	Nl/min	470
TRA / TRR monostable at 6 bar	ms	12 / 26
TRA / TRR bistable at 6 bar	ms	21 / 21
Type of manual actuation		Monostable on solenoid pilot (with bistable manual valve on request)
Pilot with integrated coil		24 VDC - 24 VAC - 110 VAC - 220 VAC
Power	W	1
Voltage tolerance		-10% to -15%
Insulation class		F 155
Degree of protection		IP 65 EN60529 with connector
Solenoid rating		100% ED
Electrical contacts		DIN 43650 C Shape

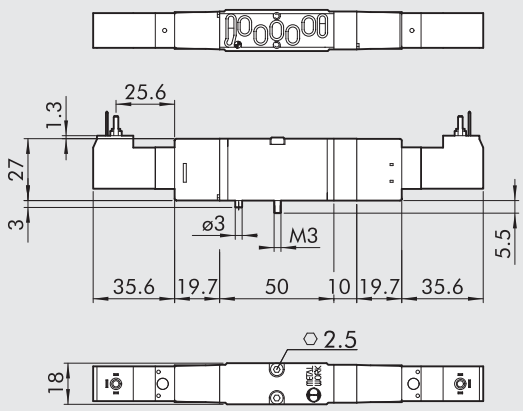


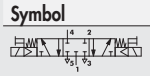
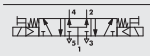
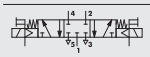
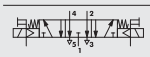
MONOSTABLE 5/2



Symbol	Code	Abbrev.	Weight [g]
	7063020132	MSV D5 SOS OO 24VDC	110
	7063020133	MSV D5 SOS OO 24VAC	110
	7063020134	MSV D5 SOS OO 110VAC	110
	7063020135	MSV D5 SOS OO 220VAC	110
	7063030132	MSV D5 SES OO 24VDC	110
	7063030133	MSV D5 SES OO 24VAC	110
	7063030134	MSV D5 SES OO 110VAC	110
	7063030135	MSV D5 SES OO 220VAC	110

MONOSTABLE 5/3



Symbol	Code	Abbrev.	Weight [g]
	7063020212	MSV D6 SOS CC 24VDC	156
	7063020213	MSV D6 SOS CC 24VAC	156
	7063020214	MSV D6 SOS CC 110VAC	156
	7063020215	MSV D6 SOS CC 220VAC	156
	7063020312	MSV D6 SOS OC 24VDC	156
	7063020313	MSV D6 SOS OC 24VAC	156
	7063020314	MSV D6 SOS OC 110VAC	156
	7063020315	MSV D6 SOS OC 220VAC	156
	7063020412	MSV D6 SOS PC 24VDC	156
	7063020413	MSV D6 SOS PC 24VAC	156
	7063020414	MSV D6 SOS PC 110VAC	156
	7063020415	MSV D6 SOS PC 220VAC	156
	7063030212	MSV D6 SES CC 24VDC	156
	7063030213	MSV D6 SES CC 24VAC	156
	7063030214	MSV D6 SES CC 110VAC	156
	7063030215	MSV D6 SES CC 220VAC	156
	7063030312	MSV D6 SES OC 24VDC	156
	7063030313	MSV D6 SES OC 24VAC	156
	7063030314	MSV D6 SES OC 110VAC	156
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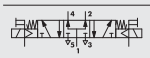
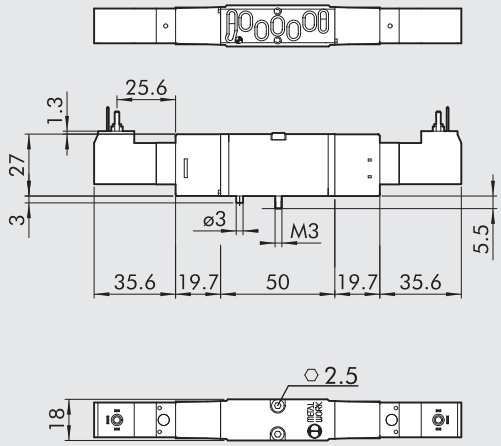
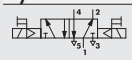
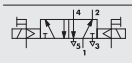
	7063030412	MSV D6 SES PC 24VDC	156
	7063030413	MSV D6 SES PC 24VAC	156
	7063030414	MSV D6 SES PC 110VAC	156
	7063030415	MSV D6 SES PC 220VAC	156

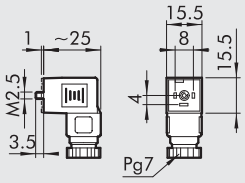
BISTABLE 5/2



Symbol	Code	Abbrev.	Weight [g]
	**7063020112**	MSV D5 SOB OO 24VDC	143
	7063020113	MSV D5 SOB OO 24VAC	143
	7063020114	MSV D5 SOB OO 110VAC	143
	7063020115	MSV D5 SOB OO 220VAC	143
	**7063030112**	MSV D5 SEB OO 24VDC	143
	7063030113	MSV D5 SEB OO 24VAC	143
	7063030114	MSV D5 SEB OO 110VAC	143
	7063030115	MSV D5 SEB OO 220VAC	143

ACCESSORIES

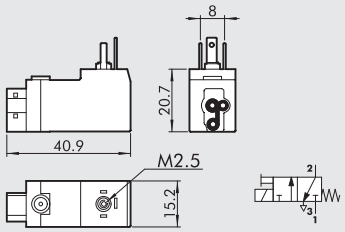
CONNECTOR 15 mm DIN 43650 SHAPE C



Code	Description
W0970501021	Connector 15 mm C shape DIN 43650
W0970501022	Connector 15 mm C shape DIN 43650 LED 24V
W0970501025	Connector 15 mm C shape DIN 43650 LED+VDR 24V

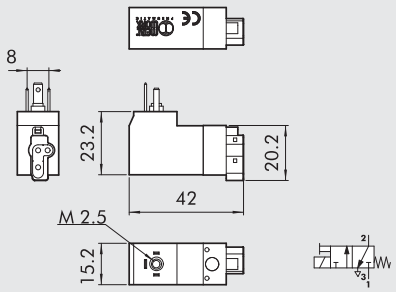
SPARE PARTS

PILOT MACH 18 (OLD)



Code	Description
W4015101000	In-line pilot 24VDC
W4015101010	In-line pilot 24VAC 50/60 Hz
W4015101020	In-line pilot 110VAC 50/60 Hz
W4015101030	In-line pilot 220VAC 50/60 Hz

PILOT MACH 18 (NEW)

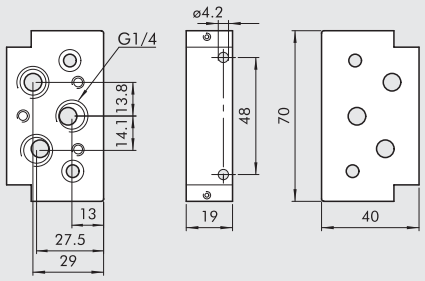


Code	Description
W4015301000	In-line pilot 24VDC
W4015301010	In-line pilot 24VAC 50/60 Hz
W4015301020	In-line pilot 110VAC 50/60 Hz
W4015301030	In-line pilot 220VAC 50/60 Hz

N.B.: if the pilot to be replaced bears the writing **CE**, you have to order among the NEW pilots, otherwise order among the OLD pilots.

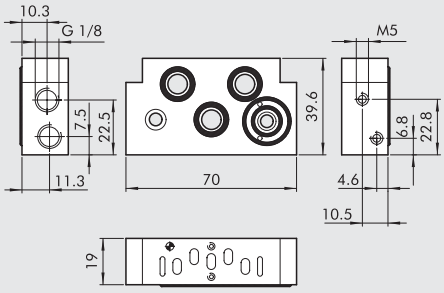
BASES TO ISO 15407-1/VDMA 24563-02 FOR MACH 18 VALVES

① INPUT END PLATE



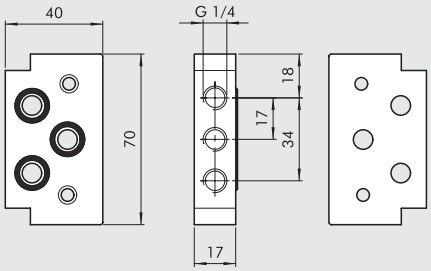
Code	Description	Weight [g]
0227100201	ISO 15407-1 input end plate kit	125

② MANIFOLD BASE, SIDE PORTS



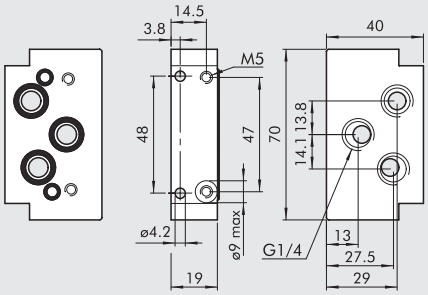
Code	Description	Weight [g]
0227200150	ISO 15407-1 manifold base, side ports kit	125

③ INTERMEDIATE UPPER PORTS



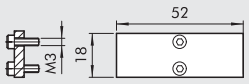
Code	Description	Weight [g]
0227200300	ISO 15407-1 intermediate upper ports kit	118

④ OUTPUT END PLATE



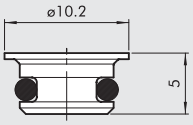
Code	Description	Weight [g]
0227100200	ISO 15407-1 output end-plate kit	122

⑤ BLANKING PLATE - UNUSED POSITION



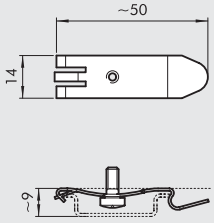
Code	Description	Weight [g]
0227200500	ISO 15407-1 blanking plate	24

⑥ INTERMEDIATE DIAPHRAGM



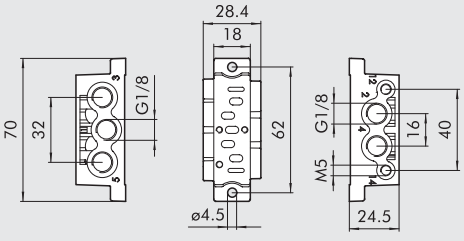
Code	Description	Weight [g]
0227100000	Intermediate diaphragm	2

⑦ CONNECTION BRACKETS ON THE BAR OMEGA (DIN EN 50022)



Code	Description	Weight [g]
0227300600	Connection brackets on DIN bar	7

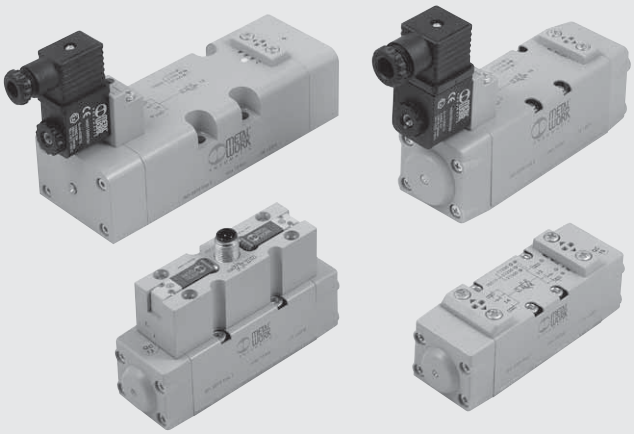
⑧ INDIVIDUAL BASE



Code	Description	Weight [g]
0227200800	ISO 15407-1 individual base kit	51

VALVES ISO 5599/1, SERIES IPV-ISV

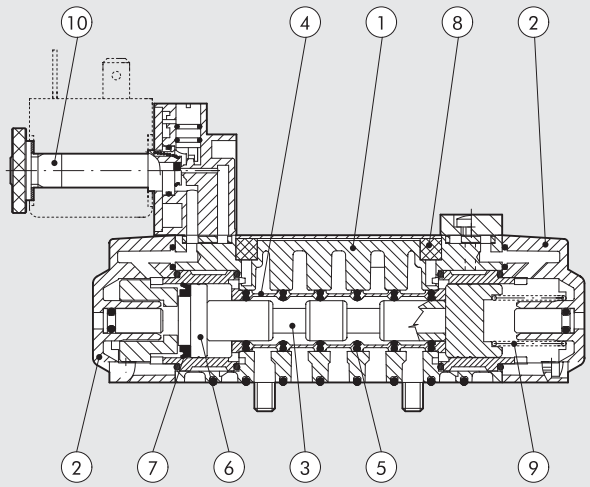
The assembly surface dimensions of ISO1, ISO2 and ISO 3 valves are to ISO5599-1. They are available in the 5-way versions with 2 and 3 positions and with pneumatic or solenoid actuation.



TECHNICAL DATA		ISO 1	ISO 2	ISO 3
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous		
Operating pressure:	bar			
• monostable		Vacuum to 10 pneumatic / 2.5 to 10 solenoid/pneumatic		
• bistable		Vacuum to 10 pneumatic / 1 to 10 solenoid/pneumatic		
• pilot-assisted		Vacuum to 10		
Minimum pilot pressure	bar	2.5		
Operating temperature range	°C	-10 to +60		
Nominal diameter	mm	7.5	12	15
Conductance C	Nl/min · bar	250	657.14	971.43
Critical ratio b	bar/bar	0.36	0.25	0.43
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	700	1800	3200
Flow rate at 6 bar ΔP 1 bar	Nl/min	1100	2700	4600
Installation		In any position (vertical assembly is not recommended for bistable valves subjected to vibration)		
Assembly		On single and manifold bases according to ISO 5599/1		
Recommended lubricant		ISO and UNI FD 22		
Solenoid pilot		to CNOMO/in-line pilot / M12		to CNOMO
Manual		Bistable on solenoid pilot		
		Monostable on valve body		
Maximum coil nut torque	Nm	1		
Compatibility with oils		See **chapter Z1**		

COMPONENTS

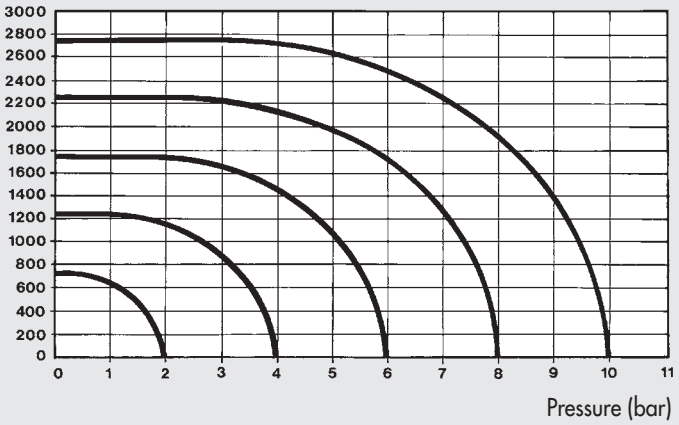
① VALVE BODY: Aluminium
② END CAP: Hostaform®
③ SPOOL: chemically nickel-plated aluminium
④ DISTANCE PLATES: plastic
⑤ GASKETS: NBR
⑥ PISTONS: Hostaform®
⑦ PISTON GASKET: NBR
⑧ FILTER: sintered bronze
⑨ SPRINGS: special steel
⑩ OPERATOR: Brass pipe – Stainless steel core



FLOW CHART

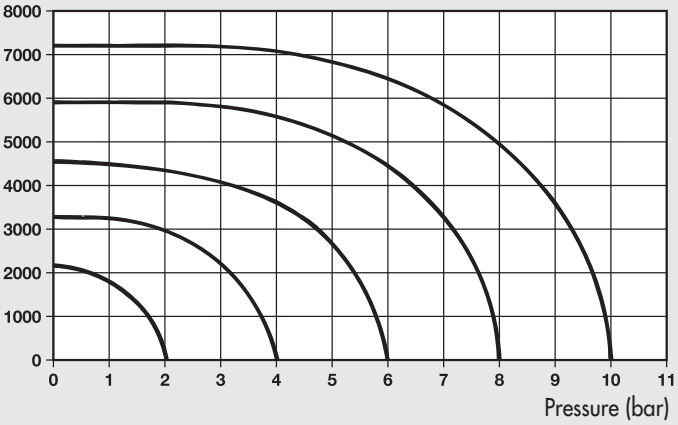
ISO 1

Flow rates (Nl/min)



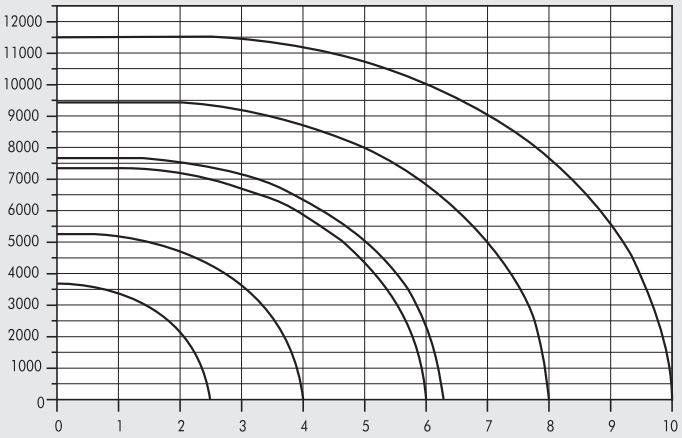
ISO 2

Flow rates (Nl/min)



ISO 3

Flow rates (Nl/min)



SYNOPTIC, SIZES AND VERSIONS

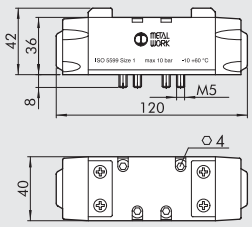
I P V	5	5	P N	S	O O
FAMILY	**DIMENSIONS**	**FUNCTION**	**OPERATORS 14**	**RESETTING (12)**	**FURTHER DETAILS**
IPV ISO pneumatic	**5** ISO 1	**5** 5/2	**PN** pneumatic	**S** mechanical springs	**OO** 5/2
ISV ISO solenoid/pneumatic	**6** ISO 2	**6** 5/3	**SO** solenoid/pneumatic	**B** bistable	**CC** closed centres
	7 ISO 3		**SE** electric pilot-assisted	**D** differential	**OC** open centres
			✱ **DO** solenoid/pneumatic in line		**PC** pressure centres
			✱ **DE** solenoid assisted in line M12		
			● **CO** M12 solenoid/pneumatic		
			● **CE** M12 solenoid assisted		

✱ Only for ISO 1
● Only for ISO 1 and ISO 2

VALVES ISO 5599/1, PNEUMATIC
SERIES IPV

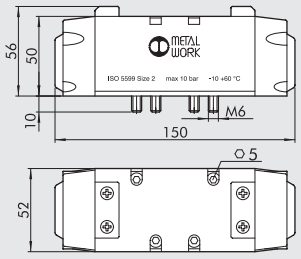
TECHNICAL DATA		ISO 1	ISO 2	ISO 3
Operating pressure	bar	Vacuum to 10		
Minimum operation pressure:				
• monostable	bar	2.5		
• bistable	bar	1		
Operating temperature range	°C	-10° to +60		
Nominal diameter	mm	7.5	12	15
Conductance C	Nl/min · bar	250	657.14	971.43
Critical ratio b	bar/bar	0.36	0.25	0.43
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	700	1800	3200
Flow rate at 6 bar ΔP 1 bar	Nl/min	1100	2700	4600
Response times at 6 Bar:				
• monostable	ms	12	24	35
• bistable	ms	20	30	45
Repositioning response times at 6 Bar:				
• monostable	ms	30	43	55
• bistable	ms	20	30	45
Manual		monostable on valve body		

PNEUMATIC ACTUATION ISO 1



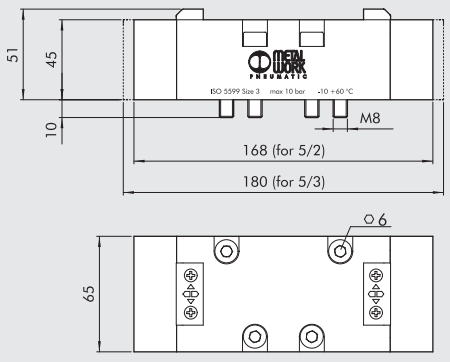
Symbol	Code	Abbrev.	Weight [g]
	7051011100	IPV 55 PNS OO	310
	7051011200	IPV 55 PNB OO	310
	7051011300	IPV 55 PND OO	310
	7051012100	IPV 56 PNS CC	310
	7051012200	IPV 56 PNS OC	310
	7051012300	IPV 56 PNS PC	310

PNEUMATIC ACTUATION ISO 2



Symbol	Code	Abbrev.	Weight [g]
	7052011100	IPV 65 PNS OO	705
	7052011200	IPV 65 PNB OO	705
	7052011300	IPV 65 PND OO	705
	7052012100	IPV 66 PNS CC	705
	7052012200	IPV 66 PNS OC	705
	7052012300	IPV 66 PNS PC	705

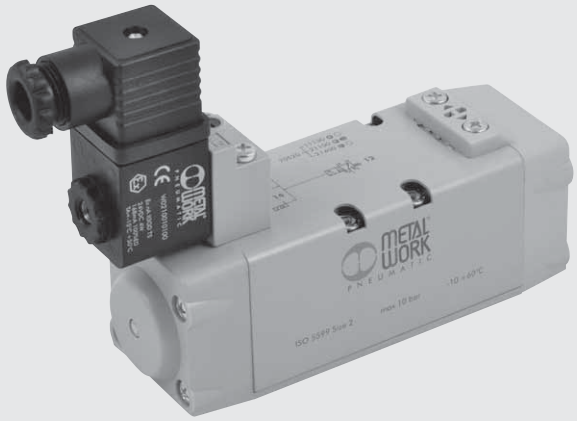
PNEUMATIC ACTUATION ISO 3



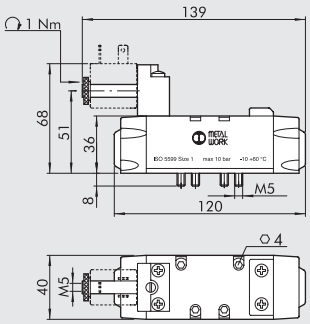
Symbol	Code	Abbrev.	Weight [g]
	7056011100	IPV 75 PNS OO	1175
	7056011200	IPV 75 PNB OO	1175
	7056011300	IPV 75 PND OO	1175
	7056012100	IPV 76 PNS CC	1290
	7056012200	IPV 76 PNS OC	1290
	7056012300	IPV 76 PNS PC	1290

VALVES ISO 5599/1, SOLENOID/PNEUMATIC, SERIES ISV

TECHNICAL DATA		ISO 1	ISO 2	ISO 3
Operating pressure:	bar			
• monostable		2.5 to 10		
• bistable		1 to 10		
• pilot-assisted		Vacuum to 10		
Minimum pilot pressure	bar	2.5		
Operating temperature range	°C	-10 to +60		
Nominal diameter	mm	7.5	12	15
Conductance C	Nl/min · bar	250	657.14	971.43
Critical ratio b	bar/bar	0.36	0.25	0.43
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	700	1800	3200
Flow rate at 6 bar ΔP 1 bar	Nl/min	1100	2700	4600
TRA / TRR monostable at 6 bar	ms	24 / 50	39 / 60	50 / 120
TRA / TRR bistable at 6 bar	ms	20 / 20	25 / 25	35 / 35
Solenoid pilot		Standards CNOMO		
Manual		Bistable on solenoid pilot		
		Monostable on valve body		
Coils		30 mm side DIN 43650 Form A – ISO 22 mm side		
Maximum coil nut torque	Nm	1		



MONOSTABLE 5/2 ISO 1



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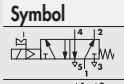
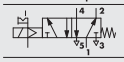
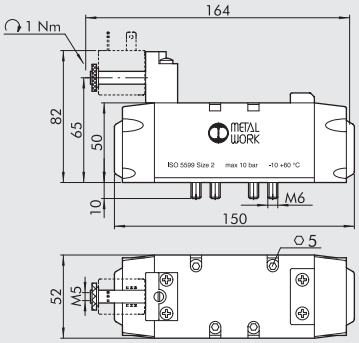
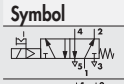
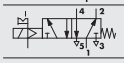
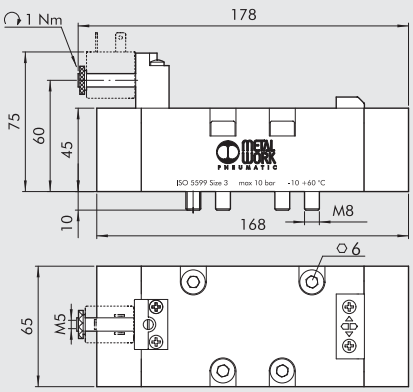
	7051021100	ISV 55 SOS OO	344
	7051021400	ISV 55 SES OO	344

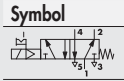
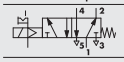
MONOSTABLE 5/2 ISO 2



Symbol	Code	Abbrev.	Weight [g]
	7052021100	ISV 65 SOS OO	715
	7052021400	ISV 65 SES OO	715

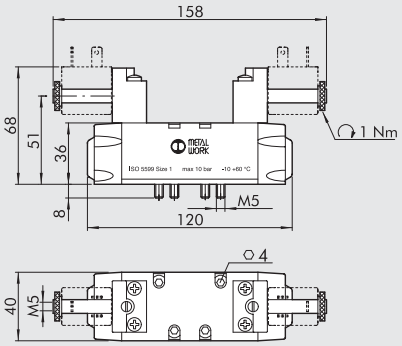
MONOSTABLE 5/2 ISO 3



Symbol	Code	Abbrev.	Weight [g]
	7056021100	ISV 75 SOS OO	1207
	7056021400	ISV 75 SES OO	1207

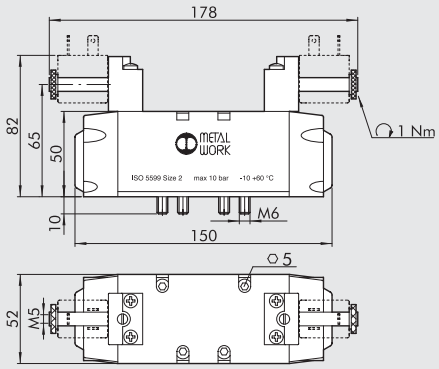
METAL WORK PNEUMATIC

BISTABLE 5/2 ISO 1 - MONOSTABLE 5/3 ISO 1



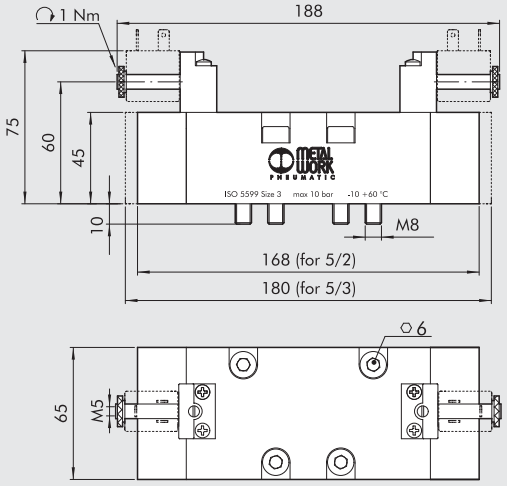
Symbol	Code	Abbrev.	Weight [g]
	7051021200	ISV 55 SOB OO	388
	7051021300	ISV 55 SOD OO	375
	7051022100	ISV 56 SOS CC	372
	7051022200	ISV 56 SOS OC	372
	7051022300	ISV 56 SOS PC	372
	7051021500	ISV 55 SEB OO	388
	7051021600	ISV 55 SED OO	375
	7051022400	ISV 56 SES CC	372
	7051022500	ISV 56 SES OC	372
	7051022600	ISV 56 SES PC	372

BISTABLE 5/2 ISO 2 - MONOSTABLE 5/3 ISO 2



Symbol	Code	Abbrev.	Weight [g]
	7052021200	ISV 65 SOB OO	740
	7052021300	ISV 65 SOD OO	710
	7052022100	ISV 66 SOS CC	720
	7052022200	ISV 66 SOS OC	720
	7052022300	ISV 66 SOS PC	720
	7052021500	ISV 65 SEB OO	740
	7052021600	ISV 65 SED OO	710
	7052022400	ISV 66 SES CC	720
	7052022500	ISV 66 SES OC	720
	7052022600	ISV 66 SES PC	720

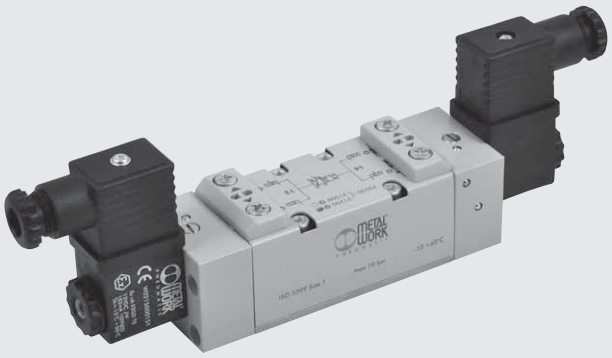
BISTABLE 5/2 ISO 3 - MONOSTABLE 5/3 ISO 3



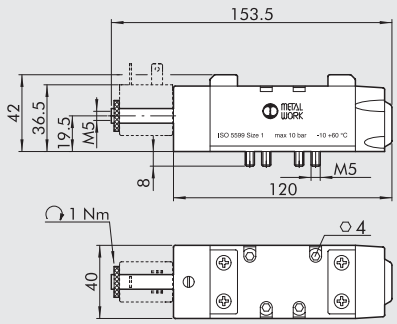
Symbol	Code	Abbrev.	Weight [g]
	7056021200	ISV 75 SOB OO	1230
	7056021300	ISV 75 SOD OO	1230
	7056022100	ISV 76 SOS CC	1355
	7056022200	ISV 76 SOS OC	1355
	7056022300	ISV 76 SOS PC	1355
	7056021500	ISV 75 SEB OO	1230
	7056021600	ISV 75 SED OO	1230
	7056022400	ISV 76 SES CC	1355
	7056022500	ISV 76 SES OC	1355
	7056022600	ISV 76 SES PC	1355

VALVES ISO 5599/1, PNEUMATIC, SERIES ISV WITH IN-LINE SOLENOID PILOT

TECHNICAL DATA		ISO 1
Operating pressure:	bar	
• monostable		2.5 to 10
• bistable		1 to 10
• pilot-assisted		Vacuum to 10
Minimum pilot pressure	bar	2.5
Operating temperature range	°C	-10 to +60
Nominal diameter	mm	7.5
Conductance C	Nl/min · bar	250
Critical ratio b	bar/bar	0.36
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	700
Flow rate at 6 bar ΔP 1 bar	Nl/min	1100
TRA / TRR monostable at 6 bar	ms	24 / 50
TRA / TRR bistable at 6 bar	ms	20 / 20
Solenoid pilot		In line pilot
Manual		Bistable on solenoid pilot
Coils		30 mm side DIN 43650
		Form A – ISO
		22 mm side
Maximum coil nut torque	Nm	1



MONOSTABLE 5/2 ISO 1



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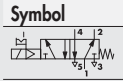
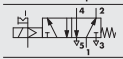
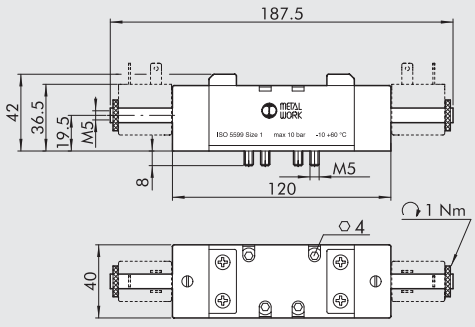
	7053021100	ISV 55 DOS OO	396
	7053021400	ISV 55 DES OO	396

BISTABLE 5/2 ISO 1



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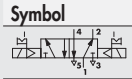	7053021200	ISV 55 DOB OO	450
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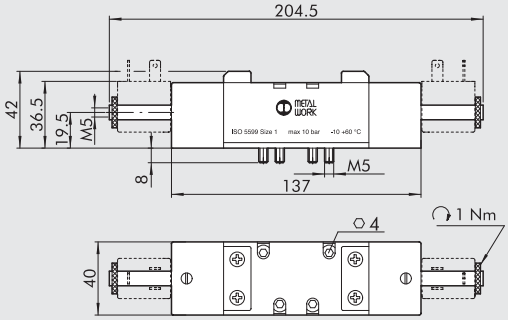
MONOSTABLE 5/3 ISO 1



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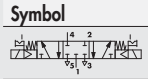	7053022100	ISV 56 DOS CC	517
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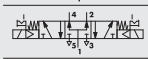
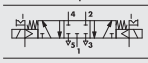
	7053022300	ISV 56 DOS PC	516
	7053022400	ISV 56 DES CC	517
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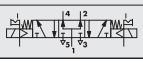
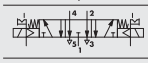
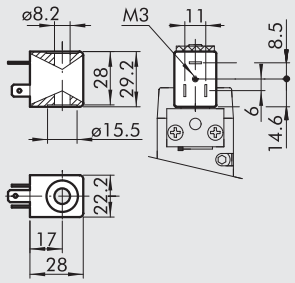
	7053022600	ISV 56 DES PC	515

COILS AND CONNECTORS FOR ISO 5599/1
SOLENOID VALVES SERIES ISV

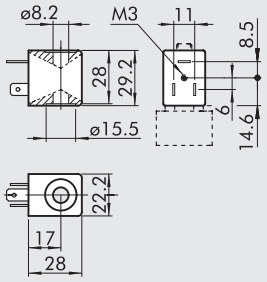
COILS SIDE 22 mm



- Voltage tolerance: –10% to + 15%
- Insulation class: F155
- Degree of protection: IP65 EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- Coil temperature 100% ED: 55°C at 20°C – Ambient temperature
- According to Atex 94/9 CE rule, group 2, category 3 GD

Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0215000151	Coil 22 Ø 8 BA 2W-12VDC	12Vcc	2W	2W
W0215000101	Coil 22 Ø 8 BA 2W-24VDC	24Vcc	2W	2W
W0215000111	Coil 22 Ø 8 BA 3.5VA-24VAC	24V 50/60Hz	5.3VA	3.5VA
W0215000121	Coil 22 Ø 8 BA 3.5VA-110VAC	110V 50/60Hz	5.3VA	3.5VA
W0215000131	Coil 22 Ø 8 BA 3.5VA-220VAC	220V 50/60Hz	5.3VA	3.5VA

"UL" AND "CSA" COILS 22 mm

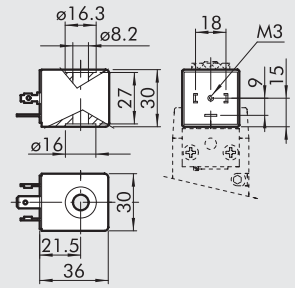


c UL us

- Voltage tolerance: –10% to + 15%
- Insulation class: F155
- Degree of protection: IP65 EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- Coil temperature 100% ED: 55°C at 20°C – Ambient temperature

Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0215000251	Coil 22 Ø 8 BA 2W-12VDC UR	12Vcc	2W	2W
W0215000201	Coil 22 Ø 8 BA 2W-24VDC UR	24Vcc	2W	2W
W0215000211	Coil 22 Ø 8 BA 3.5VA-24VAC UR	24V 50/60Hz	5.3VA	3.5VA
W0215000221	Coil 22 Ø 8 BA 3.5VA-110VAC UR	110V 50/60Hz	5.3VA	3.5VA
W0215000231	Coil 22 Ø 8 BA 3.5VA-220VAC UR	220V 50/60Hz	5.3VA	3.5VA

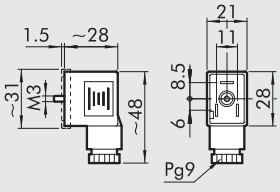
COILS SIDE 30 mm



- Electric contact DIN43650 shape A – ISO 4400
- Voltage tolerance: -10% + 10%
- Insulation class: F155
- Degree of protection: IP65 EN60529 with connector
- Avoid prolonged exposure to the atmospheric agents
- According to Atex 94/9 CE rule, group 2, category 3 GD

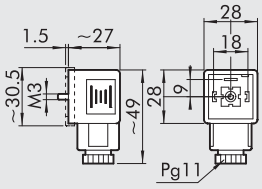
Code	Abbrev.	Nominal voltage	Absorption	
			Inrush	Holding
W0210010100	Coil 30 Ø 8 2W-24VDC	24Vcc	5W	2W
W0210011100	Coil 30 Ø 8 3.5VA-24VAC	24V 50/60Hz	10VA	3.5VA
W0210012100	Coil 30 Ø 8 3.5VA-110VAC	110V 50/60Hz	10VA	3.5VA
W0210013100	Coil 30 Ø 8 3.5VA-220VAC	220V 50/60Hz	10VA	3.5VA

CONNECTOR FOR COILS SIDE 22 mm



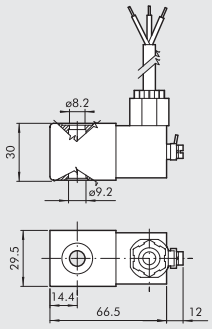
Code	Type	Colour	Ø Cable
W0970510011	Standard	Black	PG9
W0970510012	LED 24V	Transparent	PG9
W0970510013	LED 110V	Transparent	PG9
W0970510014	LED 220V	Transparent	PG9
W0970510015	LED + VDR 24V	Transparent	PG9
W0970510016	LED + VDR 110V	Transparent	PG9
W0970510017	LED + VDR 220V	Transparent	PG9
W0970510070	Atex II 2 GD	Black	PG9

CONNECTOR FOR COILS SIDE 30 mm



Code	Type	Colour	Ø Cable
W0970520033	Standard	Black	PG11
W0970520034	LED 24V	Transparent	PG11
W0970520035	LED 110V	Transparent	PG11
W0970520036	LED 220V	Transparent	PG11
W0970520037	LED + VDR 24V	Transparent	PG11
W0970520038	LED + VDR 110V	Transparent	PG11
W0970520039	LED + VDR 220V	Transparent	PG11

KIT COIL EEXM



Code	Description
0227606913	Kit for coil 30 24 VDC EEXMT5 cable 3 m
0227606915	Kit for coil 30 24 VDC EEXMT5 cable 5 m
0227608013	Kit for coil 30 24 VAC EEXMT5 cable 3 m
0227608015	Kit for coil 30 24 VAC EEXMT5 cable 5 m
0227608023	Kit for coil 30 110 VAC EEXMT5 cable 3 m
0227608025	Kit for coil 30 110 VAC EEXMT5 cable 5 m
0227608033	Kit for coil 30 230 VAC EEXMT5 cable 3 m
0227608035	Kit for coil 30 230 VAC EEXMT5 cable 5 m

According to Atex 94/9 CE rule,
Ⓔx II 2G Ex mb IIC T4/T5 Gb
Ⓔx II 2D Ex tb IIIC T130/T95 °C IP66 Db

KIT COILS SIDE 22 IP65

Code	Description
0222100100	Kit for coil 22 - IP65

Improved IP65 protection, even after prolonged exposure to atmospheric agents.
Applicable to valves with a technopolymer control.

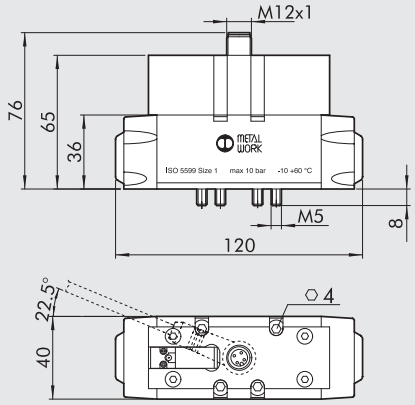
NOTES

VALVES ISO 5599/1, SOLENOID/PNEUMATIC, SERIES ISV WITH M12 CONNECTOR

METAL WORK PNEUMATIC

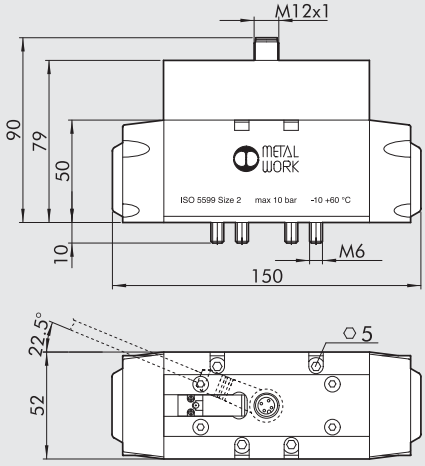
TECHNICAL DATA		ISO 1	ISO 2
Operating pressure:	bar		
• monostable		2.5 to 10	
• bistable		1 to1 0	
• pilot-assisted		Vacuum to 10	
Minimum pilot pressure	bar	2.5	
Operating temperature range	°C	-10 to +60	
Nominal diameter	mm	7.5	12
Conductance C	Nl/min · bar	250	657.14
Critical ratio b	bar/bar	0.36	0.25
Flow rate at 6 bar ΔP 0.5 bar	Nl/min	700	1800
Flow rate at 6 bar ΔP 1 bar	Nl/min	1100	2700
TRA / TRR monostable at 6 bar	ms	22 / 60	78 / 180
Solenoid pilot		With built-in coil	
Manual		Monostable on solenoid pilot	
		Monostable on valve body	
Coil power	W	1.2	
Voltage		24 VDC ±10%	
Electrical connection		M12	
Degree of protection		IP65 EN60529	
Electrical protection		Transil	

MONOSTABLE 5/2 ISO 1



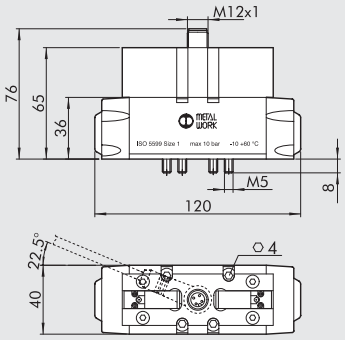
Symbol	Code	Abbrev.	Weight [g]
	7054021100	ISV 55 COS OO	508
	7054021400	ISV 55 CES OO	508

MONOSTABLE 5/2 ISO 2



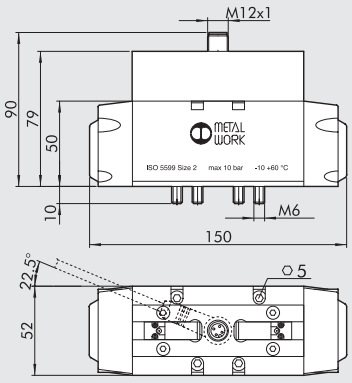
Symbol	Code	Abbrev.	Weight [g]
	7055021100	ISV 65 COS OO	901
	7055021400	ISV 65 CES OO	901

BISTABLE 5/2 ISO 1 - MONOSTABLE 5/3 ISO 1



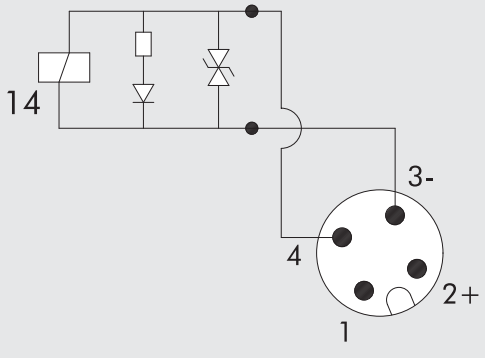
Symbol	Code	Abbrev.	Weight [g]
	7054021200	ISV 55 COB OO	512
	7054021300	ISV 55 COD OO	490
	7054022100	ISV 56 COS CC	496
	7054022200	ISV 56 COS OC	496
	7054022300	ISV 56 COS PC	496
	7054021500	ISV 55 CEB OO	512
	7054021600	ISV 55 CED OO	490
	7054022400	ISV 56 CES CC	496
	7054022500	ISV 56 CES OC	496
	7054022600	ISV 56 CES PC	496

BISTABLE 5/2 ISO 2 - MONOSTABLE 5/3 ISO 2

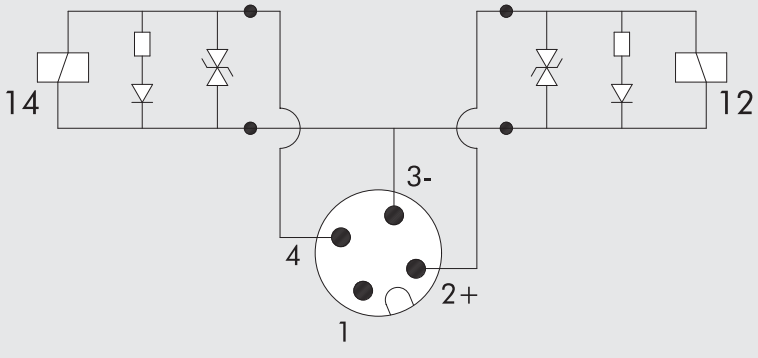


Symbol	Code	Abbrev.	Weight [g]
	7055021200	ISV 65 COB OO	860
	7055021300	ISV 65 COD OO	860
	7055022100	ISV 66 COS CC	868
	7055022200	ISV 66 COS OC	868
	7055022300	ISV 66 COS PC	868
	7055021500	ISV 65 CEB OO	860
	7055021600	ISV 65 CED OO	860
	7055022400	ISV 66 CES CC	868
	7055022500	ISV 66 CES OC	868
	7055022600	ISV 66 CES PC	868

WIRING DIAGRAM

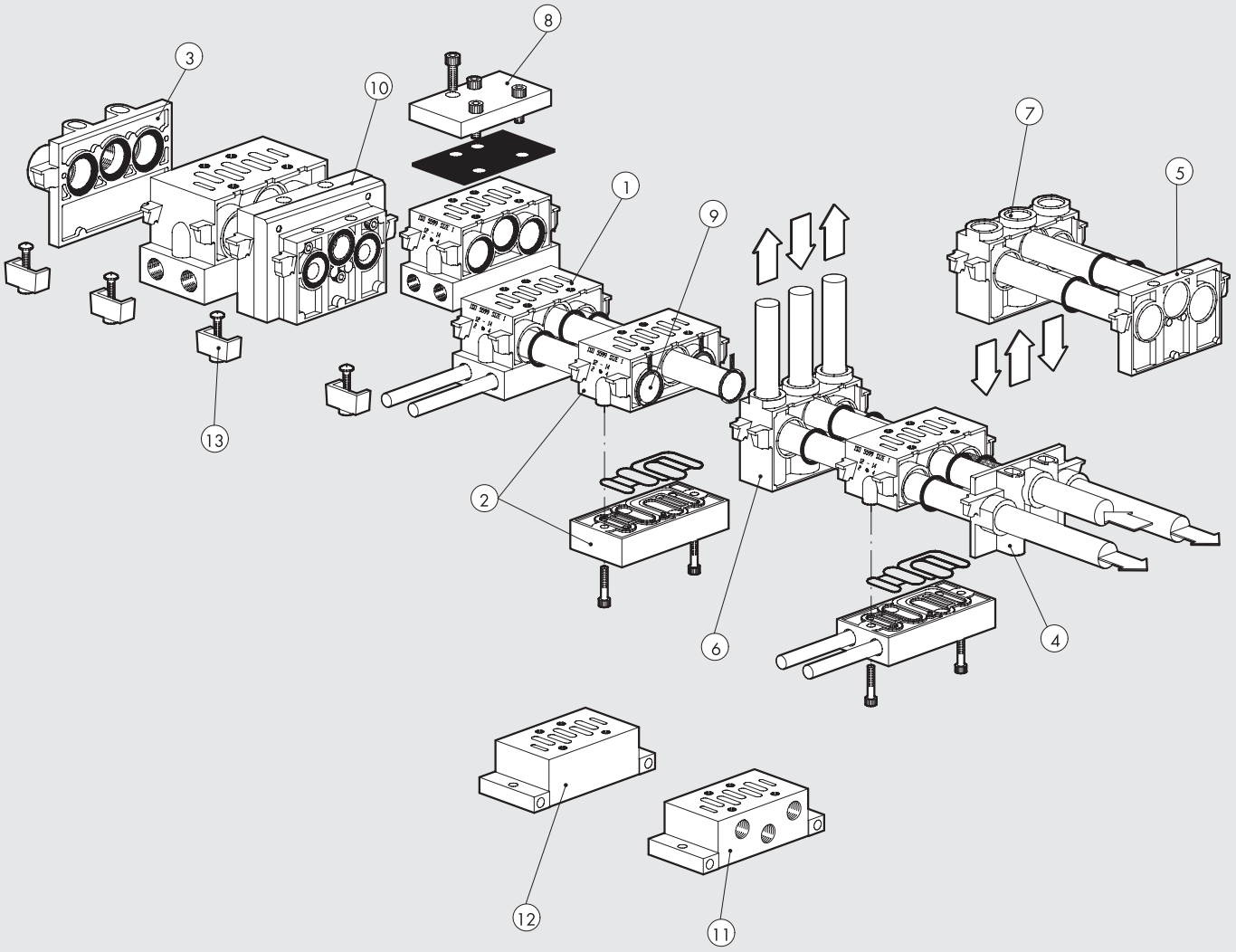


MONOSTABLE



BISTABLE

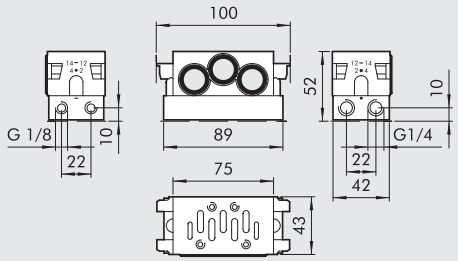
BASES ISO 5599/1 FOR VALVES SERIES IPV-ISV SIZE 1 AND 2



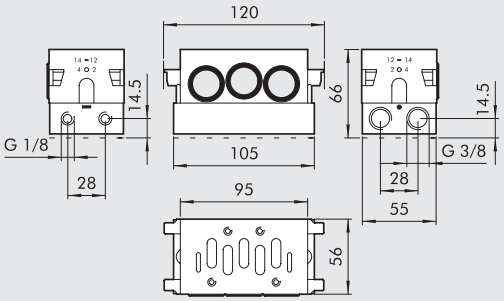
Reference	Code ISO 1	Code ISO 2	Description
①	0228000150	0228001150	Manifold base - side ports
②	0228000155	0228001155	Manifold base with bottom ports
③	0228000200	0228001200	Input end plate
④	0228000201	0228001201	Additional input end plate
⑤	0228000210	0228001210	Blind end plate
⑥	0228000300	0228001300	Intermediate - top ports
⑦	0228000301	0228001301	Intermediate - back ports
⑧	0228000500	0228001500	Blanking plate
⑨	0228000400	0228001400	Intermediate diaphragm
⑩	0228000600	–	ISO 1/ISO 2 port adapter
⑪	0228000100	0228001100	Individual base - side ports
⑫	0228000110	0228001110	Base - bottom ports
⑬	0228000700	0228001700	Assembly kit

① MANIFOLD BASE, SIDE PORTS

ISO 1



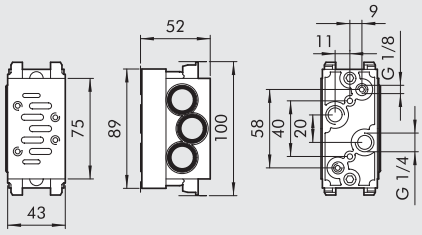
ISO 2



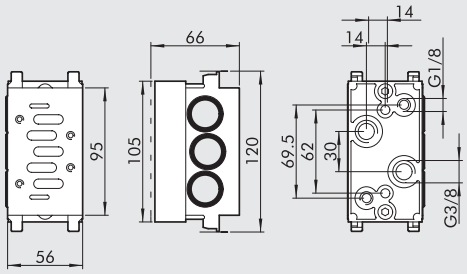
Code	Description	Weight [g]
0228000150	Manifold base, side ports, ISO 1	131
0228001150	Manifold base, side ports, ISO 2	314

② MANIFOLD BASE, BOTTOM PORTS

ISO 1



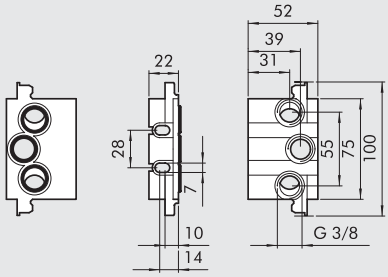
ISO 2



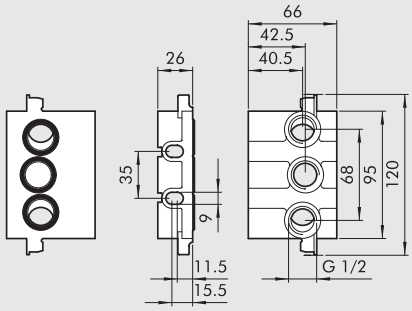
Code	Description	Weight [g]
0228000155	Manifold base, bottom ports, ISO 1	314
0228001155	Manifold base, bottom ports, ISO 2	505

③ INPUT END PLATE

ISO 1



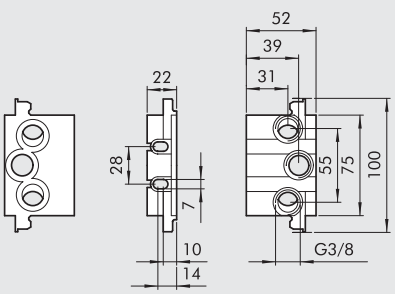
ISO 2



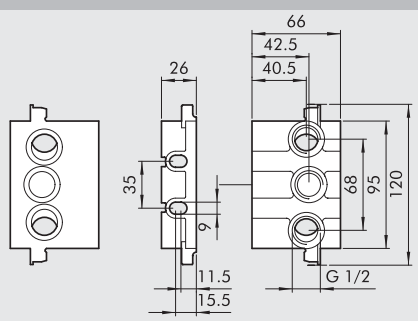
Code	Description	Weight [g]
0228000200	Input end plate ISO 1	129
0228001200	Input end plate ISO 2	206

④ ADDITIONAL INPUT END PLATE

ISO 1



ISO 2

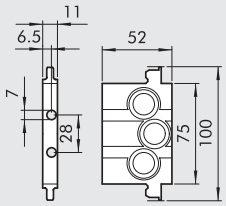


Code	Description	Weight [g]
0228000201	Additional input end plate, ISO 1	84
0228001201	Additional input end plate, ISO 2	162

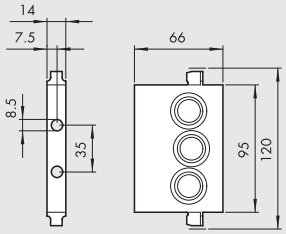
METAL WORK PNEUMATIC

⑤ BLIND END PLATE

ISO 1



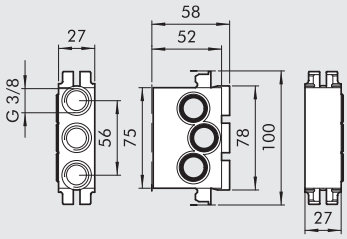
ISO 2



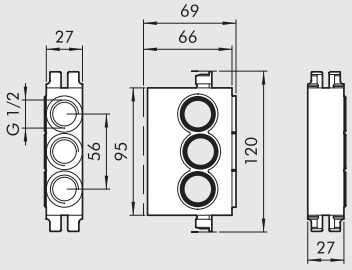
Code	Description	Weight [g]
0228000210	Blind end plate, ISO 1	79
0228001210	Blind end plate, ISO 2	130

⑥ INTERMEDIATE TOP PORTS

ISO 1



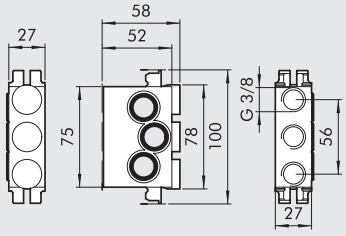
ISO 2



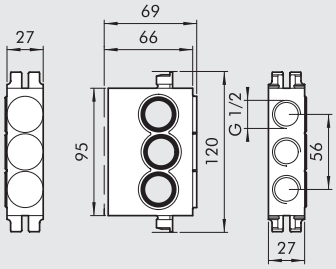
Code	Description	Weight [g]
0228000300	Intermediate top ports, ISO 1	235
0228001300	Intermediate top ports, ISO 2	299

⑦ INTERMEDIATE REAR PORTS

ISO 1



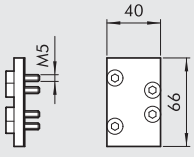
ISO 2



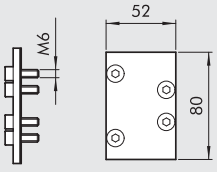
Code	Description	Weight [g]
0228000301	Intermediate rear ports, ISO 1	237
0228001301	Intermediate rear ports, ISO 2	299

⑧ BLANKING PLATE

ISO 1

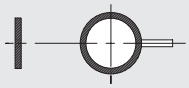


ISO 2



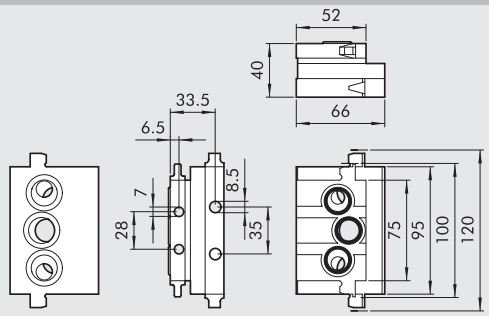
Code	Description	Weight [g]
0228000500	Blanking plate, ISO 1	47
0228001500	Blanking plate, ISO 2	96

⑨ INTERMEDIATE DIAPHRAGM



Code	Description	Weight [g]
0228000400	Intermediate diaphragm, ISO 1	4
0228001400	Intermediate diaphragm, ISO 2	7

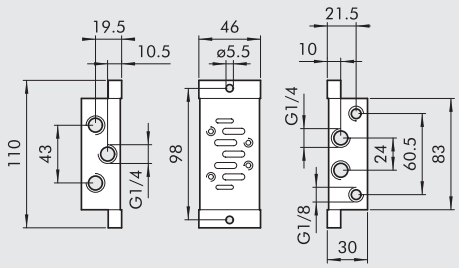
⑩ DIMENSION ADAPTER



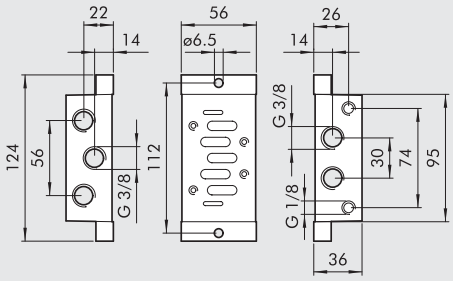
Code	Description	Weight [g]
0228000600	Dimension adapter ISO 1-2	454

⑪ INDIVIDUAL BASE SIDE PORTS

ISO 1



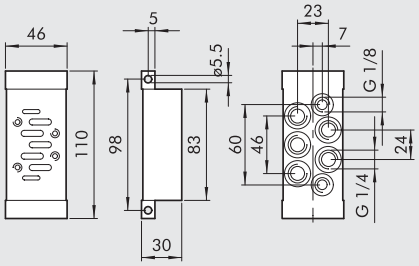
ISO 2



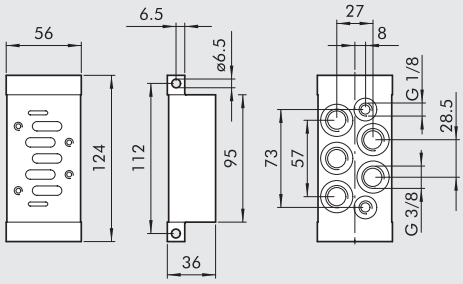
Code	Description	Weight [g]
0228000100	Individual base side ports, ISO 1	165
0228001100	Individual base side ports, ISO 2	257

⑫ INDIVIDUAL BASE BOTTOM PORTS

ISO 1



ISO 2



Code	Description	Weight [g]
0228000110	Individual base bottom ports, ISO 1	197
0228001110	Individual base bottom ports, ISO 2	304

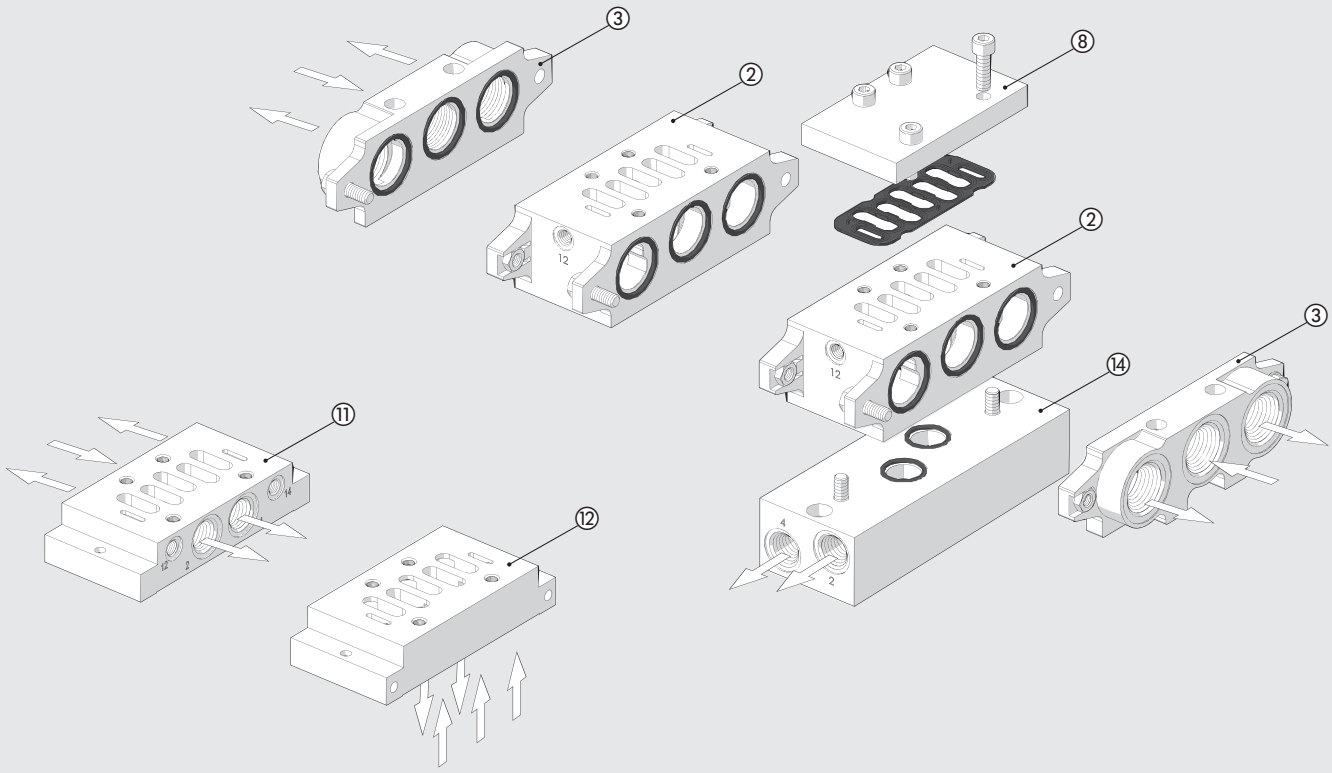
⑬ ASSEMBLY KIT

ISO 1

ISO 2

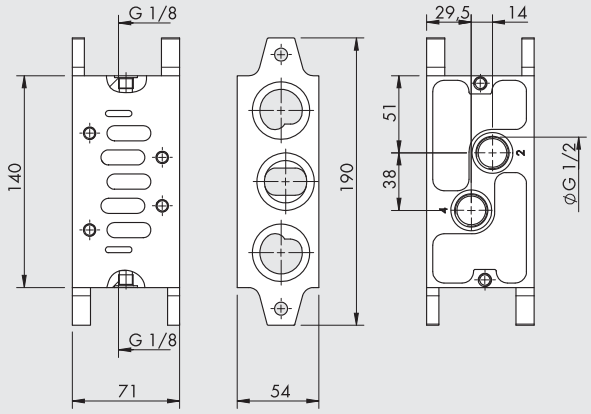
Code	Description	Weight [g]
0228000700	Assembly kit, ISO 1	47
0228001700	Assembly kit, ISO 2	47

BASES ISO 5599/1
FOR VALVES SERIES IPV-ISV SIZE ISO 3



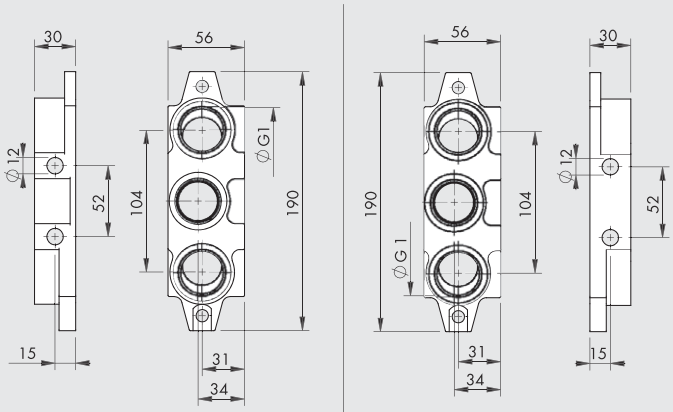
Reference	Code ISO 3	Description
②	**0228002155**	Manifold base with bottom ports
③	**0228002200**	Input end plate
⑧	**0228002500**	Blanking plate
⑪	**0228002100**	Individual base - side ports
⑫	**0228002110**	Base - bottom ports
⑭	**0228002150**	Side interface

② MANIFOLD BASE, BOTTOM PORTS



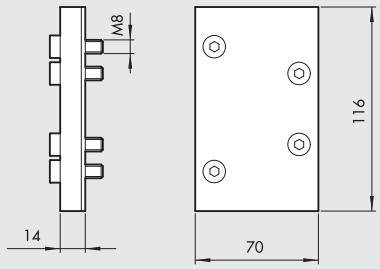
Code	Description	Weight [g]
0228002155	Manifold base, bottom ports, ISO 3	915

③ INPUT END PLATE



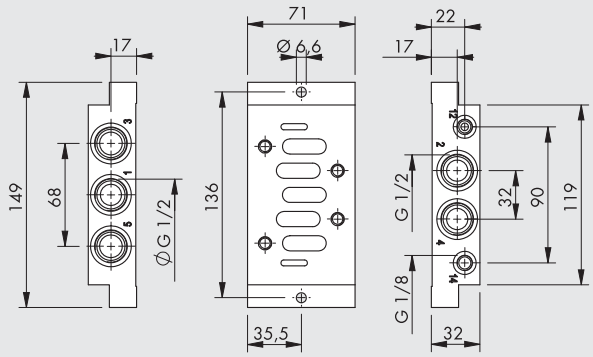
Code	Description	Weight [g]
0228002200	Input end plate, ISO 3	880

⑧ BLANKING PLATE



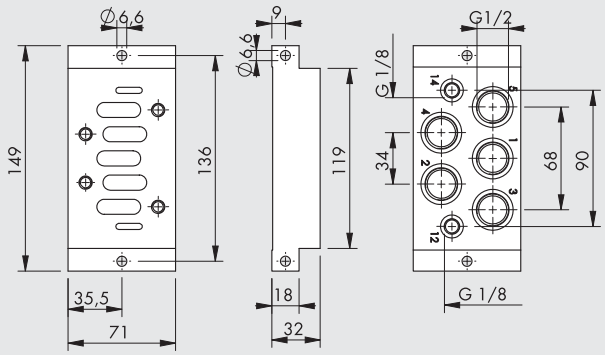
Code	Description	Weight [g]
0228002500	Blanking plate, ISO 3	350

⑪ INDIVIDUAL BASE SIDE PORTS



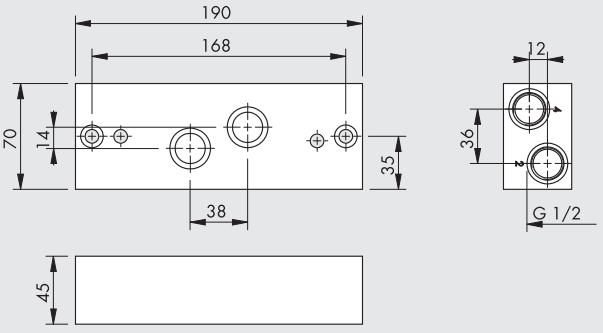
Code	Description	Weight [g]
0228002100	Individual base side ports, ISO 3	470

⑫ INDIVIDUAL BASE BOTTOM PORTS



Code	Description	Weight [g]
0228002110	Individual base bottom ports, ISO 3	655

⑭ SIDE INTERFACE

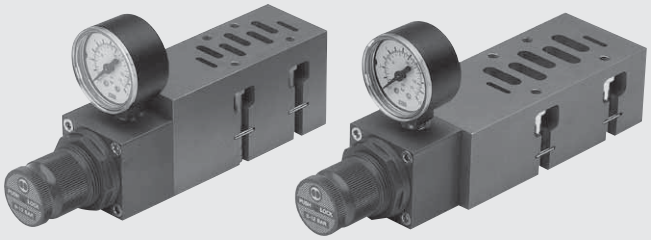


Code	Description	Weight [g]
0228002150	Side interface, ISO 3	1470

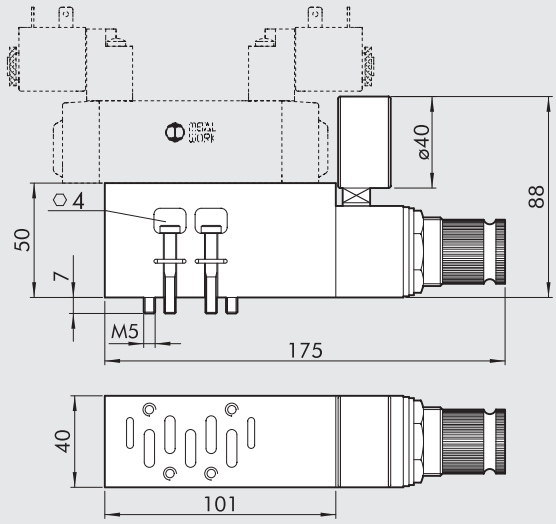
SANDWICH REGULATORS FOR ISO 5599/1 BASES ISO1-2

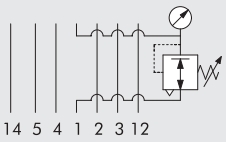
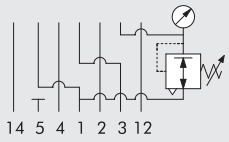
METAL WORK PNEUMATIC

TECHNICAL DATA		ISO 1	ISO 2
Max upstream pressure	bar	13	
Pressure range	bar	0 to 12	
Pressure gauge range	bar	0 to 12	
Flow rate at 6 bar ΔP 1 bar	Nl/min	400	550
Operating temperature range	°C	−10 to +60	
Fixing screw on ISO 5599/1 base		M5 anti-extraction	M6 anti-extraction
Installation		In any position	
Instructions for use		Downstream pressure must always be set to increasing values	



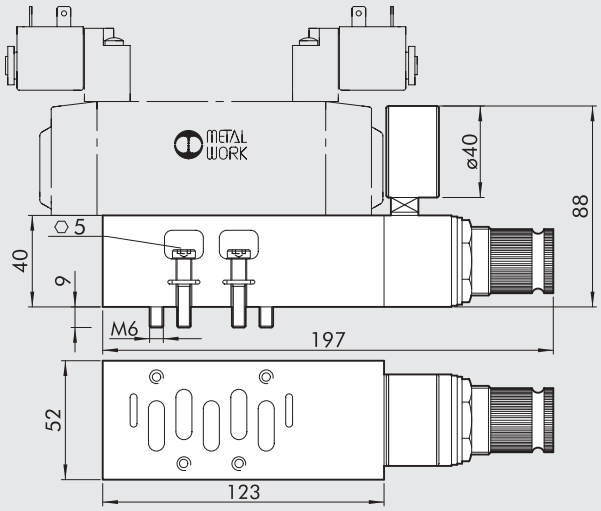
SANDWICH REGULATOR FOR ISO 1 VALVES

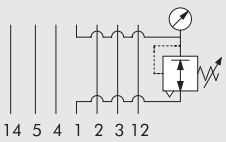
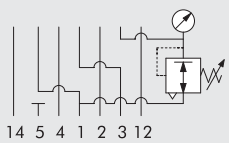


Symbol	Code	Description	Weight [g]
	0228000804	Sandwich regulator 1 0 to 12 bar ISO 1	760
	0228000814*	Sandwich regulator 3 0 to 12 bar ISO 1	760

* A pilot-assisted valve needs to be used since port 1 relieves pressure, it is not under pressure

SANDWICH REGULATOR FOR ISO 2 VALVES



Symbol	Code	Description	Weight [g]
	0228001804	Sandwich regulator 1 0 to 12 bar ISO 2	900
	0228001814*	Sandwich regulator 3 0 to 12 bar ISO 2	900

* A pilot-assisted valve needs to be used since port 1 relieves pressure, it is not under pressure

VALVES SERIES 70
SAFE AIR®

Starting from the robust and reliable valves series 70, we have added a few distinctive features, such as the presence of a valve status diagnostic system and the creation of a double communication channel guaranteeing redundancy of the architecture.

The simplest version is obtained from a pneumatically-operated 3/2 monostable valve. It is well known that when this type of valve is in the idle state (coil de-energized), port 1 is not connected to the downstream pneumatic circuit and port 2 is on relief; when the valve is operated (coil energized), port 1 is connected to port 2. When the coil is de-energized again, the valve is returned to the idle state (and hence port 2 relieves) by means of a spring that returns the spool to the home position.

In the event of a failure, the spool may remain in the actuation position, even when the coil is de-energized, thus leaving port 2 pressurized.
To offset this problem, we have added a Hall-effect sensor that reads the spool position. This means that when the valve is deactivated, the sensor is in the ON state, when the valve is activated, the sensor is in the OFF state.
A status in which the sensor is OFF state and the coil de-energized indicates that there is a problem.
To reduce the probability of risk during plant maintenance, the manual actuator mounted on the electric control is the monostable type.
The sensor inside the valve is available in the standard version with a 2.5m three-wire cable (standard or ATEX certified) or with an M8 connector and 300 mm cable.
This valve, which is available in sizes 1/8", 1/4" and 3/8", is a category 2 component, according to ISO EN 13849, and is suitable for use in safety circuits up to PL = c.

For applications requiring higher performance levels, we have also develop a double-channel version (redundant) that requires the use of two valves series 70 with a monitored spool arranged so that port 2 of valve 1 is connected with port 1 of valve 2. If just one of the valves de-energizes, port 2 relieves, so, even if one of the two spools remains blocked, the other guarantees relief of the compressed-air circuit. In this case, too, the presence of spool position sensors can be used to monitor the status.
The double valve, which is available in the size 1/8", 1/4" and 3/8" as well, is a category 4 component according to ISO EN 13849 and is suitable for use in safety circuits up to PL = e.
Both the single- and double-channel valves come with:
- a Type-Approval certificate no. P14056/14/MC/mc and no. P14100/14/MC/mc, issued by Bureau Veritas in accordance with EN ISO 13849;
- a certificate of compliance no. CV 013-12-2014 and no. CV 014-12-2014 to European Machinery Directive, issued by Bureau Veritas.

SINGLE VALVE SERIES 70 SAFE AIR®

TECHNICAL DATA		1/8"	1/4"	3/8"
Fluid		Filtered unlubricated air (50µm); lubrication, if used, must be continuous		
Operation		3/2 monostable		
Operating pressure:	bar			
• non-assisted		from 2.5 to 10		
• pilot-assisted		from vacuum to 10		
Minimum pilot pressure	bar	2.5		
Operating temperature range	°C	from -10 to +60 (from -10 to +45 for Atex version)		
Nominal diameter	mm	5	7.5	13.3
Conductance C	Nl/min · bar	121	264	505
Critical ratio b	bar/bar	0.32	0.27	0.32
Flow rate at 6.3 bar Δp 0.5 bar	Nl/min	390	820	1600
Flow rate at 6.3 bar Δp 1 bar	Nl/min	530	1130	2200
Conductance C on relief	Nl/min · bar	128	270	491
Critical ratio b on relief	bar/bar	0.23	0.29	0.40
Flow rate on free exhaust at 6.3 bar	Nl/min	900	2050	3550
TRA/TRR a 6.3 bar	ms/ms	15 / 35	19 / 45	21 / 72
Installation		Any position		
Assembly		In-line		
Manual actuator		Monostable		
Recommended lubricant		ISO and UNI FD 22		
Compatibility with oils		See **chapter Z1**		
Coils		22 mm side, ø 8 hole – EN175301-803 connection, type B		
		Certified EN 60204.1 and VDE 0580		
		Refer to the Accessories section for the electrical features page **B1**.54*		
Class of protection		IP65 with coil and connector mounted		
Noise level		Max. 78 dBA with silenced relief		
Max coil ring nut torque	Nm	1		
CE marking		In accordance with Machinery Directive, Annexe V (**)		
ATEX category (only for versions with an ATEX sensor)		Ⓔx II 3G Ex nA c IIC T4 Gc x -10°C<Ta<45°C		
		Ⓔx II 3D Ex tc IIIC T135°C IP65 Dc		
Safety function		Cuts off the power supply and relieves the air circuit connected to port 2		
Type of sensor used		Hall effect (refer to page **B1**.151 for sensor details)		
B10d		50 x 10^6 cycles		
Category - ISO EN 13849		2		
DC		Low (80 %)		
PL - ISO EN 13849		Suitable for use in safety circuits up to PL=c		

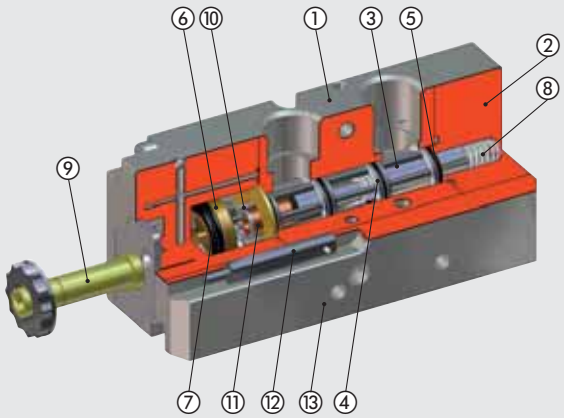
* To avoid malfunctions, we recommend using Metal Work accessories

** The declaration can be downloaded from www.metalwork.it

IMPORTANT: Do not mount 2 or more SAFE AIR® valves in adjacent positions.
When mounting valves side by side, the minimum distance is specified in the user manual.
Any ferromagnetic masses must be at least 40 mm from the sensor.
Prevent magnetic fields from creating disturbance in the sensor area.

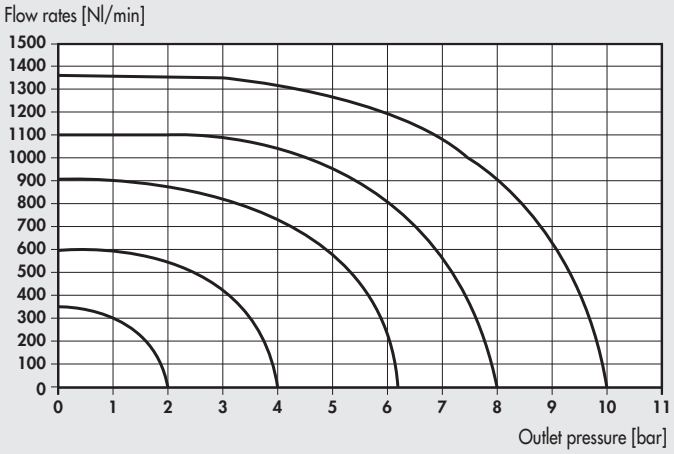
COMPONENTS

① VALVE BODY: Aluminium
② CONTROL/END CAP: plastic
③ SPOOL: chemically nickel-plated aluminium
④ DISTANCE PLATES: technopolymer
⑤ GASKETS: NBR
⑥ PISTONS: Hostaform®
⑦ PISTON GASKET: NBR
⑧ SPRINGS: special steel
⑨ OPERATOR: Brass pipe – Stainless steel core
⑩ LOCKING RING: special steel
⑪ MAGNET: Neodymium
⑫ SENSOR: Hall effect
⑬ SENSOR SUPPORTING PLATE: Aluminium

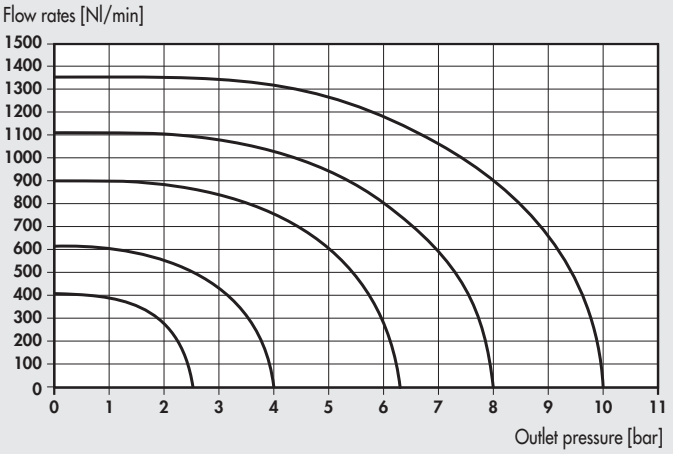


FLOW CHARTS - SINGLE VALVE

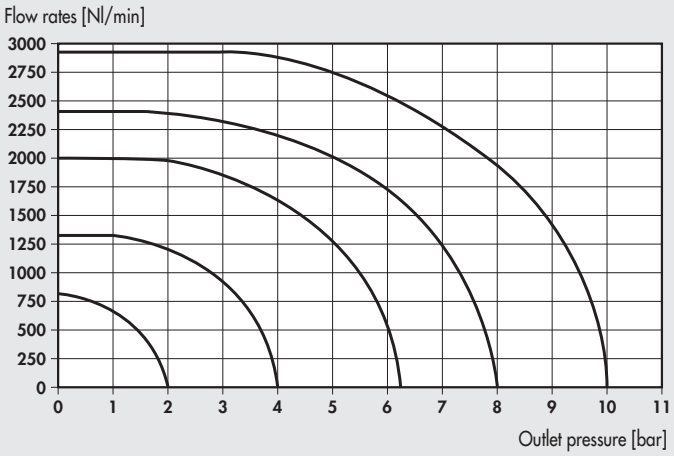
1/8" - ON DELIVERY



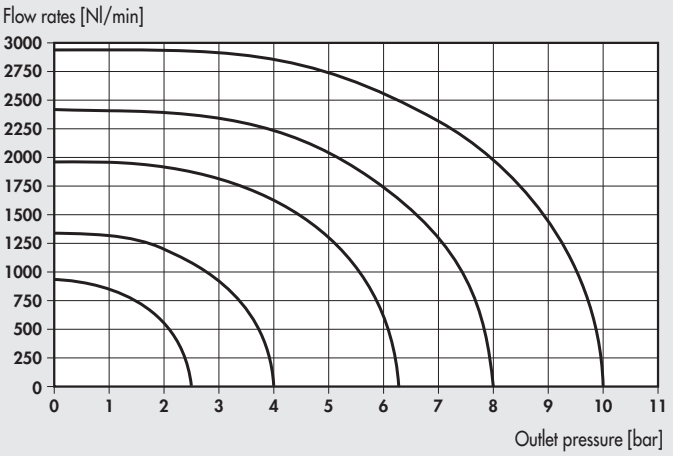
1/8" - ON RELIEF



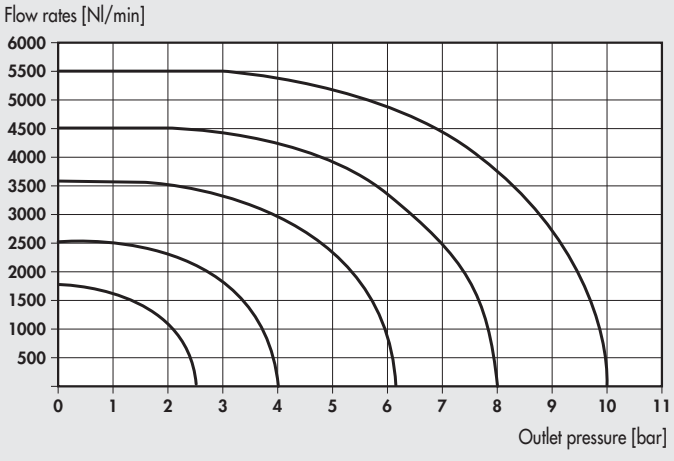
1/4" - ON DELIVERY



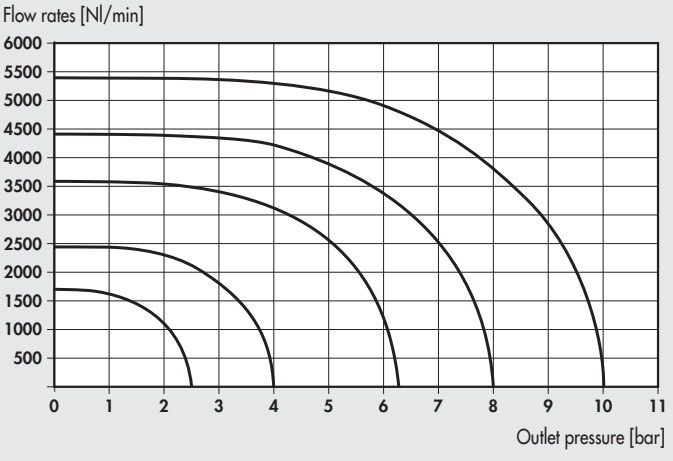
1/4" - ON RELIEF



3/8" - ON DELIVERY



3/8" - ON RELIEF

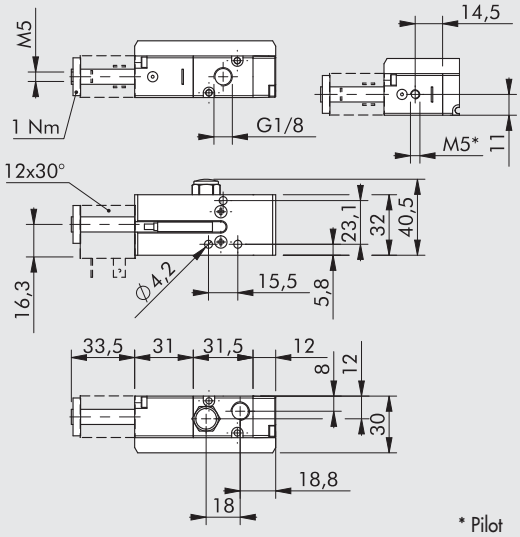


SYNOPTIC, SIZES AND VERSIONS

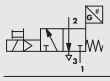
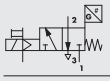
S O V	2	3	S O	S	N C	3 F
FAMILY	**DIMENSIONS**	**FUNCTION**	**OPERATORS 14**	**RESETTING 12**	**FURTHER DETAILS**	**SENSOR**
SOV solenoid/ pneumatic	**2** 1/8"	**3** 3/2	**SO** solenoid/ pneumatic	**S** mechanical springs	**NC** Normally-Closed	**3F** 2.5 m 3 wires
	3 1/4"		**SE** electric pilot-assisted			**M8** 0.3 m M8
	C 3/8"					**AT** 2 m ATEX

METAL WORK PNEUMATIC

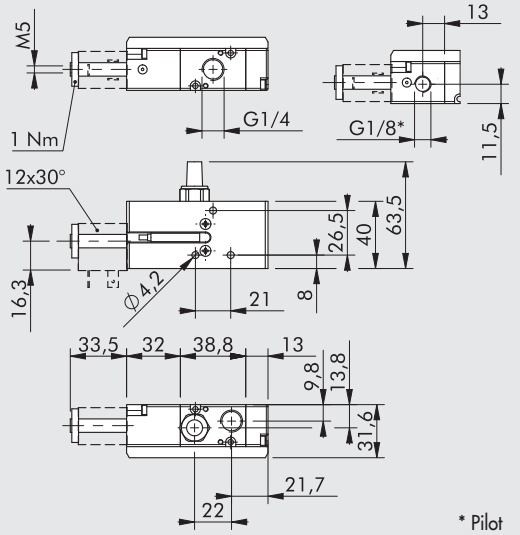
3/2 MONOSTABLE – 1/8"



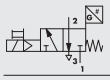
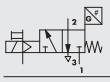
* Pilot

Symbol	Code	Abbrev.	Sensor	Weight [g]
	7015020200	SOV 23 SOS NC 3F	2.5 m 3 wires	182
	7015120200	SOV 23 SOS NC M8	0.3 m M8	178
	7015220200	SOV 23 SOS NC AT	2 m ATEX	174
	7015020500	SOV 23 SES NC 3F	2.5 m 3 wires	182
	7015120500	SOV 23 SES NC M8	0.3 m M8	178
	7015220500	SOV 23 SES NC AT	2 m ATEX	174

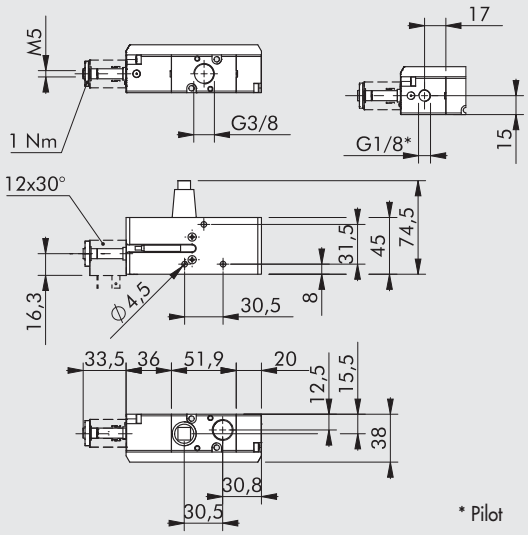
3/2 MONOSTABLE - 1/4"



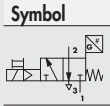
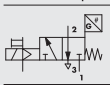
* Pilot

Symbol	Code	Abbrev.	Sensor	Weight [g]
	7025020200	SOV 33 SOS NC 3F	2.5 m 3 wires	252
	7025120200	SOV 33 SOS NC M8	0.3 m M8	248
	7025220200	SOV 33 SOS NC AT	2 m ATEX	244
	7025020500	SOV 33 SES NC 3F	2.5 m 3 wires	252
	7025120500	SOV 33 SES NC M8	0.3 m M8	248
	7025220500	SOV 33 SES NC AT	2 m ATEX	244

3/2 MONOSTABLE - 3/8"



* Pilot

Symbol	Code	Abbrev.	Sensor	Weight [g]
	7045020200	SOV C3 SOS NC 3F	2.5 m 3 wires	402
	7045120200	SOV C3 SOS NC M8	0.3 m M8	398
	7045220200	SOV C3 SOS NC AT	2 m ATEX	394
	7045020500	SOV C3 SES NC 3F	2.5 m 3 wires	402
	7045120500	SOV C3 SES NC M8	0.3 m M8	398
	7045220500	SOV C3 SES NC AT	2 m ATEX	394

EXAMPLE OF A SAFETY CIRCUIT WITH A SINGLE VALVE

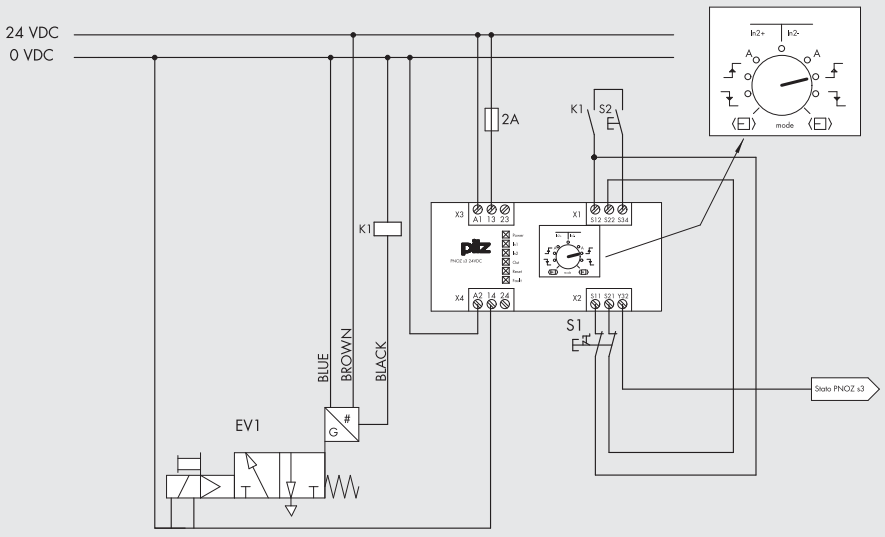
Below is an example of a wiring diagram for controlling Metal Work SAFE AIR® single valves using Pilz® components.
Circuit components:

- a Pilz® safety module PNOZ® s3 for controlling the emergency stop button; terminal Y32 indicates the status of the module, which can be relayed to the machine control logic
- an emergency stop button S1 (Pilz® - PIT® es Set) linked to terminals S11-S12-S22-S23 of the PNOZ® s3
- a Metal Work SAFE AIR® solenoid valve, the 24 VDC coil of which is fed by terminal 14 of the PNOZ® s3 (the other terminal of the coil is 0 V); the valve's Hall-effect sensor is 24 VDC
- a start/reset button S2
- a relay K1, controlled by the valve sensor; an NO contact of the relay is in series with button S2 of the PNOZ® s3.

Expected behaviour with the system operating correctly:

- system deactivated:
  - contact 14 is OFF
  - the coil is de-energized
  - the sensor is ON
  - relay K1 is energized
  - contact K1 is closed
  - contact Y32 is OFF
- with the system activated via the start/reset button S2:
  - contact 14 is ON
  - the coil is energized
  - the sensor is OFF
  - relay K1 is de-energized
  - contact K1 is open
  - contact Y32 is ON

In the event of a malfunction (e.g. spool jam), the coil is de-energized but the sensor remains OFF, relay K1 remains de-energized, contact K1 remains open (preventing subsequent restarts) and contact Y32 is OFF.
In the event of a valve fault, the circuit in the diagram below does not allow relief of the compressed air system. Sensor status must be monitored to assess valve operation. Contact Y32 indicates the status of the PNOZ® s3, not the status of the sensor.
All the electrical connections between the various components must comply with the applicable safety regulations.
If the emergency button is operated at a frequency of 1 actuation per hour, the circuit activates a safety function with PL = c (calculations made with the PAScal programme by Pilz®). Responsibility for final checking that PL lies with the person assembling the circuit.

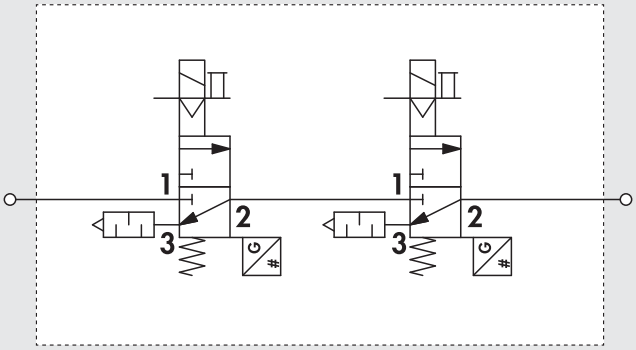


DOUBLE VALVE SERIES 70 SAFE AIR®

TECHNICAL DATA		1/8"	1/4"	3/8"
Fluid		Filtered unlubricated air (50µm); lubrication, if used, must be continuous		
Operation		double 3/2 monostable		
Operating pressure:	bar			
• non-assisted		from 2.5 to 10		
• pilot-assisted		from vacuum to 10		
Minimum pilot pressure	bar	2.5		
Operating temperature range	°C	from -10 to +60 (from -10 to +45 for Atex version)		
Conductance C	Nl/min · bar	80	202	346
Critical ratio b	bar/bar	0.35	0.11	0.24
Flow rate at 6.3 bar Δp 0.5 bar	Nl/min	261	561	1038
Flow rate at 6.3 bar Δp 1 bar	Nl/min	358	778	1433
Conductance C on relief	Nl/min · bar	132	228	491
Critical ratio b on relief	bar/bar	0.27	0.21	0.21
Flow rate on free exhaust at 6.3 bar	Nl/min	930	1700	3550
TRA/TRR at 6.3 bar	ms/ms	28 / 35	38 / 45	50 / 72
Installation		any position		
Assembly diagram		In-line		
Manual actuator		Monostable		
Recommended lubricant		ISO and UNI FD 22		
Compatibility with oils		See **chapter Z1**		
Coils		22 mm side, ø 8 hole – EN175301-803 connection, form B Certified EN 60204.1 and VDE 0580		
		Refer to the Accessories section for electrical features page **B1**.54*		
Class of protection		IP65 with coil and connector mounted		
Noise level		Max 78 dBA with silenced relief		
CE marking		In accordance with Machinery Directive, Annexe V (**)		
ATEX category (only for versions with an ATEX sensor)		Ⓔx II 3G Ex nA c IIC T4 Gc x -10°C<Ta<45°C		
		Ⓔx II 3D Ex tc IIIC T135°C IP65 Dc		
Max coil ring nut torque	Nm	1		
Safety function		Icuts off the power supply and relieves the air circuit connected to port 2		
Type of sensor used		Hall effect (refer to page **B1**.151 for sensor details)		
B10d		$50x10^6$ cycles		
Category - ISO EN 13849		4		
DC		High (≥ 99 %)		
CCF		80		
PL - ISO EN 13849		Suitable for use in safety circuits up to PL = e		

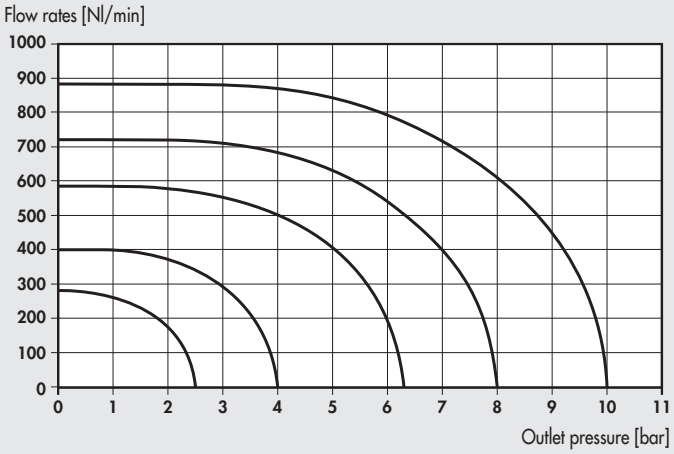
* To avoid malfunctions, we recommend using Metal Work accessories
** The declaration can be downloaded from www.metalwork.it
IMPORTANT: Any ferromagnetic masses must be at least 40 mm from the sensor.
Prevent magnetic fields from creating disturbance in the sensor area.

WIRING DIAGRAM

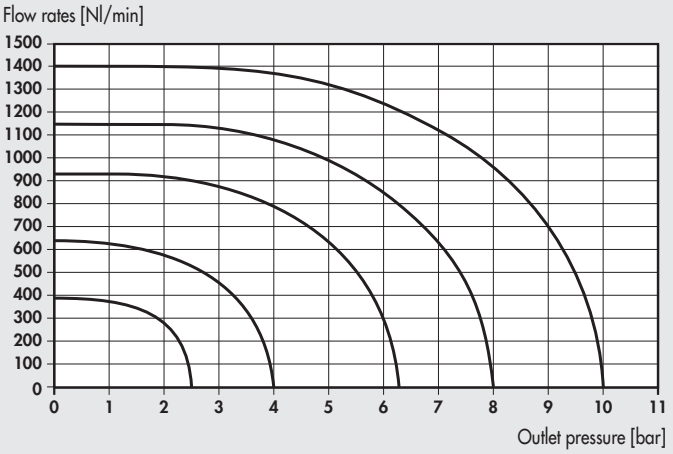


FLOW CHARTS - DOUBLE VALVE

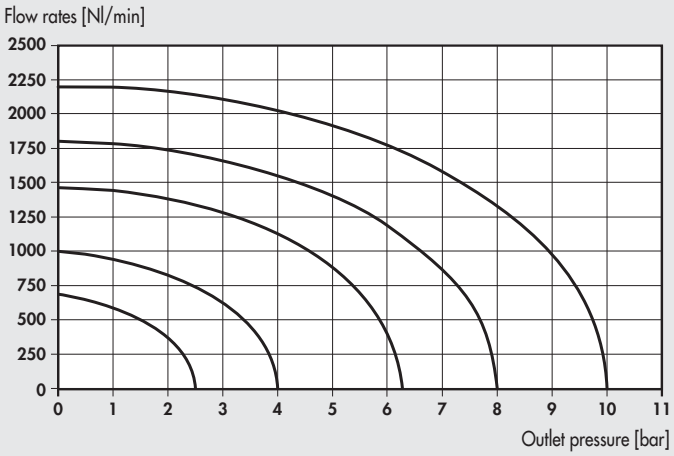
1/8" - ON DELIVERY



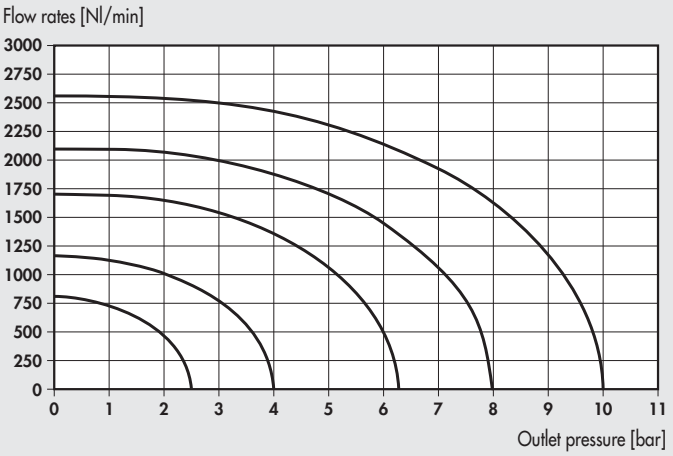
1/8" - ON RELIEF



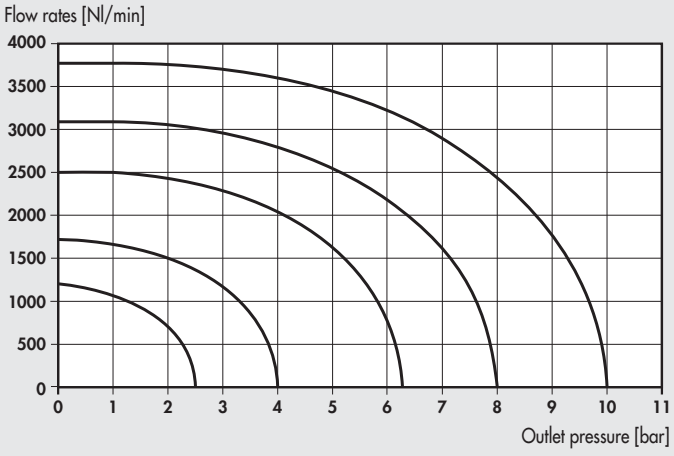
1/4" - ON DELIVERY



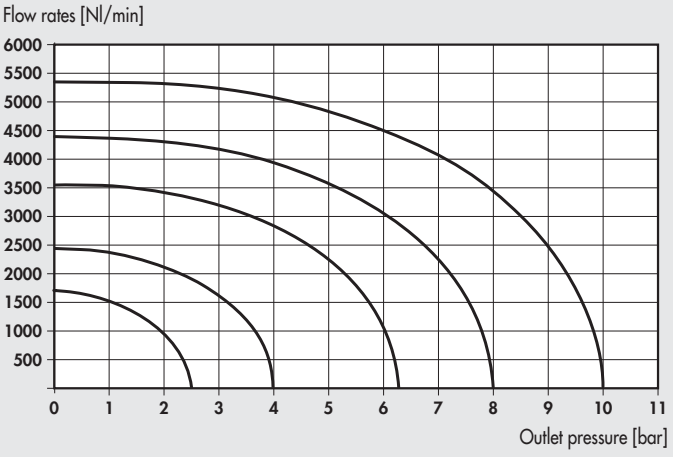
1/4" - ON RELIEF



3/8" - ON DELIVERY



3/8" - ON RELIEF

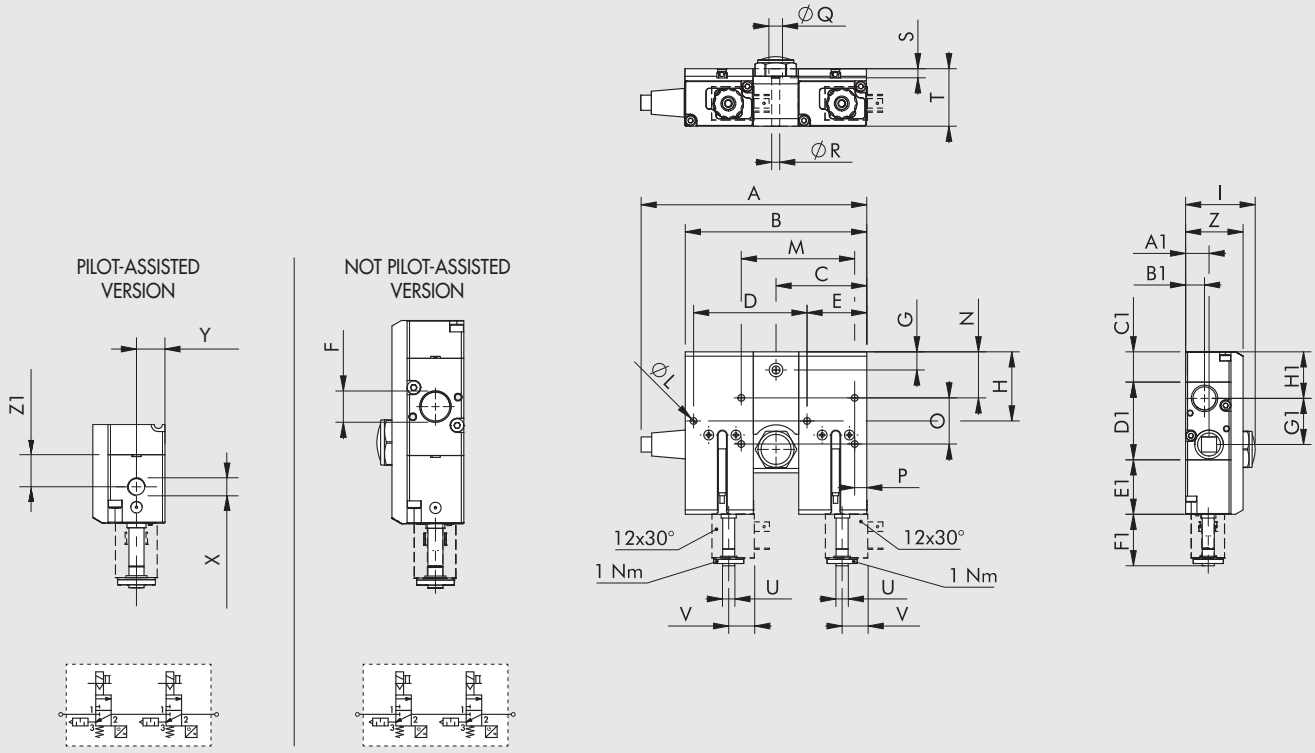


SYNOPTIC, SIZES AND VERSIONS

S O V	2	3	S O	S	D D	3 F
FAMILY	**DIMENSIONS**	**FUNCTION**	**OPERATORS 14**	**RESETTING 12**	**FURTHER DETAILS**	**SENSOR**
SOV solenoid/ pneumatic	**2** 1/8"	**3** 3/2	**SO** solenoid/ pneumatic	**S** mechanical springs	**DD** double 3/2	**3F** 2.5 m 3 wires
	3 1/4"		**SE** electric pilot-assisted			**M8** 0.3 m M8
	C 3/8"					**AT** 2 m ATEX

METAL WORK PNEUMATIC

DOUBLE 3/2 MONOSTABLE



Code	Size	Abbrev.	A	B	C	D	E	F	G	H	I	ØL	M	N	O	P	ØQ	ØR	S	T
7015020210	1/8"	SOV 23 SOS DD 3F	102.5	94	-	62	28.9	1/8"	-	27.8	35.5	4.2	-	-	-	-	-	-	-	-
7015120210	1/8"	SOV 23 SOS DD M8	102.5	94	-	62	28.9	1/8"	-	27.8	35.5	4.2	-	-	-	-	-	-	-	-
7015220210	1/8"	SOV 23 SOS DD AT	102.5	94	-	62	28.9	1/8"	-	27.8	35.5	4.2	-	-	-	-	-	-	-	-
7015020510	1/8"	SOV 23 SES DD 3F	102.5	94	-	62	28.9	1/8"	-	27.8	35.5	4.2	-	-	-	-	-	-	-	-
7015120510	1/8"	SOV 23 SES DD M8	102.5	94	-	62	28.9	1/8"	-	27.8	35.5	4.2	-	-	-	-	-	-	-	-
7015220510	1/8"	SOV 23 SES DD AT	102.5	94	-	62	28.9	1/8"	-	27.8	35.5	4.2	-	-	-	-	-	-	-	-
7025020210	1/4"	SOV 33 SOS DD 3F	133.5	110	55	70	34.5	1/4"	9	32.7	37.5	4.2	-	-	-	-	7.5	4.3	5	31.5
7025120210	1/4"	SOV 33 SOS DD M8	133.5	110	55	70	34.5	1/4"	9	32.7	37.5	4.2	-	-	-	-	7.5	4.3	5	31.5
7025220210	1/4"	SOV 33 SOS DD AT	133.5	110	55	70	34.5	1/4"	9	32.7	37.5	4.2	-	-	-	-	7.5	4.3	5	31.5
7025020510	1/4"	SOV 33 SES DD 3F	133.5	110	55	70	34.5	1/4"	9	32.7	37.5	4.2	-	-	-	-	7.5	4.3	5	31.5
7025120510	1/4"	SOV 33 SES DD M8	133.5	110	55	70	34.5	1/4"	9	32.7	37.5	4.2	-	-	-	-	7.5	4.3	5	31.5
7025220510	1/4"	SOV 33 SES DD AT	133.5	110	55	70	34.5	1/4"	9	32.7	37.5	4.2	-	-	-	-	7.5	4.3	5	31.5
7045020210	3/8"	SOV C3 SOS DD 3F	149.5	120	60	75	39.5	3/8"	12	45.7	46	4.5	75	30.45	30.5	8	9	5.3	6	38
7045120210	3/8"	SOV C3 SOS DD M8	149.5	120	60	75	39.5	3/8"	12	45.7	46	4.5	75	30.45	30.5	8	9	5.3	6	38
7045220210	3/8"	SOV C3 SOS DD AT	149.5	120	60	75	39.5	3/8"	12	45.7	46	4.5	75	30.45	30.5	8	9	5.3	6	38
7045020510	3/8"	SOV C3 SES DD 3F	149.5	120	60	75	39.5	3/8"	12	45.7	46	4.5	75	30.45	30.5	8	9	5.3	6	38
7045120510	3/8"	SOV C3 SES DD M8	149.5	120	60	75	39.5	3/8"	12	45.7	46	4.5	75	30.45	30.5	8	9	5.3	6	38
7045220510	3/8"	SOV C3 SES DD AT	149.5	120	60	75	39.5	3/8"	12	45.7	46	4.5	75	30.45	30.5	8	9	5.3	6	38

Code	Size	Abbrev.	U	V	Z	X	Y	Z1	A1	B1	C1	D1	E1	F1	G1	H1	Sensor	Weight [g]
7015020210	1/8"	SOV 23 SOS DD 3F	M5	16.3	-	-	-	14.5	12	8	12	31.6	31	33.5	18	18.8	2.5 m 3 wires	482
7015120210	1/8"	SOV 23 SOS DD M8	M5	16.3	-	-	-	14.5	12	8	12	31.6	31	33.5	18	18.8	0.3 m M8	479
7015220210	1/8"	SOV 23 SOS DD AT	M5	16.3	-	-	-	14.5	12	8	12	31.6	31	33.5	18	18.8	2 m ATEX	466
7015020510	1/8"	SOV 23 SES DD 3F	M5	16.3	30	M5	11	14.5	12	8	12	31.6	31	33.5	18	18.8	2.5 m 3 wires	482
7015120510	1/8"	SOV 23 SES DD M8	M5	16.3	30	M5	11	14.5	12	8	12	31.6	31	33.5	18	18.8	0.3 m M8	474
7015220510	1/8"	SOV 23 SES DD AT	M5	16.3	30	M5	11	14.5	12	8	12	31.6	31	33.5	18	18.8	2 m ATEX	466
7025020210	1/4"	SOV 33 SOS DD 3F	M5	16.3	-	-	-	13	13.8	9.8	13.25	38.9	32	33.5	22	21.7	2.5 m 3 wires	632
7025120210	1/4"	SOV 33 SOS DD M8	M5	16.3	-	-	-	13	13.8	9.8	13.25	38.9	32	33.5	22	21.7	0.3 m M8	624
7025220210	1/4"	SOV 33 SOS DD AT	M5	16.3	-	-	-	13	13.8	9.8	13.25	38.9	32	33.5	22	21.7	2 m ATEX	616
7025020510	1/4"	SOV 33 SES DD 3F	M5	16.3	31.6	1/8"	11.5	13	13.8	9.8	13.25	38.9	32	33.5	22	21.7	2.5 m 3 wires	632
7025120510	1/4"	SOV 33 SES DD M8	M5	16.3	31.6	1/8"	11.5	13	13.8	9.8	13.25	38.9	32	33.5	22	21.7	0.3 m M8	624
7025220510	1/4"	SOV 33 SES DD AT	M5	16.3	31.6	1/8"	11.5	13	13.8	9.8	13.25	38.9	32	33.5	22	21.7	2 m ATEX	616
7045020210	3/8"	SOV C3 SOS DD 3F	M5	16.3	-	-	-	17	15.5	12.5	20	51.9	36	33.5	30.5	30.8	2.5 m 3 wires	972
7045120210	3/8"	SOV C3 SOS DD M8	M5	16.3	-	-	-	17	15.5	12.5	20	51.9	36	33.5	30.5	30.8	0.3 m M8	964
7045220210	3/8"	SOV C3 SOS DD AT	M5	16.3	-	-	-	17	15.5	12.5	20	51.9	36	33.5	30.5	30.8	2 m ATEX	956
7045020510	3/8"	SOV C3 SES DD 3F	M5	16.3	38	1/8"	15	17	15.5	12.5	20	51.9	36	33.5	30.5	30.8	2.5 m 3 wires	972
7045120510	3/8"	SOV C3 SES DD M8	M5	16.3	38	1/8"	15	17	15.5	12.5	20	51.9	36	33.5	30.5	30.8	0.3 m M8	964
7045220510	3/8"	SOV C3 SES DD AT	M5	16.3	38	1/8"	15	17	15.5	12.5	20	51.9	36	33.5	30.5	30.8	2 m ATEX	956

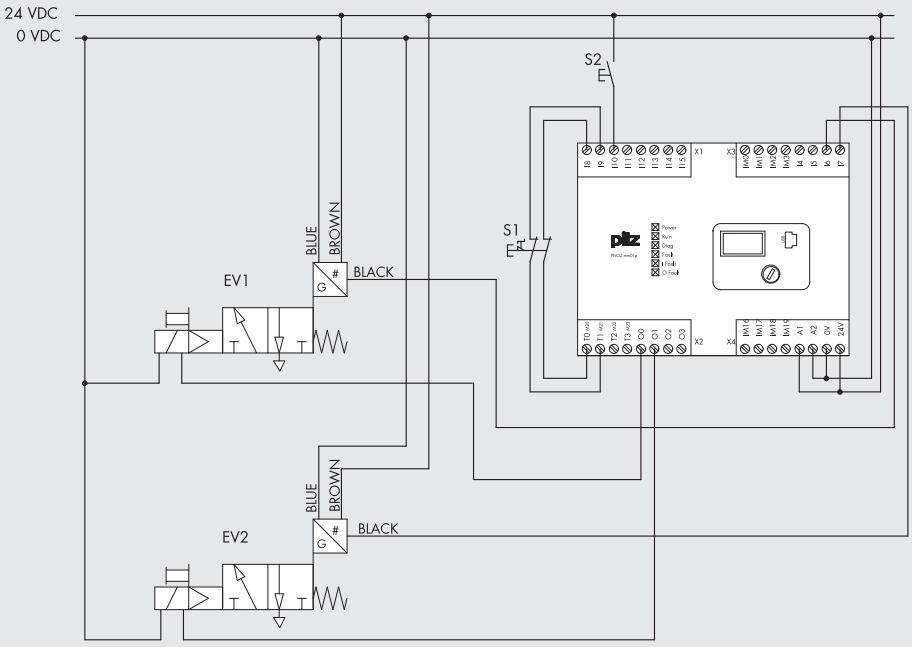
EXAMPLE OF A SAFETY CIRCUIT WITH A DOUBLE VALVE

Below is an example of a wiring diagram for controlling double valves SAFE AIR® a Metal Work using Pilz® components.
Circuit components:
- a Pilz® PNOZ® mm 0.1p modular safety system
- an emergency stop button S1 (Pilz® - PIT® es Set) linked to terminals T0-T1-I8-I9 of the PNOZ® mm 0.1p
- a Metal Work double solenoid valve SAFE AIR®, the 24 VDC coils of which are fed by terminals O0 (SV1) and O1 (SV2) of the PNOZ® mm 0.1p (the other terminals of the coils are OV); the valves' Hall-effect sensors are 24 VDC
- the sensor signals are relayed to terminals 16 (SV1) and 17 (SV2) of the PNOZ® mm 0.1p
- a start/reset button S2

Expected behaviour with the system operating correctly:
- system deactivated:
  - contacts O0 and O1 are OFF
  - the coils are de-energized
  - the sensors are ON (and hence signals to terminals 16 and 17)
  - if one of the sensors is OFF, the Pilz® module does not allow subsequent start/reset
- with the system activated via the start/reset button:
  - contacts O0 and O1 are ON
  - the coils are energized
  - the sensors are OFF (and hence signals to terminals 16 and 17)

The PNOZ® mm 0.1p module is programmed so that:
- when either sensor is OFF, and the coils are de-energized, the module does not allow subsequent restarts.
- when the valves are energized, the 2 sensors must go off within the valve actuation time (12 ms for ISO1s, 24 ms for ISO2s and 50 ms for ISO3s), otherwise the 2 valves are switched off again.
  The programme can be downloaded from www.metalwork.it (the licence for programming Pilz® modules is not included).

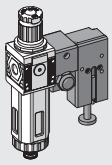
All the electrical connections between the various components must comply with the applicable safety regulations.
If the emergency button is operated at a frequency of 1 actuation per hour, the circuit activates a safety function with PL = e (calculations made with the PAScal programme by Pilz®).
Responsibility for final checking that PL lies with the person assembling the circuit.



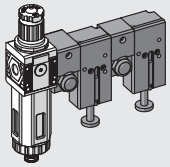
METAL WORK PNEUMATIC

ASSEMBLY DIAGRAM WITH SYNTESI®

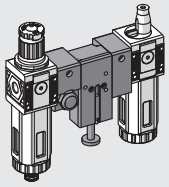
IN + SINGLE VALVE



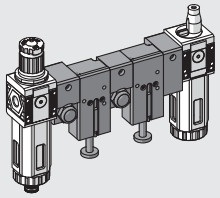
IN + DOUBLE VALVE

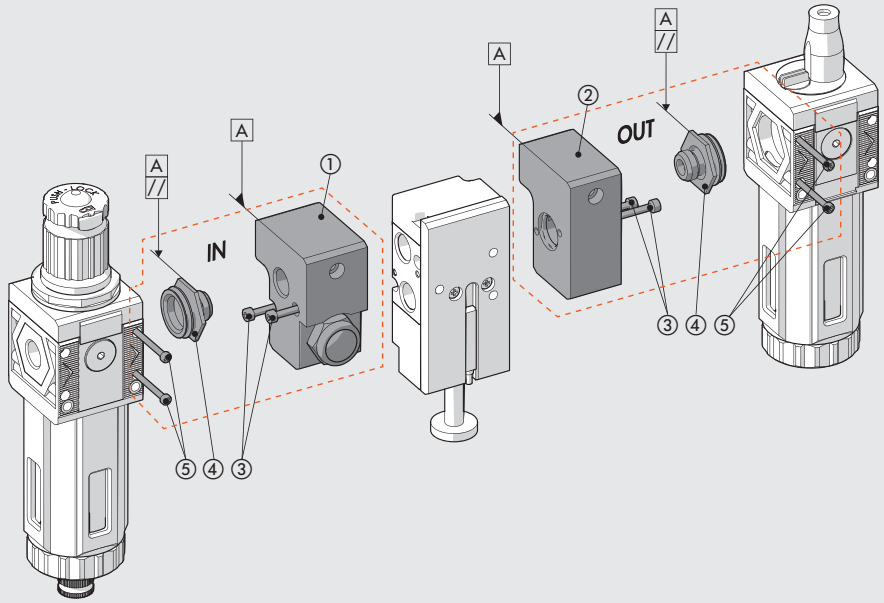


IN + SINGLE VALVE + OUT



IN + DOUBLE VALVE + OUT

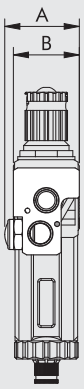


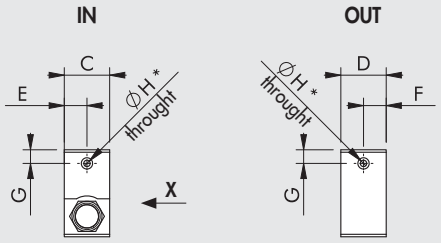


1) Connect the inlet ① or outlet ② plate to the safety component SAFE AIR® valve using the two TCE screws ③.
2) Screw the connecting bushing onto the input or output plate as far as it will go.
   (Use sealant on the G1/4" or G3/8" thread to provide a further seal).
3) Unscrew the bushing slightly until two surfaces of the hexagon are parallel to the body of plate ① or ②
   (see diagram).
4) Insert the bushing ④ into the Syntesi® unit.
5) Tighten the two self-tapping screws ⑤ in the Syntesi® unit to a torque of 0.4 Nm max (SY1) and
   2.5 Nm max (SY2).

SYNTESI® 2 - View from "X"

SYNTESI® 1 - View from "X"





* Wall fixing.

Code	Description	A	B	C	D	E	F	G	Ø H	Weight [g]
9210015	IN 1/4 SY1 block accessory	49.6	43.6	30	-	15	-	9	4.3	175
9210016	OUT 1/4 SY1 block accessory	-	43.6	-	30	-	15	9	4.3	180
9210017	IN 3/8 SY2 block accessory	64	56	30	-	15	-	12	5.3	325
9210018	OUT 3/8 SY2 block accessory	-	56	-	30	-	15	12	5.3	330

N.B. The output accessory for Syntesi® is optional. It should be used when you intend to mount a Syntesi® component (CAN'T be a valve) downstream the SAFE AIR® safety device.
N.B. The **REG**, **FR**, **V3V**, **APR** elements cannot be mounted downstream the safety valves because if the elements are blocked, safety relief is not guaranteed.

ACCESSORIES

Refer to page **B1**.54 for coils and connectors.

VALVES ISO 5599/1 SERIES SAFE AIR®

Starting from a series of sturdy, reliable valves, such as those to ISO 5599/1, some special features have been added, such as the presence of a valve status diagnostic system and the creation of a double channel guaranteeing architecture redundancy.

The simplest version features one electropneumatically-operated 5/2 monostable valve. It is common knowledge that when this type of valve is in the idle state (coil not energized), port 1 is connected to port 2, and port 4 relieves. When the valve is operated (coil energized), port 1 is connected to port 4, and port 2 relieves. When the coil is de-energized again, the valve is returned to the idle state (so port 4 relieves) by means of a spring that returns the spool to the home position.
In the event of a failure, the spool may remain in the actuating position, even with coil de-energized, leaving port 4 pressurized.

To offset this problem, we have added a Hall-effect sensor that reads the spool position. This means that when the valve is deactivated, the sensor is on, and when the valve is activated, the sensor is off. A status in which the sensor is off and the coil de-energized indicates a problem.

To reduce the probability of risk during plant maintenance, the manual actuator mounted on the Cnomo electric control is the monostable type.
The sensor inside the valve is available in the standard version with a 2.5m three-wire cable (standard or ATEX certified) or with an M8 connector and a 300 mm cable.
This valve, which is available in 3 sizes for the ISO 5599/1 series, is a category 2 component according to ISO EN 13849 and is suitable for use in safety circuits up to PL=c.

For those requiring higher PLs, we have also developed a double-channel version (redundant) that requires the use of ISO 5599/1 valves with a monitored coil arranged so that ports 2 are in parallel and ports 4 are in series. If just one of the valves de-energizes, port 4 relieves, so, even if one of the two coils remains blocked, the other guarantees relief of the compressed-air circuit. In this case, too, the presence of spool position sensors can be used to monitor the status.

The double valve is also available in 3 sizes for the ISO 5599/1 series. It is a category 4 component according to ISO EN 13849 and is suitable for use in safety circuits up to PL=e.
Both the single- and the double-channel valve come with:
- a Type-Approval n° P13104/11/MC/nb issued by Bureau Veritas in accordance with EN ISO 13849
- a certificate of compliance examination to the Machinery Directive 2006/42/EC CV **No. CV 002-10-2011 released by Bureau Veritas.

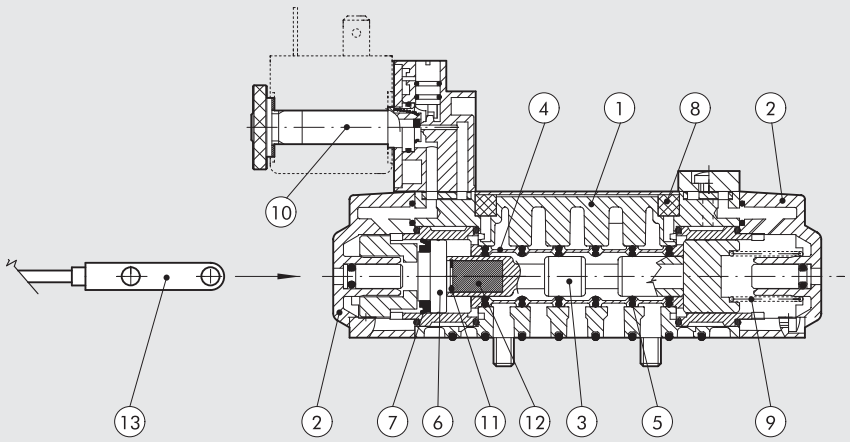
SINGLE VALVE ISO 5599/1 SERIES SAFE AIR®

TECHNICAL DATA		ISO 1	ISO 2	ISO3
Fluid		Filtered unlubricated air (50 µm); lubrication, if used, must be continuous		
Operation		5/2 monostable		
Operating pressure:	bar			
• non-assisted		from 2.5 to 10		
• pilot-assisted		from vacuum to 10		
Minimum pilot pressure	bar	2.5		
Operating temperature range	°C	from -10 to +60 (from -10 to +45 for Atex version)		
Nominal diameter	mm	7.5	12	15
Conductance C	Nl/min · bar	250	657	971
Critical ratio b	bar/bar	0.36	0.43	0.43
Flow rate at 6.3 bar Δp 0.5 bar	Nl/min	700	1800	3200
Flow rate at 6.3 bar Δp 1 bar	Nl/min	1100	2700	4600
TRA/TRR at 6.3 bar	ms/ms	24 / 50	39 / 60	50 / 120
Conductance C on relief	Nl/min · bar	267	817	1095
Critical ratio b on relief	bar/bar	0.34	0.24	0.56
Flow rate on free exhaust at 6.3 bar	Nl/min	1850	4900	8000
Installation		any position		
Assembly		On single or manifold bases to ISO 5599/1 (*)		
Solenoid pilot		to CNOMO		
Manual actuator		Monostable on solenoid pilot and valve body		
Recommended lubricant		ISO and UNI FD 22		
Compatibility with oils		See **chapter Z1**		
Coils		30 mm side, ø 8 hole – EN175301-803 connection, type A		
		22 mm side, ø 8 hole – EN175301-803 connection, type B		
		Certified EN 60204.1 and VDE 0580		
		Refer to the Accessories section for the electrical features page **B1**.121 (*)		
Class of protection		IP65 with coil and connector mounted		
Noise level		Max. 78 dBA with silenced relief		
Max coil ring nut torque	Nm	1		
CE marking		In accordance with Machinery Directive, Annexe V (**)		
ATEX category (only for versions with an ATEX sensor)		⟨Ex⟩ II 3G Ex nA c IIC T4 Gc x -10°C<Ta<45°C		
		⟨Ex⟩ II 3D Ex tc IIIC T135°C IP65 Dc		
Safety function		Cuts off the power supply and relieves the air circuit connected to port 4		
Type of sensor used		Hall effect (refer to page **B1**.151 for sensor details)		
B10d		50 x 10^6 cycles		
Category - ISO EN 13849		2		
DC		Low (80 %)		
PL - ISO EN 13849		Suitable for use in safety circuits up to PL=c		

* To avoid malfunctions, we recommend using Metal Work accessories
** The declaration can be downloaded from www.metalwork.it
IMPORTANT: Do not mount 2 or more SAFE AIR® valves in adjacent positions.
Any ferromagnetic masses must be at least 30mm from the sensor.
Prevent magnetic fields from creating disturbance in the sensor area.

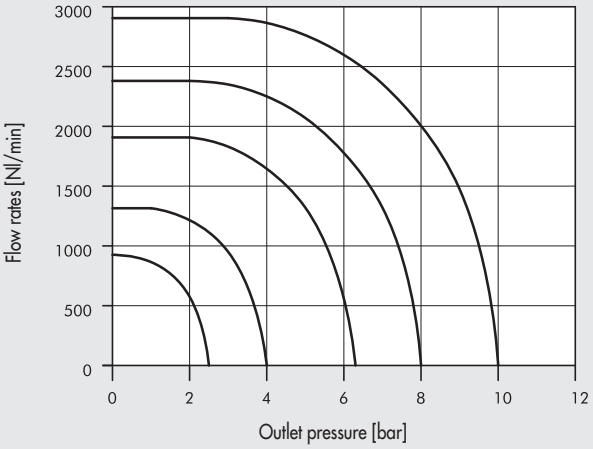
COMPONENTS

① VALVE BODY: Aluminium
② END CAP: Hostaform®
③ SPOOL: chemically nickel-plated aluminium
④ DISTANCE PLATES: plastic
⑤ GASKETS: NBR
⑥ PISTONS: Hostaform®
⑦ PISTON GASKET: NBR
⑧ FILTER: sintered bronze
⑨ SPRINGS: special steel
⑩ OPERATOR: Brass pipe – Stainless steel core
⑪ LOCKING RING: special steel
⑫ MAGNET: Neodymium
⑬ SENSOR: Hall effect

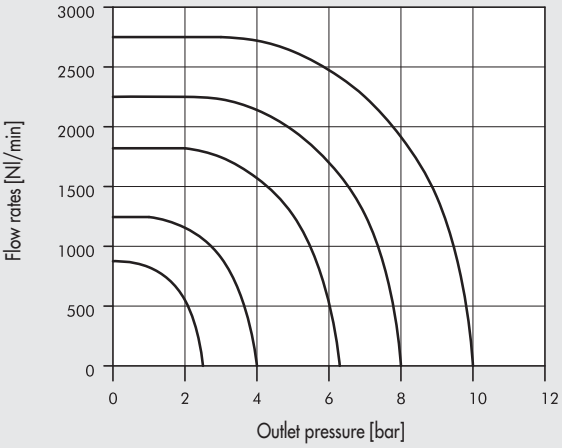


FLOW CHARTS - SINGLE VALVE

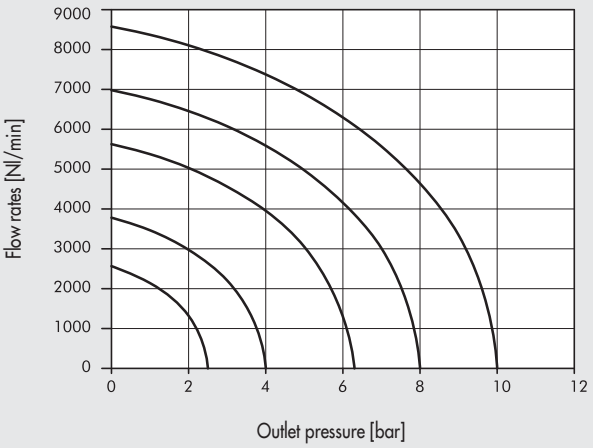
ISO 1 - ON DELIVERY



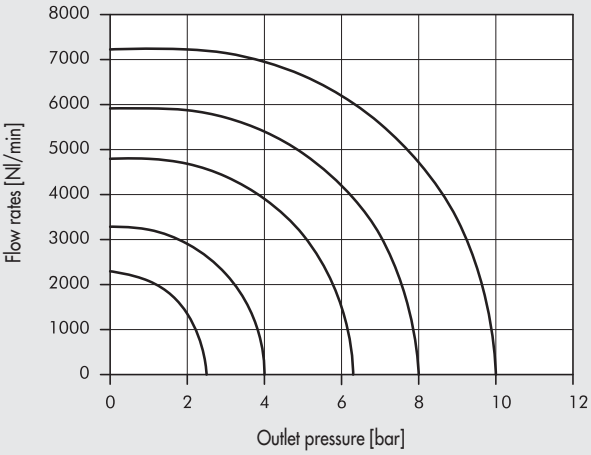
ISO 1 - ON RELIEF



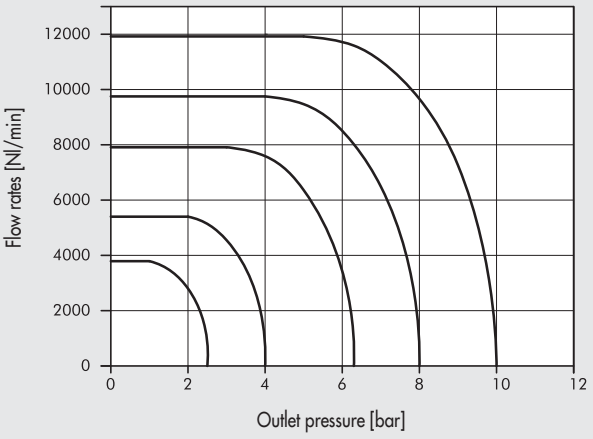
ISO 2 - ON DELIVERY



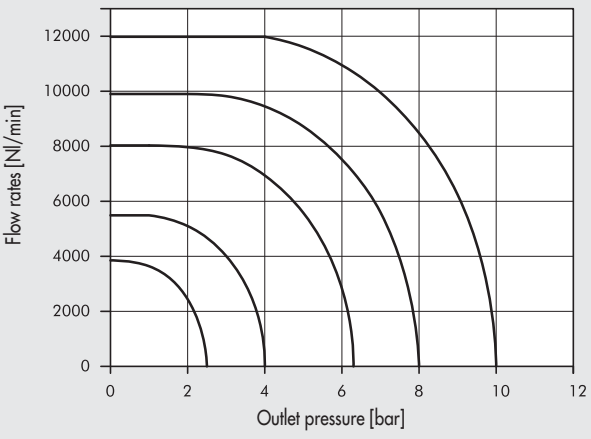
ISO 2 - ON RELIEF



ISO 3 - ON DELIVERY



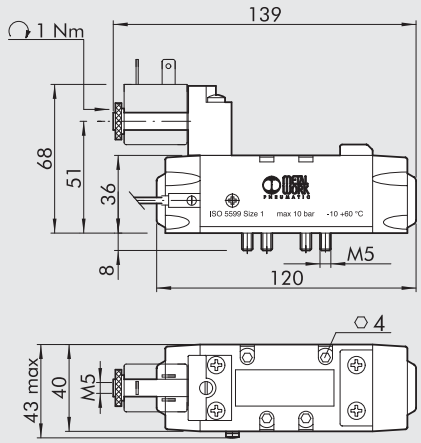
ISO 3 - ON RELIEF



SYNOPTIC, SIZES AND VERSIONS

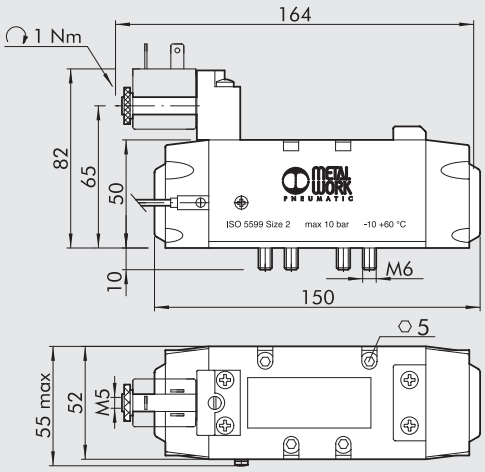
I S V	5	5	S O	S	O O	3 F
FAMILY	**DIMENSIONS**	**FUNCTION**	**OPERATORS 14**	**RESETTING 12**	**FURTHER DETAILS**	**SENSOR**
ISV ISO solenoid/ pneumatic	**5** ISO1 **6** ISO2 **7** ISO3	**5** 5/2	**SO** solenoid/ pneumatic **SE** electric pilot-assisted	**S** mechanical springs	**OO** 5/2	**3F** 2.5 m 3 wires **M8** 0.3 m M8 **AT** 2 m ATEX

5/2 MONOSTABLE - ISO 1



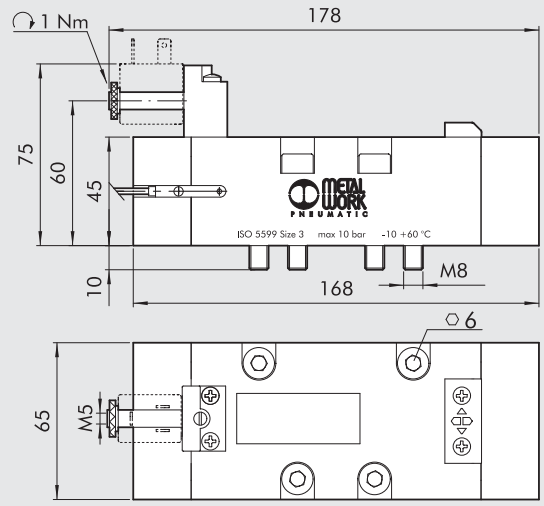
Symbol	Code	Abbrev.	Sensor	Weight [g]
	7057021100	ISV 55 SOS OO 3F	2.5 m 3 wires	380
	7057121100	ISV 55 SOS OO M8	0.3 m M8	350
	7057221100	ISV 55 SOS OO AT	2 m ATEX	370
	7057021400	ISV 55 SES OO 3F	2.5 m 3 wires	380
	7057121400	ISV 55 SES OO M8	0.3 m M8	350
	7057221400	ISV 55 SES OO AT	2 m ATEX	370

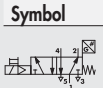
5/2 MONOSTABLE - ISO 2



Symbol	Code	Abbrev.	Sensor	Weight [g]
	7058021100	ISV 65 SOS OO 3F	2.5 m 3 wires	750
	7058121100	ISV 65 SOS OO M8	0.3 m M8	720
	7058221100	ISV 65 SOS OO AT	2 m ATEX	740
	7058021400	ISV 65 SES OO 3F	2.5 m 3 wires	750
	7058121400	ISV 65 SES OO M8	0.3 m M8	720
	7058221400	ISV 65 SES OO AT	2 m ATEX	740

5/2 MONOSTABLE - ISO 3



Symbol	Code	Abbrev.	Sensor	Weight [g]
	7059021100	ISV 75 SOS OO 3F	2.5 m 3 wires	1240
	7059121100	ISV 75 SOS OO M8	0.3 m M8	1210
	7059221100	ISV 75 SOS OO AT	2 m ATEX	1230
	7059021400	ISV 75 SES OO 3F	2.5 m 3 wires	1240
	7059121400	ISV 75 SES OO M8	0.3 m M8	1210
	7059221400	ISV 75 SES OO AT	2 m ATEX	1230

EXAMPLE OF A SAFETY CIRCUIT WITH A SINGLE VALVE

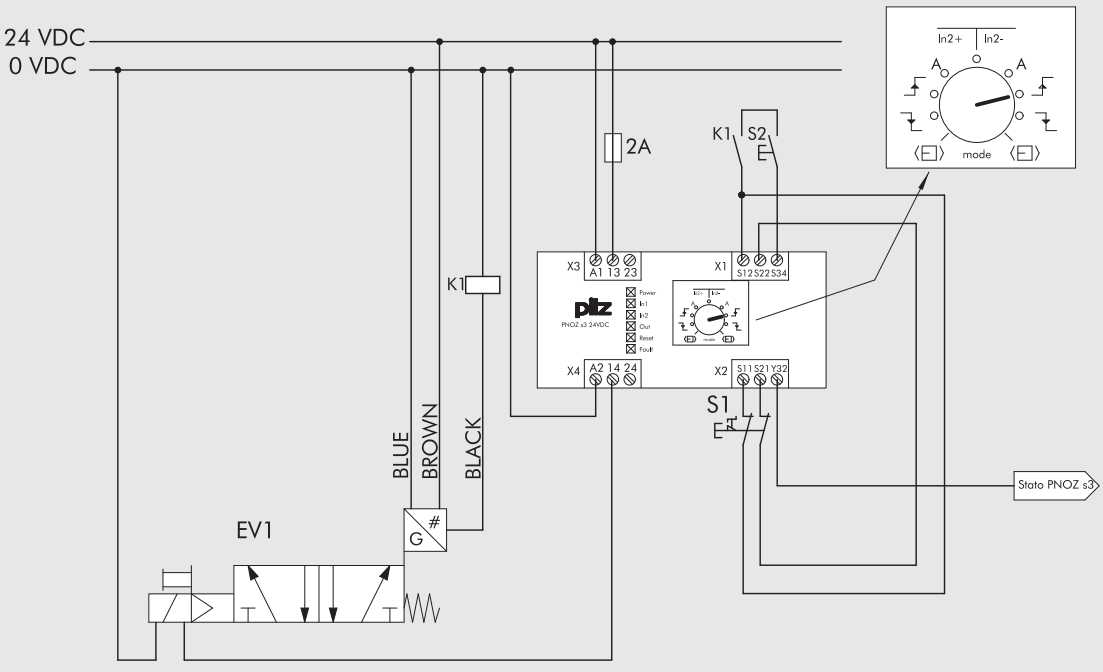
Below is an example of a wiring diagram for controlling Metal Work SAFE AIR® single valves using Pilz® components.
Circuit components:

- a Pilz® safety module PNOZ® s3 for controlling the emergency stop button; terminal Y32 indicates the status of the module, which can be relayed to the machine control logic
- an emergency stop button S1 (Pilz® - PIT® es Set) linked to terminals S11-S12-S22-S23 of the PNOZ® s3
- a Metal Work SAFE AIR® solenoid valve, the 24 VDC coil of which is fed by terminal 14 of the PNOZ® s3 (the other terminal of the coil is 0 V); the valve's Hall-effect sensor is 24 VDC
- a start/reset button S2
- a relay K1, controlled by the valve sensor; an NO contact of the relay is in series with button S2 of the PNOZ® s3.

Expected behaviour with the system operating correctly:

- system deactivated:
  - contact 14 is OFF
  - the coil is de-energized
  - the sensor is ON
  - relay K1 is energized
  - contact K1 is closed
  - contact Y32 is OFF
- with the system activated via the start/reset button:
  - contact 14 is ON
  - the coil is energized
  - the sensor is OFF
  - relay K1 is de-energized
  - contact K1 is open
  - contact Y32 is ON

In the event of a malfunction (e.g. spool jam), the coil is de-energized but the sensor remains OFF, relay K1 remains de-energized, contact K1 remains open (preventing subsequent restarts) and contact Y32 is OFF.
In the event of a valve fault, the circuit in the diagram below does not allow relief of the compressed air system. Sensor status must be monitored to assess valve operation. Contact Y32 indicates the status of the PNOZ® s3, not the status of the sensor.
All the electrical connections between the various components must comply with the applicable safety regulations.
If the emergency button is operated at a frequency of 1 actuation per hour, the circuit activates a safety function with PL = c (calculations made with the PAScal programme by Pilz®). Responsibility for final checking that PL lies with the person assembling the circuit.

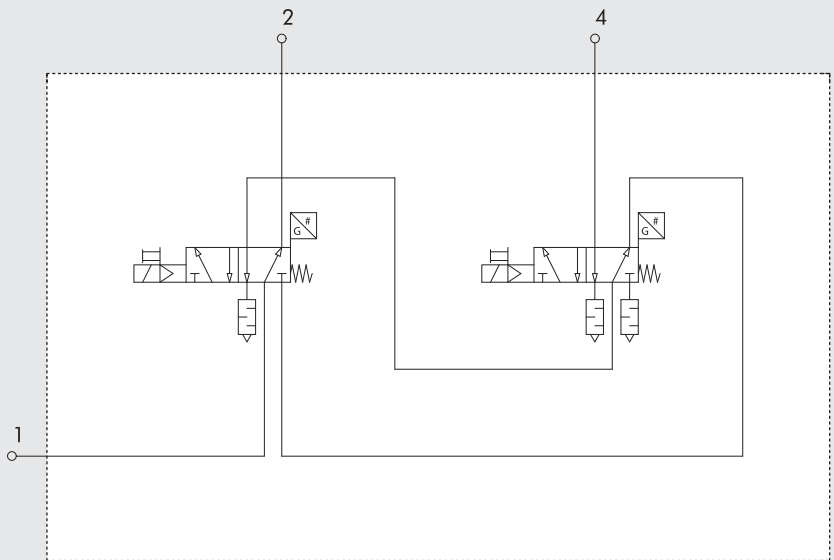


DOUBLE VALVE ISO 5599/1 SERIES SAFE AIR®

TECHNICAL DATA		ISO 1	ISO 2	ISO3
Fluid		Filtered unlubricated air (50µm); lubrication, if used, must be continuous		
Operation		double 5/2 monostable		
Operating pressure:	bar			
• non-assisted		from 2.5 to 10		
• pilot-assisted		from vacuum to 10		
Minimum pilot pressure	bar	2.5		
Operating temperature range	°C	from -10 to +60 (from -10 to +45 for Atex version)		
Conductance C	Nl/min · bar	228	498	720
Critical ratio b	bar/bar	0.40	0.24	0.44
Flow rate at 6.3 bar Δp 0.5 bar	Nl/min	770	1250	2500
Flow rate at 6.3 bar Δp 1 bar	Nl/min	1050	1750	3400
Conductance C on relief	Nl/min · bar	222	554	724
Critical ratio b on relief	bar/bar	0.30	0.02	0.41
Flow rate on free exhaust at 6.3 bar	Nl/min	1600	4000	5300
TRA/TRR at 6.3 bar	ms/ms	24 / 50	39 /60	50 / 120
Installation		any position		
Solenoid pilot		to CNOMO		
Manual actuator		monostable on solenoid pilot and valve body		
Recommended lubricant		ISO and UNI FD 22		
Compatibility with oils		See **chapter Z1**		
Coils		30 mm side, ø 8 hole – EN175301-803 connection, form A		
		22 mm side, ø 8 hole – EN175301-803 connection, form B		
		Certified EN 60204.1 and VDE 0580		
		Refer to the Accessories section for electrical features page **B1**.121 (*)		
Class of protection		IP65 with coil and connector mounted		
Noise level		Max. 78 dBA with silenced relief		
CE marking		in accordance with Machinery Directive, Annexe V (**)		
ATEX category (only for versions with an ATEX sensor)		Ⓔx II 3G Ex nA c IIC T4 Gc x -10°C<Ta<45°C		
		Ⓔx II 3D Ex tc IIIC T135°C IP65 Dc		
Max coil ring nut torque	Nm	1		
Safety function		Icuts off the power supply and relieves the air circuit connected to port 4		
Type of sensor used		Hall effect (refer to page **B1**.151 for sensor details)		
B10d		$50x10^6$ cycles		
Category - ISO EN 13849		4		
DC		High (≥ 99 %)		
CCF		80		
PL - ISO EN 13849		Suitable for use in safety circuits up to PL=e		

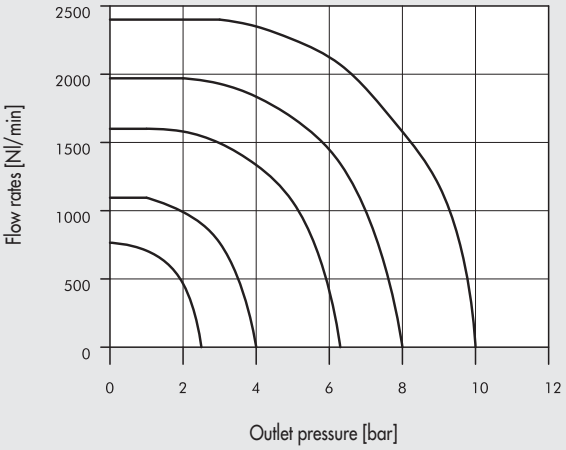
* To avoid malfunctions, we recommend using Metal Work accessories
** The declaration can be downloaded from www.metalwork.it
IMPORTANT: Any ferromagnetic masses must be at least 30 mm from the sensor.
Prevent magnetic fields from creating disturbance in the sensor area.

WIRING DIAGRAM

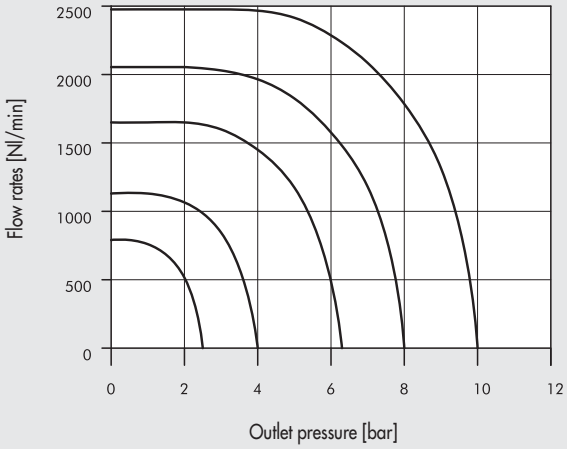


FLOW CHARTS - DOUBLE VALVE

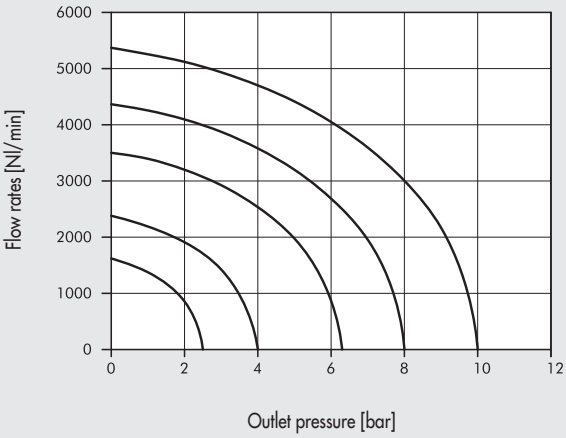
ISO 1 - ON DELIVERY



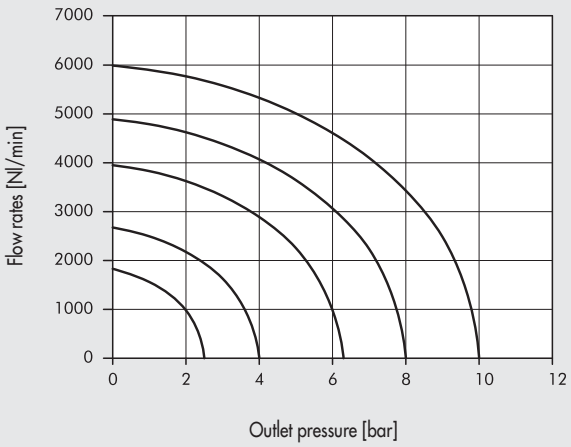
ISO 1 - ON RELIEF



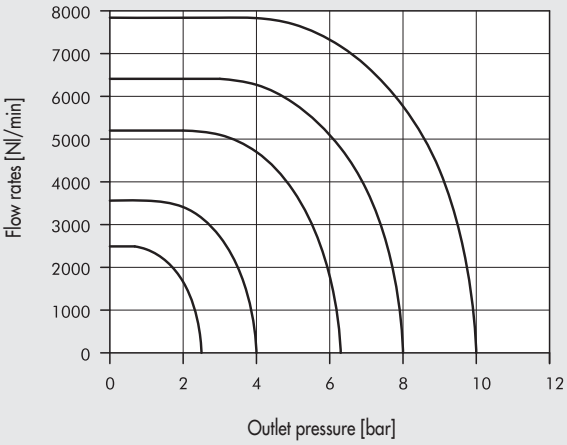
ISO 2 - ON DELIVERY



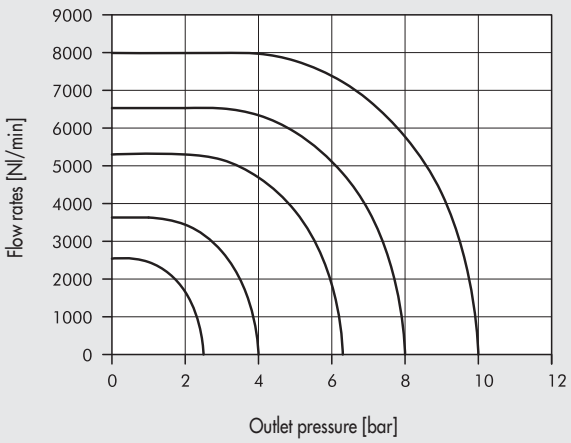
ISO 2 - ON RELIEF



ISO 3 - ON DELIVERY



ISO 3 - ON RELIEF

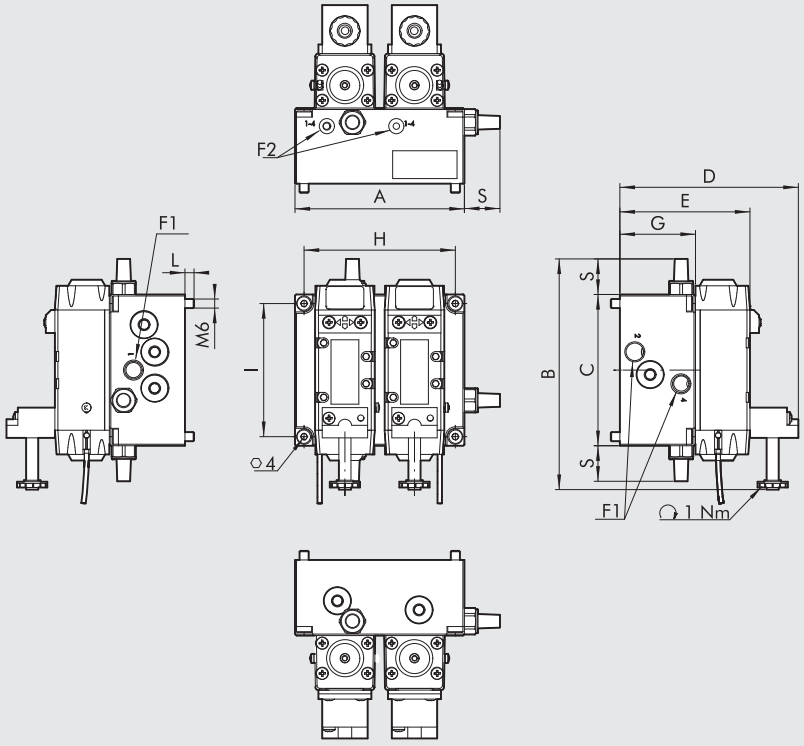


SYNOPTIC, SIZES AND VERSIONS

I S V	5	5	S O	S	D D	3 F
FAMILY	**DIMENSIONS**	**FUNCTION**	**OPERATORS 14**	**RESETTING 12**	**FURTHER DETAILS**	**SENSOR**
ISV ISO solenoid/ pneumatic	**5** ISO1 **6** ISO2 **7** ISO3	**5** 5/2	**SO** solenoid/ pneumatic **SE** electric pilot-assisted	**S** mechanical springs	**DD** double 5/2	**3F** 2.5 m 3 wires **M8** 0.3 m M8 **AT** 2 m ATEX

METAL WORK PNEUMATIC

DOUBLE 5/2 MONOSTABLE



Code	Size	Abbrev.	A	B	C	D	E	F1	F2	G	H	I	L	S	Sensor	Weight [g]
7057021110	ISO 1	ISV 55 SOS DD 3F	112	152.5	100	118	86	G 1/4"	M5	50	100	88	6	23.5	2.5 m 3 wires	2100
7057121110	ISO 1	ISV 55 SOS DD M8	112	152.5	100	118	86	G 1/4"	M5	50	100	88	6	23.5	0.3 m M8	2100
7057221110	ISO 1	ISV 55 SOS DD AT	112	152.5	100	118	86	G 1/4"	M5	50	100	88	6	23.5	2 m ATEX	2100
7057021410	ISO 1	ISV 55 SES DD 3F	112	152.5	100	118	86	G 1/4"	M5	50	100	88	6	23.5	2.5 m 3 wires	2100
7057121410	ISO 1	ISV 55 SES DD M8	112	152.5	100	118	86	G 1/4"	M5	50	100	88	6	23.5	0.3 m M8	2100
7057221410	ISO 1	ISV 55 SES DD AT	112	152.5	100	118	86	G 1/4"	M5	50	100	88	6	23.5	2 m ATEX	2100
7058021110	ISO 2	ISV 65 SOS DD 3F	146	176	116	145	113	G 3/8"	G 1/8"	63	134	104	13	29	2.5 m 3 wires	4000
7058121110	ISO 2	ISV 65 SOS DD M8	146	176	116	145	113	G 3/8"	G 1/8"	63	134	104	13	29	0.3 m M8	4000
7058221110	ISO 2	ISV 65 SOS DD AT	146	176	116	145	113	G 3/8"	G 1/8"	63	134	104	13	29	2 m ATEX	4000
7058021410	ISO 2	ISV 65 SES DD 3F	146	176	116	145	113	G 3/8"	G 1/8"	63	134	104	13	29	2.5 m 3 wires	4000
7058121410	ISO 2	ISV 65 SES DD M8	146	176	116	145	113	G 3/8"	G 1/8"	63	134	104	13	29	0.3 m M8	4000
7058221410	ISO 2	ISV 65 SES DD AT	146	176	116	145	113	G 3/8"	G 1/8"	63	134	104	13	29	2 m ATEX	4000
7059021110	ISO 3	ISV 75 SOS DD 3F	186	188	116	155	123	G 1/2"	G 1/8"	78	174	104	9	31.5	2.5 m 3 wires	5300
7059121110	ISO 3	ISV 75 SOS DD M8	186	188	116	155	123	G 1/2"	G 1/8"	78	174	104	9	31.5	0.3 m M8	5300
7059221110	ISO 3	ISV 75 SOS DD AT	186	188	116	155	123	G 1/2"	G 1/8"	78	174	104	9	31.5	2 m ATEX	5300
7059021410	ISO 3	ISV 75 SES DD 3F	186	188	116	155	123	G 1/2"	G 1/8"	78	174	104	9	31.5	2.5 m 3 wires	5300
7059121410	ISO 3	ISV 75 SES DD M8	186	188	116	155	123	G 1/2"	G 1/8"	78	174	104	9	31.5	0.3 m M8	5300
7059221410	ISO 3	ISV 75 SES DD AT	186	188	116	155	123	G 1/2"	G 1/8"	78	174	104	9	31.5	2 m ATEX	5300

NOTES

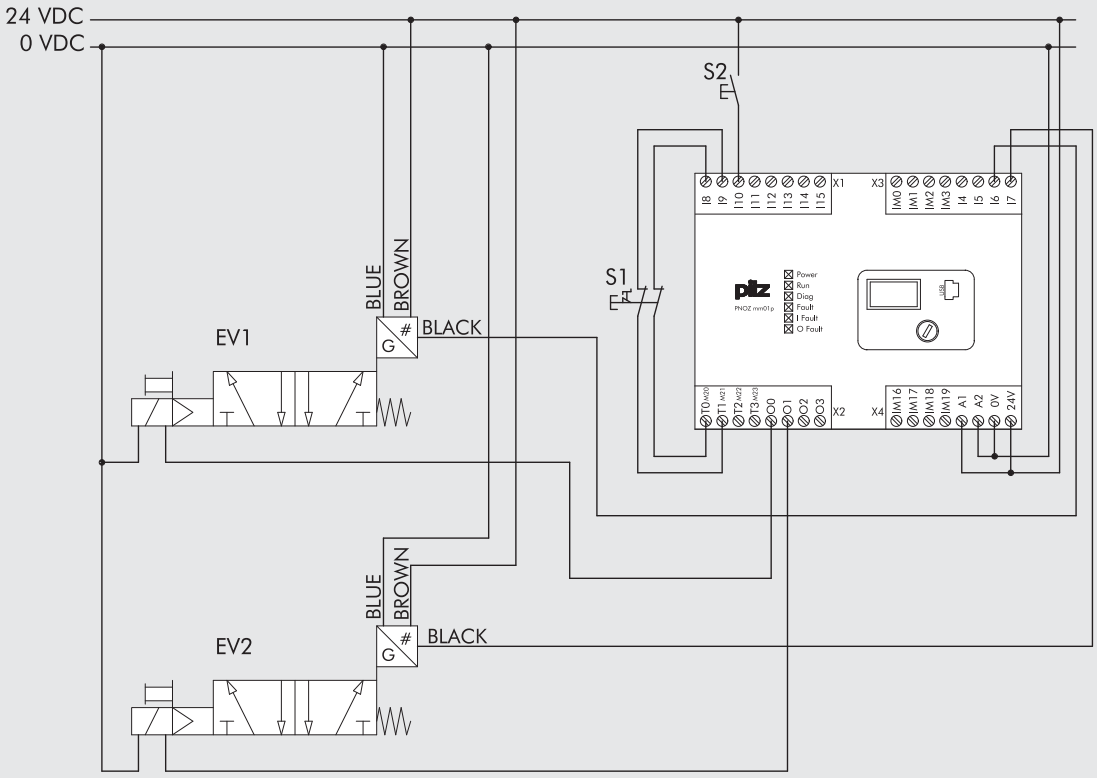
EXAMPLE OF A SAFETY CIRCUIT WITH A DOUBLE VALVE

Below is an example of a wiring diagram for controlling double valves SAFE AIR® a Metal Work using Pilz® components.
Circuit components:
- a Pilz® PNOZ® mm 0.1p modular safety system
- an emergency stop button S1 (Pilz® - PIT® es Set) linked to terminals T0-T1-I8-I9 of the PNOZ® mm 0.1p
- a Metal+ Work double solenoid valve SAFE AIR®, the 24 VDC coils of which are fed by terminals O0 (SV1) and O1 (SV2) of the PNOZ® mm 0.1p (the other terminals of the coils are OV); the valves' Hall-effect sensors are 24 VDC
- the sensor signals are relayed to terminals 16 (SV1) and 17 (SV2) of the PNOZ® mm 0.1p
- a start/reset button S2

Expected behaviour with the system operating correctly:
- system deactivated:
  - contacts O0 and O1 are OFF
  - the coils are de-energized
  - the sensors are ON (and hence signals to terminals 16 and 17)
  - if one of the sensors is OFF, the Pilz® module does not allow subsequent start/reset
- with the system activated via the start/reset button:
  - contacts O0 and O1 are ON
  - the coils are energized
  - the sensors are OFF (and hence signals to terminals 16 and 17)

The PNOZ® mm0.1p module is programmed so that:
- when either sensor is OFF, and the coils are de-energized, the module does not allow subsequent restarts.
- when the valves are energized, the 2 sensors must go off within the valve actuation time (12 ms for ISO1s, 24 ms for ISO2s and 50 ms for ISO3s), otherwise the 2 valves are switched off again.
  The programme can be downloaded from www.metalwork.it (the licence for programming Pilz® modules is not included).

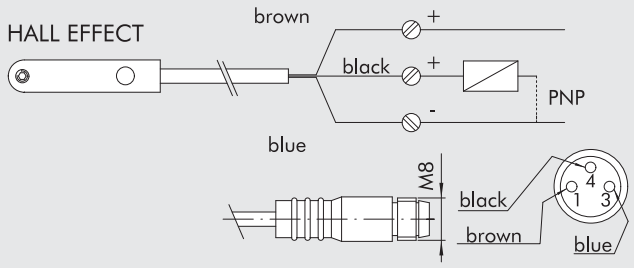
All the electrical connections between the various components must comply with the applicable safety regulations.
If the emergency button is operated at a frequency of 1 actuation per hour, the circuit activates a safety function with PL = e (calculations made with the PAScal programme by Pilz®).
Responsibility for final checking that PL lies with the person assembling the circuit.



METAL WORK PNEUMATIC

TECHNICAL DATA SENSOR			ATEX
		EFFECT HALL	EFFECT HALL
Type of contact		N.O.	N.O.
Switch		PNP	PNP
Supply voltage (Ub)	V	from 10 to 30 DC	from 18 to 30 DC
Power	W	3	≤ 1.7
Voltage variation		≤ 10% of Ub	≤ 10% of Ub
Voltage drop	V	≤ 2	≤ 2.2
Input current	mA	≤ 10	≤ 10
Output current	mA	≤ 100	≤ 70
Switching frequency	Hz	≤ 5000	1000
Short-circuit protection		Yes	Yes
Over-voltage suppression		Yes	Yes
Polarity inversion protection		Yes	Yes
EMC		EN 60 947-5-2	EN 60 947-5-2
LED display		Yellow	Yellow
Magnetic sensitivity		2.8 mT ± 25%	2.6 mT
Repeatability		≤ 0.1 mT	≤ 0.1 mT (Ub and ta fixed)
Degree of protection (EN 60529)		IP 67	IP 68, IP 69K
Vibration and shock resistance		30 g, 11 ms, from 10 to 55 Hz, 1 mm	30 g, 11 ms, from 10 to 55 Hz, 1 mm
Operating life		10^9 impulses	10^9 impulses
Temperature range	°C	from -25 to +75	from -20 to +45
Sensor capsule material		PA66 + PA6I/6T	PA
2.5 m/2 m connecting cable		PVC; 3 x 0.14 mm²	PVC; 3 x 0.12 mm²
Connecting cable with M8x1		Polyurethane; 3 x 0.14 mm²	-
Wire NO.		3	3
Category ATEX		-	II 3G Ex nA op is IIC T4 Gc X II 3D Ex tc IIIC T135°C Dc IP67 X
Certifications		CE	CE cULus Ex

WIRING DIAGRAM SENSOR



ACCESSORIES

Refer to page **B1**.121 for coils and connectors

NOTES

NOTES

METAL WORK PNEUMATIC

NOTES

SUMMARY OF VALVE ISLANDS AND FIELDBUS

EB 80

- EB 80 ELECTRO-PNEUMATIC SYSTEM — B2.4

- EB 80 - SIGNAL MODULES - S — B2.15
- EB 80 - ELECTRICAL CONNECTION - E — B2.23

- EB 80 - MULTI-POLE ELECTRICAL CONNECTION - E — B2.25

- EB 80 - ELECTRICAL CONNECTION WITH FIELDBUS - E — B2.29

- EB 80 - ADDITIONAL ELECTRICAL CONNECTION - E — B2.41

- EB 80 - COMPRESSED-AIR SUPPLY - P — B2.44

- EB 80 - BASES FOR VALVES - B — B2.47

- EB 80 - VALVES — B2.50

- EB 80 - INTERMEDIATE SUPPORT - M — B2.56

- EB 80 - CLOSED END-PLATE - C — B2.61

- EB 80 - MULTI-FUNCTION MODULE — B2.64

- EB 80 - SPLASH AREA — B2.81

HDM

- HDM + MULTI-POLE CONNECTION — B2.84
- HDM + AS-Interface — B2.88
- HDM + PROFIBUS-DP — B2.93
- HDM + EtherNet/IP — B2.97
- HDM + CANopen — B2.103

METAL WORK PNEUMATIC

- HDM + B&R B2.109
- HDM – VALVES, INTERMEDIATES ELEMENTS AND ACCESSORIES B2.112

CM

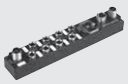
- CM CLEVER MULTIMACH B2.117
- CM + MULTI-POLE CONNECTION B2.122
- CM + Profinet IO B2.127
- CM + EtherCAT B2.131
- CM + EtherNet/IP B2.135
- CM + CANopen B2.139
- CM - VALVES, INTERMEDIATES ELEMENTS AND ACCESSORIES B2.142

MULTIMACH

- MULTIMACH B2.147
- MULTIMACH + PROFIBUS B2.155
- MULTIMACH + B&R B2.160

INPUT/OUTPUT PROFIBUS-DP

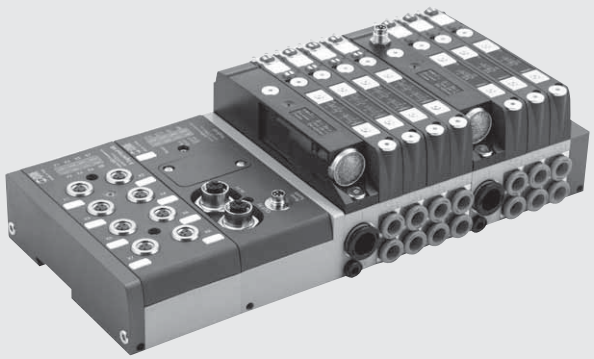
- INPUT/OUTPUT PROFIBUS-DP IP67 M12 B2.161



- INPUT PROFIBUS-DP IP67 M8 B2.165

EB 80 ELECTRO-PNEUMATIC SYSTEM

EB 80 is defined as an electro-pneumatic system as it would be simplistic to use the term "solenoid valve island". In effect, a single assembly can combine solenoid valves of all types, multi-position bases, pneumatic and electric supplies arranged as desired in a system, digital or analogue input or output signal control modules and much more besides.
The EB 80 system is protected by numerous patents and utility models, which enhance the most innovative design solutions.
The possible combinations are endless, but the most amazing thing is that they can be obtained using a small number of basic components.
In order to achieve this objective, a single size of small yet high-performance valves to cover the vast majority of applications was conceived.
A single electronic control unit is provided when supplying 12VDC or 24VDC valves with multi-pole cables or with a field bus for each protocol.
All EB 80 versions come with an efficient diagnostic system.
The EB 80 catalogue consists of a first overall introductory chapter followed by a chapter for each subsystem.
NSF H1-certified grease is used to lubricate the valve spool and seals.



TECHNICAL DATA

Supply voltage range	V	12 -10% 24 +30%					
Minimum operating voltage	V	10.8 *					
Maximum operating voltage	V	31.2					
Maximum admissible voltage	V	32 ***					
Power for each controlled pilot	W	3 for 15 ms, then holding 0.3					
Drive (for multi-pole)		PNP or NPN					
Solenoid rating		100% ED					
Solenoid valve supply power		See chapter "Electrical connection - E"					
Signal module supply power		See chapter "Signal module - S"					
Protection		Overload and short-circuit protected solenoid pilot Output					
Diagnostics		See chapter "Electrical connection - E"					
Maximum number of solenoid pilots		21 or 38 multi-pole connection; field bus 128					
Ambient temperature	°C	-10 to + 50 (at 8 bar)					
	°F	14 to 122 (at 8 bar)					
Operating pressure		**5/2 and 5/3**			**2/2 and 3/2**		
Non-assisted valves	bar	3 to 8			3.5 to 8		
	MPa	0.3 to 0.8			0.35 to 0.8		
	psi	43 to 116			51 to 116		
Assisted valves	bar	Vacuum to 10					
	MPa	Vacuum to 1					
	psi	Vacuum to 145					
Servo pressure	bar	3 to 8			min. (see graph on page **B2**.51) / max. 8		
	MPa	0.3 to 0.8			min. (see graph on page **B2**.51) / max. 0.8		
	psi	43 to 116			min. (see graph on page **B2**.51) / max. 116		
Valve flow rate, at 6.3 bar ΔP 1 bar		**Ø 4 (5/32")**	**Ø 6**	**Ø 8 (5/16")**	**Ø 1/4"**	**Ø 10 ****	**Ø 3/8" ****
valve 2/2	Nl/min	350	430	500	430	-	-
valve 3/2	Nl/min	350	600	700	600	1250	1250
valve 5/2	Nl/min	350	650	800	650	1250 - 1400	1250 - 1400
valve 5/3	Nl/min	350	460	500	460	1000 - 1250	1000 - 1250
Actuation response time (TRA) / reset response time (TRR) at 6 bar							
TRA/TRR valve 2/2 and 3/2	ms	14 / 28					
TRA/TRR valves 5/2 monostable and shut-off valve	ms	12 / 45					
TRA/TRR valve 5/2 bistable	ms	9 / 11					
TRA/TRR valve 5/3	ms	15 / 45					
TRA/TRR valve 3/2 high flow	ms	13 / 36					
Fluid		Unlubricated air					
Air quality required		ISO 8573-1 class 4-7-3					
Degree of protection		IP65 (with connectors connected or plugged if not used)					

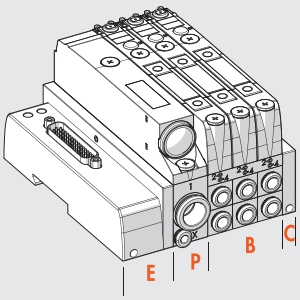
* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24
** Using high-flow valves or connected valves - see pages **B2**.52
*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

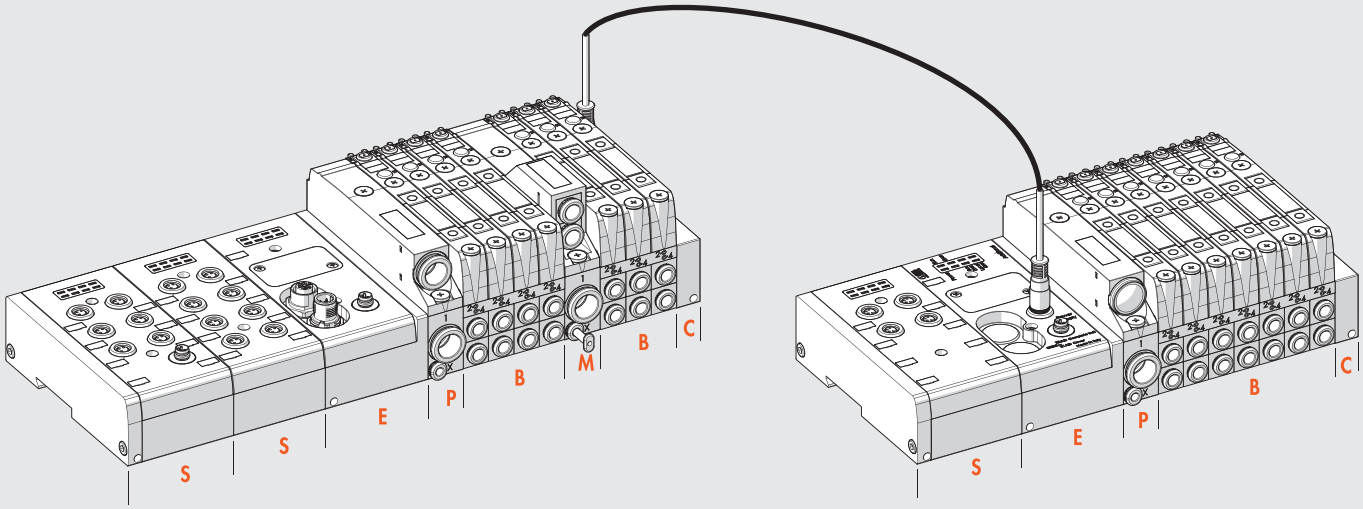
N.B.: Refer to the chapter of each EB 80 sub-assembly for specific technical data.

METAL WORK PNEUMATIC

COMPONENTS

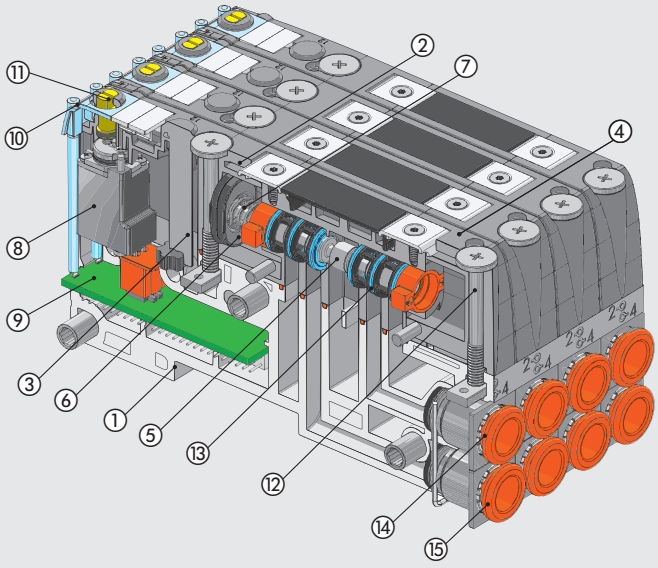
EB 80 systems are identified by a set of sub-assemblies:
- **S** I/O **S**ignal Modules
- **E** **E**lectrical connection
- **P** **P**neumatic supply
- **B** **B**ases for solenoid valves; the valves are fixed on the bases
- **M** Inter**M**ediate Modules
- **C** **C**losed end-plate





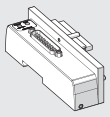
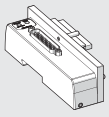
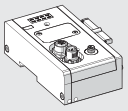
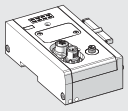
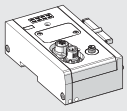
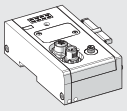
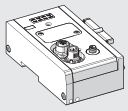
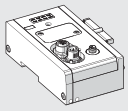
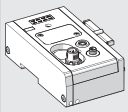
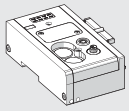
COMPONENTS – SOLENOID VALVE AND BASE

① BASE: technopolymer
② VALVE BODY: technopolymer
③ CONTROL: technopolymer
④ BASE: technopolymer
⑤ SPOOL: chemically nickel-plated aluminium
⑥ CONTROL PISTON: Stainless steel and NBR
⑦ SPRING: Oteva® steel and Dacromet treatment
⑧ SOLENOID VALVE
⑨ ELECTRONIC BOARD
⑩ LED light display: technopolymer
⑪ MANUAL CONTROL: nickel-plated brass
⑫ SCREW SECURING VALVE TO THE BASE: galvanised steel
⑬ SPOOL GASKET: NBR
⑭ Push-in fitting CARTRIDGE for port 2
⑮ Push-in fitting CARTRIDGE for port 4

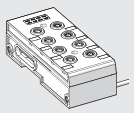
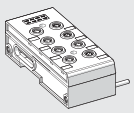
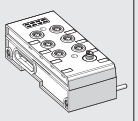
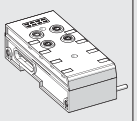
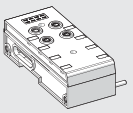
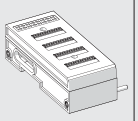
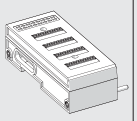
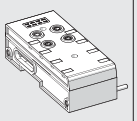


THE EB 80 WORLD

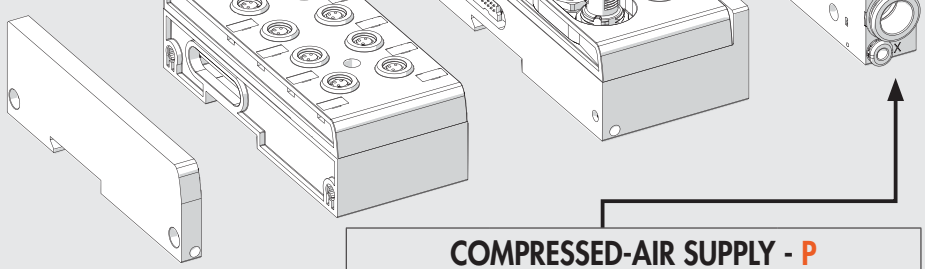
ELECTRICAL CONNECTION - E

E025	E044	E0EN	E0EC	E0PN	E0CN	E0PB	E0PL	E0IO	E0AD
									
EB 80 25-pin electrical connection	EB 80 44-pin electrical connection	EB 80 Electrical connection EtherNet/IP	EB 80 Electrical connection EtherCAT	EB 80 Electrical connection Profinet IO	EB 80 Electrical connection CANopen	EB 80 Electrical connection Profibus-DP	EB 80 Electrical connection Ethernet POWERLINK	EB 80 Electrical connection IO-Link	Additional electrical connection EB 80
See page **B2**.26	See page **B2**.26	See page **B2**.37	See page **B2**.37	See page **B2**.37	See page **B2**.37	See page **B2**.37	See page **B2**.37	See page **B2**.37	See page **B2**.42

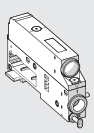
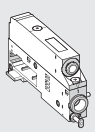
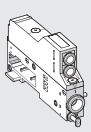
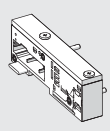
SIGNAL MODULE - S

S01	S02	S03	S04	S05	S06	S07	S08
							
EB 80 module with 8 M8 digital inputs	EB 80 module with 8 M8 digital outputs	EB 80 module with 6 M8 digital outputs + electrical supply	EB 80 module with 4 M8 analogue inputs	EB 80 module with 4 M8 analogue outputs	EB 80 module with 16 digital terminal block inputs	EB 80 module with 16 digital terminal block outputs	EB 80 module with 4 M8 analogue inputs for temperature measurement
See page **B2**.16	See page **B2**.16	See page **B2**.17	See page **B2**.17	See page **B2**.18	See page **B2**.18	See page **B2**.19	See page **B2**.19

Part included in the **ELECTRICAL CONNECTION - E** with Fieldbus

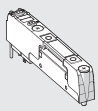
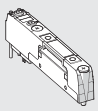
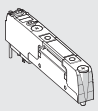
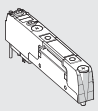
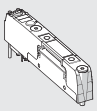
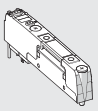
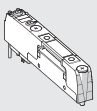
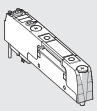
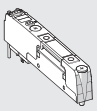
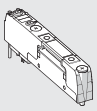
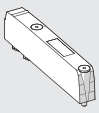
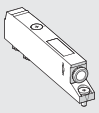


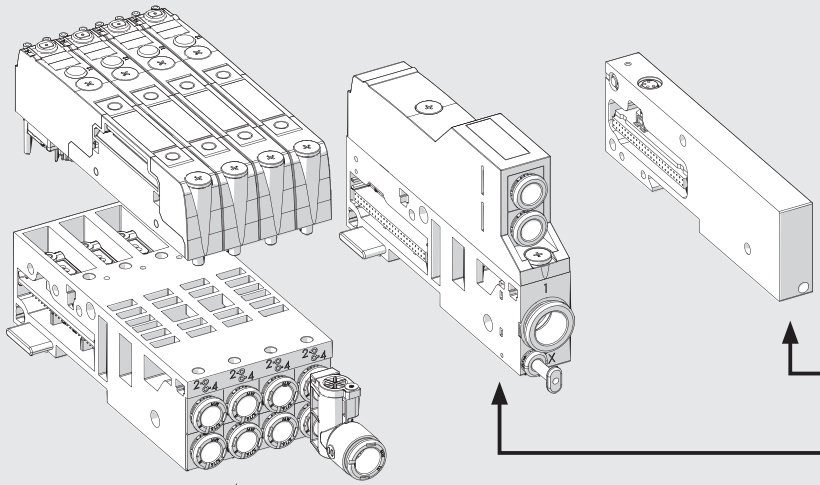
COMPRESSED-AIR SUPPLY - P

P_ _Z00	P_ _Z_ _	P_ _Z60	P91Z90
			
Compressed air supply - Silenced relief	Compressed air supply - Conveyed relief	Compressed air supply - Separate reliefs	Module for electric version only
See page **B2**.45	See page **B2**.45	See page **B2**.45	See page **B2**.46

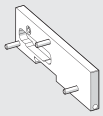
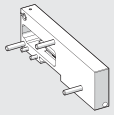
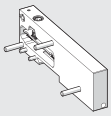
METAL WORK PNEUMATIC

VALVES

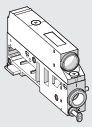
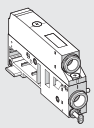
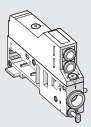
Z_	I_	W_	L_	V_	K_	O_	G_	J_	R_	N0	Y8
											
2 valves 2/2 NC	2 valves 3/2 NC (valid as 5/3 OC)	2 valves 3/2 NO (valid as 5/3 PC)	3/2 NC + 3/2 NO	monostable 5/2	bistable 5/2	5/3 CC	3/2 NC high flow	3/2 NO high flow	Shut-off valve	Dummy valve	Bypass
See page **B2**.51	See page **B2**.51	See page **B2**.51	See page **B2**.51	See page **B2**.51	See page **B2**.51	See page **B2**.51	See page **B2**.52	See page **B2**.52	See page **B2**.53	See page **B2**.54	See page **B2**.54



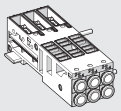
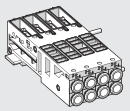
CLOSED END-PLATE - C

C1	C2	C3
		
Closed end-plate for islands with multi-pole connector	Closed end-plate for islands with fieldbus	Closed end-plate for electrical connection of islands with fieldbus to additional islands
See page **B2**.62	See page **B2**.62	See page **B2**.62

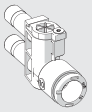
INTERMEDIATE SUPPORT - M

M_ _ _ Z0_	M_ _ _ Z_ _	M_ _ _ Z6_
		
Intermediate module - Silenced relief	Intermediate module - Conveyed relief	Intermediate module - Separate relief
See page **B2**.57	See page **B2**.58	See page **B2**.59

BASES FOR VALVES - B

B3_ _ _ _ _0	B4_ _ _ _ _ _
	
3-position base for valves	4-position base for valves
See page **B2**.48	See page **B2**.48

Y-FITTING

R2

Y-fitting
See page **B2**.55

FIXING OPTIONS

1 - Fixing on a DIN bar: tighten the grub screws into modules E (electrical connection) and C (closed end plate).
For islands with more than 40 valves or 5 modules, also use the additional plate code 02282R4001.

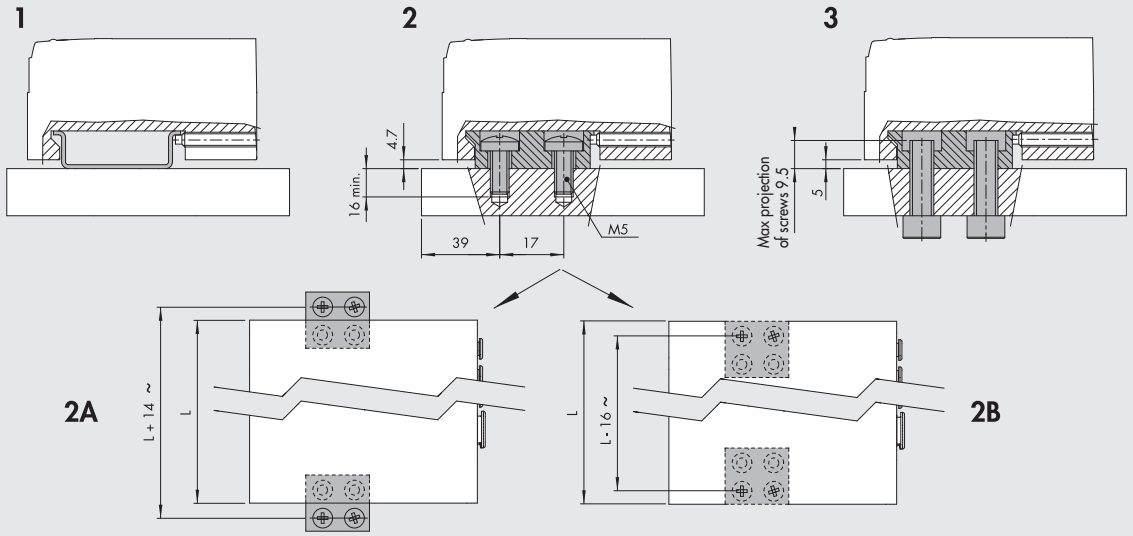
2 - Fixing on a flat surface: use the pair of brackets code 02282R4000 and the M5x20 screws supplied.
You can choose where to position the brackets in relation to the island:

2A - *Protruding brackets*: can be used to install the island + brackets unit from above. First secure the brackets to the modules E and C using the grub screws, then secure everything with M5x20 screws.

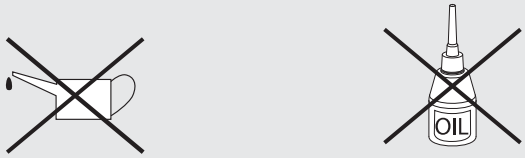
2B - *Concealed brackets*: the overall dimensions of the island are reduced. First secure the brackets to the flat top with M5x20 screws, then place the island onto the brackets and lock the two grub screws provided in the modules E and C.

3 - Fixing through a wall: use the brackets code 02282R4000. The brackets come with M6 threaded holes and can be fixed with M6 screws (not included in the supply) passing through the wall. The brackets can fixed either protruded or concealed.

N.B.: Planar surfaces are required to ensure correct fixing. Avoid twisting or bending the valve units.



LUBRICATION



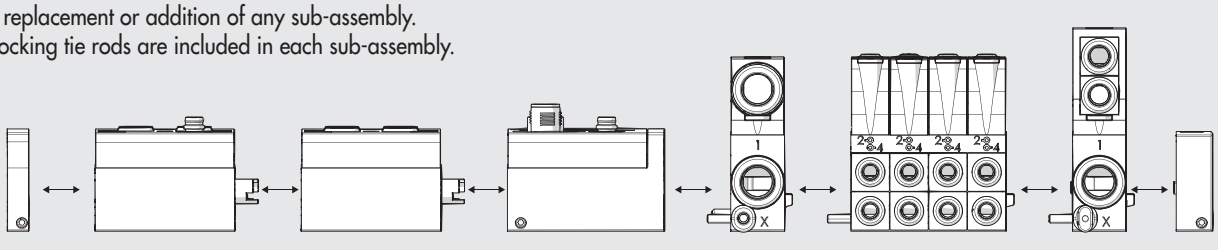
NO LUBE NO OIL

The EB 80 electro-pneumatic system is designed to run millions of cycles without the need for any lubrication. This is possible thanks to the optimisation of its components and the use of a special grease with excellent properties and NSF H1 certified. To avoid removing the grease, it is highly recommended not to lubricate the valve input and output ports and check the quality (to ISO 8573-1 class 4-7-3) of the compressed air used, which is often contaminated by particularly aggressive oils that are released by compressors and are not always compatible with the elastomers used in the valves.

SOME CHARACTERISTICS OF EB 80 SYSTEMS

HORIZONTAL MODULARITY

- Easy replacement or addition of any sub-assembly.
  The locking tie rods are included in each sub-assembly.

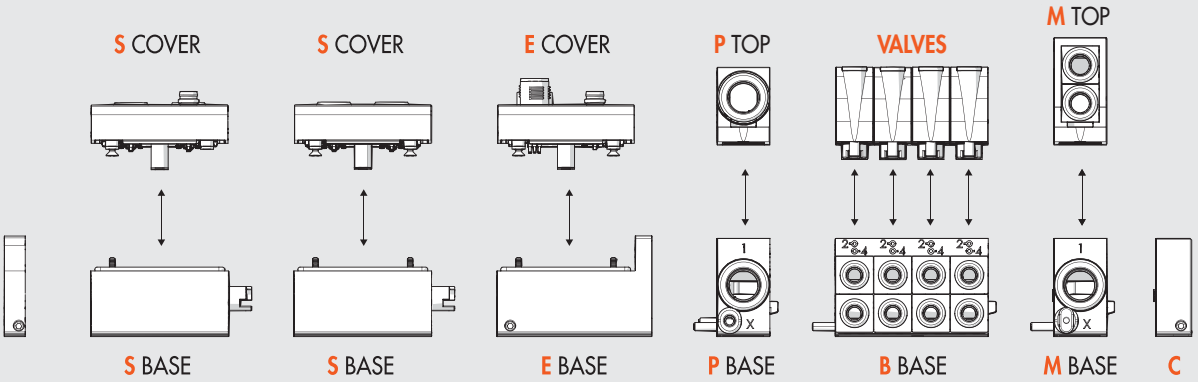


METAL WORK PNEUMATIC

VERTICAL MODULARITY

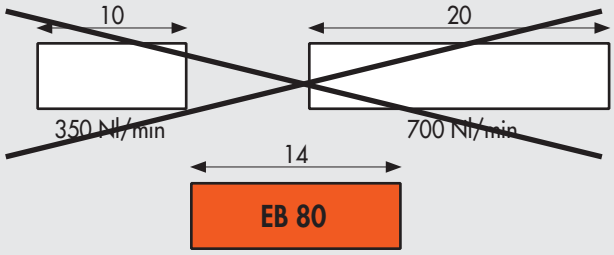
- Easy replacement – no need to disassemble the pack – of the valves on the Bases – B and also of the top part (cover) of subsystems **S**, **E**, **P**, **M** using a single Phillips-head screwdriver.

N.B.: All protocols can be mounted on the base for field buses and all input or output modules can be mounted on the same base for signals.



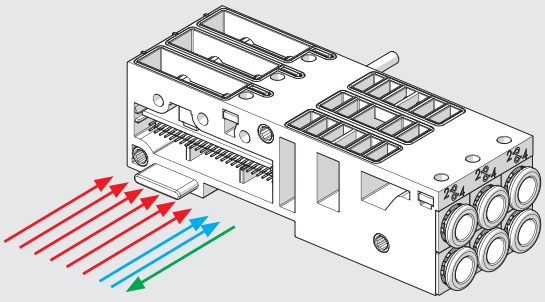
ONE SIZE FITS ALL

- Reduced dimensions
- High flow rate
- One warehouse and spares



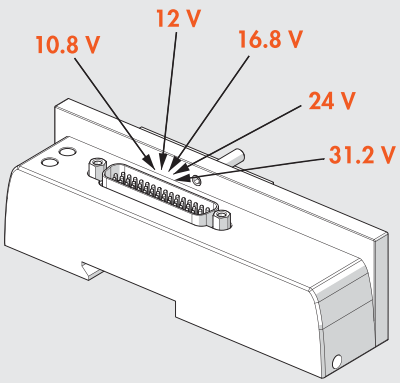
THE SAME BASE FITS BOTH MULTI-POLE CONNECTIONS AND FIELD BUSES

- Controls from multi-pole connection
- Controls from field buses
- Diagnostics



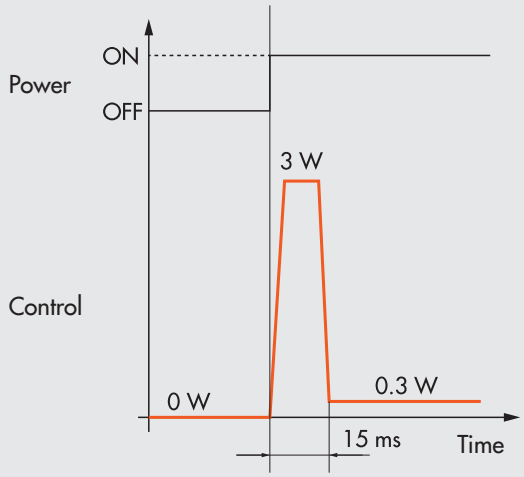
PATENTED

THE SAME ISLAND CAN BE SUPPLIED 10.8 - 31.2 VDC



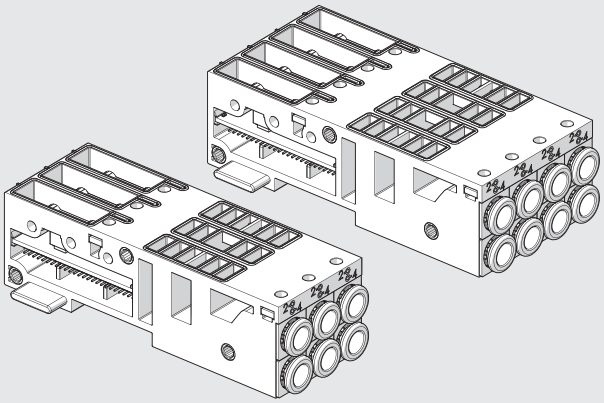
ONLY 0.3 W FOR EACH SOLENOID VALVE

- Speed-up solenoid valve control:
  - high power for a few milliseconds ensures high performance and rapid and safe switching;
  - reduced holding power resulting in reduced temperatures and energy saving.



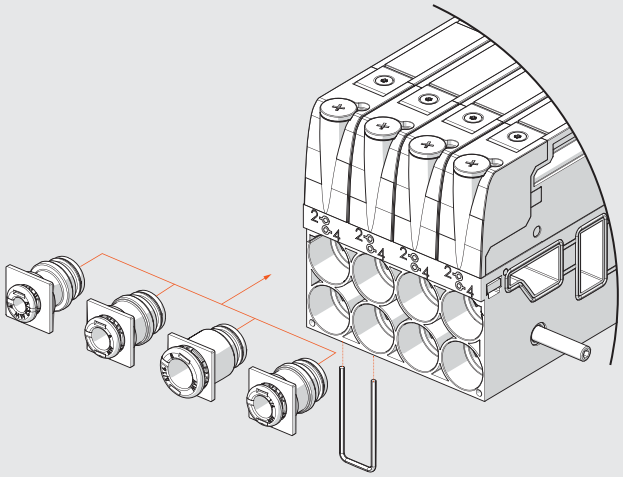
3- OR 4-POSITION BASES FOR VALVES

- Island layout options:
  - **3** 1 base with 3 positions
  - **4** 1 base with 4 positions
  - (**5** 2 bases with 3 positions and 1 dummy valve)
  - **6** 2 bases with 3 positions
  - **7** 1 base with 3 and 1 with 4 positions
  - **8** 2 bases with 4 positions
  - ...
- Compared to single-base solutions, this configuration is advantageous because:
  - just a few bases are required for multiple positions;
  - the base is sturdy and rigid;
  - there is plenty of space to accommodate smart electronics



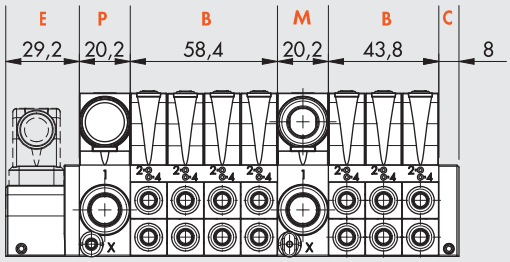
INTERCHANGEABLE CARTRIDGE FITTINGS

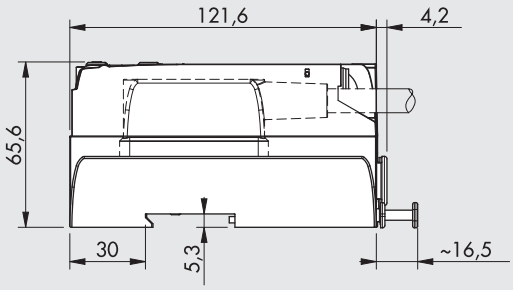
- For pipes Ø 4 (5/32"), 6, 8 (5/16"), 1/4"

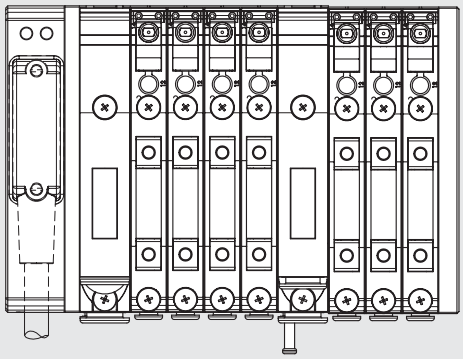


DIMENSIONS

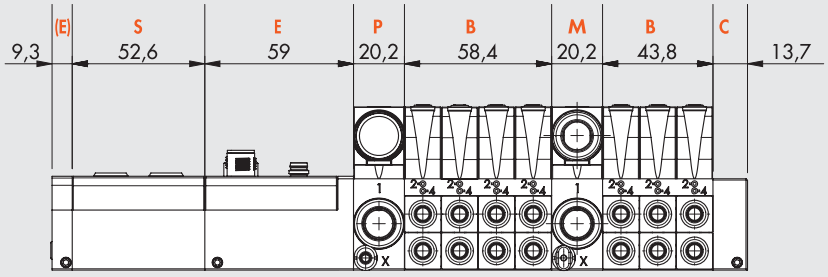
DIMENSION OF VERSIONS WITH MULTI-POLE CONNECTION

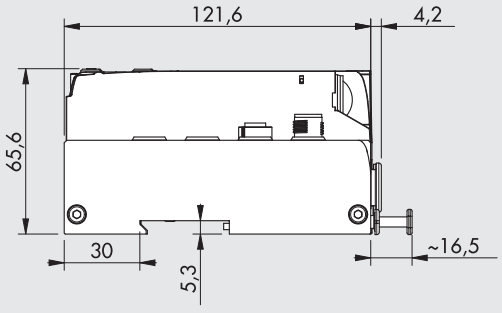


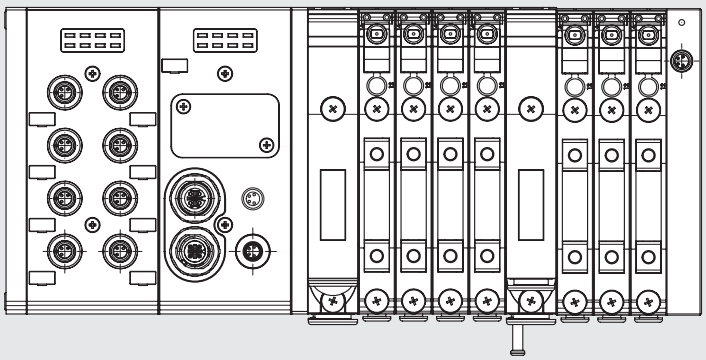




DIMENSION OF VERSIONS WITH FIELD BUS OR ADDITIONAL CONNECTION







DESCRIPTION

A complete system has a compound **description** of all its subsystems listed in sequence from left to right, as shown below.
The abbreviation of each subsystem is obtained by taking the code and omitting the first digits 02282.
For example: the digital 8-input signal module is identified with code 02282S01; only write S01 in the description.

The abbreviation of each base for valves consists of:

Abbreviation of the Base	**Manual valve control**	**Type of valves**
Obtained from the code, after removing 02282	0 = monostable 1 = bistable	Valves Dummy valve Bypass
Example		
4-position base, 8 solenoid pilots, Ø 6 pipe; code 02282B4086666	Monostable	2 monostable 5/2 valves - V 1 double 3/2 NO - W 1 dummy valve - F
Abbreviation		
B4086666	0	VVWF

The description is therefore a sequence of this type:

EB 80	**- S_ _**	**- E_ _ _**	**- P_ _ _ _ _**	**- B_ _ _ _ _ _ _ _ _ _ _**	**- M_ _ _ _ _ _**	**- C_**
EB 80 system	**Signal module** (if present)	**Electrical connection**	**Compressed air supply**	**Base for valves** (as many as there are) with normal or dummy	**Intermediate** (if present)	**Closed end-plate**
For the codes:	see page **B2**.20	see page **B2**.24	see page **B2**.46	see page **B2**.49 and **B2**.54	see page **B2**.60	see page **B2**.63

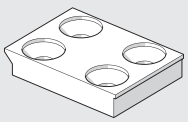
Example:
EB 80-S01-E0EN-P3XZ00-B40866660VWKN-M300Z30-B30388800VVN-C2

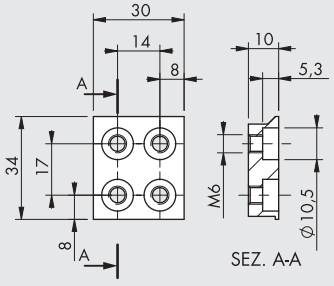
EB 80	**- S01**	**- E0EN**	**- P3XZ00**	**- B40866660VWKN**	**- M300Z30**	**- B30388800VVN**	**- C2**
EB 80 system	**Signal module** complete 8 M8 digital inputs	**Electrical connection** EtherNet/IP	**Compressed air supply** - fitting Ø 12 - pilot servo Ø 4 - silenced relief	**Base for valves** - 4 positions - 8 controls - fittings for pipe Ø 6 - manual monostable control - 5/2 monostable valve - 2 3/2 NO valves - bistable 5/2 valve - dummy valve	**Intermediate** - fittings for pipe Ø 12 - through ports - without supplementary power supply	**Base** - 3 positions - 3 controls - fittings for pipe Ø 8 - manual monostable control - 5/2 monostable valve - 5/2 monostable valve - dummy valve	**Closed end-plate** for valve Island with field bus

Endless number of EB 80 systems can be obtained and their description is variable in length, which can be very extended.
The actual ordering CODE of an EB 80 system is created by Metal Work S.p.a. with a limited number of characters.
The ordering code is not explicative. The description only is univocal, complete and explicative.

ACCESSORIES

FIXING BRACKET





Code	**Description**	**Weight [g]**
02282R4000	EB 80 base fixing bracket	47

Note: 2 pieces per pack complete with 4 M5x20 screws

NOTES

Please refer to the subsystem chapter for other accessories (e.g. connectors) and spare parts.

EB 80 INDUSTRY 4.0

The new advanced EB 80 diagnostic functions, known as EB 80 I4.0, provide a powerful analysis tool for traditional maintenance operations, ensuring the safe, reliable and lasting operation of production units.
They are available for all electrical connections with fieldbuses and bases marked I4.0, with advanced diagnostics integrated in accordance with Industry 4.0 philosophy.
These functions use the original EB 80 diagnostics, integrating them with the ability of the station itself to control IOs.
They re-organise and optimise maintenance management by developing predictive maintenance in order to:
- predict faults;
- intervene early to avoid system downtime;
- have all information on equipment operation available in real time;
- monitor component end-of-lifetime;
- optimise warehouse spare parts management.

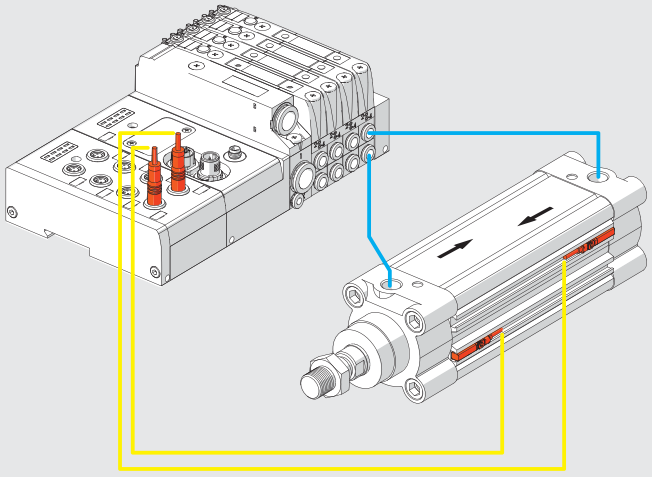
This makes it possible to turn the data collected into concrete actions using standard EB 80 stations without needing additional modules.

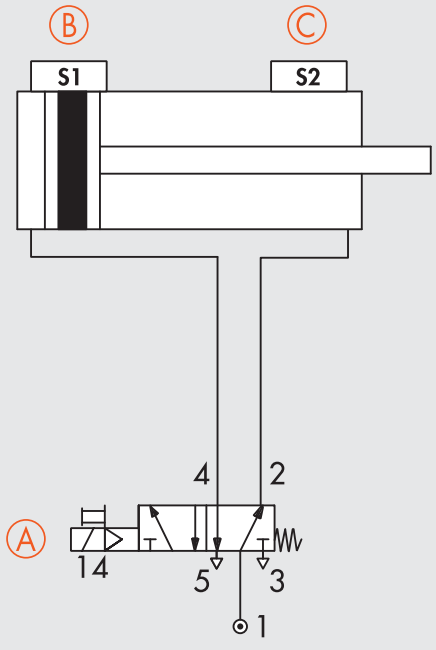
Description of EB 80 I4.0 functions:

• System data:
- EB 80 system startup counter;
- supply alert counter.

• Valve data. Each valve base for each solenoid valve permanently stores the following information:
- cycle counter;
- counter for total solenoid valve excitation time;
- activation of a flag to signal average lifetime exceeded;
- short circuit alert counter;
- open circuit alert counter.

• Electropneumatic system control functions (data updated with each cycle):
- measurement of the delay between activating the solenoid valve "A" and actuator movement commencing via the signal of sensor "B", with delays that exceed the limit flagged;
- measurement of actuator movement time using two linked sensors "B" and "C", with exceeded time limits flagged;
- measurement of the delay between deactivating the solenoid valve "A" (or activating a second valve) and actuator return commencing via the signal of sensor "B", with exceeded time limits flagged;
- measurement of actuator return time using two linked sensors "B" and "C", with exceeded time limits flagged;
- counter for actuator range of motion.

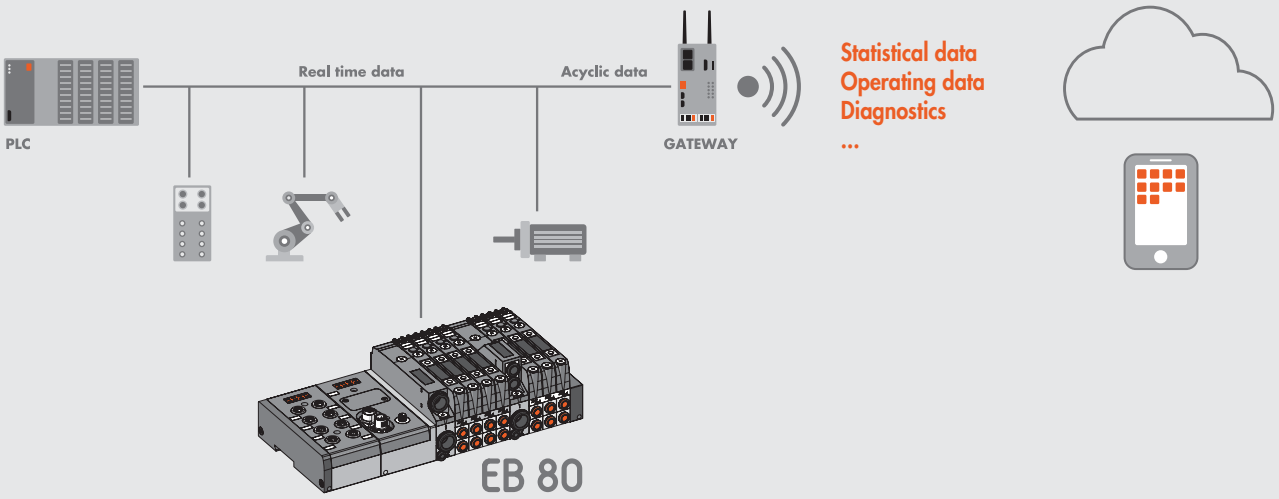




Electrical connection modules can be used to complement the EB 80 with the main field buses available in the market. In this way, the control system (generally a PLC) can handle in real time the behaviour of the solenoid valve island, including signal modules.

With the introduction of the I4.0 version, the field bus connection modules also send to the network the historical and diagnostic data relating to the behaviour of the island (such as the number of cycles for each solenoid pilot, total activation time and alarms) and the controlled pneumatic circuit (such as the delay times in sensor switching and actuator activation times).

This data is also sent to the control system and can be handled differently depending on the situation: in some cases, it can be used in real time, like in the case of fault alarms; in other cases, it can be sent to a storage local unit or one remotely controlled on a cloud server, and is analysed in a subsequent stage; in other cases, the alarms can be sent to a teleservice station that can monitor the state of the system remotely.



EB 80 SIGNAL MODULES - S

The EB 80 systems come with numerous input or output signal modules, which can be mounted on systems with fieldbus electrical connection or additional systems.
The signal modules can be added at any time. You only need to unscrew the aluminium plate to the left side of the "Electrical connection - E" module and install the "Signal Modules - S" (ready fitted with fixing tie rods) and retighten the end plate to the left.
Each signal module consists of two parts: the lower part, which contains transmission electronics of the controls, is unique and valid for all modules; the upper part, which is specific for each type.
This design highlights the modular features of the EB 80 system: the upper part of the "Signal Module - S" can be replaced either with a similar one by simply unscrewing the screws in the event of failure or one of another type.
All this without having to remove anything from the system.

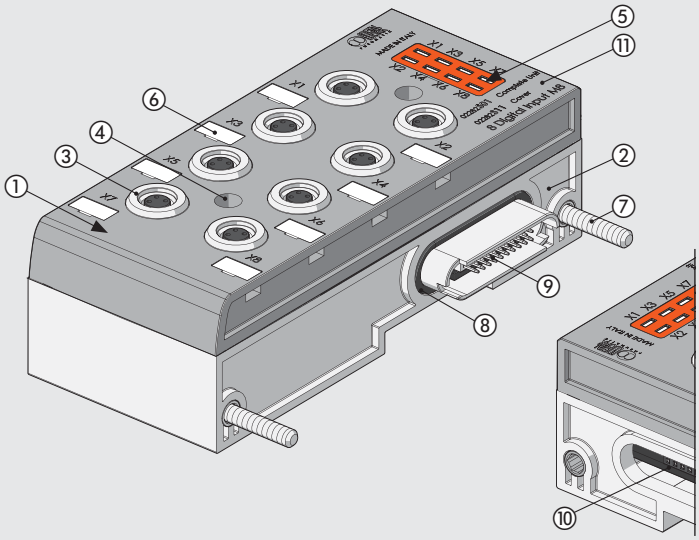
TECHNICAL DATA

Supply voltage range	V	12 -10% 24 +30%
Minimum operating voltage	V	10.8 *
Maximum operating voltage	V	31.2
Maximum admissible voltage	V	32 ***
Power and current		see individual "Signal Modules - S"
Protection		Overload and polarity inversion protection
Diagnostics		Local via LED light and software message
		Undervoltage, overvoltage, short-circuit and overload of individual connector and the entire module,
Maximum number of signal modules		16 digital inputs modules 8 M8 +
		16 digital outputs modules 8 M8 (or 8 modules with 16 Inputs + 8 modules with 16 Outputs) ** +
		4 analogue inputs modules + 4 analogue outputs modules +
		4 analogue input modules for temperature measurement
Ambient temperature	°C	-10 to + 50
	°F	14 to 122
Versions		digital input, digital output, analogue input, analogue output
Degree of protection		IP65 (with connectors connected or plugged if not used)
		IP40 for 16-position I/O modules

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24
** **For 16-IN/OUT modules, powered via the fieldbus. Check that the total current of simultaneously connected Inputs and Outputs is not greater than 3.5 A.**
*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**
N.B.: Refer to the following pages for specific technical data of each module.

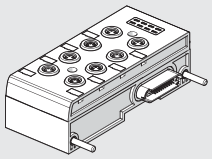
COMPONENTS

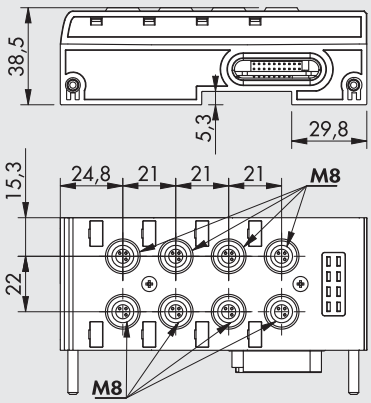
① UPPER PART BODY: technopolymer
② LOWER PART BODY: technopolymer
③ M8 CONNECTOR: signal connection
④ SCREW securing the upper part to the lower part
⑤ LED light
⑥ NAMEPLATE: removable
⑦ TIE ROD to secure modules: galvanized brass and steel
⑧ GASKET: NBR
⑨ MALE CONNECTOR for other modules - S or fieldbus connection - E
⑩ FEMALE CONNECTOR for other modules - S or fieldbus connection - E
⑪ IDENTIFICATION of wording with laser

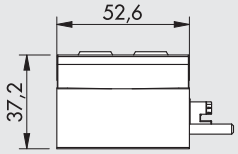


DIMENSIONS - ORDERING CODES

8 M8 DIGITAL INPUTS



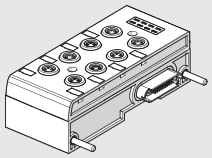


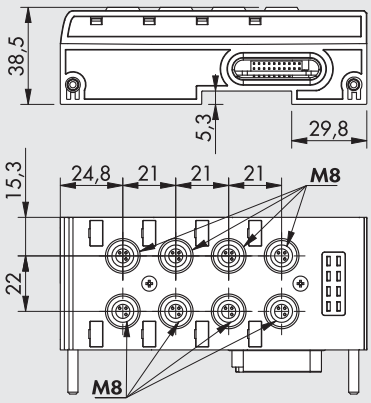


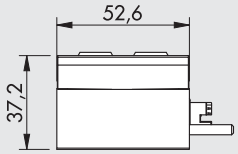
Code	Description	Weight [g]
02282**S01**	EB 80 module with 8 M8 digital inputs	240

TECHNICAL DATA		
Sensors supply voltage		Corresponding to the supply voltage
Current for each connector	mA	max 200
Current for each module	mA	max 500
Input impedance	kΩ	3.9
Type of input		Software-configurable PNP/NPN
Protection		Overload and short-circuit protected inputs
Connections		8 M8 3-pole female connectors
Input active signals		One LED for each input

8 M8 DIGITAL OUTPUTS



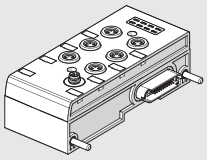


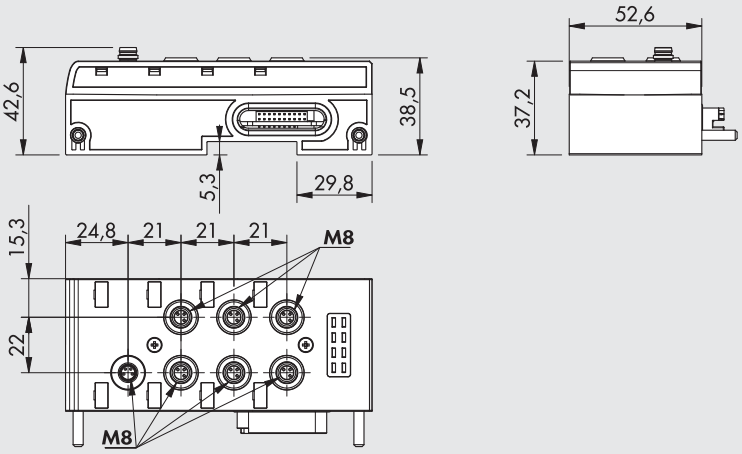


Code	Description	Weight [g]
02282**S02**	EB 80 module with 8 M8 digital outputs	240

TECHNICAL DATA		
Output voltage		Corresponding to the supply voltage
Current for each connector	mA	max 500
Current for each module	mA	max 3000
Type of output		Software-configurable PNP/NPN
Protection		Overload and short-circuit protected inputs
Connections		8 M8 3-pole female connectors
Outputs active signals		One LED for each output

6 M8 DIGITAL OUTPUTS + ELECTRICAL POWER SUPPLY





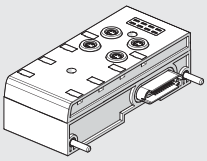
Code	Description	Weight [g]
02282**S03**	EB 80 module with 6 M8 digital outputs + electrical supply	248

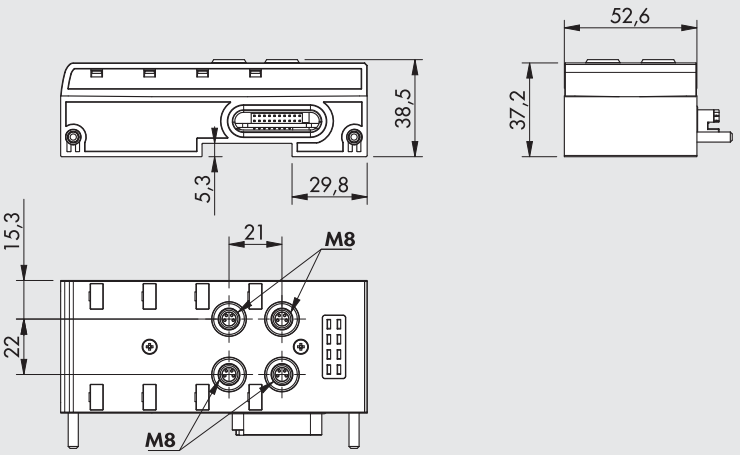
TECHNICAL DATA		
Supply voltage range	V	12 -10% 24 +30%
Minimum operating voltage	V	10.8 *
Maximum operating voltage	V	31.2
Maximum admissible voltage	V	32 ***
Output voltage		Corresponding to the supply voltage
Current for each connector	mA	max 1000
Current for each module	mA	max 4000
Type of output		Software-configurable PNP/NPN
Protection		Overload and short-circuit protected inputs
Connections		6 M8 3-pole female connectors for Signals
		1 M8 4-pole male connector for Supply
Input active signals		One LED for each input

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24

*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

4 M8 ANALOGUE INPUTS

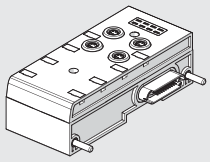


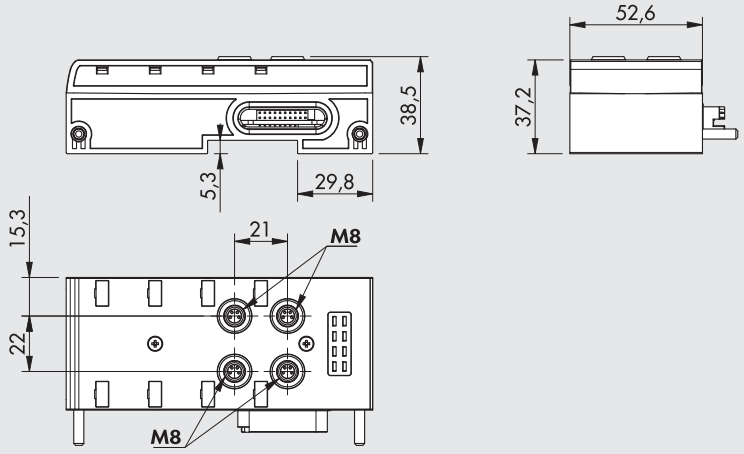


Code	Description	Weight [g]
02282**S04**	EB 80 module with 4 M8 analogue inputs	223

TECHNICAL DATA		
Sensors supply voltage		Corresponding to the supply voltage
Current for each connector	mA	max 200
Current for each module	mA	max 650
Type of input, software configurable		0/10 V; 0/5 V; +/-10 V; +/-5 V; 4/20 mA; 0/20 mA
Protection		Overload and short-circuit protected inputs
Connections		4 M8 4-pin female connectors
Local diagnostic signal via LED		Overload, short-circuit or type of input not complying with the configuration
Digital convert resolution		15 bit + prefix

4 M8 ANALOGUE OUTPUTS

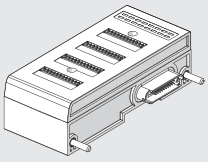


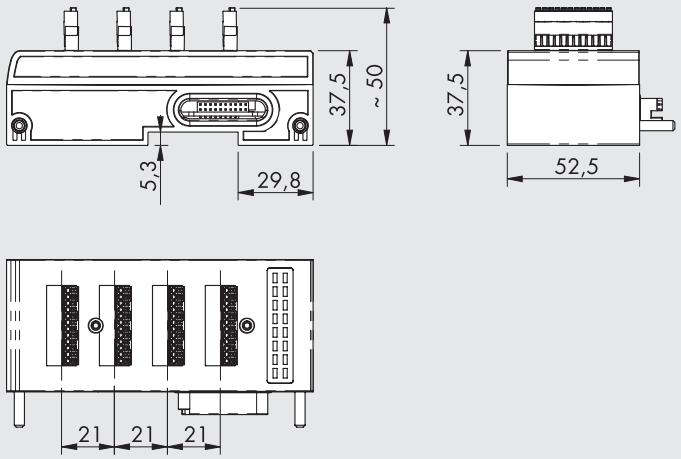


Code	Description	Weight [g]
02282**S05**	EB 80 module with 4 M8 analogue outputs	223

TECHNICAL DATA		
Devices supply voltage		Corresponding to the supply voltage
Current for each connector	mA	max 200
Current for each module	mA	max 650
Type of output		0/10 V; 0/5 V; +/-10 V; +/-5 V; 4/20 mA; 0/20 mA
Protection		Overload and short-circuit protected outputs
Connections		4 M8 4-pole female connectors
Local diagnostic signal via LED		Overload, short-circuit or type of connection not complying with the configuration
Digital convert resolution		15 bit + prefix

16 DIGITAL TERMINAL BLOCK INPUTS

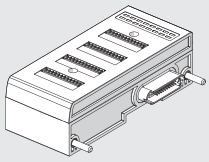


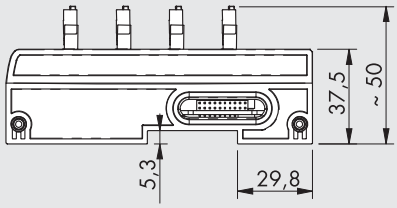


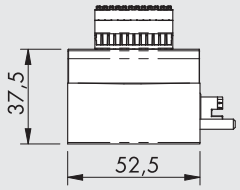
Code	Description	Weight [g]
02282**S06**	EB 80 module with 16 digital terminal block inputs	240

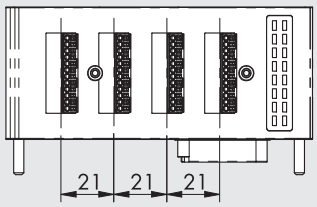
TECHNICAL DATA		
Sensors supply voltage		Corresponding to the supply voltage
Current for each connector	mA	max 200
Current for each module	mA	max 500
Input impedance	kΩ	3.9
Type of input		Software-configurable PNP/NPN
Protection		Overload and short-circuit protected inputs
Connections		4 12-pin connectors with spring clamping
Input active signals		One LED for each input
Degree of protection		IP40

16 DIGITAL TERMINAL BLOCK OUTPUTS







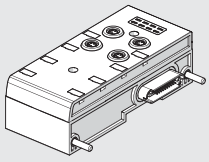


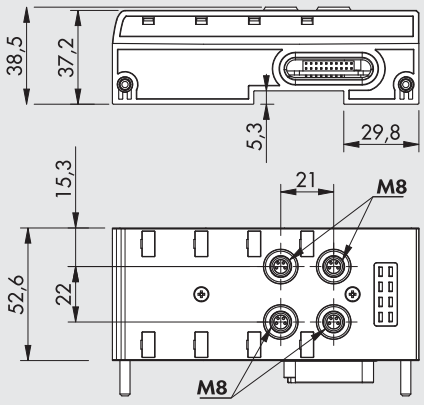
Code	Description	Weight [g]
02282**S07**	EB 80 module with 16 digital terminal block outputs	240

TECHNICAL DATA		
Output voltage		Corresponding to the supply voltage
Current for each connector	mA	max 500
Current for each module	mA	max 3000 *
Type of output		Software-configurable PNP/NPN
Protection		Overload and short-circuit protected outputs
Connections		4 12-pin connectors with spring clamping
Outputs active signals		One LED for each Output
Degree of protection		IP40

*** IMPORTANT: the module is powered via the fieldbus. Check that the total current of connected outputs is not greater than 3.5A.**

4 M8 ANALOGUE INPUTS FOR TEMPERATURE MEASUREMENT





Code	Description	Weight [g]
02282**S08**	EB 80 module with 4 M8 analogue inputs for temperature measurement	223

TECHNICAL DATA		
Sensors supply voltage		Corresponding to the supply voltage
Maximum input voltage	VDC	30
Sensor type (RTD)		
platinum (-200 to +850°C)		Pt100, Pt200, Pt500, Pt1000 (TK = 0.00385 and TK = 0.00391)
nickel (-60 to +180°C)		Ni100, Ni120, Ni500, Ni1000 (TK = 0.00618)
Connections type (RTD)		2, 3 or 4-wire
Type of thermocouple (TC)		J, E, T, K, N, S, B, R
Cold junction compensation for thermocouples		
internal		With internal electronic sensor included
external (recommended in case of sudden changes in the ambient temperature)		PT1000 sensor for connection with the M8 thermocouple connector
Temperature range	°C	– 200 to + 800
	°F	– 328 to + 1472
Digital convert resolution		15 bit + prefix
Max error compared to ambient temperature		±0.5% (TC)
		±0.06% (RTD)
Max. basic error (ambient T 25°C)		±0.4% (TC)
	°C	±0.6 (with 4-wire RTD with 0.1 resolution)
	°C	±0.2 (with 4-wire RTD with 0.01 resolution)
Repeatability (ambient T 25°C)		±0.03%
Address employment		2 bytes for each input - 8 bytes per module
Cycle time (module)	ms	240
Software linearization		
for RTD		Piecewise linear approximation
for TC		NIST (National Institute of Standards and Technology) Linearization based on ITS-90 scale (International Temperature Scale of 1990) for the thermocouple linearization
Maximum length of shielded cable for the connection	m	< 30
Diagnostics		One LED for each input and reporting to the Master

KEY TO CODES

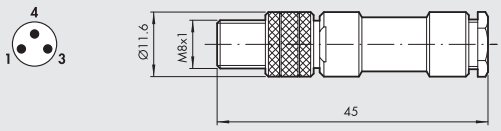
02282	S	0	1
FAMILY	**SUBSYSTEM**	**SUPPLY**	**TYPE**
02282 EB 80	**S** Signals	**0** Complete	**1** 8 M8 digital inputs **2** 8 M8 digital outputs **3** 6 M8 digitaloutputs + electrical supply **4** 4 M8 analogue inputs **5** 4 M8 analogue outputs **6** 16 digital terminal block inputs **7** 16 digital terminal block outputs **8** 4 M8 analogue inputs for temperature measurement

ACCESSORIES

M8 PLUG

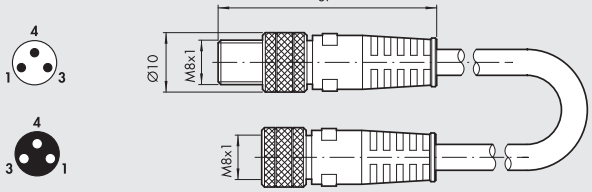
Code	Description
0240009039	Plug for M8 connector

M8 CONNECTOR FOR DIGITAL INPUTS / OUTPUTS



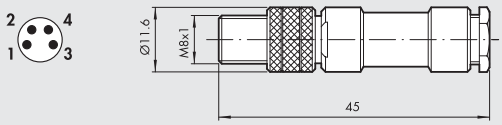
Code	Description
0240009010	M8 3-pin straight connector

M8 CONNECTOR WITH CABLE FOR DIGITAL INPUTS /OUTPUTS



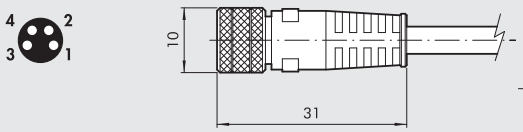
Code	Description
0240009009	M8-M8 3-pin straight connector with cable L = 3 m

M8 MALE CONNECTOR FOR ANALOGUE INPUTS/OUTPUTS



Code	Description
0240010300	M8 4-pin male connector

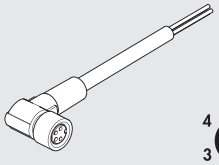
M8 CONNECTOR FOR POWER SUPPLY



Pin	Cable color
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009060	M8 4-pin female connector for power supply, cable L = 3 m
0240009037	M8 4-pin female connector for power supply, cable L = 5 m
0240009058	M8 4-pin female connector for power supply, cable L = 10 m
0240009059	M8 4-pin female connector for power supply, cable L = 15 m

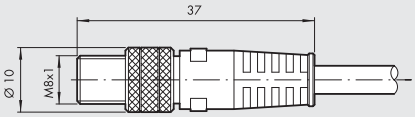
90° M8 CONNECTORS



Pin	Cable color
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009102	M8 4-pin connector - female, 90° angle L = 2 m
0240009103	M8 4-pin connector - female, 90° angle L = 5 m

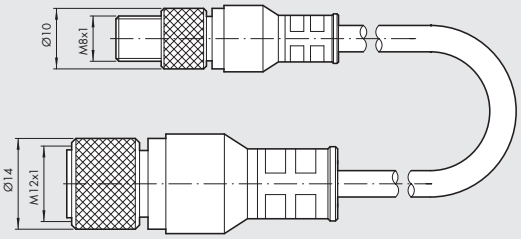
M8 4-POLE MALE CONNECTOR



Pin	Colore cavo
1	Marrone
2	Bianco
3	Blu
4	Nero

Code	Description
0240010105	M8 4-pin connector shielded cable L = 5 m

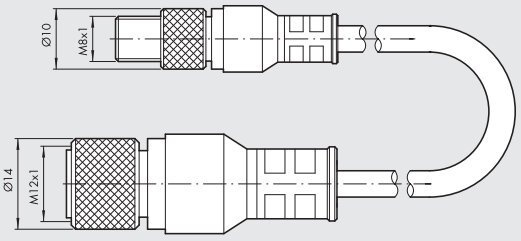
M8 3-POLE MALE – M12 5-POLE FEMALE CONNECTOR WITH CABLE FOR DIGITAL INPUTS/OUTPUTS



Code	Description
0240009045	M8 3-pole male straight - M12 5-pole female connector with cable L= 0.2 m

M8	M12
pin 1	pin 1
pin 2	pin 2
pin 3	pin 3

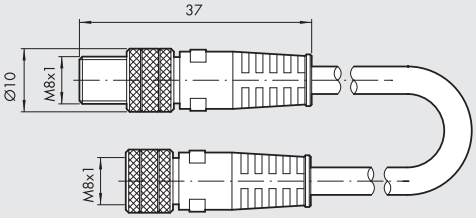
M8 4-POLE MALE – M12 8-POLE FEMALE CONNECTOR WITH CABLE FOR REGTRONIC CONNECTION



Code	Description
0240009046	M8 4-pole male straight - M12 8-pole female connector with cable L= 1 m

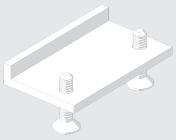
M8	M12
pin 1	pin 8
pin 2	pin 3
pin 3	pin 7
pin 4	disconnect

M8 CONNECTOR WITH SHIELDED CABLE FOR ANALOGUE INPUTS/OUTPUTS



Code	Description
0240005005	M8-M, M8-F 4-pole straight connector with shielded cable L = 1 m
0240005006	M8-M, M8-F 4-pole straight connector with shielded cable L = 3 m
0240005003	M8-M, M8-F 4-pole straight connector with shielded cable L = 5 m
0240005008	M8-M, M8-F 4-pole straight connector with shielded cable L = 10 m

ADDITIONAL FIXING BRACKET TO OMEGA BAR



Code	Description	Weight [g]
02282R4001	Additional fixing bar accessory to EB 80 omega bar	5

Individually packed

N.B.: to be used to improve the fixing to Omega bars of islands with more than 40 valves. The bracket must be positioned every 20-25 valves.

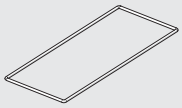
SPARE PARTS

EB 80 BUS/SIGNAL INTERFACE OR SEAL

Code	Description
02282R1005	EB 80 BUS/Signal interface OR seal

Comes in 10-pc. packs

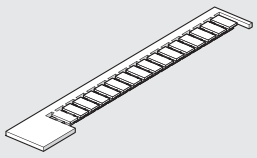
EB 80 GASKET BETWEEN BASE AND BUS/SIGNAL COVER



Code	Description
02282R1004	Kit of gaskets between base and BUS/Signal cover

Comes in 10-pc. packs

IDENTIFICATION PLATE KIT



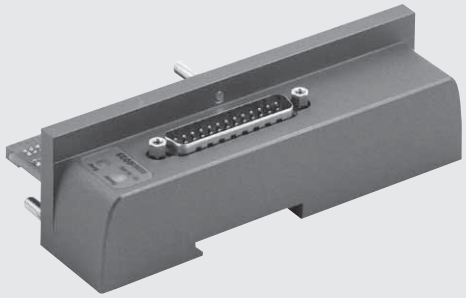
Code	Description
0226107000	Identification plate kit

Comes in 10-pc. packs

NOTES

EB 80 ELECTRICAL CONNECTION - E

The job of the "Electrical Connection - E" subsystem is to power the EB 80 systems, transmit control signals for the solenoid valves, send and receive signals for the input/output management modules and control diagnostics.
Versions with a multi-pole connector or fieldbus are also available.
It is worth noting that the island of solenoid valves functions equally with both systems. This means that all the valves, bases and intermediate elements can work both with parallel and serial controls (patented).
Smart electronics of all electrical connection modules, including multi-pole ones, can be used to control unexpected functions, including very interesting diagnostics.
The system can be supplied with a very wide voltage range, so much so that the EB 80 island can be controlled either at 12VDC or 24VDC (patented).
Overvoltages up to 30% of the rated value, i.e. up to 31.2V, are admitted.
The minimum voltage for solenoid pilots can be 10.8V, i.e. 12V-10%.
The body of the multi-pole version is made of metal in one piece.
Versions with a fieldbus instead consist of two parts: a lower part, with a single metal body separate from the bus protocol; an upper part with a technopolymer body dedicated to each specific bus protocol.



TECHNICAL DATA

Supply voltage range	V	12 -10% 24 +30%			
Minimum operating voltage	V	10.8 *			
Maximum operating voltage	V	31.2			
Maximum admissible voltage	V	32 ***			
Drive (for multi-pole)		PNP or NPN			
Solenoid rating		100% ED			
Power supply without controlled valves:					
steady rate, with multi-pole connection	W	0.1 for "Electrical connection - E" + 0.25 for each "Base - B"			
steady rate, with fieldbus connection	W	4 for "Electrical connection - E" + 0.25 for each "Base - B"			
Signal module supply power		See chapter "Signal module - S"			
Maximum operating power supply (data useful for the sizing of the power supply unit)	W	3.15 for each solenoid pilot operated simultaneously + input and output			
Maximum current admissible					
with multi-pole connection	A	6 continuous, 9 instantaneous			
with fieldbus connection	A	4 continuous, 6 instantaneous for valve supply			
		4 continuous, 6 instantaneous for bus and signal supply			
Protection		Overload and short-circuit protected solenoid pilot Output			
Diagnostics		LED signal on valve, LED light on electrical connection.			
		With multi-pole: fault signal OUT activation.			
		With field bus: software message.			
Faults signalled		Short-circuited solenoid pilot; Solenoid pilot broken or missing			
		Power supply out of range (under-voltage or over-voltage)			
		With fieldbus only, different configuration, on switching on, compared to that stored; communication control between modules			
Ambient temperature	°C	-10 to + 50			
	°F	14 to 122			
Versions		Plug connectors, fieldbus with various protocols, additional island			
		25-pin connector	44-pin connector	Fieldbus	additional island
Maximum number of controllable solenoid pilots		21	38	128	128
Maximum number of controllable solenoid valves		Ditto as above, depending on the number of solenoid pilots and type of base			
Degree of protection		IP65 (with connectors connected or plugged if not used)			
Weight	g	180	180	350	320

*** Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2.24**
***** IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

SYSTEM VOLTAGE DROP

Voltage drop depends on the input maximum current drawn by the system and the length of the cable for connection to the system.
In a 24VDC-powered system, with cable lengths up to 20 m, voltage drops do not need to be taken into account.
In a 12VDC-powered system, there must be enough voltage to ensure correct operation. It is necessary to take into account any voltage drops due to the number of active solenoid valves, the number of valves controlled simultaneously and the cable length.
The actual voltage supplied to the solenoid pilots must be at least 10.8 V.
More details are given in the instruction manual (please refer to the Metal Work website).
A synthesis of the verification algorithm is shown here below.

Maximum current: I max [A] = $\frac{\text{no. of solenoid pilots controlled simultaneously x 4 + no. of active solenoid valves x 0.5}}{\text{VDC}}$

Voltage drop: with a 25-pole connector: ΔV = Imax [A] x Rs [0.067Ω/m] x 2L [m]
Voltage drop: with a 44-pole connector: ΔV = Imax [A] x Rs [0.067Ω/m] x L [m]
Where Rs is the cable resistance and L its length.

The voltage at the cable inlet, Vin must be at least 10.8 V + ΔV

Example:
12V supply voltage, 5 m cable, 25-pin connector, 3 pilots activate while other 10 are already active:

I max = $\frac{3x4 + 10x0.5}{12}$ = 1.41 A

ΔV = (1.41 x 0.067 x 2x5) = 0.95 V

This means that at the power supply voltage greater than or equal to 10.8 + 0.95 = 11.75 V is required.
Vin =12 V > 11.75 --> OK

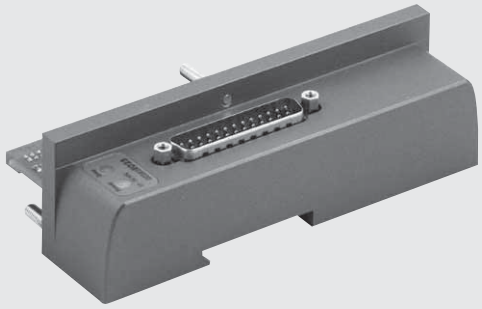
KEY TO CODES

02282	E	0	25
FAMILY	**SUBSYSTEM**	**SUPPLY**	**TYPE**
02282 EB 80	**E** Electrical connection	**0** Complete	**25** 25-pin connector **44** 44-pin connector **EN** EtherNet/IP **EC** EtherCAT **PN** Profinet IO **CN** CANopen **PB** Profibus-DP **PL** Ethernet POWERLINK **IO** IO-Link **AD** Additional island

NOTE

EB 80 MULTI-POLE ELECTRICAL CONNECTION - E

The job of the multi-pole version of the electrical connection subsystem is to power the EB solenoid valve islands. The system accepts to be supplied with a very wide range of voltages, to such an extent that the EB 80 island alone can be controlled at either 12VDC or 24VDC (patented). Overvoltages up to 30% of the rated value, i.e. up to 31.2V, are admitted.
The minimum voltage for the solenoid pilots can be 10.8 V, i.e. 12 V - 10%.
The body of the multi-pole version is made of metal in a single piece.



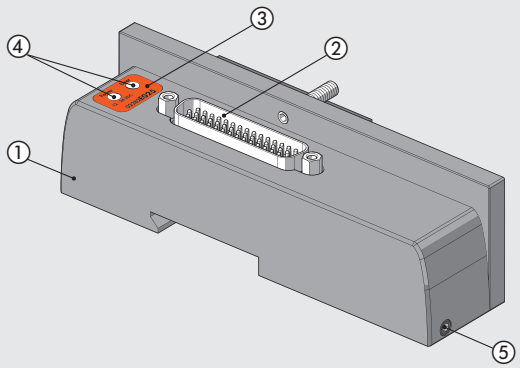
TECHNICAL DATA

Supply voltage range	V	12 -10% 24 +30%	
Minimum operating voltage	V	10.8 *	
Maximum operating voltage	V	31.2	
Maximum admissible voltage	V	32 ***	
Drive		Configurable PNP or NPN	
Power supply without controlled valves	W	0.1 for "Electrical connection - E" + 0.25 for each "Base - B"	
Solenoid pilot power on start-up (Speed Up)	W	3 for 15 msec	
Solenoid pilot power after start-up (holding)	W	0.3	
Maximum admissible current	A	6 continuous, 9 instantaneous	
Protection		System protected against overload	
		short-circuit protected solenoid pilot Output	
Diagnostics		FAULT signal red light and Out signal on "Electrical connection - E"	
		LED light signal on valve	
Faults signalled		Short-circuited solenoid pilot; Solenoid pilot broken or missing	
		Power supply out of range (under-voltage or over-voltage)	
Ambient temperature	°C	-10 to + 50	
	°F	14 to 122	
Electrical connection		Plug connectors	
		25-pin connector	44-pin connector
Maximum number of controllable solenoid pilots **		21	38
Maximum number of controllable solenoid valves		Ditto as above, depending on the number of solenoid pilots and type of base	
Maximum number of simultaneously controllable solenoid pilots:			
at 24VDC		21	38
at 12VDC		Depending on the voltage drop – see page **B2**.24	
Maximum current at 24VDC	A	3	5
Maximum current at 12VDC	A	6	9
Degree of protection		IP65 (with connectors connected or plugged if not used)	
Weight	g	180	180

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24
** If the units are made up of bases exceeding the maximum number of controllable solenoid pilots (by mounting a dummy valve N or a bypass Y in the excess positions), operation is only possible on the islands with a positive signal (PNP), conversely (with an NPN signal), an error message is generated by the diagnostic system.
*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

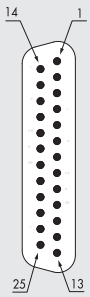
COMPONENTS

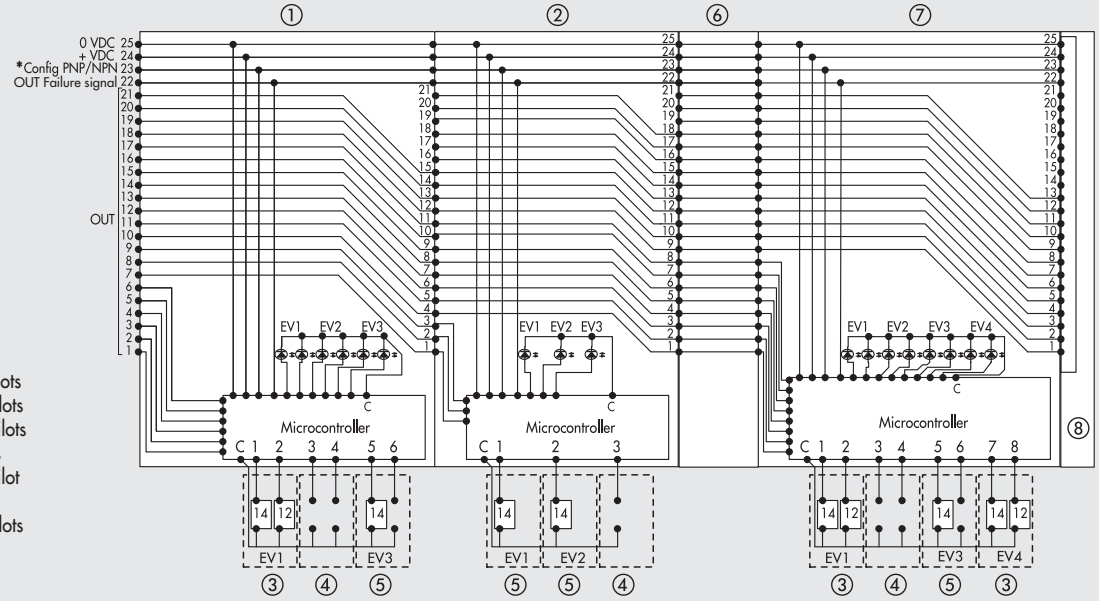
① BODY: painted metal
② CONNECTOR: plug type
③ NAMEPLATE: with product code
④ LED: signal on and alarm
⑤ GRUB SCREW securing the DIN bar or bracket: galvanized steel



WIRING DIAGRAM

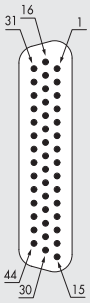
D-Sub 25-pin CONNECTOR

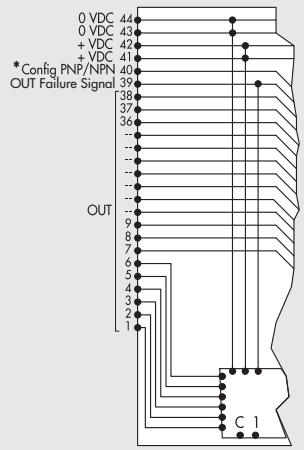




① 3-position base for 6 pilots
② 3-position base for 3 pilots
③ Valve with 2 solenoid pilots
④ Dummy valve or bypass
⑤ Valve with 1 solenoid pilot
⑥ Intermediate module
⑦ 4-position base for 8 pilots
⑧ Closed end-plate

D-Sub 44-pin CONNECTOR

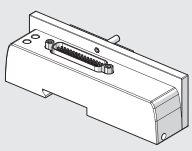


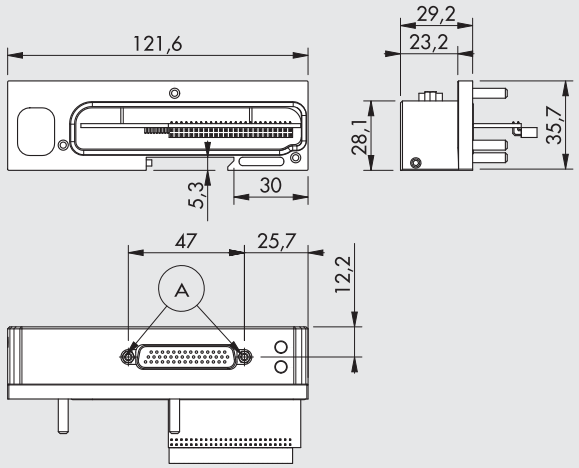


* Connect to +VDC if (Out) valves with a POSITIVE signal are to be controlled
Connect to 0VDC if (Out) valves with a NEGATIVE signal are to be controlled

DIMENSIONS - ORDERING CODES

DIMENSION OF A MULTI-POLE ELECTRICAL CONNECTION



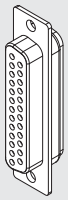


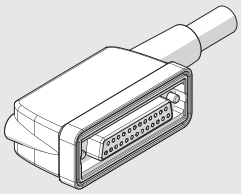
Ⓐ = Holes for D-Sub connector 25-pin or 44-pin

Code	Description	Weight [g]
02282**E025**	EB 80 25-pin electrical connection	180
02282**E044**	EB 80 44-pin electrical connection	180

ACCESSORIES

IP65 25-PIN PRE-WIRED PLUG CONNECTOR



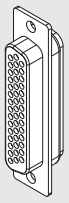


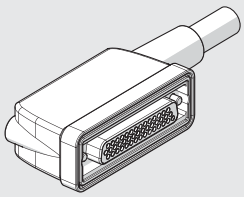
Code	Description	Weight [g]
02269A0100	IP65 25-pin 90° connector, UL cable L = 1 m	180
02269A0250	IP65 25-pin 90° connector, UL cable L = 2.5 m	365
02269A0500	IP65 25-pin 90° connector, UL cable L = 5 m	680
02269A1000	IP65 25-pin 90° connector, UL cable L = 10 m	1220
02269A2000	IP65 25-pin 90° connector, UL cable L = 20 m	2350
02269C0100	IP65 25-pin 90° connector, UL robotics, cable L = 1 m	180
02269C0250	IP65 25-pin 90° connector, UL robotics, cable L = 2.5 m	365
02269C0500	IP65 25-pin 90° connector, UL robotics, cable L = 5 m	680
02269C1000	IP65 25-pin 90° connector, UL robotics, cable L = 10 m	1220

Position of electrical contact	Colour of the corresponding wire	Function
1	White	Out 1
2	Brown	Out 2
3	Green	Out 3
4	Yellow	Out 4
5	Grey	Out 5
6	Pink	Out 6
7	Blue	Out 7
8	Red	Out 8
9	Black	Out 9
10	Violet	Out 10
11	Grey + Pink ring	Out 11
12	Red + Blue ring	Out 12
13	White + Green ring	Out 13
14	Brown + Green ring	Out 14
15	White + Yellow ring	Out 15
16	Yellow + Brown ring	Out 16
17	White + Grey ring	Out 17
18	Grey + Brown ring	Out 18
19	White + Pink ring	Out 19
20	Pink + Brown ring	Out 20
21	White + Blue ring	Out 21
22	Brown + Blue ring	Fault reporting
23	White + Red ring	Config. PNP/NPN *
24	Brown + Red ring	+VDC
25	White + Black ring	0VDC

* Connect to +VDC if (Out) valves with a POSITIVE signal are to be controlled
Connect to 0VDC if (Out) valves with a NEGATIVE signal are to be controlled

IP65 44-PIN PRE-WIRED PLUG CONNECTOR





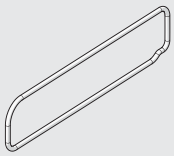
Code	Description	Weight [g]
02269B0100	IP65 44-pin 90° connector, UL cable L = 1 m	275
02269B0250	IP65 44-pin 90° connector, UL cable L = 2.5 m	630
02269B0500	IP65 44-pin 90° connector, UL cable L = 5 m	1180
02269B1000	IP65 44-pin 90° connector, UL cable L = 10 m	2210
02269B2000	IP65 44-pin 90° connector, UL cable L = 20 m	4340
02269D0100	IP65 44-pin 90° connector, UL robotics, cable L = 1 m	275
02269D0250	IP65 44-pin 90° connector, UL robotics, cable L = 2.5 m	630
02269D0500	IP65 44-pin 90° connector, UL robotics, cable L = 5 m	1180
02269D1000	IP65 44-pin 90° connector, UL robotics, cable L = 10 m	2210

Position of electrical contact	Colour of the corresponding wire	Function
1	White	Out 1
2	Brown	Out 2
3	Green	Out 3
4	Yellow	Out 4
5	Grey	Out 5
6	Pink	Out 6
7	Blue	Out 7
8	Red	Out 8
9	Black	Out 9
10	Violet	Out 10
11	Grey + Pink ring	Out 11
12	Red + Blue ring	Out 12
13	White + Green ring	Out 13
14	Brown + Green ring	Out 14
15	White + Yellow ring	Out 15
16	Yellow + Brown ring	Out 16
17	White + Grey ring	Out 17
18	Grey + Brown ring	Out 18
19	White + Pink ring	Out 19
20	Pink + Brown ring	Out 20
21	White + Blue ring	Out 21
22	Brown + Blue ring	Out 22
23	White + Red ring	Out 23
24	Brown + Red ring	Out 24
25	White + Black ring	Out 25
26	Brown + Black ring	Out 26
27	Grey + Green ring	Out 27
28	Yellow + Grey ring	Out 28
29	Pink + Green ring	Out 29
30	Yellow + Pink ring	Out 30
31	Green + Blue ring	Out 31
32	Yellow + Blue ring	Out 32
33	Green + Red ring	Out 33
34	Yellow + Red ring	Out 34
35	Green + Black ring	Out 35
36	Yellow + Black ring	Out 36
37	Grey + Blue ring	Out 37
38	Pink + Blue ring	Out 38
39	Grey + Red ring	Fault reporting
40	Pink + Red ring	Config. PNP/NPN *
41	Grey + Black ring	+VDC
42	Pink + Black ring	+VDC
43	Blue + Black ring	0VDC
44	Red + Black ring	0VDC

* Connect to +VDC if (Out) valves with a POSITIVE signal are to be controlled
Connect to 0VDC if (Out) valves with a NEGATIVE signal are to be controlled

SPARE PARTS

EB 80 ELECTRICAL CONNECTION INTERFACE OR SEAL



Code	Description
02282R1003	EB80 electrical connection interface OR seal

Comes in 10-pc. packs

NOTES

EB 80 ELECTRICAL CONNECTION WITH FIELDBUS - E

The job of the electrical connection with fieldbus is to power the EB 80 systems, transmit control signals for the solenoid valves, send or receive signals for input/output management modules and control diagnostics.
The system can be supplied with a very wide voltage range, so much so that the EB 80 island can be controlled either at 12VDC or 24VDC (patented).
Overvoltages up to 30% of the rated value, i.e. up to 31.2V, are admitted.
The minimum voltage for solenoid pilots can be 10.8V, i.e. 12V-10%.
The modules come into parts: a lower part, with a single aluminium body separate from the bus protocol; an upper part with a technopolymer body dedicated to each specific bus protocol.

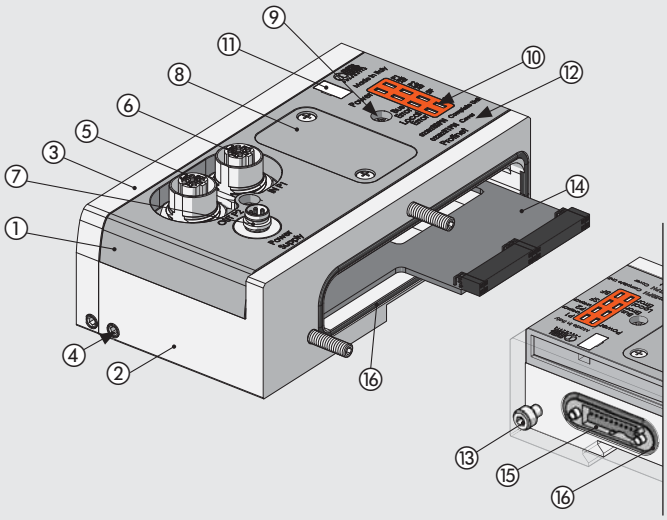
TECHNICAL DATA

Supply voltage range	V	12 -10% 24 +30%
Minimum operating voltage	V	10.8 *
Maximum operating voltage	V	31.2
Maximum admissible voltage	V	32 ***
Power supply without controlled valves	W	4 for "Electrical connection - E" + 0.25 for each "Base - B"
Solenoid pilot power on start-up (Speed Up)	W	3 for 15 msec
Solenoid pilot power after start-up (holding)	W	0.3
Maximum admissible current	A	4 continuous, 6 instantaneous for valve supply
		4 continuous, 6 instantaneous for bus and signal supply
Protection		Overload and short-circuit protected solenoid pilot Output
Diagnostics		LED signal on valve, LED on electrical connection and software message regarding:
		short-circuited solenoid pilot; solenoid pilot with coil failure;
		voltage out of range (undervoltage and overvoltage); module communication control;
		on switching, configuration other than that stored
Maximum number of solenoid pilots		128
Maximum number of simultaneously controllable solenoid pilots		38
to actuate a greater number of solenoid pilots at the same time, add "Intermediate modules - M" with electrical connection		
Maximum number of signals **		128 digital inputs, 128 digital outputs, 16 analogue inputs, 16 analogue outputs
Maximum number of nodes **		40 Bases for valves + 16 digital inputs+ 16 digital outputs+ 4 analogue inputs + 4 analogue outputs
Ambient temperature	°C	-10 to + 50
	°F	14 to 122
Versions		EtherNet/IP, EtherCAT, CANopen, Profinet IO, Profibus-DP, Ethernet POWERLINK, IO-Link
Degree of protection		IP65 (with connectors connected or plugged if not used)
Weight	g	350

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2.24**
** For topological limits (maximum lengths, etc.) see the instructions.
*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

COMPONENTS

① UPPER PART BODY: technopolymer
② LOWER PART BODY: painted aluminium
③ END PLATE: painted aluminium
④ GRUB SCREW securing the DIN bar or bracket: galvanised steel
⑤ Fieldbus signal receive CONNECTOR
⑥ Fieldbus signal send CONNECTOR
⑦ M8 power supply CONNECTOR
⑧ COVER for access to bus address switches: technopolymer
⑨ SCREW securing the upper part to the lower part
⑩ LED light
⑪ NAMEPLATE: removable
⑫ IDENTIFICATION wording: laser etched
⑬ SCREW securing the end plate
⑭ CONNECTOR for solenoid valve base modules
⑮ CONNECTOR for input/output signal modules
⑯ GASKETS interfacing: NBR



EtherNet/IP WIRING DIAGRAM

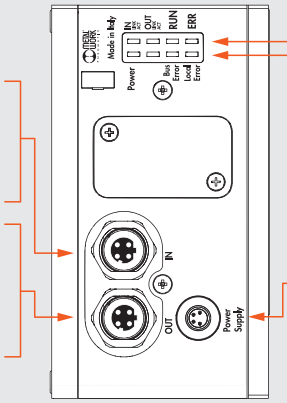
Connection to the EtherNet/IP network

IN (M12 female connector, D encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield

OUT (M12 female connector, D encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield



EtherNet/IP diagnostic signaling LED

EB 80 Net diagnostic signaling LED

Power Supply (M8 male connector)

Connection for node power supply and auxiliary valve power supply

1 = +24V bus (Brown)
2 = +24V valve (White)
3 = GND (Blue)
4 = GND (Black)

End plate with intermediate control

EB 80 Net (M8 female connector)

1 = CAN H
2 = CAN L
3 = Token
4 = GND

TECHNICAL DATA		
Fieldbus		10 - 100 Mbit/S - Full-duplex - Half-duplex - Supports auto-negotiation and Quick Connect
Factory settings		IP address: 192.168.193.32
Addressing		Software - DHCP hardware
Supply voltage range	V	12 -10% 24 +30%
Minimum operating voltage	V	10.8 *
Maximum operating voltage	V	31.2
Maximum admissible voltage	V	32 ***
Protection		Module protected from overload and polarity inversion. Outputs protected from overloads and short-circuits.
Connections		Fieldbus: 2 M12 F, D encoding, internal switch. Power supply: M8, 4-pin
Diagnostics **		EtherNet/IP: via local LED lights and software messages. Outputs: via local LED lights and state bytes
Bus power supply current absorption		nominal Icc 180 mA at 24 V
Maximum number of pilots		128
Maximum number of digital inputs		128
Maximum number of digital outputs		128
Maximum number of analogue inputs		16
Maximum number of analogue outputs		16
Maximum number of inputs for temperatures		16
Data bit value		0 = non-active; 1= active
State of outputs in the absence of communication		Configurable for each output: non-active, holding of the state, setting of a preset state

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24

** Refer to the user manual for a detailed description.

*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

EtherCAT WIRING DIAGRAM

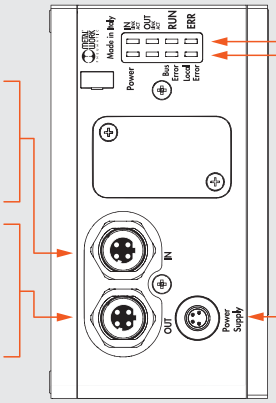
Connection to the EtherCAT network

IN (M12 female connector, D encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield

OUT (M12 female connector, D encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield



EtherCAT diagnostic signaling LED

EB 80 Net diagnostic signaling LED

Power Supply (M8 male connector)

Connection for node power supply and auxiliary valve power supply

1 = +24V bus (Brown)
2 = +24V valve (White)
3 = GND (Blue)
4 = GND (Black)

End plate with intermediate control

EB 80 Net (M8 female connector)

1 = CAN H
2 = CAN L
3 = Token
4 = GND

TECHNICAL DATA		
Fieldbus		100 Mbit/S - Full-duplex - Supports auto-negotiation
Factory settings		module denomination: EB80series
Addressing		Automatic from the master depending on its topological position. Fixes with the second slave address function
Supply voltage range	V	12 -10% 24 +30%
Minimum operating voltage	V	10.8 *
Maximum operating voltage	V	31.2
Maximum admissible voltage	V	32 ***
Protection		Module protected from overload and polarity inversion. outputs protected from overloads and short-circuits.
Connections		Fieldbus: 2 M12 F D encoding, internal switch. Power supply: M8, 4-PIN
Diagnostics **		EtherCAT: via local LED lights and software messages. Outputs: via local LED lights and state bytes
Bus power supply current absorption		nominal Icc 180 mA at 24 V
Maximum number of pilots		128
Maximum number of digital inputs		128
Maximum number of digital outputs		128
Maximum number of analogue inputs		16
Maximum number of analogue outputs		16
Maximum number of inputs for temperatures		16
Data bit value		0 = non-active; 1= active
State of outputs in the absence of communication		Configurable for each output: non-active, holding of the state, setting of a preset state

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24

** Refer to the user manual for a detailed description.

*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

CANopen WIRING DIAGRAM

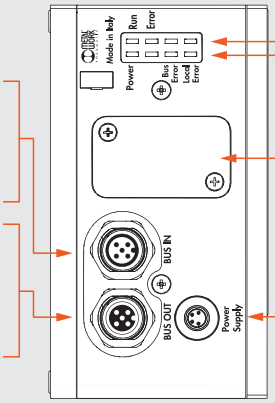
Connection to the CANopen network

IN (M12 male connector, A encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield

OUT (M12 female connector, A encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield



CANopen diagnostic signaling LED

EB 80 Net diagnostic signaling LED

The following is under the cover plate:
- address assignment switches
- transmission speed setting and the entry of the terminating resistors

Power Supply (M8 male connector)

Connection for node power supply and auxiliary valve power supply

1 = +24V bus (Brown)
2 = +24V valve (White)
3 = GND (Blue)
4 = GND (Black)

End plate with intermediate control

EB 80 Net (M8 female connector)

1 = CAN H
2 = CAN L
3 = Token
4 = GND

TECHNICAL DATA		
Fieldbus		Complying with CiA DS401 specification
Factory settings		Module denomination: EB80series - Address 5
Addressing		Hardware via DIP SWITCH
Supply voltage range	V	12 -10% 24 +30%
Minimum operating voltage	V	10.8 *
Maximum operating voltage	V	31.2
Maximum admissible voltage	V	32 ***
Protection		Module protected from overload and polarity inversion. Outputs protected from overloads and short-circuits.
Connections		Fieldbus: BUS IN M12 Male, 5 poles, A encoding - BUS OUT M12 Female, 5 poles, encoding A - Power supply: M8, 4-PIN
Diagnostics**		CANopen: via local LED lights and software messages. Outputs: via local LED lights and state bytes
Bus power supply current absorption		nominal Icc 180 mA at 24 V
Maximum number of pilots		128
Maximum number of digital inputs		128
Maximum number of digital outputs		128
Maximum number of analogue inputs		16
Maximum number of analogue outputs		16
Maximum number of inputs for temperatures		16
Data bit value		0 = non-active; 1= active
State of outputs in the absence of communication		Configurable for each output: non-active, holding of the state, setting of a preset state

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2.24**

** Refer to the user manual for a detailed description.

*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

Profinet IO WIRING DIAGRAM

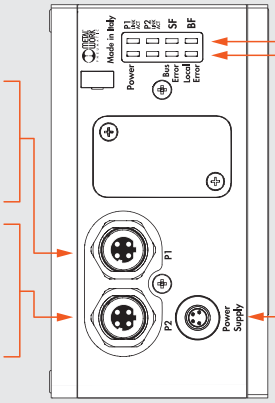
Connection to the Profinet IO network

P1 (M12 female connector, D encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield

P2 (M12 female connector, D encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield



Profinet IO diagnostic signaling LED

EB 80 Net diagnostic signaling LED

Power Supply (M8 male connector)

Connection for node power supply and auxiliary valve power supply

1 = +24V bus (Brown)
2 = +24V valve (White)
3 = GND (Blue)
4 = GND (Black)

End plate with intermediate control

EB 80 Net (M8 female connector)

1 = CAN H
2 = CAN L
3 = Token
4 = GND

TECHNICAL DATA		
Fieldbus		100 Mbit/s - Full-duplex – Supports Fast Start Up, RT communication, Shared Device, Identification & Maintenance 1-4
Factory settings		Module denomination: EB80series – IP address: 0.0.0.0
Addressing		DCP Software
Supply voltage range	V	12 -10% 24 +30%
Minimum operating voltage	V	10.8 *
Maximum operating voltage	V	31.2
Maximum admissible voltage	V	32 ***
Protection		Module protected from overload and polarity inversion. Outputs protected from overloads and short-circuits.
Connections		Fieldbus: 2 M12 Female, D encoding, internal switch. Power supply: M8, 4-PIN
Diagnostics **		Profinet IO: via local LED lights and software messages. Outputs: via local LED lights and state bytes
Bus power supply current absorption		nominal Icc 180 mA at 24 V
Maximum number of pilots		128
Maximum number of digital inputs		128
Maximum number of digital outputs		128
Maximum number of analogue inputs		16
Maximum number of analogue outputs		16
Maximum number of inputs for temperatures		16
Data bit value		0 = non-active; 1= active
State of outputs in the absence of communication		Configurable for each output: non-active, holding of the state, setting of a preset state

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24

** Refer to the user manual for a detailed description.

*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

Profibus-DP WIRING DIAGRAM

Connection to the Profibus-DP network

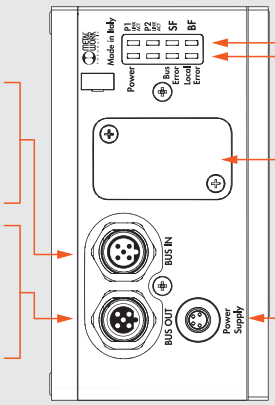
BUS IN (M12 Male Connector, B encoding)

1 = 5 V*
2 = A
3 = 0 V*
4 = B
5 = Shield

BUS OUT (M12 female connector, B encoding)

1 = 5 V*
2 = A
3 = 0 V*
4 = B
5 = Shield

* DO NOT CONNECT PIN 1 and PIN 3:
Only the power supply of external terminating resistors must be used.



Profibus-DP diagnostic signaling LED

EB 80 Net diagnostic signaling LED

The following is under the cover plate:
- address assignment switches
- the entry of the terminating resistors

Power Supply (M8 male connector)

Connection for node power supply and auxiliary valve power supply

1 = +24V bus (Brown)
2 = +24V valve (White)
3 = GND (Blue)
4 = GND (Black)

End plate with intermediate control

EB 80 Net (M8 female connector)

1 = CAN H
2 = CAN L
3 = Token
4 = GND

TECHNICAL DATA	
Fieldbus	Complying with Profibus-DP DIN E 1924 specification
Factory settings	Module denomination: EB80series - Address 5
Addressing	Hardware via ROTARY SWITCH
Supply voltage range	12 -10% 24 +30%
Minimum operating voltage	10.8 *
Maximum operating voltage	31.2
Maximum admissible voltage	32 ***
Protection	Module protected from overload and polarity inversion. Outputs protected from overloads and short-circuits.
Connections	Fieldbus: BUS IN M12 Male, 5 poles, B encoding - BUS OUT M12 Female, 5 poles, B encoding - Power supply: M8, 4-PIN
Diagnostics **	Profibus-DP: via local LED lights and software messages. Outputs: via local LED lights and state bytes
Bus power supply current absorption	nominal Icc 180 mA at 24 V
Maximum number of pilots	128
Maximum number of digital inputs	128
Maximum number of digital outputs	128
Maximum number of analogue inputs	16
Maximum number of analogue outputs	16
Maximum number of inputs for temperatures	16
Data bit value	0 = non-active; 1= active
State of outputs in the absence of communication	Configurable for each output: non-active, holding of the state, setting of a preset state

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24

** Refer to the user manual for a detailed description.

*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

Ethernet POWERLINK WIRING DIAGRAM

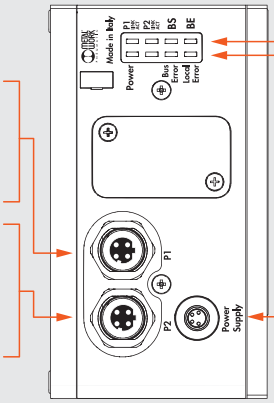
Connection to the Ethernet POWERLINK network

P1 (M12 female connector, D encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield

P2 (M12 female connector, D encoding)

1 = TD+
2 = RD+
3 = TD-
4 = RD-
Metal ring nut = Shield



Ethernet POWERLINK diagnostic signaling LED

EB 80 Net diagnostic signaling LED

Power Supply (M8 male connector)

Connection for node power supply and auxiliary valve power supply

1 = +24V bus (Brown)
2 = +24V valve (White)
3 = GND (Blue)
4 = GND (Black)

End plate with intermediate control

EB 80 Net (M8 female connector)

1 = CAN H
2 = CAN L
3 = Token
4 = GND

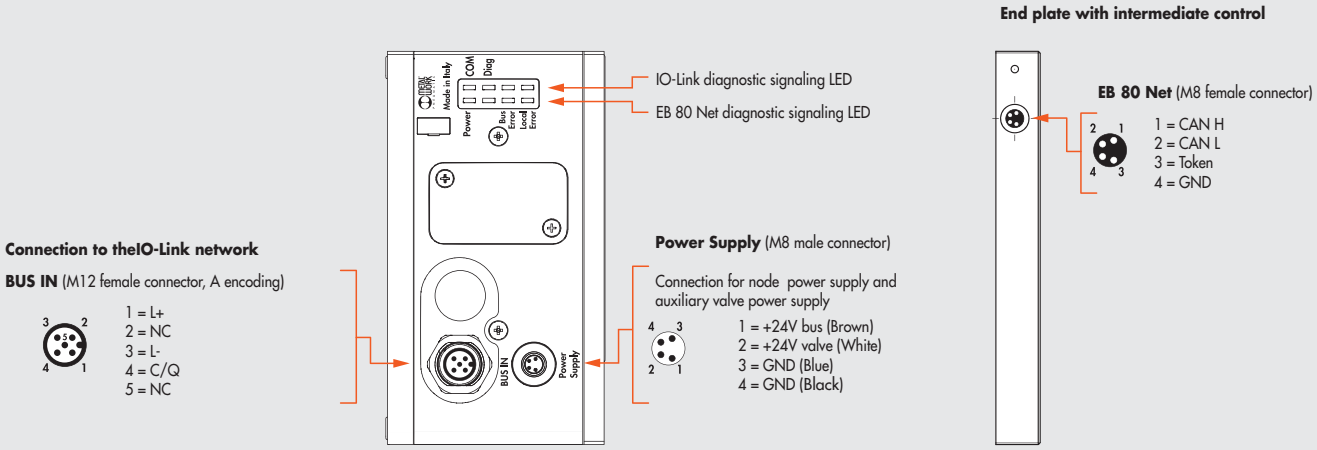
TECHNICAL DATA	
Fieldbus	100 Mbit/S - Half-duplex - Supports auto-negotiation
Factory settings	module denomination: EB80series address number 2
Addressing	Hardware by rotary switch
Supply voltage range	12 -10% 24 +30%
Minimum operating voltage	10.8 *
Maximum operating voltage	31.2
Maximum admissible voltage	32 ***
Protection	Module protected from overload and polarity inversion. Outputs protected from overloads and short-circuits.
Connections	Fieldbus: 2 M12 Female, D encoding, internal switch. Power supply: M8, 4-PIN
Diagnostics **	Ethernet POWERLINK: via local LED lights and software messages. Outputs: via local LED lights and state bytes
Bus power supply current absorption	nominal Icc 180 mA at 24 V
Maximum number of pilots	128
Maximum number of digital inputs	128
Maximum number of digital outputs	128
Maximum number of analogue inputs	16
Maximum number of analogue outputs	16
Maximum number of inputs for temperatures	16
Data bit value	0 = non-active; 1= active
State of outputs in the absence of communication	Configurable for each output: non-active, holding of the state, setting of a preset state

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24

** Refer to the user manual for a detailed description.

*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

IO-Link WIRING DIAGRAM

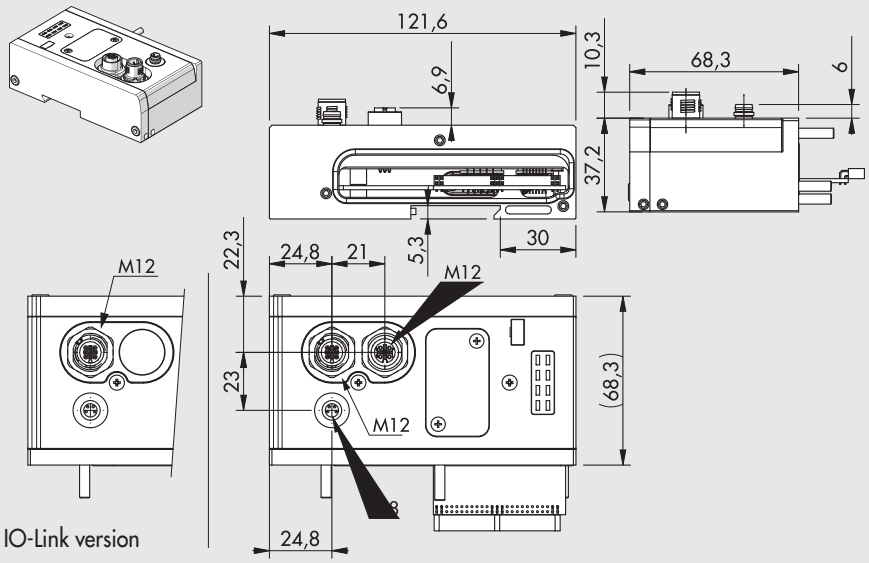


TECHNICAL DATA		
Fieldbus		IO-Link version 1.1
Communication speed	Kbps	230.4 (COM3)
Vendor ID / Device ID		1046 (hex 0x0416) / 32 (hex 0x000020)
Minimum cycle time	ms	2.8
Process data length		5 byte of Input / 4 byte of Output
Supply voltage range (M8 connector)	V	12 -10% 24 +30%
Minimum operating voltage	V	10.8 *
Maximum operating voltage	V	31.2
Maximum admissible voltage	V	32 ***
IO-Link power supply (L+L - Bus IN connector)	VDC	min 20, max 30
Protection		Module protected from overload and polarity inversion. Outputs protected from overloads and short-circuits.
Connections		Fieldbus: M12 male, A-coded - port class A. Power supply: M8, 4-PIN
Diagnostics **		IO-Link: via local LED lights and software messages. Outputs: via local LED lights and state bytes
Power supply current absorption		See IO-Link instruction manual
Maximum number of pilots		32
Maximum number of digital inputs		32
Data bit value		0 = non-active; 1= active
State of outputs in the absence of communication		Configurable for each output: non-active, holding of the state, setting of a preset state

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24
** Refer to the user manual for a detailed description.
*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

DIMENSIONS - ORDERING CODES

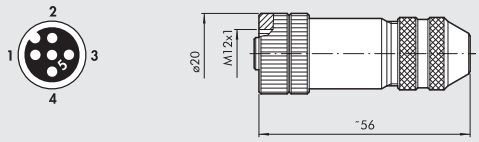
ELECTRICAL CONNECTION FIELDBUS DIMENSION



Code	Description	Weight [g]
02282**E0EN**	EB 80 Electrical connection EtherNet/IP	350
02282**E0EC**	EB 80 Electrical connection EtherCAT	350
02282**E0PN**	EB 80 Electrical connection Profinet IO	350
02282**E0CN**	EB 80 Electrical connection CANopen	350
02282**E0PB**	EB 80 Electrical connection Profibus-DP	350
02282**E0PL**	EB 80 Electrical connection Ethernet POWERLINK	350
02282**E0IO**	EB 80 Electrical connection IO-Link	350

ACCESSORIES

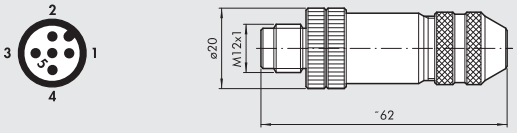
M12 FEMALE CONNECTOR FOR BUS-IN, A ENCODING



Code	Description
0240009055	M12 5-pin female connector, encoding A

Note: Can be used for Bus CANopen and IO-Link

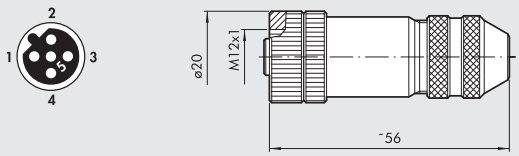
M12 MALE CONNECTOR FOR BUS-IN, A ENCODING



Code	Description
0240009038	M12 5-pin male connector, encoding A

Note: Can be used for Bus CANopen

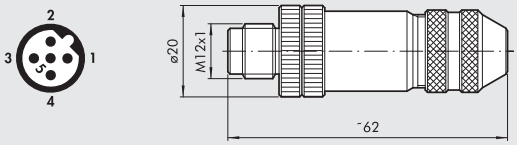
M12 FEMALE CONNECTOR FOR BUS-IN, B ENCODING



Code	Description
0240009036	M12 5-pin female connector, encoding B

Note: Can be used for Profibus-DP

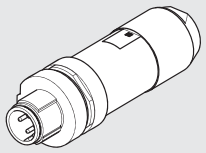
M12 MALE CONNECTOR FOR BUS-IN, B ENCODING



Code	Description
0240009035	M12 5-pin male connector, encoding B

Note: Can be used for Profibus-DP

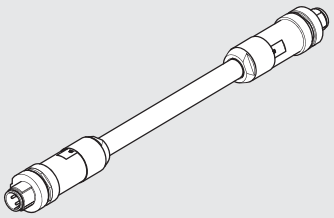
M12 BUS CONNECTOR, D ENCODING



Code	Description
0240005051	M12 4-pin BUS connector, D-coded

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP, Ethernet POWERLINK)

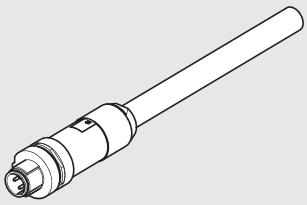
STRAIGHT CONNECTOR FOR M12-M12 BUS, D-CODED



Code	Description
0240005103	Straight connector for M12-M12 4-pin BUS, D-coded, with 3 m cable
0240005105	Straight connector for M12-M12 4-pin BUS, D-coded, with 5 m cable
0240005110	Straight connector for M12-M12 4-pin BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP, Ethernet POWERLINK)

STRAIGHT CONNECTOR FOR M12 BUS, D-CODED

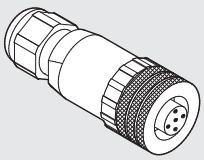


Pin	Cable color
1	Yellow
2	White
3	Red
4	Blue

Code	Description
0240005093	Straight connector for M12 4-pin BUS, D-coded, with 3 m cable
0240005095	Straight connector for M12 4-pin BUS, D-coded, with 5 m cable
0240005100	Straight connector for M12 4-pin BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP, Ethernet POWERLINK)

STRAIGHT CONNECTOR FOR M12, A-CODED

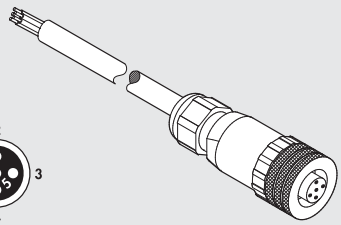


Code	Description
W0970513001	5-PIN M12X1 straight connector

Note: Can be used for IO-Link

STRAIGHT CONNECTOR WITH WIRE FOR M12, A-CODED

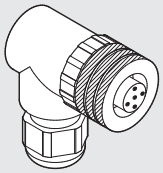
Pin	Cable color
1	Brown
2	White
3	Blue
4	Black
5	Gray



Code	Description
W0970513002	5-PIN M12X1 straight connector with wire L = 5 m

Note: Can be used for IO-Link

90° CONNECTOR FOR M12, A-CODED

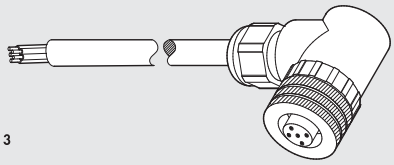


Code	Description
W0970513003	M12X1 5-PIN 90° connector

Note: Can be used for IO-Link

90° CONNECTOR WITH WIRE FOR M12, A-CODED

Pin	Cable color
1	Brown
2	White
3	Blue
4	Black
5	Gray



Code	Description
W0970513004	M12X1 5-PIN 90° connector with wire L = 5 m

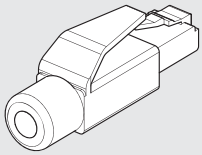
Note: Can be used for IO-Link

CABLE FOR BUS

Code	Description
0240005220*	Cable for BUS 20 m
0240005250	Cable for BUS CANopen BUS 20 m

* Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP, Ethernet POWERLINK)

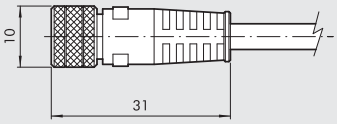
RJ45 CONNECTOR



Code	Description
0240005050	RJ45 connector with 4 contacts according to IEC 60 603-7

M8 CONNECTOR FOR POWER SUPPLY

Pin	Cable color
1	Brown
2	White
3	Blue
4	Black



Code	Description
0240009060	M8 4-pin female connector for power supply, cable L = 3 m
0240009037	M8 4-pin female connector for power supply, cable L = 5 m
0240009058	M8 4-pin female connector for power supply, cable L = 10 m
0240009059	M8 4-pin female connector for power supply, cable L = 15 m

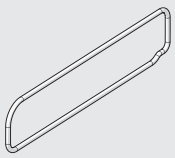
M8-M12 PLUG

Code	Description
0240009039	Plug for M8 connector
0240009040	Plug for M12 connector

NOTES

SPARE PARTS

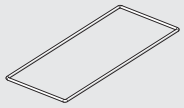
EB 80 ELECTRICAL CONNECTION INTERFACE OR-SEAL



Code	Description
02282R1003	EB 80 electrical connection interface or-seal

Comes in 10-pc. packs

GASKET BETWEEN EB 80 BASE AND COVER BUS/SIGNALS



Code	Description
02282R1004	Kit of gaskets between EB 80 base and cover bus/signals

Comes in 10-pc. packs

EB 80 BUS/SIGNAL INTERFACE OR-SEAL

Code	Description
02282R1005	EB 80 BUS/Signal interface OR-seal

Comes in 10-pc. packs

NOTES

EB 80 ADDITIONAL ELECTRICAL CONNECTION - E

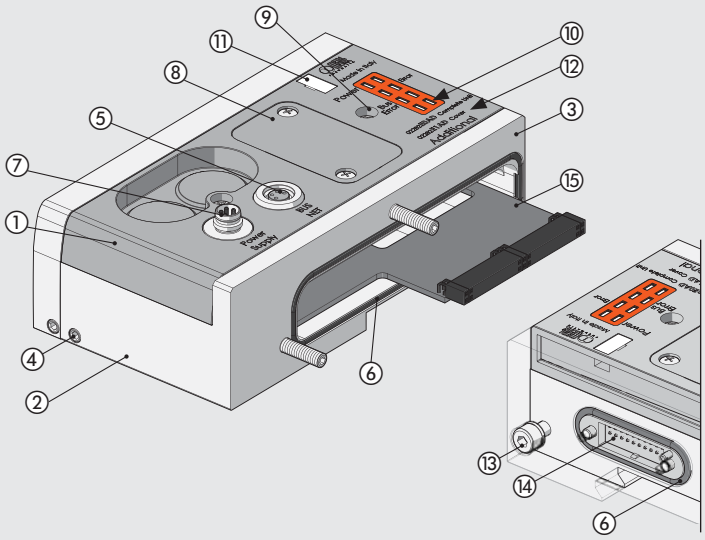
The additional electrical connection can be used to connect different EB 80 systems to a single bus node. To do this, the main island is equipped with a C3-type closed end plate, equipped with an M8 connector.
An M8-M8 connected cable relays the signal to the additional system.
The system can be supplied with a very wide range of voltages, so much so that the EB 80 island can be controlled at either 12VDC or 24VDC (patented). Overvoltages up to 30% of the nominal value are admitted, i.e. up to 31.2V. The minimum voltage for the solenoid pilots can be 10.8V, i.e. 12V-10%.
The modules consist of two parts: a lower part with a single aluminium body similar to that used for fieldbuses; an upper part with a technopolymer body specific for the additional model.

TECHNICAL DATA		
Supply voltage range	V	12 -10% 24 +30%
Minimum operating voltage	V	10.8 *
Maximum operating voltage	V	31.2
Maximum admissible voltage	V	32 ***
Power supply without controlled valves	W	4 for "Electrical connection - E" + 0.25 for each "Base - B"
Solenoid pilot power on start-up (Speed Up)	W	3 for 15 msec
Solenoid pilot power after start-up (holding)	W	0.3
Maximum admissible current	A	4 continuous, 6 instantaneous for valve supply
		4 continuous, 6 instantaneous for bus and signal supply
Protection		Overload and short-circuit protected solenoid pilot Output
Diagnostics		LED signal on valve, LED on electrical connection and software message regarding:
		short-circuited solenoid pilot; solenoid pilot with coil failure;
		voltage out of range (undervoltage and overvoltage);
		module communication control; on switching, configuration other than that stored.
Maximum number of solenoid pilots		128 **
Maximum number of simultaneously controllable solenoid pilots (to actuate a greater number of pilots at the same time, add "Intermediate modules - M" with "Electrical connection - E")		38
Maximum number of signals **		128 digital inputs, 128 digital outputs, 16 analogue inputs, 16 analogue outputs
Maximum number of nodes **		40 Bases for valves + 16 Digital inputs + 16 Digital outputs + 4 Analogue inputs + 4 Analogue outputs
Maximum length of the connection cables ****	m	40
Ambient temperature	°C	-10 to + 50
	°F	14 to 122
Degree of protection		IP65 (with connectors connected or plugged if not used)
Weight	g	320

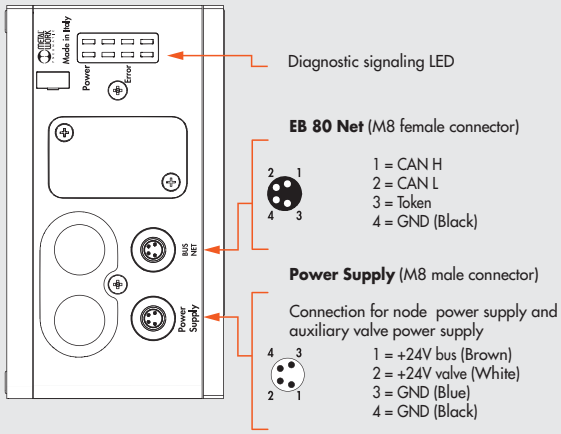
* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power supply output using the calculations shown on page B2**.24
** Total numbers, by summing up those of the fieldbus connection and all additional connections.
*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**
**** Sum of the lengths of the cables between the fieldbus electrical connection and any additional electrical connections.

COMPONENTS

① UPPER PART BODY: technopolymer
② LOWER PART BODY: painted aluminium
③ END PLATE: painted aluminium
④ GRUB SCREW securing the DIN bar or bracket: galvanised steel
⑤ CONNECTOR for connection to the valve island (main one)
⑥ GASKETS interfacing: NBR
⑦ M8 power supply CONNECTOR
⑧ COVER for access to bus address switches: technopolymer
⑨ SCREW securing the upper part to the lower part
⑩ LED light
⑪ NAMEPLATE: removable
⑫ IDENTIFICATION wording: laser etched
⑬ SCREW securing the end plate
⑭ CONNECTOR for solenoid valve base modules
⑮ CONNECTOR for Input/Output signal modules

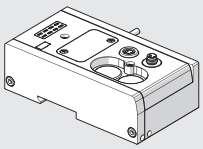


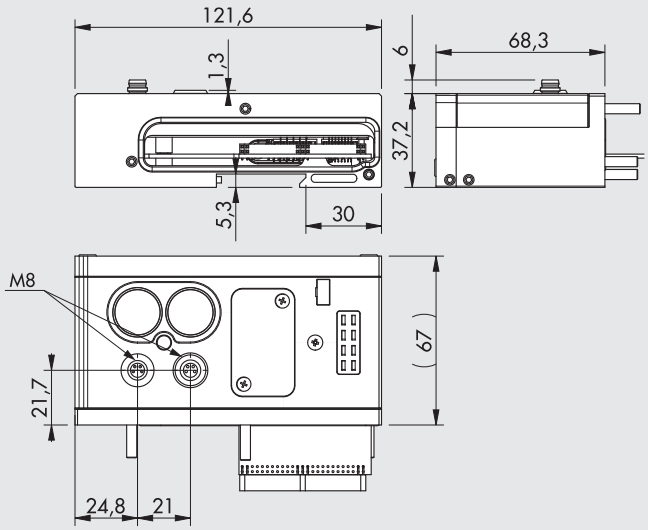
WIRING DIAGRAM



DIMENSIONS - ORDERING CODES

DIMENSION OF ADDITIONAL ELECTRICAL CONNECTION

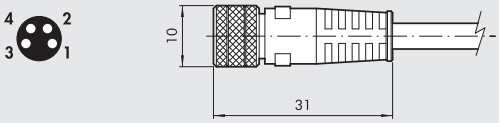




Code	Description	Weight [g]
02282**E0AD**	Additional electrical connection EB 80	320

ACCESSORIES

M8 CONNECTOR FOR POWER SUPPLY



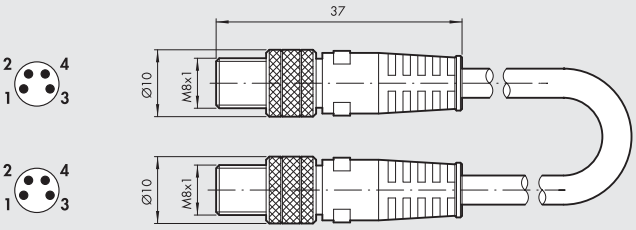
Pin	Cable color
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009060	M8 4-pin female connector for power supply, cable L = 3 m
0240009037	M8 4-pin female connector for power supply, cable L = 5 m
0240009058	M8 4-pin female connector for power supply, cable L = 10 m
0240009059	M8 4-pin female connector for power supply, cable L = 15 m

M8 PLUG

Code	Description
0240009039	Plug for M8 connector

M8 CONNECTOR WITH CABLE FOR CONNECTION BETWEEN EB 80 ISLANDS

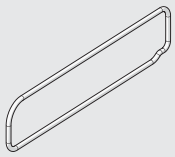


Code	Description	Weight [g]
0240010201	M8-M8 4-pin male shielded cable L = 1 m	45
0240010205	M8-M8 4-pin male shielded cable L = 5 m	185
0240010210	M8-M8 4-pin male shielded cable L = 10 m	330
0240010215	M8-M8 4-pin male shielded cable L = 15 m	475
0240010220	M8-M8 4-pin male shielded cable L = 20 m	620

N.B.: For correct operation of the entire EB 80 system, use M8-M8 pre-wired, twisted and shielded cables only.

SPARE PARTS

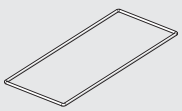
EB 80 ELECTRICAL CONNECTION INTERFACE OR-SEAL



Code	Description
02282R1003	EB 80 electrical connection interface OR-seal

Comes in 10-pc. packs

GASKET BETWEEN EB 80 BASE AND COVER BUS/SIGNALS



Code	Description
02282R1004	Kit of gaskets between EB 80 base and cover bus/signals

Comes in 10-pc. packs

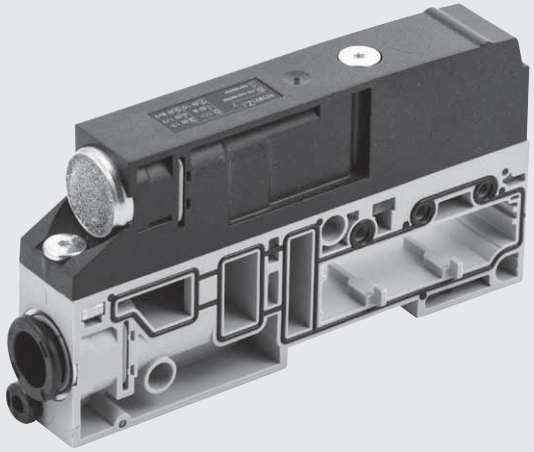
EB 80 BUS/SIGNAL INTERFACE OR-SEAL

Code	Description
02282R1005	EB 80 BUS/Signal interface OR-seal

Comes in 10-pc. packs

EB 80 COMPRESSED-AIR SUPPLY - P

The Compressed air supply - P modules power the valve base and collect the air coming from the relief ports. Various versions are available, with pipe fittings of different diameter. The product code also identifies whether the module is set to supply the pilots without servo-assistance, in which case you only need to connect compressed air to the supply fitting; or with servo-assistance (recommended), in which case you only need to connect the compressed air to the Ø 4 pilot fitting. Switching from servo to non-servo operation or vice versa is possible, however, by changing the position of the orange gasket situated between the lower and the upper part of the module; the configuration is identified by a tab protruding at the back.
Relief ports 3 and 5 can be either connected using a silencer or conveyed via a fitting.
A version with separate ports 3 and 5 is also available. This feature is useful in versions with pilot servo-assistance to power the valves from ports 3 and 5, at different pressures from vacuum to 8 bar at different pressures from vacuum to 8 bar, including the version to configure a fieldbus island with signal modules only, without the pneumatic part.

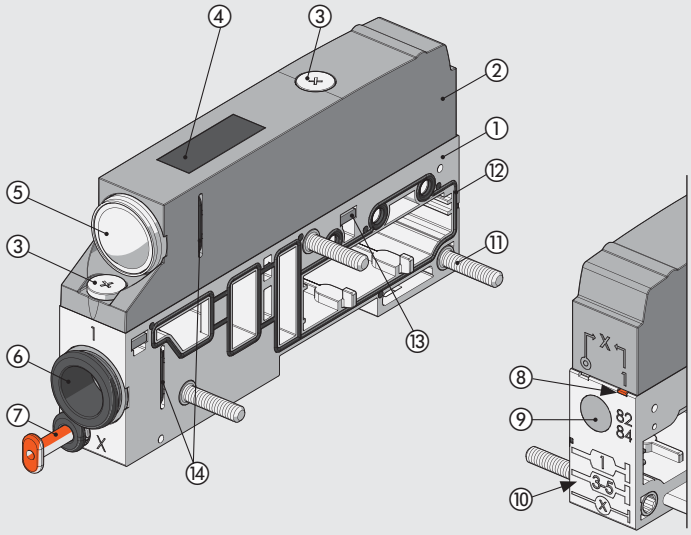


TECHNICAL DATA

Operating pressure					
Non-servo versions and solenoid pilot servo pressure		**5/2 and 5/3**		**2/2 and 3/2**	
	bar	3 to 8		min. (see graph on page **B2**.51) / max. 8	
	MPa	0.3 to 0.8		min. (see graph on page **B2**.51) / max. 0.8	
	psi	43 to 116		min. (see graph on page **B2**.51) / max. 116	
Assisted valves	bar	Vacuum to 10			
	MPa	Vacuum to 1			
	psi	Vacuum to 145			
Ambient temperature	°C	-10 to + 50			
	°F	14 to 122			
Flow rate at 6.3 bar ΔP 1 bar		**Ø 8 (5/16")**	**Ø 10**	**Ø 12**	**Ø 1/2"**
Feeding (port 1)	Nl/min	1800	2800	3500	3500
Exhaust with fitting (ports 3 and 5)	Nl/min	2000	3200	4400	4400
Separate exhausts Ø 8 (N.B.: Pmax 8 bar)	Nl/min	1800 x 2	-	-	-
Flow rate at 6.3 bar free exhaust					
Exhaust with fitting (ports 3 and 5)	Nl/min	2700	3900	6100	6100
Silenced exhaust	Nl/min	3600			
Exhaust with fitting Ø12 and silencer W0970530086	Nl/min	6000			
Separate exhausts Ø 8 (N.B.: Pmax 8 bar)	Nl/min	2700 x 2	-	-	-
Fluid		Unlubricated air			
Versions		Silenced relief or conveyed relief, fittings for pipes Ø 8, 10, 12, 1/2"			
Degree of protection		IP65			
Weight	g	140	130	125	125

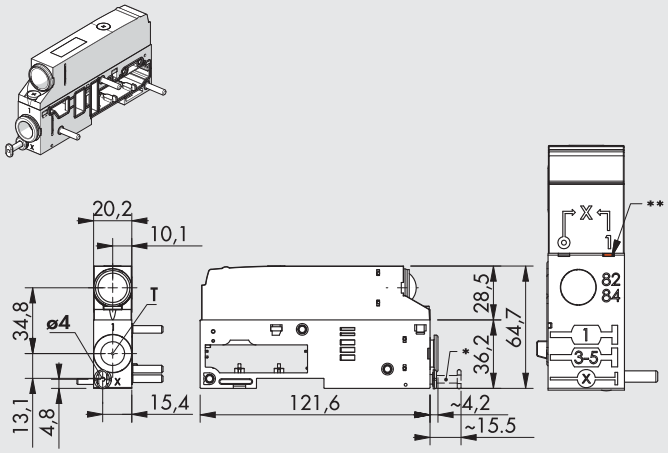
COMPONENTS

① LOWER PART BODY: technopolymer
② UPPER PART BODY: technopolymer
③ SCREWS securing the island bodies: galvanised steel (Tightening torque: 1.2 Nm)
④ TAG: with laser etched wording - technopolymer
⑤ RELIEF: silencer or pipe fitting
⑥ POWER SUPPLY: pipe fitting
⑦ PILOTING (X): Ø 4 pipe fitting
⑧ INDICATOR: indicaes whether pilot power supply is separate or not
⑨ PILOT RELIEF: HDPE silencer
⑩ PICTOGRAM: showing compressed air system layout
⑪ TIE ROD: nickelled steel
⑫ GASKET: NBR
⑬ THREADED PLATE: galvanised steel
⑭ CARTRIDGE FIXING CLIP: stainless steel



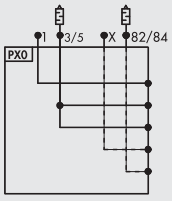
DIMENSIONS - ORDERING CODES

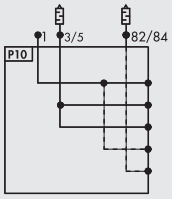
COMPRESSED AIR SUPPLY - SILENCED RELIEF



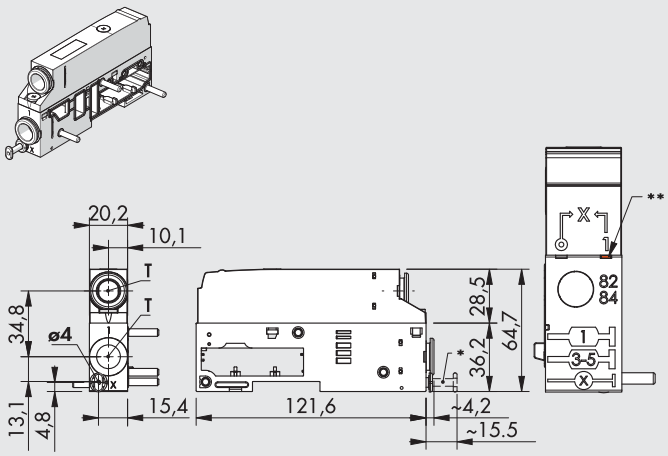
* R9 plug for NON-SERVOASSISTED versions
** Orange tab in SERVO-ASSISTED (◎) or NON-SERVO-ASSISTED (1) position

Symbol	T - Pipe fitting	Code	Weight [g]
Servo-assisted	Ø 8 (5/16″)	02282**P1XZ00**	140
	Ø 10	02282**P2XZ00**	130
	Ø 12	02282**P3XZ00**	125
	Ø 1/2″	02282**P5XZ00**	125
Non-servo-assisted	Ø 8 (5/16″)	02282**P11Z00**	140
	Ø 10	02282**P21Z00**	130
	Ø 12	02282**P31Z00**	125
	Ø 1/2″	02282**P51Z00**	125



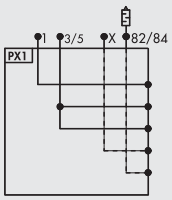


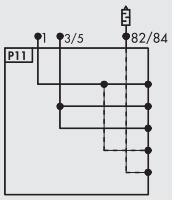
COMPRESSED AIR SUPPLY - CONVEYED RELIEF



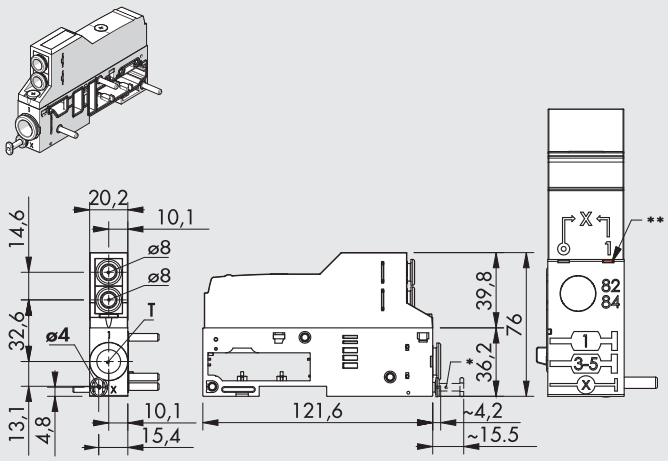
* R9 plug for NON-SERVOASSISTED versions
** Orange tab in SERVO-ASSISTED (◎) or NON-SERVO-ASSISTED (1) position

Symbol	T - Pipe fitting	Code	Weight [g]
Servo-assisted	Ø 8 (5/16″)	02282**P1XZ10**	140
	Ø 10	02282**P2XZ20**	130
	Ø 12	02282**P3XZ30**	125
	Ø 1/2″	02282**P5XZ50**	125
Non-servo-assisted	Ø 8 (5/16″)	02282**P11Z10**	140
	Ø 10	02282**P21Z20**	130
	Ø 12	02282**P31Z30**	125
	Ø 1/2″	02282**P51Z50**	125



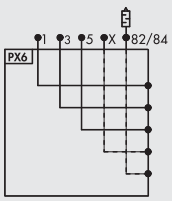


COMPRESSED AIR SUPPLY - SEPARATE RELIEFS

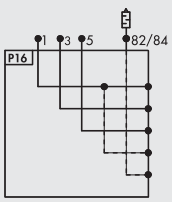


* R9 plug for NON-SERVOASSISTED versions
** Orange tab in SERVO-ASSISTED (◎) or NON-SERVO-ASSISTED (1) position

Symbol	T - Pipe fitting	Code	Weight [g]
Servo-assisted	Ø 8 (5/16″)	02282**P1XZ60**	155
	Ø 10	02282**P2XZ60**	145
	Ø 12	02282**P3XZ60**	140
	Ø 1/2″	02282**P5XZ60**	140
Non-servo-assisted	Ø 8 (5/16″)	02282**P11Z60**	155
	Ø 10	02282**P21Z60**	145
	Ø 12	02282**P31Z60**	140
	Ø 1/2″	02282**P51Z60**	140

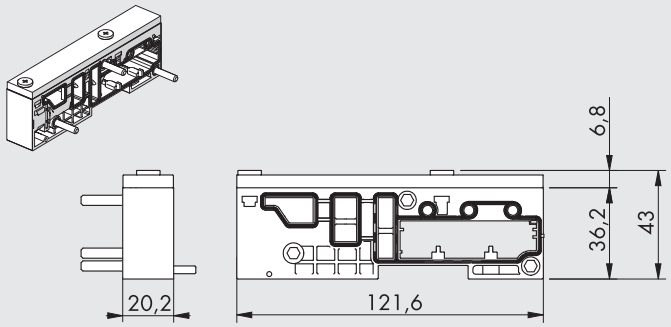


N.B.: Maximum pressure in the ports 3 and 5: 8 bar



N.B.: Maximum pressure in the ports 3 and 5: 8 bar

MODULE FOR ELECTRIC VERSION ONLY



Code	Description	Weight [g]
02282**P91Z90**	Module for electric version only	120

N.B.: Version used to make up an EB 80 island without pneumatic part, but only with "S" signal modules and fieldbus or additional electrical connection "E". Bases and valves cannot be added.

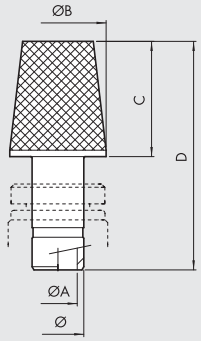
KEY TO CODES

02282	P	3	1	Z	3	0
FAMILY	**SUBSYSTEM**	**PORT PIPE 1**	**PILOT SERVO-ASSISTED**	**UPPER PART**	**PORTS 3 AND 5 CONNECTION**	**SPECIALTY**
02282 EB 80	**P** Compressed air supply	**1** Pipe Ø 8 (5/16") **2** Pipe Ø 10 **3** Pipe Ø 12 **5** Pipe Ø 1/2" **9** Module for electric version only	**1** Non-servo-assisted **X** Servo-assisted **1** Non-servo-assisted	**Z** The upper part is present	**0** Silencer ▲ **1** Pipe Ø 8 (5/16") ▲ **2** Pipe Ø 10 ▲ **3** Pipe Ø 12 ▲ **5** Pipe Ø 1/2" **6** 2 pipes Ø 8 (5/16") (one for port 3, one for port 5) **9** Without connection	**0** Standard

▲ For ports 3 and 5 use the same pipe Ø of port 1.

ACCESSORIES

SILENCER FOR FITTING

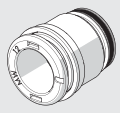


Ø	Ø A	Ø B	C	D
8	6	15	18	35.7
12	10	18.8	29	51.5

Code	Description	Weight [g]
W0970530084	Silencer for fitting, Ø 8	15
W0970530086	Silencer for fitting, Ø 12	24

SPARE PARTS

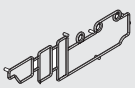
CARTRIDGE



Code	Description	Ø
02282R2110	EB 80 silencer cartridge kit	silencer
02282R2113	EB 80 Ø 8 power supply round cartridge kit	8 (5/16")
02282R2114	EB 80 Ø 10 power supply round cartridge kit	10
02282R2115	EB 80 Ø 12 power supply round cartridge kit	12
02282R2118	EB 80 Ø 1/2 power supply round cartridge kit	1/2"

Comes in 10-pc. packs

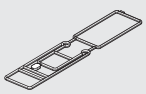
BASE INTERFACE GASKET



Code	Description
02282R1000	EB 80 base interface gasket kit

Comes in 10-pc. packs

LOWER /UPPER BODY GASKET

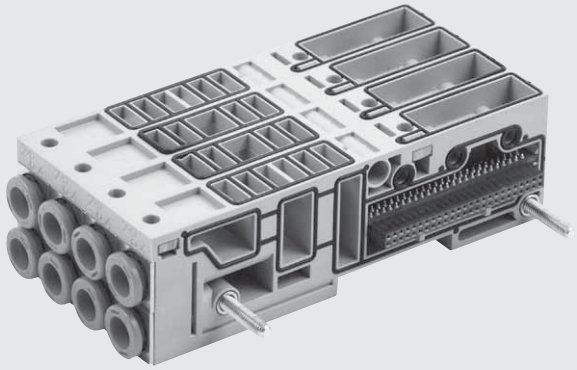


Code	Description
02282R1001	EB 80 lower/upper body gasket kit

Comes in 10-pc. packs

EB 80 BASES FOR VALVES - B

The EB 80 "Bases for valves - B" can be provided with 3 or 4 positions.
A version is available with an electrical connection for a single control of each position, suitable for 5/2 monostable solenoid valves (physically impossible to install other valves). Another version comes with two electrical connections for each position and is suitable for all types of valves.
The electronics in the base controls the signal coming from both the multi-pole connector and the fieldbus, so the base is the same, regardless of the control system of the island.
The air delivery ducts (ports 2 and 4) are made up of cartridge-type push-in fittings. The cartridge can be replaced, for example when the pipe diameter needs to be changed, by pulling out the clip placed under the base.
The air flow ducts (ports 1, 3, 5, X) of the 4-position base are the full flow type. For the 3-position base, either full-flow or one or more sectioned ports can be mounted. With this solution, islands with zones with differentiated pressure can be created.



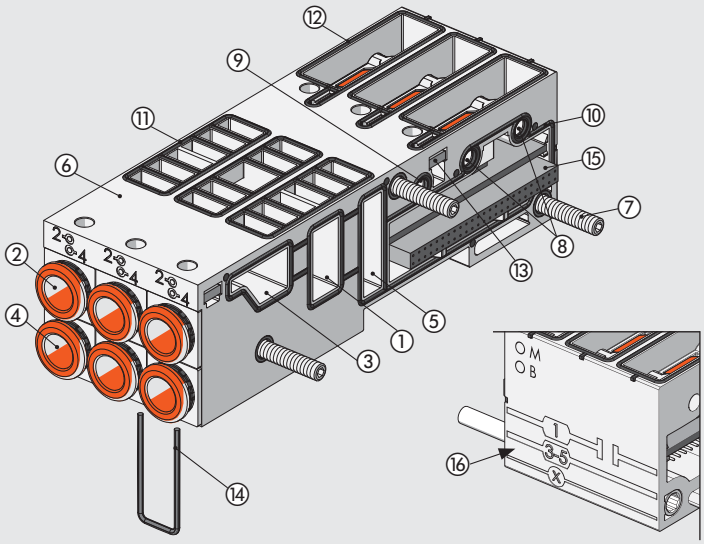
PATENTED

TECHNICAL DATA

Ambient temperature	°C	-10 to + 50
	°F	14 to 122
Fluid		Unlubricated air
Versions		3-position base for controlling 3 solenoid pilots; 3 positions for 6 solenoid pilots; 4 positions for 4 solenoid pilots; 4 positions for 8 solenoid pilots.
		Pipe fittings Ø 4 (5/32"), 6, 8 (5/16"), 1/4" Ducts
		1, 3, 5 and X full flow
		3-position base with 1 sectioned duct; 1, 3 a 5 sectioned; 3 and 5 sectioned (after the first position)
Degree of protection		IP65

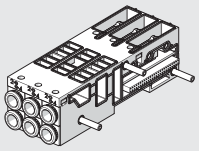
COMPONENTS

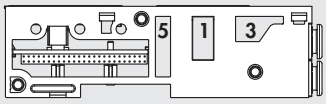
① PORT 1 DUCT
② PORT 2 CARTRIDGE: push-in fitting
③ PORT 3 DUCT
④ PORT 4 CARTRIDGE: push-in fitting
⑤ PORT 5 DUCT
⑥ BODY: technopolymer
⑦ TIE ROD: nickeled brass and galvanised steel threading
⑧ 82/84 DUCT: pilot air relief
⑨ X DUCT: pilot control
⑩ GASKET BETWEEN BASES: NBR
⑪ GASKET FOR THE VALVE: NBR
⑫ GASKET FOR IP65:NBR
⑬ THREADED PLATE for securing the valves: galvanised steel
⑭ CLIP for securing the cartridge: stainless steel
⑮ ELECTRONICS
⑯ PICTOGRAM: indication of compressed air system layout

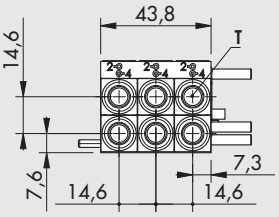


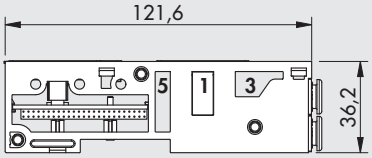
DIMENSIONS - ORDERING CODES

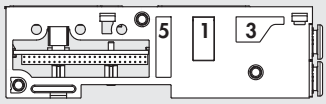
3-POSITION BASE FOR VALVES

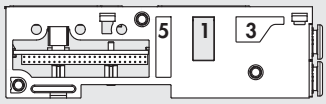




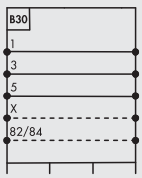


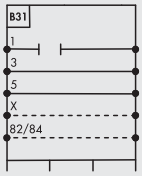


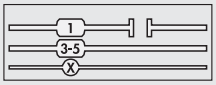


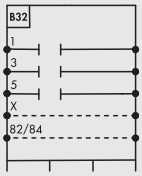


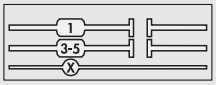
Symbol	T - Pipe fitting	Code 3 CONTROLS	Code 6 CONTROLS	Weight [g]
Full-flow ports	without cartridges	02282**B3031110**	02282**B3061110**	148
	Ø 4 (5/32")	02282**B3034440**	02282**B3064440**	210
	Ø 6	02282**B3036660**	02282**B3066660**	200
	Ø 8 (5/16")	02282**B3038880**	02282**B3068880**	183
	Ø 1/4"	02282**B3032220**	02282**B3062220**	200
Port 1 sectioned after the first position	without cartridges	02282**B3131110**	02282**B3161110**	148
	Ø 4 (5/32")	02282**B3134440**	02282**B3164440**	210
	Ø 6	02282**B3136660**	02282**B3166660**	200
	Ø 8 (5/16")	02282**B3138880**	02282**B3168880**	183
	Ø 1/4"	02282**B3132220**	02282**B3162220**	200
Ports 1, 3 and 5 sectioned after the first position	without cartridges	02282**B3231110**	02282**B3261110**	148
	Ø 4 (5/32")	02282**B3234440**	02282**B3264440**	210
	Ø 6	02282**B3236660**	02282**B3266660**	200
	Ø 8 (5/16")	02282**B3238880**	02282**B3268880**	183
	Ø 1/4"	02282**B3232220**	02282**B3262220**	200
Ports 3 and 5 sectioned after the first position	without cartridges	02282**B3331110**	02282**B3361110**	148
	Ø 4 (5/32")	02282**B3334440**	02282**B3364440**	210
	Ø 6	02282**B3336660**	02282**B3366660**	200
	Ø 8 (5/16")	02282**B3338880**	02282**B3368880**	183
	Ø 1/4"	02282**B3332220**	02282**B3362220**	200

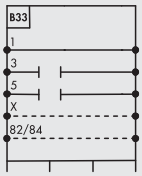


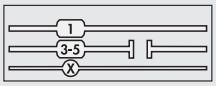




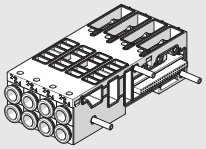


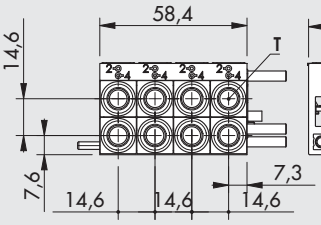


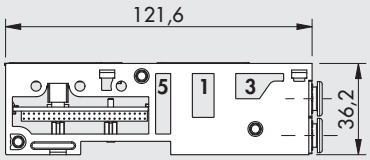




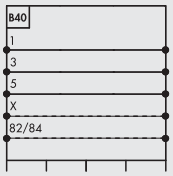
4-POSITION BASE FOR VALVES

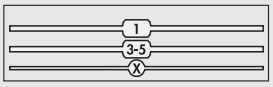






Symbol	T - Pipe fitting	Code 4 CONTROLS	Code 8 CONTROLS	Weight [g]
Full-flow ports	without cartridges	02282**B4041111**	02282**B4081111**	196
	Ø 4 (5/32")	02282**B4044444**	02282**B4084444**	276
	Ø 6	02282**B4046666**	02282**B4086666**	256
	Ø 8 (5/16")	02282**B4048888**	02282**B4088888**	244
	Ø 1/4"	02282**B4042222**	02282**B4082222**	256





METAL WORK PNEUMATIC

KEY TO CODES

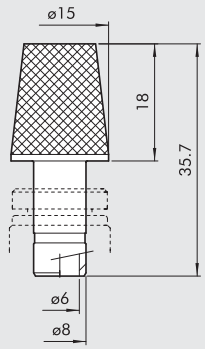
02282	B	3	0	6	8	8	8	0
FAMILY	SUBSYSTEM	NUMBER OF POSITIONS	PORTS IN THE BASE	NUMBER OF SOLENOID PILOT CONTROLS	FITTINGS 1st position (from left)	FITTINGS 2nd position	FITTINGS 3rd position	FITTINGS 4TH position
02282 EB 80	**B** Base for valve	**3** 3 positions **4** 4 positions	**0** Full-flow ports ▲ **1** Port 1 sectioned ▲ **2** Ports 1, 3 and 5 sectioned ▲ **3** Ports 3 and 5 sectioned	▲ **3** 3 controls ■ **4** 4 controls ▲ **6** 6 controls ■ **8** 8 controls	**1** Without cartridges **2** Pipe fitting Ø 1/4" **4** Pipe fitting Ø 4 (5/32") **6** Pipe fitting Ø 6 **8** Pipe fitting Ø 8 (5/16")			▲ **0** (for 3-position base) ■ **1** Without cartridges ■ **2** Pipe fitting Ø 1/4" ■ **4** Pipe fitting Ø 4 (5/32") ■ **6** Pipe fitting Ø 6 ■ **8** Pipe fitting Ø 8 (5/16")

▲ For 3-position base only.

■ For 4-position base only.

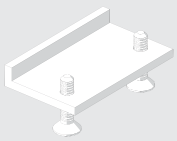
ACCESSORIES

SILENCER FOR FITTING, Ø 8



Code	Description	Weight [g]
W0970530084	Silencer for fitting, Ø 8	15

ADDITIONAL FIXING BRACKET TO OMEGA BAR



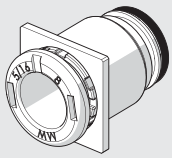
Code	Description	Weight [g]
02282R4001	Additional fixing bar accessory to EB 80 omega bar	5

Individually packed

N.B.: to be used to improve the fixing to Omega bars of islands with more than 40 valves. The bracket must be positioned every 20-25 valves.

SPARE PARTS

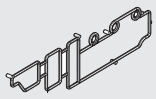
CARTRIDGE



Code	Description	Ø
02282R2001	EB 80 Ø 4 base square cartridge kit	4 (5/32")
02282R2002	EB 80 Ø 6 base square cartridge kit	6
02282R2003	EB 80 Ø 8 base square cartridge kit	8 (5/16")
02282R2006	EB 80 Ø 1/4 base square cartridge kit	1/4"

Comes in 10-pc. packs

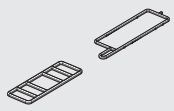
BASE INTERFACE GASKET



Code	Description
02282R1000	EB 80 base interface gasket kit

Comes in 10-pc. packs

BASE-VALVE GASKET

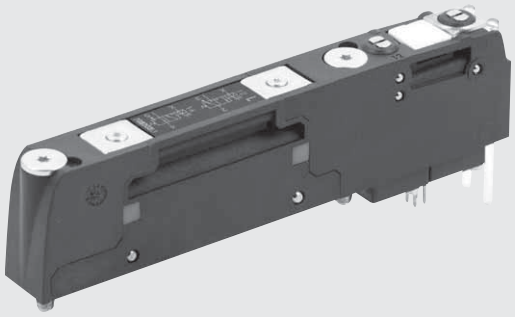


Code	Description
02282R1002	EB 80 base-valve gasket kit

Comes in 10-pc. packs

EB 80 VALVES

The valves in the EB 80 series are designed to ensure high flow using only one small size valve (14 mm wide), without the need of installing a larger size one, to the benefit of component standardisation.
Versions are available with all the main air supply diagrams - from 2/2 to 5/3. The valves are secured to the base with two sturdy M4 captive screws. They come with all the accessories that facilitate their use: manual control, monostable or bistable, LED light, plate with air supply diagram and technical data, white plates available to the customer.
The range also includes:
- High-flow valves which have an innovative system that reaches flow rates that are uncommon for this size of valve.
- Bypass element that makes it possible to boost supply and reliefs or create special pneumatic circuits.
- Circuit shut-off valve (V3V) to connect/disconnect all station valves.
- Dummy valve to plug blank base positions.



TECHNICAL DATA

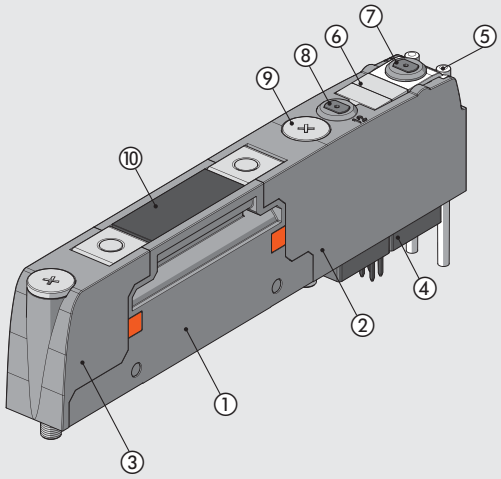
Operating pressure		**5/2 and 5/3**			**2/2 and 3/2**		
Non-assisted valves	bar	3 to 8			3.5 to 8		
	MPa	0.3 to 0.8			0.35 to 0.8		
	psi	43 to 116			51 to 116		
Assisted valves	bar	Vacuum to 10					
	MPa	Vacuum to 1					
	psi	Vacuum to 145					
Servo pressure	bar	3 to 8			min. (see graph on page **B2**.51) / max. 8		
	MPa	0.3 to 0.8			min. (see graph on page **B2**.51) / max. 0.8		
	psi	43 to 116			min. (see graph on page **B2**.51) / max. 116		
Ambient temperature	°C	-10 to 50 (at 8 bar)					
	°F	14 to 122 (at 8 bar)					
Flow rate at 6.3 bar ΔP 1 bar		**Ø 4 (5/32")**	**Ø 6**	**Ø 8 (5/16")**	**Ø 1/4"**	**Ø 10 ****	**Ø 3/8" ****
valve 2/2	Nl/min	350	430	500	430	-	-
valve 3/2	Nl/min	350	600	700	600	1250	1250
valve 5/2	Nl/min	350	650	800	650	1250 - 1400	1250 - 1400
valve 5/3	Nl/min	350	460	500	460	1000 - 1250	1000 - 1250
valve V3V (R)	Nl/min	-	-	-	-	1000	1000
Actuation response time (TRA) / reset response time (TRR) at 6 bar							
TRA/TRR valves 2/2 and 3/2	ms	14 /28					
TRA/TRR valves 5/2 monostable and shut-off valve	ms	12/45					
TRA/TRR valve 5/2 bistable	ms	9 / 11					
TRA/TRR valve 5/3	ms	15 / 45					
TRA/TRR valve 3/2 high flow	ms	13 / 36					
Fluid		Unlubricated air					
Air quality required		ISO 8573-1 class 4-7-3					
Supply voltage range	V	12 -10% 24 +30%					
Minimum operating voltage	V	10.8 *					
Maximum operating voltage	V	31.2					
Maximum admissible voltage	V	32 ***					
Power for each valve	W	3 for a few milliseconds. Holding 0.3					
Drive		PNP or NPN					
Solenoid rating		100% ED					
Versions		Manual monostable or bistable control. Various compressed air diagrams					
Degree of protection		IP65					

* **Minimum voltage 10.8V required at solenoid pilots. Check the minimum voltage at the power pack output using the calculations shown on page B2**.24
** Using high-flow valves or connected valves - see pages **B2**.52
*** **IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.**

METAL WORK PNEUMATIC

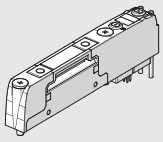
COMPONENTS

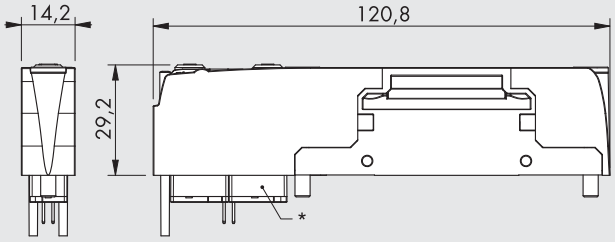
① BODY: technopolymer
② CONTROL: technopolymer
③ BASE: technopolymer
④ SOLENOID PILOT
⑤ DISPLAY: LED light and optical tester in technopolymer
⑥ TAG: removable
⑦ MANUAL CONTROL 14, for port 4: monostable or bistable, in brass
⑧ MANUAL CONTROL 12, for port 2: monostable or bistable, in brass
⑨ SCREW FOR FIXING TO THE BASE: M4 with PH 1 cross-head, galvanised steel. Tightening torque: 1.2 Nm
⑩ TAG: technopolymer with laser-etched wording



DIMENSIONS - ORDERING CODES

EB 80 VALVE



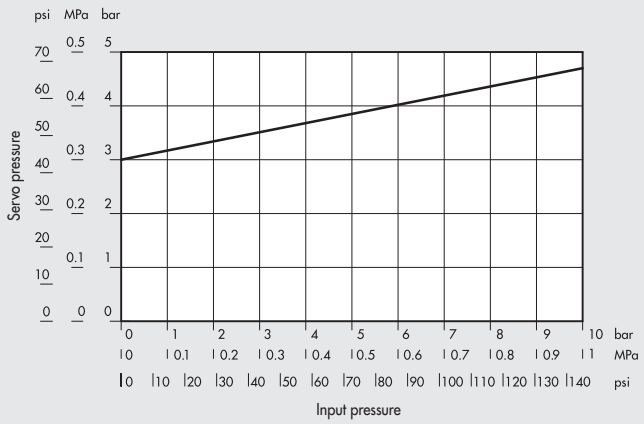


* The second solenoid pilot is not present in the valves V= 5/2 monostable.

N.B.: The valves Z, I, W, L, K, O can be mounted only on bases having 6 or 8 controls.

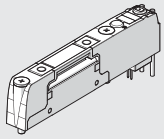
SERVO MINIMUM PRESSURE FOR VALVES 2/2 AND 3/2

If the island is configured without servo, minimum pressure 3.5 bar

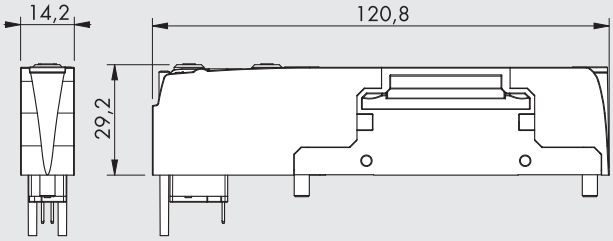


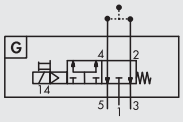
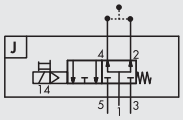
Symbol	Type	Code	Manual control	Weight [g]
Z	2 valves 2/2 NC	708203**Z0**	monostable	82
		708203**Z1**	bistable	82
I	2 valves 3/2 NC	708203**I0**	monostable	82
		708203**I1**	bistable	82
	valid as 5/3 OC			
W	2 valves 3/2 NO	708203**W0**	monostable	82
		708203**W1**	bistable	82
	valid as 5/3 PC			
L	3/2 NC + 3/2 NO	708203**L0**	monostable	82
		708203**L1**	bistable	82
V	monostable 5/2	708203**V0**	monostable	69
		708203**V1**	bistable	69
K	bistable 5/2	708203**K0**	monostable	81
		708203**K1**	bistable	81
O	5/3 CC	708203**O0**	monostable	82
		708203**O1**	bistable	82

EB 80 HIGH-FLOW VALVE



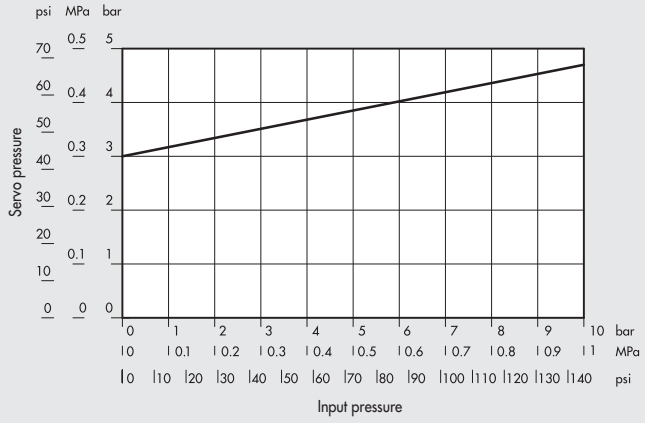
PATENTED



Symbol	Type	Code	Manual control	Weight [g]
G 	3/2 NC high flow	708203**G0**	monostable	69
		708203**G1**	bistable	69
J 	3/2 NO high flow	708203**J0**	monostable	69
		708203**J1**	bistable	69

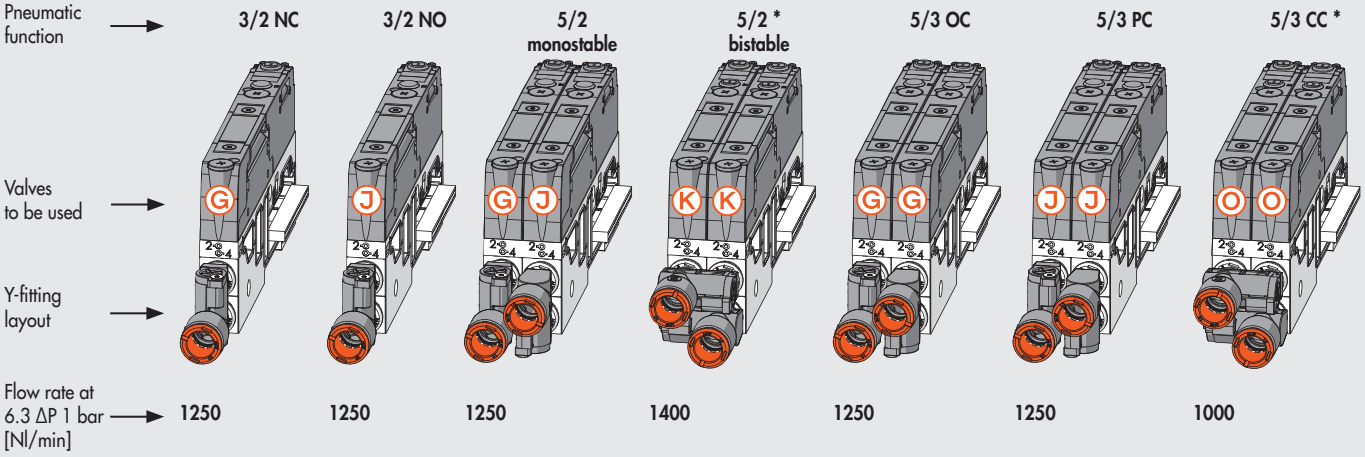
SERVO MINIMUM PRESSURE

If the island is configured without servo, minimum pressure 3.5 bar



HOW TO GET HIGH-FLOW RATE FOR EACH PNEUMATIC FUNCTION

N.B. The two cartridges on the base (2 and 4) must fit the Ø 8 mm pipe.
Outputs 2 and 4 must be connected one to the other. To do this, you can use the special Y-fitting.
When connecting one or more valves using the Y-fitting, the pneumatic system functions must be configured according to the following diagram.

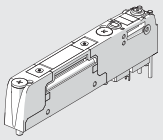


In order to get 5/2 monostable, 5/2 bistable and 5/3 DC high flow, use two parallel valves, by energizing the solenoids simultaneously.

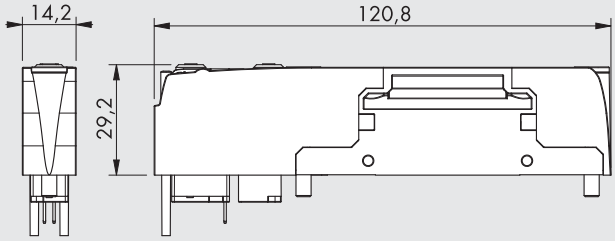
* The Y-fittings of this valve must be installed longitudinally with one Y-fitting connecting the two outputs (2) and the other the two outputs (4).
The solenoid pilots must be operated simultaneously.

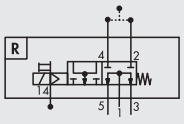
METAL WORK PNEUMATIC

EB 80 SHUT-OFF VALVE (V3V)



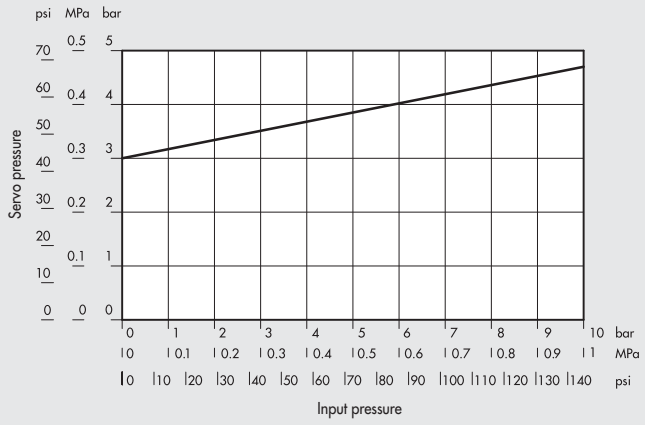
PATENTED



Symbol	Type	Code	Manual control	Weight [g]
R 	Shut-off valve	708203**R0**	monostable	69
		708203**R1**	bistable	69

SERVO MINIMUM PRESSURE

If the island is configured without servo, minimum pressure 3.5 bar

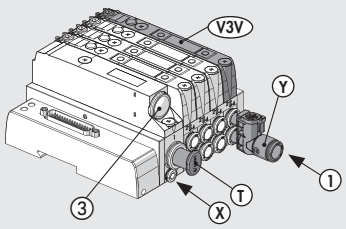


This valve enables the supply/relief of all station valves. The pneumatic supply is delivered via ports 2 and 4 on the base underneath the valve. It is discharged via ports 3 and 5 with general station discharge. Port 1 on pneumatic supply module P must be plugged for the system to operate and slave the island by supplying continuous pressure to port X.
The shut-off valve is designed for the following uses and benefits:
- the valve can be fitted in any position and not necessarily to the left of the others;
- if the station is split into areas with separate channels (1) via intermediate modules M or bases with port 1 selected, the shut-off valve only operates in the area where it is fitted.
- if the capacity of a shut-off valve is not sufficient for its use, two or more can be fitted and operated simultaneously.

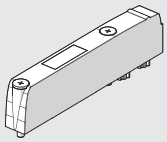
TECHNICAL DATA		
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	1000 (with 2 Ø 8 fittings or a Y fitting, pipe Ø 10 mm or 3/8")
Exhaust flow rate at 6.3 bar	Nl/min	660
Actuation response time (TRA) / reset response time (TRR) at 6 bar	ms	12/45
Servo pressure		See technical data 3/2 valves (page **B2**.50)

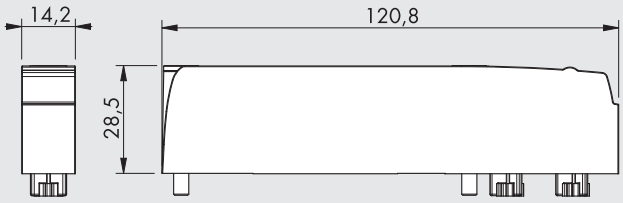
SHUT-OFF VALVE DIAGRAM

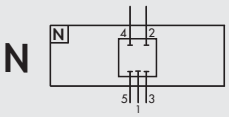
V3V Shut-off valve, can be fitted in any position
1 Pneumatic supply
3 Relief
Y Y-fitting with black bush (page **B2**.55)
T Plug port 1 of pneumatic supply P module
X Always use the pneumatic supply servo version



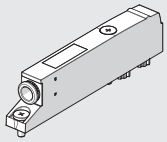
DUMMY VALVE (PLUG)

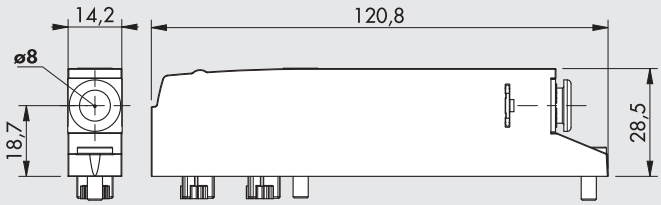


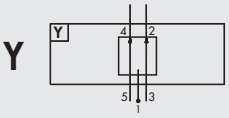


Symbol	Description	Code	Weight [g]
	Dummy valve	708203**N0**	47

BYPASS





Symbol	Description	Code	Weight [g]
	Bypass Ø8	708203**Y8**	50

N.B.: Maximum pressure in the ports 2 and 4: 8 bar

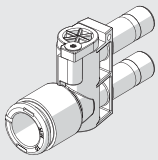
Connects port 3 of the base to port 2 and port 5 to port 4.
The fitting present is connected to port 1.

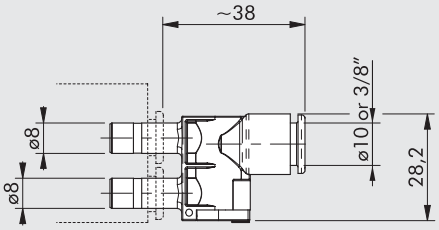
KEY TO CODES

7082	03	V	0
FAMILY	**TYPE**	**SCHEMA**	**MANUAL CONTROL**
7082 EB 80	**03** Electric, servo-assisted	**Z** 2 valves 2/2NC **I** 2 valves 3/2 NC **W** 2 valves 3/2 NO **L** 3/2 NC + 3/2 NO **V** 5/2 monostable **K** 5/2 bistable **O** 5/3 CC **G** 3/2 NC high flow **J** 3/2 NO high flow **R** Shut-off valve **Y** Bypass **N** Dummy valve (plug)	**0** Monostable or for dummy valve **1** Bistable **8** For bypass only

ACCESSORIES

Y-FITTING





Code	Description	Release bushing color
02282R2Y04	Y-fitting for EB 80 Ø 8 (5/16") - Ø 10	Orange
02282R2Y14	Y-fitting for EB 80 Ø 8 (5/16") - Ø 10	Black
02282R2Y07	Y-fitting for EB 80 Ø 8 (5/16") - Ø 3/8"	Orange
02282R2Y17	Y-fitting for EB 80 Ø 8 (5/16") - Ø 3/8"	Black

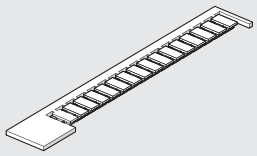
SPARE PARTS

BASE FIXING SCREW

Code	Description
02282R3000	Kit of screws for fixing the EB 80 base

Comes in 10-pc. packs

IDENTIFICATION PLATE KIT



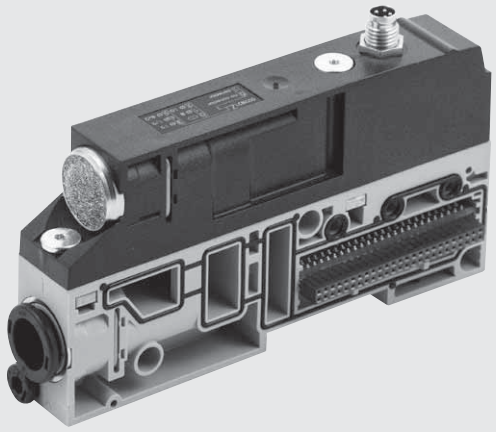
Code	Description
0226107000	Identification plate kit

Comes in 16-pc. packs

NOTES

EB 80 INTERMEDIATE SUPPORT - M

The "Intermediate modules - M" perform a series of functions.
They can help increase the flow rate available in an EB 80 island, when various valves are used at the same time. They can be used to divide an island in areas of different pressures.
They can also be used as additional electrical power supply, when there is a high number of solenoid pilots actuated simultaneously; or to electrically separate and cut out a part of the island, in the event of an emergency, for example.
Intermediate modules can be placed in any position in the EB 80 island.
Several versions are available, with fittings for pipes of different diameter.
Relief ports 3 and 5 can be either connected using a silencer or conveyed via a fitting.
A version with separate ports 3 and 5 is also available. This feature is useful in versions with pilot servo-assistance to power the valves from ports 3 and 5, at different pressures, from vacuum to 8 bar.
The lower body of the intermediate plate comes with different air flow ducts: with full flow ports or one or more closed ports.



TECHNICAL DATA

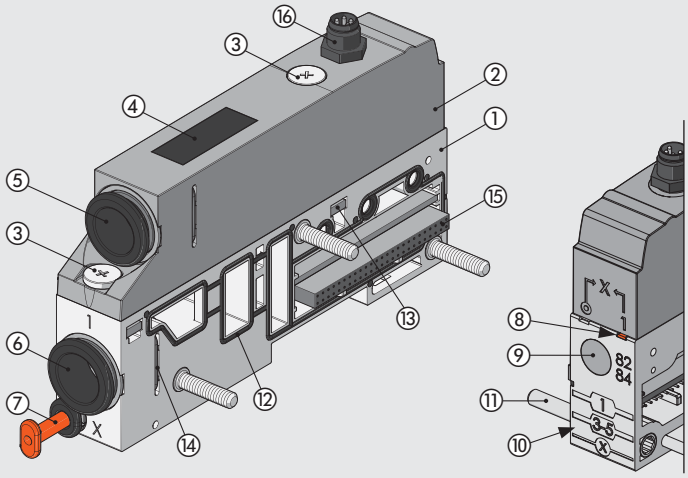
Operating pressure		Vacuum to 10 bar / Vacuum to 1 MPa / Vacuum to 145 psi			
Ambient temperature		-10 to + 50 °C / 14 to 122 °F			
Flow rate at 6.3 bar ΔP 1 bar		Ø 8 (5/16")	Ø 10	Ø 12	Ø 1/2"
Feeding (port 1)	Nl/min	1800	2800	3500	3500
Exhaust with fitting (ports 3 and 5)	Nl/min	2000	3200	4400	4400
Separate exhausts Ø 8	Nl/min	1800 x 2	-	-	-
Flow rate at 6.3 bar free exhaust					
Exhaust with fitting (ports 3 and 5)	Nl/min	2700	3900	6100	6100
Silenced exhaust	Nl/min	3600			
Exhaust with fitting Ø 12 and silencer W0970530086	Nl/min	6000			
Separate exhausts Ø 8 (N.B.: Pmax 8 bar)	Nl/min	2700 x 2	-	-	-
Fluid		Unlubricated air			
Additional electrical power supply		M8 4-pin connector *			
Voltage range	V	12 to 31.2			
Maximum number of solenoid pilots that can be actuated simultaneously					
from the additional electrical connection:					
at 24VDC		With 100% simultaneity: 48 / With 60% simultaneity: 80			
at 12VDC		With 100% simultaneity: 32 / With 60% simultaneity: 64			
Versions		Pipe fittings Ø 8, 10, 12, 1/2"; Silenced relief, conveyed relief, ports 3 and 5 separate			
		Full-flow ports in the base, 1 closed, 1, 3 and 5 closed, 3 and 5 closed, 1, 3, 5 and X closed			
		With or without additional electrical power supply			
Degree of protection		IP65 (with connectors connected or plugged if not used)			

IMPORTANT! Voltage greater than 32VDC will damage the system irreparably.

* If electric power is not supplied: the red power LED light comes on and the LEDs at the base keep flashing (voltage out of range); in the version with multi-pin electrical connection, the "OUT" fault signal is triggered; in the version with fieldbus, a software message is sent.

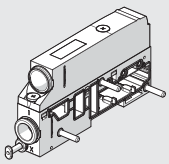
COMPONENTS

① LOWER PART BODY: technopolymer
② UPPER PART BODY: technopolymer
③ SCREWS for fixing between the bodies: galvanised steel (Tightening torque: 1.2 Nm)
④ TAG with laser-etched wording: technopolymer
⑤ AIR RELIEF: silencer or pipe fitting
⑥ POWER SUPPLY: pipe fitting
⑦ PILOTING (X): pipe fitting Ø 4
⑧ INDICATOR: indicating whether power supply to pilots is separate or not
⑨ PILOT RELIEF: silencer in HDPE
⑩ PICTOGRAM: indication of compressed air system layout
⑪ TIE RODS: nickel-plated steel
⑫ GASKET: NBR
⑬ THREADED PLATE: galvanised steel
⑭ CARTRIDGE FIXING CLIP: stainless steel
⑮ ELECTRONIC BOARD
⑯ M8 CONNECTOR: only for version with additional electrical power supply

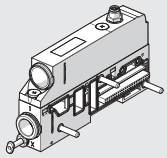


DIMENSIONS - ORDERING CODES

INTERMEDIATE MODULE - SILENCED RELIEF



WITHOUT additional electrical power supply

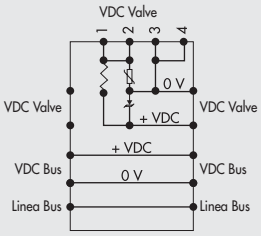


WITH additional electric power supply

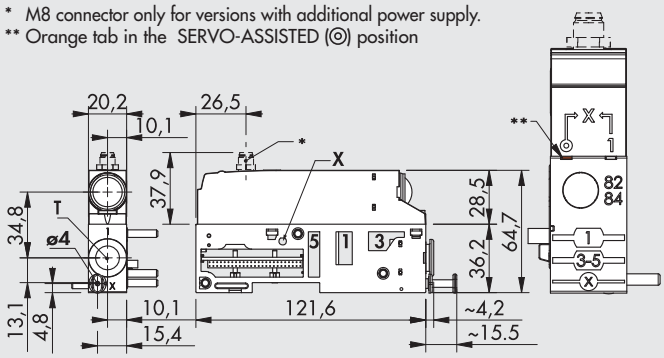
WIRING DIAGRAM NTERMEDIATE MODULE - M, WITH ADDITIONAL POWER SUPPLY

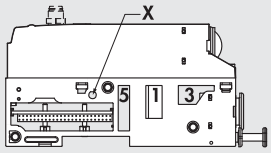
M8 male connector

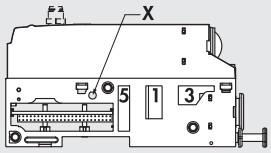
1 = + VDC
2 = + VDC
3 = GND
4 = GND

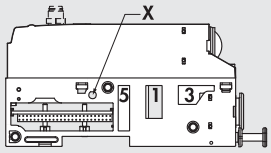


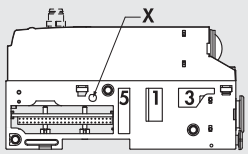
* M8 connector only for versions with additional power supply.
** Orange tab in the SERVO-ASSISTED (◎) position

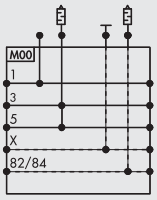
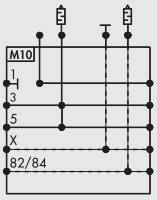
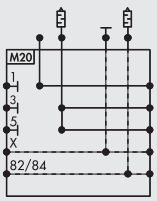
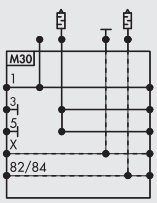
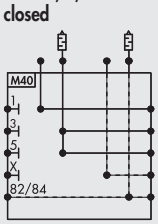




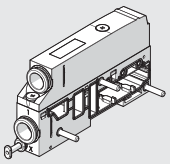




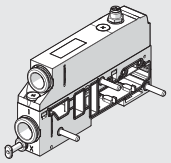


Symbol	T Pipe fitting	Code Additional electric power supply WITHOUT	 WITH	Weight [g]
Full-flow ports	Ø 8 (5/16")	02282**M100Z00**	02282**M101Z01**	168
	Ø 10	02282**M200Z00**	02282**M201Z01**	164
	Ø 12	02282**M300Z00**	02282**M301Z01**	160
	Ø 1/2"	02282**M500Z00**	02282**M501Z01**	160
Port 1 closed	Ø 8 (5/16")	02282**M110Z00**	02282**M111Z01**	168
	Ø 10	02282**M210Z00**	02282**M211Z01**	164
	Ø 12	02282**M310Z00**	02282**M311Z01**	160
	Ø 1/2"	02282**M510Z00**	02282**M511Z01**	160
Ports 1, 3 and 5 closed	Ø 8 (5/16")	02282**M120Z00**	02282**M121Z01**	168
	Ø 10	02282**M220Z00**	02282**M221Z01**	164
	Ø 12	02282**M320Z00**	02282**M321Z01**	160
	Ø 1/2"	02282**M520Z00**	02282**M521Z01**	160
Ports 3 and 5 closed	Ø 8 (5/16")	02282**M130Z00**	02282**M131Z01**	168
	Ø 10	02282**M230Z00**	02282**M231Z01**	164
	Ø 12	02282**M330Z00**	02282**M331Z01**	160
	Ø 1/2"	02282**M530Z00**	02282**M531Z01**	160
Ports 1, 3, 5 and X closed	Ø 8 (5/16")	02282**M140Z00**	02282**M141Z01**	168
	Ø 10	02282**M240Z00**	02282**M241Z01**	164
	Ø 12	02282**M340Z00**	02282**M341Z01**	160
	Ø 1/2"	02282**M540Z00**	02282**M541Z01**	160

INTERMEDIATE MODULE - CONVEYED RELIEF



WITHOUT additional electrical power supply

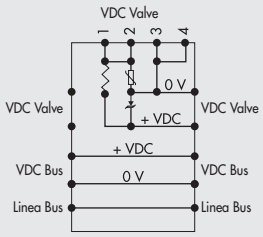


WITH additional electric power supply

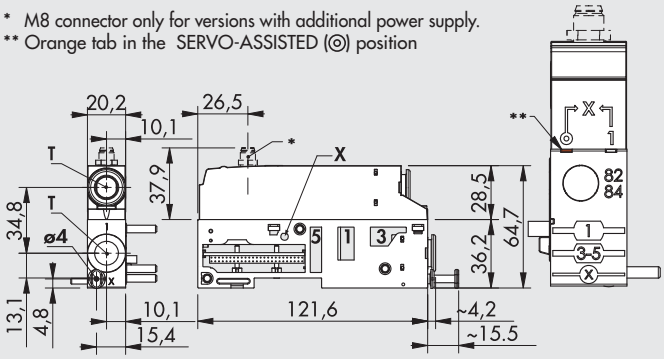
WIRING DIAGRAM NTERMEDIATE MODULE - M, WITH ADDITIONAL POWER SUPPLY

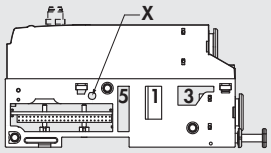
M8 male connector

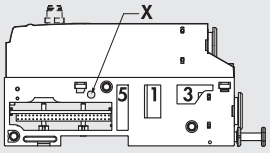
1 = + VDC
2 = + VDC
3 = GND
4 = GND

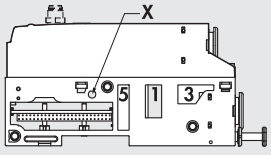


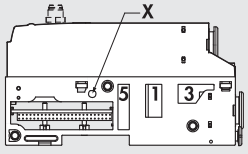
* M8 connector only for versions with additional power supply.
** Orange tab in the SERVO-ASSISTED (◎) position



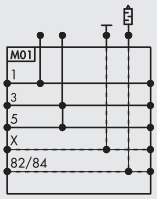


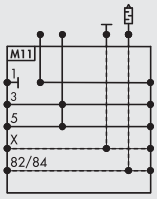


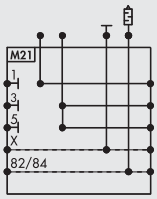


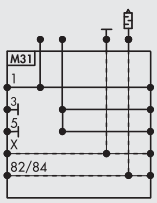


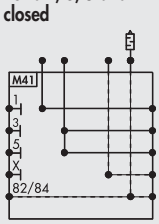
Symbol	T Pipe fitting	Code Additional electric power supply WITHOUT	 WITH	Weigh [g]
Full-flow ports	Ø 8 (5/16")	02282**M100Z10**	02282**M101Z11**	168
	Ø 10	02282**M200Z20**	02282**M201Z21**	164
	Ø 12	02282**M300Z30**	02282**M301Z31**	160
	Ø 1/2"	02282**M500Z50**	02282**M501Z51**	160
Port 1 closed	Ø 8 (5/16")	02282**M110Z10**	02282**M111Z11**	168
	Ø 10	02282**M210Z20**	02282**M211Z21**	164
	Ø 12	02282**M310Z30**	02282**M311Z31**	160
	Ø 1/2"	02282**M510Z50**	02282**M511Z51**	160
Ports 1, 3 and 5 closed	Ø 8 (5/16")	02282**M120Z10**	02282**M121Z11**	168
	Ø 10	02282**M220Z20**	02282**M221Z21**	164
	Ø 12	02282**M320Z30**	02282**M321Z31**	160
	Ø 1/2"	02282**M520Z50**	02282**M521Z51**	160
Ports 3 and 5 closed	Ø 8 (5/16")	02282**M130Z10**	02282**M131Z11**	168
	Ø 10	02282**M230Z20**	02282**M231Z21**	164
	Ø 12	02282**M330Z30**	02282**M331Z31**	160
	Ø 1/2"	02282**M530Z50**	02282**M531Z51**	160
Ports 1, 3, 5 and X closed	Ø 8 (5/16")	02282**M140Z10**	02282**M141Z11**	168
	Ø 10	02282**M240Z20**	02282**M241Z21**	164
	Ø 12	02282**M340Z30**	02282**M341Z31**	160
	Ø 1/2"	02282**M540Z50**	02282**M541Z51**	160



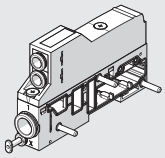




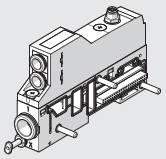




INTERMEDIATE MODULE - SEPARATE RELIEF



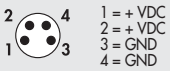
WITHOUT additional electrical power supply

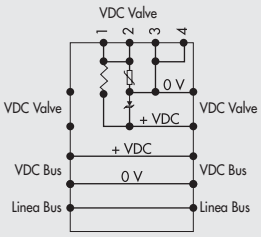


WITH additional electrical power supply

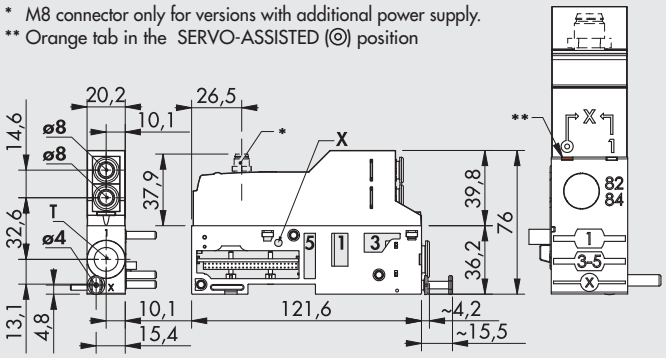
WIRING DIAGRAM NTERMEDIATE MODULE - M, WITH ADDITIONAL POWER SUPPLY

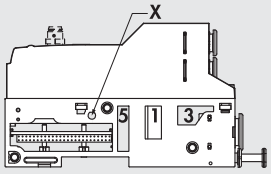
M8 male connector

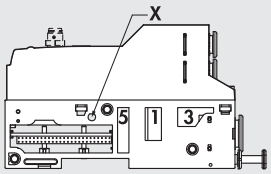


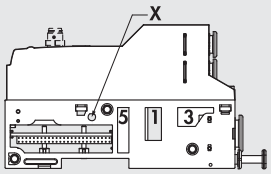


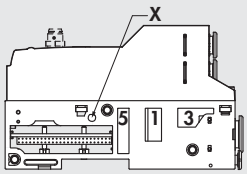
* M8 connector only for versions with additional power supply.
** Orange tab in the SERVO-ASSISTED (◎) position











N.B.: Maximum pressure in the ports 3 and 5: 8 bar

Symbol	T Pipe fitting	Code Additional electric power supply WITHOUT	Code Additional electric power supply WITH	Weight [g]
Full-flow ports	Ø 8 (5/16")	02282**M100Z60**	02282**M101Z61**	179
	Ø 10	02282**M200Z60**	02282**M201Z61**	175
	Ø 12	02282**M300Z60**	02282**M301Z61**	171
	Ø 1/2"	02282**M500Z60**	02282**M501Z61**	171
Port 1 closed	Ø 8 (5/16")	02282**M110Z60**	02282**M111Z61**	179
	Ø 10	02282**M210Z60**	02282**M211Z61**	175
	Ø 12	02282**M310Z60**	02282**M311Z61**	171
	Ø 1/2"	02282**M510Z60**	02282**M511Z61**	171
Ports 1, 3 and 5 closed	Ø 8 (5/16")	02282**M120Z60**	02282**M121Z61**	179
	Ø 10	02282**M220Z60**	02282**M221Z61**	175
	Ø 12	02282**M320Z60**	02282**M321Z61**	171
	Ø 1/2"	02282**M520Z60**	02282**M521Z61**	171
Ports 3 and 5 closed	Ø 8 (5/16")	02282**M130Z60**	02282**M131Z61**	179
	Ø 10	02282**M230Z60**	02282**M231Z61**	175
	Ø 12	02282**M330Z60**	02282**M331Z61**	171
	Ø 1/2"	02282**M530Z60**	02282**M531Z61**	171
Ports 1, 3, 5 and X closed	Ø 8 (5/16")	02282**M140Z60**	02282**M141Z61**	179
	Ø 10	02282**M240Z60**	02282**M241Z61**	175
	Ø 12	02282**M340Z60**	02282**M341Z61**	171
	Ø 1/2"	02282**M540Z60**	02282**M541Z61**	171

KEY TO CODES

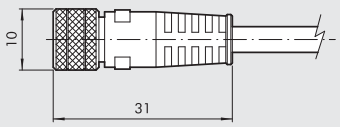
02282	M	3	0	0	Z	3	0
FAMILY	SUBSYSTEM	PORT FITTING 1	PORTS IN THE BASE	ADDITIONAL ELECTRICAL POWER SUPPLY	UPPER PART	PORTS 3 AND 5 FITTING	ELECTRICAL CONNECTOR
02282 EB 80	**M** Intermediate	**1** Pipe fitting Ø 8 (5/16″) **2** Pipe fitting Ø 10 **3** Pipe fitting Ø 12 **5** Pipe fitting Ø 1/2″	**0** Full-flow ports **1** Port 1 closed **2** Ports 1, 3 and 5 closed **3** Ports 3 and 5 closed **4** Ports 1, 3, 5 and X closed	■ **0** Without ● **1** With	**Z** The upper part is present	**0** Silencer ▲ **1** Pipe fitting Ø 8 (5/16″) ▲ **2** Pipe fitting Ø 10 ▲ **3** Pipe fitting Ø 12 ▲ **5** Pipe fitting Ø 1/2″ **6** 2 pipes fitting Ø 8 (5/16″) (one for port 3, one for port 5)	■ **0** Without ● **1** With

▲ For ports 3/5, use the same Ø pipe as port 1.
■ Same number for both positions.
● Same number for both positions.

ACCESSORIES

M8 CONNECTOR FOR POWER SUPPLY

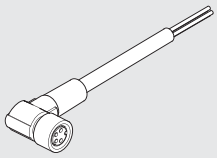
Pin	Cable color
1	Brown
2	White
3	Blue
4	Black



Code	Description
0240009060	M8 4-pin female connector for power supply, cable L = 3 m
0240009037	M8 4-pin female connector for power supply, cable L = 5 m
0240009058	M8 4-pin female connector for power supply, cable L = 10 m
0240009059	M8 4-pin female connector for power supply, cable L = 15 m

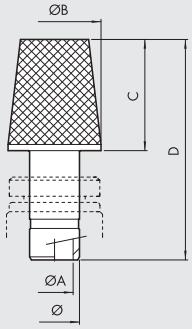
M8 90° CONNECTOR FOR POWER SUPPLY

Pin	Cable color
1	Brown
2	White
3	Blue
4	Black



Code	Description
0240009103	M8 4-pin connector - female, 90° angle L = 5 m

SILENCER FOR FITTING

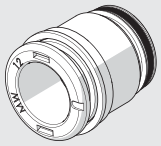


Ø	Ø A	Ø B	C	D
8	6	15	18	35.7
12	10	18.8	29	51.5

Code	Description	Weight [g]
W0970530084	Silencer for fitting, Ø 8	15
W0970530086	Silencer for fitting, Ø 12	24

SPARE PARTS

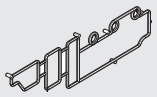
CARTRIDGE



Code	Description	Ø
02282R2110	EB 80 silencer cartridge kit	silencer
02282R2113	EB 80 Ø 8 power supply round cartridge kit	8 (5/16″)
02282R2114	EB 80 Ø 10 power supply round cartridge kit	10
02282R2115	EB 80 Ø 12 power supply round cartridge kit	12
02282R2118	EB 80 Ø 1/2 power supply round cartridge kit	1/2"

Comes in 10-pc. packs

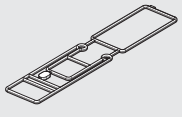
BASE INTERFACE GASKET



Code	Description
02282R1000	EB 80 base interface gasket kit

Comes in 10-pc. packs

LOWER /UPPER BODY GASKET

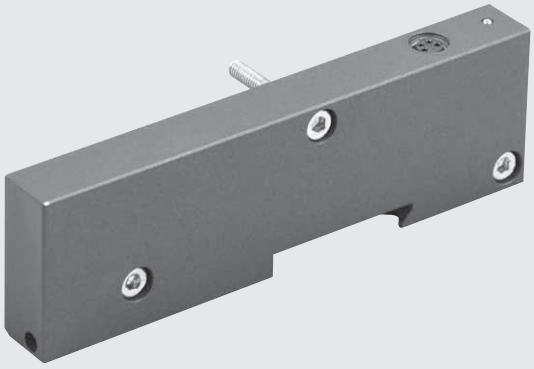


Code	Description
02282R1001	EB 80 lower/upper body gasket kit

Comes in 10-pc. packs

EB 80 CLOSED END-PLATE - C

The "Closed end plate - C" is the last element of each EB 80 system.
A version for islands with multi-pole connector is available.
One for islands with fieldbus, containing a small electronic board; one for connection to other additional EB 80 islands (only for systems with fieldbus).
The end plate houses the system for mechanically fixing the island to external supports.

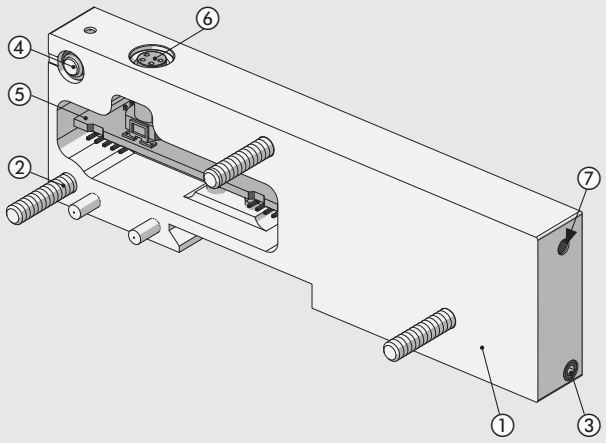


TECHNICAL DATA

Ambient temperature	°C	-10 to + 50
	°F	14 to 122
Versions		For islands with multi-pole connection. For island with fieldbus. For connection to additional islands.
Degree of protection		IP65 (with connectors connected or plugged if not used)
Notes		All valve units (including multi-pole versions) require earthing protection. Use M4 thread on the end plate with braided cable code 02282R6000 provided or, when fixing the unit onto a DIN bar, connect the bar to earthing.

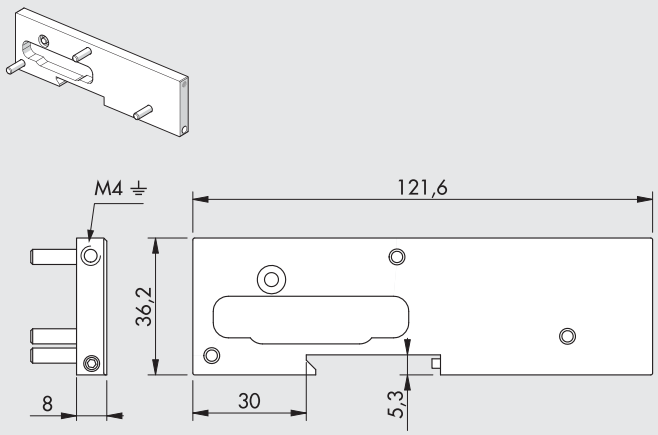
COMPONENTS

① BODY: painted metal
② FIXING SCREW: TCE M4x20 galvanised steel
③ GRUB SCREW securing the DIN bar or bracket: galvanized steel
④ RELIEF VALVE: safety in case of internal pressure increase due to temperature or losses
⑤ ELECTRONIC BOARD: none in the Closed end plate for islands with multi-pole connector
⑥ M8 CONNECTOR: only in the Closed end plate for connection with additional islands
⑦ GROUNDING ⏚



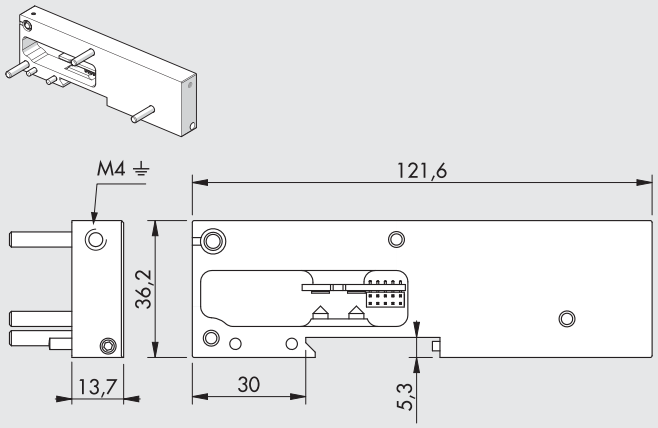
DIMENSIONS - ORDERING CODES

CLOSED END PLATE FOR ISLANDS WITH MULTI-POLE CONNECTOR



Symbol	Code	Description	Weight [g]
	02282**C1**	Closed end-plate for islands with multi-pole connector	92

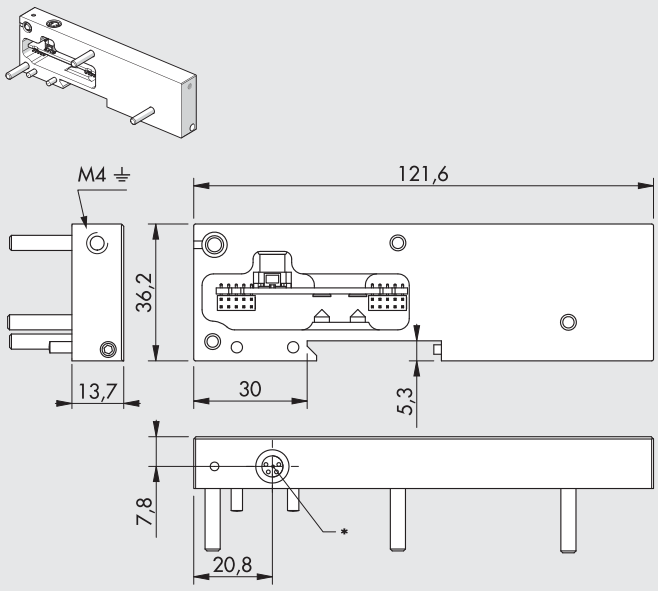
CLOSED END-PLATE FOR ISLANDS WITH FIELDBUS

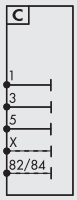


Symbol	Code	Description	Weight [g]
	02282**C2**	Closed end-plate for islands with fieldbus	148

Note: also usable for islands with multi-pole connector

CLOSED END PLATE FOR ELECTRICAL CONNECTION OF ISLANDS WITH FIELDBUS TO ADDITIONAL ISLANDS



Symbol	Code	Description	Weight [g]
	02282**C3**	Closed end-plate for electrical connection to additional islands	148

Note: if you do not connect additional island you must mount the M8 end connector

* M8 connector for connection to additional islands.

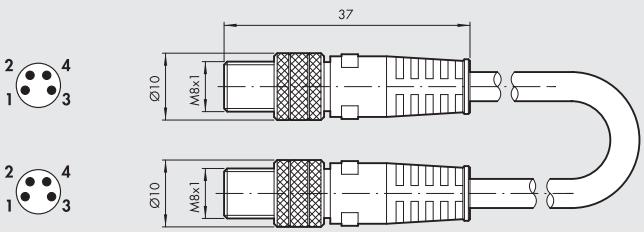
N.B.: The system does not work until the connector is connected to the "Additional electrical connection - E" module.

KEY TO CODES

02282	C	1
FAMILY	SUBSYSTEM	TYPE
02282 EB 80	**C** Closed end-plate	**1** For islands with multi-pole connection **2** For islands with fieldbus **3** For connection to additional islands

ACCESSORIES

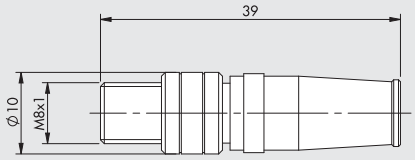
M8 CONNECTOR WITH CABLE FOR CONNECTION BETWEEN EB 80 ISLANDS



Code	Description	Weight [g]
0240010201	M8-M8 4-pin male shielded cable L = 1 m	45
0240010205	M8-M8 4-pin male shielded cable L = 5 m	185
0240010210	M8-M8 4-pin male shielded cable L = 10 m	330
0240010215	M8-M8 4-pin male shielded cable L = 15 m	475
0240010220	M8-M8 4-pin male shielded cable L = 20 m	620

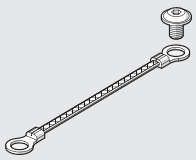
N.B.: For correct operation of the entire EB 80 system, use M8-M8 pre-wired, twisted and shielded cables only.

M8 END CONNECTOR FOR EB 80 VALVES



Code	Description
02282R5000	M8 end connector for EB 80 valves

BRAIDED EARTH CABLE

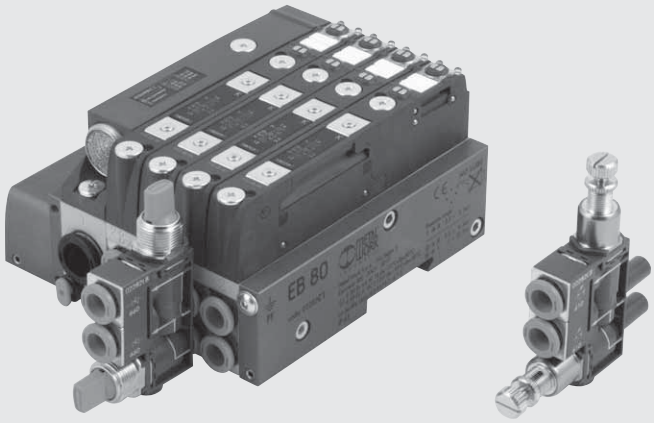


Code	Description
02282R6000	Braided earth cable

NOTES

EB 80 MULTI-FUNCTION MODULE

The multi-function module is an important extension of the possibilities offered by the EB 80 systems to manage the performance of actuators controlled by individual solenoid valves. For each port, it can regulate the pressure and the flow rate, provide manual sectioning, display the presence of pressurized air and much more besides.
In line with the modular EB 80 configuration, the multi-function module is designed to ensure maximum flexibility: it can be installed at any time; the function connected to port 2 may differ from that connected to port 4 (e.g. regulating the pressure at output 2 and the air flow at port 4);
the modules can be mounted in series one after the other; the cartridge fittings for the pipes can be replaced at any time and are the same as those used in the EB 80 valve bases.
Given that the air input pipes have a Ø 8 mm, the multi-function module must be inserted in the EB 80 bases with cartridges suitable for Ø 8 fittings; but if the base to which you want to connect has a cartridge of a different diameter, you only need to buy a multi-function fitting with Ø 8 cartridges and replace those of the base with those of the module.
The code and the pneumatic diagram are laser etched on the technopolymer body.



PATENTED

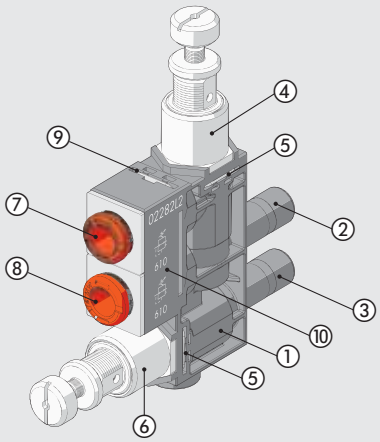
TECHNICAL DATA

Operating pressure	bar	10
	MPa	1
	psi	145
Temperature range	°C	-10 to + 50
	°F	14 to 122
Fluid		Unlubricated air
Air quality required		ISO 8573-1 class 4-7-3
Functions		Unidirectional flow regulator, bidirectional flow regulator, pressure regulator, quick-relief valve, check valve, 2- or 3-way shut-off valve, pneumatic valve, pressure display, calibrated choke.
Air inlet		Tubes for Ø 8 mm fittings
Air delivery		Cartridge fittings for pipes Ø 4 (5/32"), Ø 6, Ø 1/4", Ø 8 (5/16")
Recommended pipe		Rilsan PA 11 - Nylon 6 - Polyamide 12 - Polypropylene

N.B.: For more specific technical data, please refer to the chapters for individual function-modules

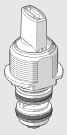
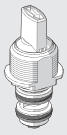
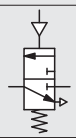
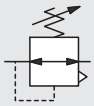
COMPONENTS

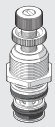
① BODY: technopolymer
② TUBE to be inserted into port 2 of the EB 80 base
③ TUBE to be inserted into port 4 of the EB 80 base
④ PNEUMATIC FUNCTION relating to port 2
⑤ CLIP for the pneumatic function, steel
⑥ PNEUMATIC FUNCTION relating to port 4
⑦ Cartridge FITTING for port 2
⑧ Cartridge FITTING for port 4
⑨ CLIP for the cartridges
⑩ CODE AND DIAGRAM, laser etched

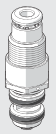
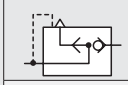
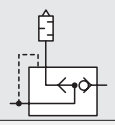
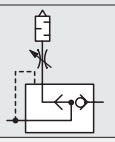
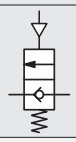


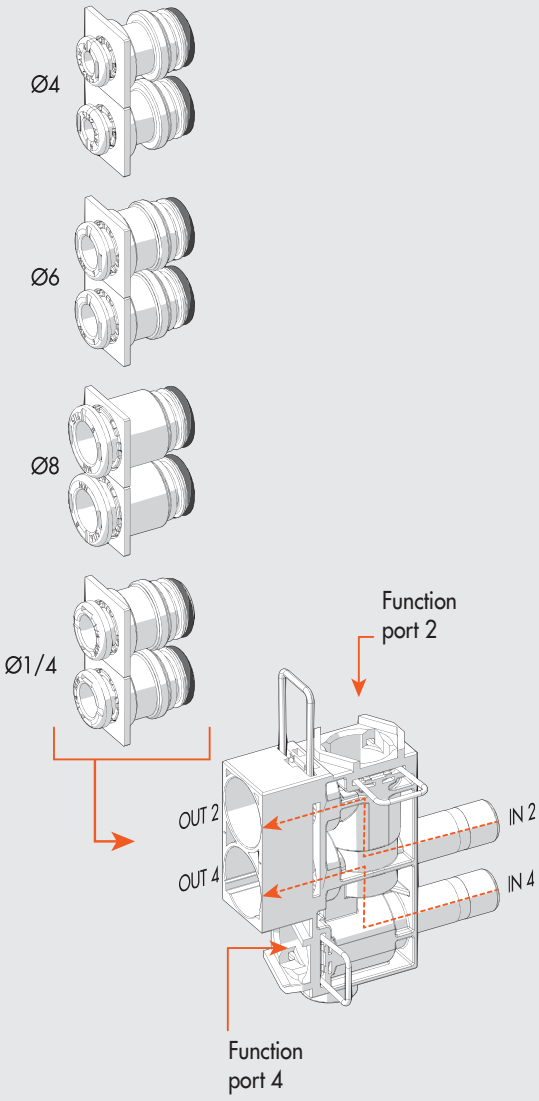
METAL WORK PNEUMATIC

EXPLODED FUNCTION DIAGRAM

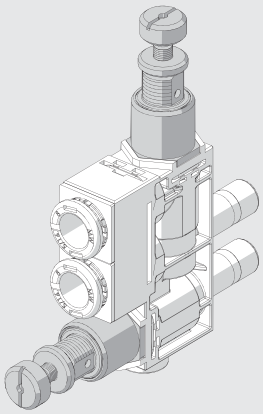
PNV	REG	LAM	V2V	V3V
				
3-way pneumatic valve	Pressure regulator	Pressure indicator	Shut-off valve 2-way	Shut-off valve 3-way
				
Code **670**	Code **610**	Code **680 / 682**	Code **650**	Code **660**
See page **B2**.68	See page **B2**.69	See page **B2**.70	See page **B2**.71	See page **B2**.71

RFL		RFF	
			
Flow regulator unidirectional	Flow regulator bidirectional	Calibrated choke unidirectional type V	Calibrated choke bidirectional type B
Code **410**	Code **411**	Code **7_ _**	Code **8_ _**
See page **B2**.72		See page **B2**.74	

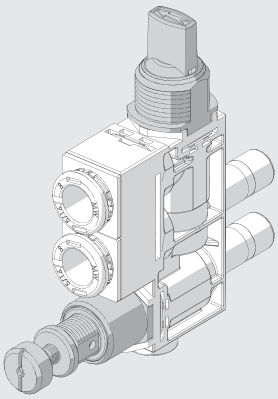
VSRC	VSRS	VSRR	P2V	VNR	NF
					
Quick-exhaust valve conveyed	Quick-exhaust valve silenced	Quick-exhaust valve regulated	Unidirectional 2-way pneumatic valve	Check valve	No function
					
Code **630**	Code **631**	Code **632**	Code **671**	Code **640**	Code **000**
See page **B2**.75	See page **B2**.75	See page **B2**.76	See page **B2**.78	See page **B2**.79	See page **B2**.80



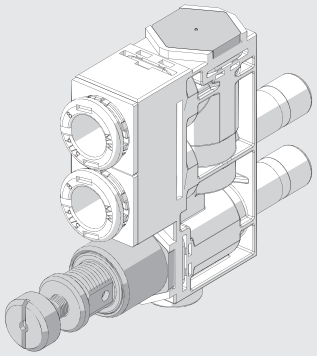
EXAMPLES OF MODULARITY



SAME FUNCTIONS ON PORTS 2 AND 4

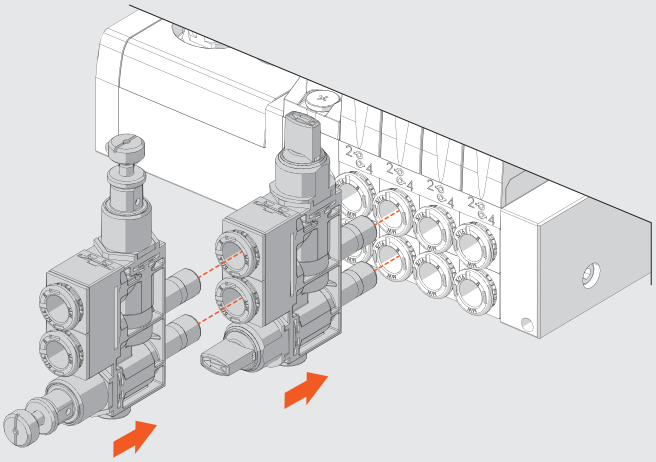


FUNCTION ON PORT 2 DIFFERENT FROM THAT ON PORT 4



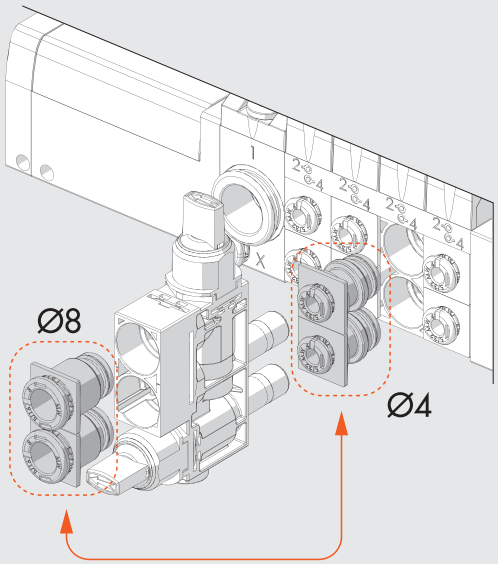
FUNCTION ON ONE PORT ONLY

SERIES ASSEMBLING



REPLACING THE CARTRIDGES

When fittings for pipes other than Ø 8 pipes are mounted on the base, choose a multi-function module with Ø 8 fittings and invert them with those of the base.



KEY TO CODES

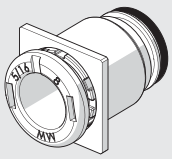
02282	L	6	610	410
FAMILY	**SUBSYSTEM**	**FITTINGS**	**FUNCTION PORT 2 (Top)**	**FUNCTION PORT 4 (Bottom)**
02282 EB 80	**L** Multi-function module	**2** Pipe fitting Ø 1/4" **4** Pipe fitting Ø 4 (5/32") **6** Pipe fitting Ø 6 **8** Pipe fitting Ø 8 (5/16")	**000** NF - No function **410** RFL - Flow regulator unidirectional **411** RFL - Flow regulator bidirectional **610** REG - Pressure regulator **630** VSRC - Quick-exhaust valve, conveyed **631** VSRS - Quick-exhaust valve, silenced **632** VSRR - Quick-exhaust valve, regulated **640** VNR - Check valve **650** V2V - 2-way shut-off valve **660** V3V - 3-way shut-off valve **670** PNV - 3-way pneumatic valve **671** P2V - Unidirectional 2-way pneumatic valve **680** LAM - Orange pressure indicator **682** LAM - Green pressure indicator **7_ _*** RFF - Calibrated choke unidirectional - type V **8_ _*** RFF - Calibrated choke bidirectional - type B	**000** NF - No function **410** RFL - Flow regulator unidirectional **411** RFL - Flow regulator bidirectional **610** REG - Pressure regulator **630** VSRC - Quick-exhaust valve, conveyed **631** VSRS - Quick-exhaust valve, silenced **632** VSRR - Quick-exhaust valve, regulated **640** VNR - Check valve **650** V2V - 2-way shut-off valve **660** V3V - 3-way shut-off valve **670** PNV - 3-way pneumatic valve **671** P2V - Unidirectional 2-way pneumatic valve **680** LAM - Orange pressure indicator **682** LAM - Green pressure indicator **7_ _*** RFF - Calibrated choke unidirectional - type V **8_ _*** RFF - Calibrated choke bidirectional - type B

* The last two digits indicate the narrowing Ø.

02 = Ø 0.2 mm	**05** = Ø 0.5 mm	**10** = Ø 1.0 mm
03 = Ø 0.3 mm	**06** = Ø 0.6 mm	**13** = Ø 1.3 mm
04 = Ø 0.4 mm	**08** = Ø 0.8 mm	**15** = Ø 1.5 mm

SPARE PARTS

CARTRIDGE



Code	Description	Ø
02282R2001	EB 80 Ø 4 base square cartridge kit	4 (5/32")
02282R2002	EB 80 Ø 6 base square cartridge kit	6
02282R2003	EB 80 Ø 8 base square cartridge kit	8 (5/16")
02282R2006	EB 80 Ø 1/4 base square cartridge kit	1/4"

Comes in 10-pc. packs

NOTES

EB 80 3-WAY PNEUMATIC VALVE – PNV

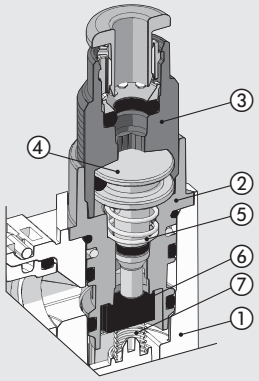
It is a normally closed 3/2 valve driven pneumatically via a Ø 4 pipe.
It intercepts the air flow leaving the EB 80 valve. If the PNV is activated, the flow opens up, when it is de-activated the pressure is discharged downstream.

TECHNICAL DATA

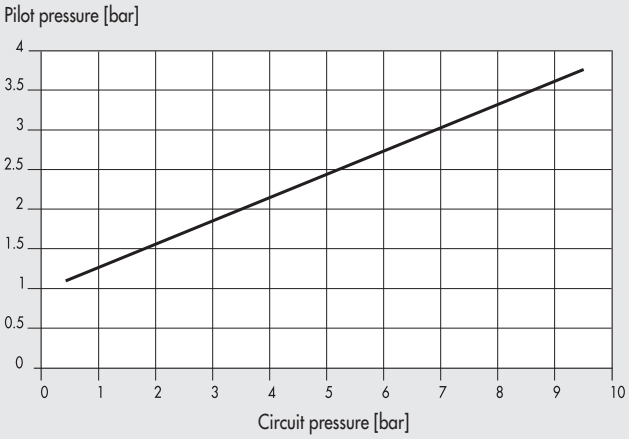
Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Max. operating pressure	bar	10			
	MPa	1			
	psi	145			
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	110	380	420	380
Flow rate at 6.3 bar free exhaust	Nl/min	80			
Minimum pilot pressure		See graph			

COMPONENTS

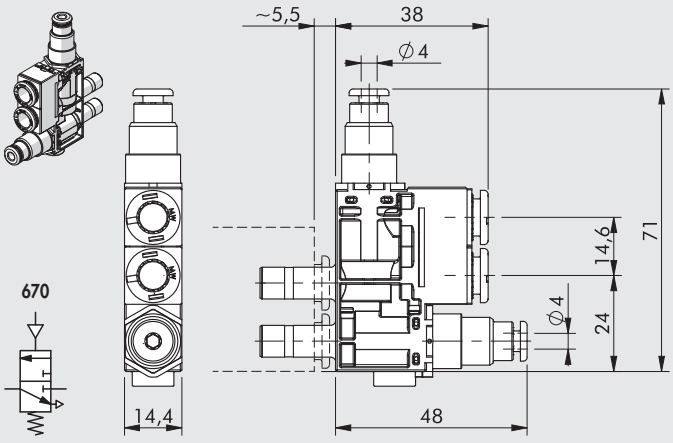
① BODY: technopolymer
② INSERT: nickel-plated brass
③ PILOT INSERT: nickel-plated brass
④ PISTON ROD: brass
⑤ CLAMPING SPRING: stainless steel
⑥ SEAL: NBR
⑦ POPPET SPRING: stainless steel



MINIMUM PILOT PRESSURE



DIMENSIONS



EB 80 PRESSURE REGULATOR - REG

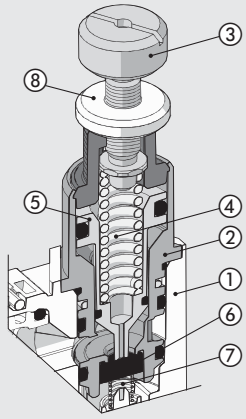
It regulates the pressure coming from the EB 80 base to individual branches.
It comes with an overpressure relief device.
It can be used as an economizer: if the thrust in a cylinder must be exerted in one direction, e.g. at the piston rod output, while a lower thrust is required in the other direction, a lot of energy can be saved by inserting the pressure regulator into the port connected to piston rod retraction.

TECHNICAL DATA

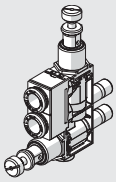
Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Setting range		1 to 8 bar - 0.1 to 0.8 MPa - 14.5 to 116 psi			
Input pressure	bar	2 to 10			
	MPa	0.2 to 1			
	psi	30 to 145			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar	Nl/min	80	130	150	130
Flow rate on exhaust at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	300	380	400	380
Adjustment		Manual or using a screwdriver			
Notes on use		The pressure must always be set upwards			

COMPONENTS

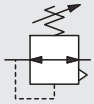
① BODY: technopolymer
② INSERT: nickel-plated brass
③ ADJUSTING SCREW: nickel-plated brass
④ ADJUSTING SPRING: steel
⑤ PISTON ROD: brass
⑥ SHUTTER: NBR
⑦ POPPET SPRING: stainless steel
⑧ ADJUSTING SCREW RING NUT: nickel-plated brass

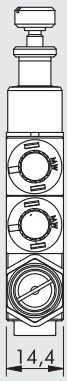


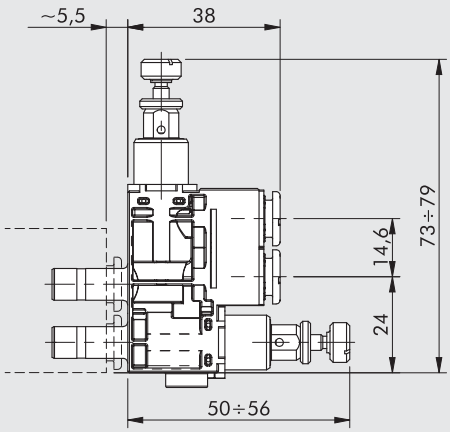
DIMENSIONS



610







EB 80 PRESSURE INDICATOR - LAM

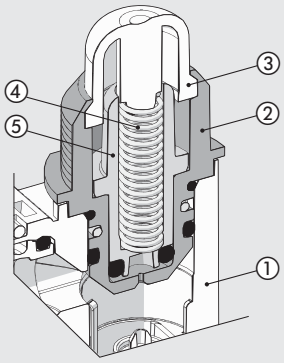
Also called pneumatic lamp, it optically indicate the presence of compressed air in the circuit.
If there is no pressure, the transparent technopolymer bell is empty; if there is pressure an orange or a green sign is indicated.

TECHNICAL DATA

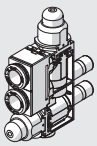
Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Operating pressure	bar	2 to 10			
	MPa	0.2 to 1			
	psi	29 to 145			
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	130	500	600	500
Colour with pressure		Orange - Green			

COMPONENTS

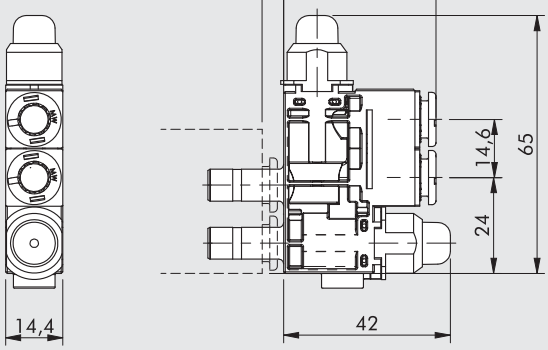
① BODY: technopolymer
② INSERT: nickel-plated brass
③ COVER: clear technopolymer
④ RETURN SPRING: stainless steel
⑤ MOBILE INDICATOR: technopolymer



DIMENSIONS



680/682



EB 80 SHUT-OFF VALVE - V2V-V3V

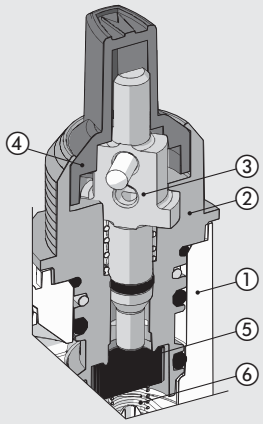
It shuts off the flow of air coming from the EB 80 via a manual command. Two versions are available: the two-way unidirectional V2V valve and the V3V 3-way valve. The latter, when deactivated, intercepts the flow from the EB 80 valve and relieves downstream pressure.

TECHNICAL DATA

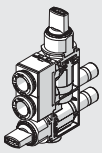
Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Max. operating pressure	bar		10		
	MPa		1		
	psi		145		
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	120	370	420	370
Flow rate of the V3V when relieving at 6.3 bar	Nl/min		110		

COMPONENTS

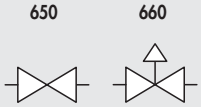
① BODY: technopolymer
② INSERT: nickel-plated brass
③ ROD: brass
④ KNOB: technopolymer
⑤ VALVE: NBR
⑥ VALVE COMPRESSION SPRING: stainless steel

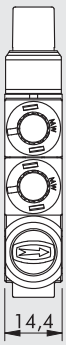


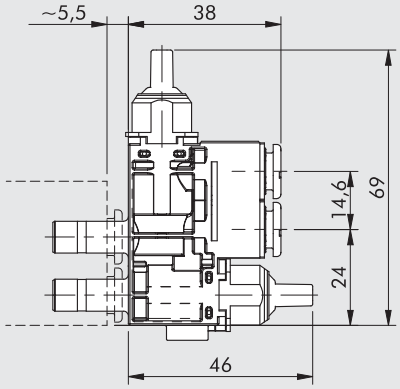
DIMENSIONS



650 660







EB 80 FLOW REGULATOR - RFL

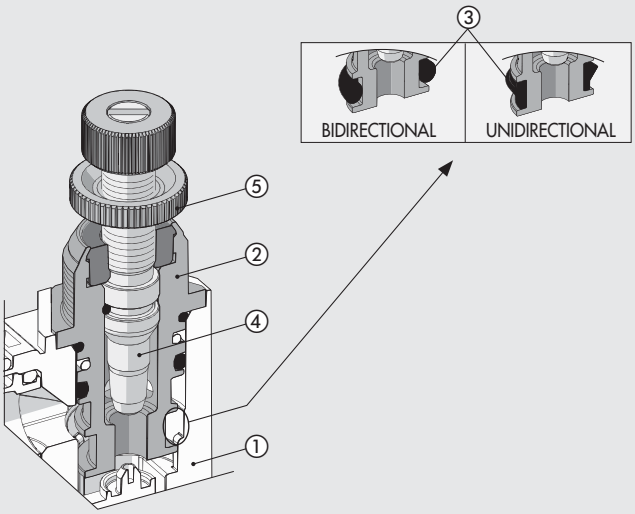
It regulates the air flow rate, and hence the speed, in pneumatic actuators. Two versions are available: the bidirectional one regulating the flow in both directions and the unidirectional one regulating the flow when the EB 80 valve is relieving.

TECHNICAL DATA

Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Max. operating pressure	bar	10			
	MPa	1			
	psi	145			
Maximum flow rate during regulation at 6.3 bar	Nl/min	440	650	710	650
Exhaust flow rate (unidirectional version)	Nl/min	450	720	800	720
Adjustment		Manual or using a screwdriver			
Operating system		Tapered needle			

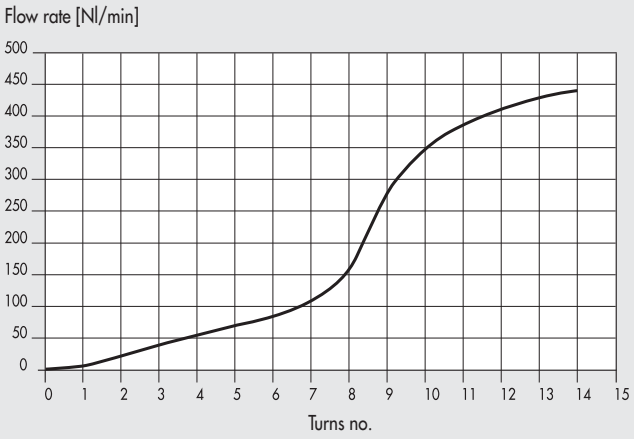
COMPONENTS

① BODY: technopolymer
② SEAL SUPPORT: nickel-plated brass
③ GASKET: NBR
④ ADJUSTING NEEDLE: brass
⑤ NEEDLE RING NUT: nickel-plated brass

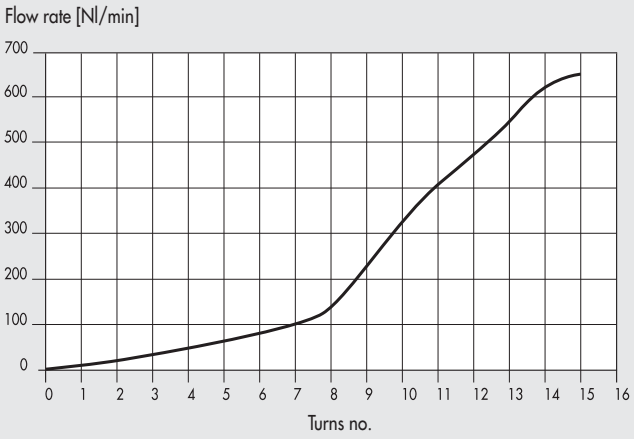


FLOW RATE CHARTS AT 6.3 bar DEPENDING ON THE TURNS EFFECTED BY THE REGULATION OF THE NEDDLE

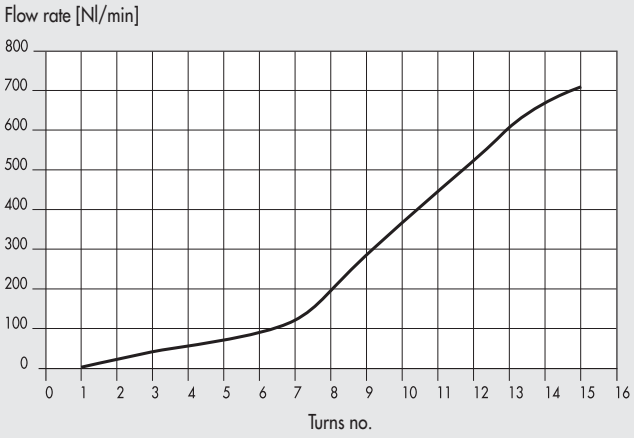
RFL Ø4



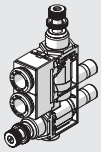
RFL Ø6 - Ø1/4

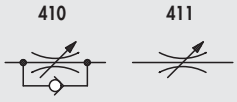


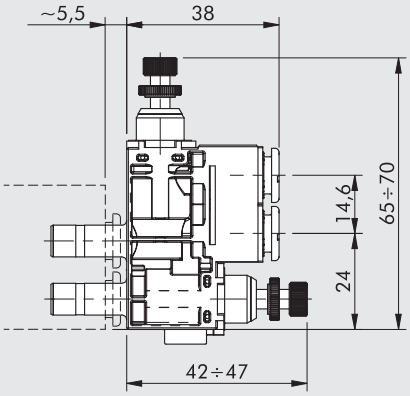
RFL Ø8



DIMENSIONS

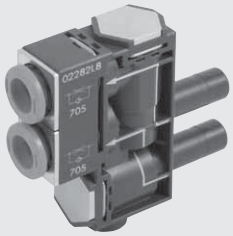






EB 80 CALIBRATED CHOKE - RFF

It regulates the air flow rate, and hence the speed, in pneumatic actuators. This is done by means of a choke of a calibrated diameter. In order to obtain the desired air flow rate, you can choose different choking diameters. Compared to adjustable versions, the main advantage is that it does not require any adjustments during the assembly of the machine and prevents from subsequent tampering.
Two versions are available: the bidirectional one regulating the flow in both directions and the unidirectional one regulating the flow when the EB 80 valve is relieving.

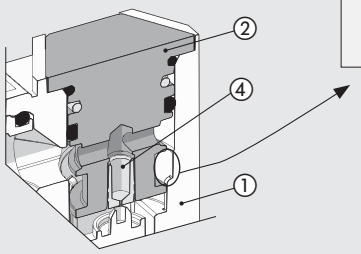


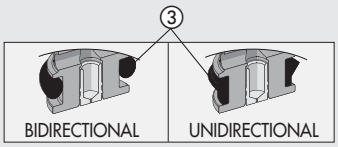
TECHNICAL DATA

Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Max. operating pressure	bar	10			
	MPa	1			
	psi	145			
Flow rates		See tables			
Adjustment		Fixed			
Operating system		Calibrated hole			

COMPONENTS

① BODY: technopolymer
② SEAL SUPPORT: nickel-plated brass
③ GASKET: NBR
④ THROTTLE CARTRIDGE: brass





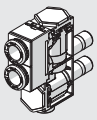
EXHAUST FLOW RATE AT 6.3 bar UNIDIRECTIONAL VERSION [Nl/min]

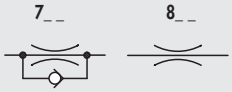
Choke [mm]	Ø 4	Ø 6 - Ø 1/4	Ø 8
Ø 0.2	240	550	640
Ø 0.3	242	552	642
Ø 0.4	245	555	645
Ø 0.5	250	560	650
Ø 0.6	255	565	660
Ø 0.8	265	570	690
Ø 1.0	275	580	710
Ø 1.3	290	610	750
Ø 1.5	300	620	800

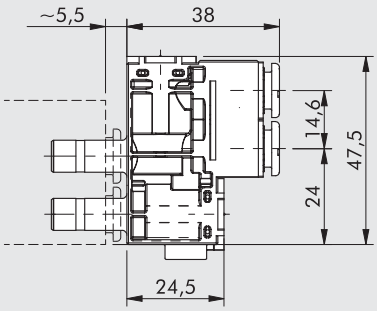
CHOKE FLOW-RATE AT 6 bar WITH FREE EXHAUST

Choke [mm]	Flow rate [Nl/min]
Ø 0.2	2
Ø 0.3	4
Ø 0.4	7
Ø 0.5	13
Ø 0.6	15
Ø 0.8	32
Ø 1.0	50
Ø 1.3	85
Ø 1.5	110

DIMENSIONS

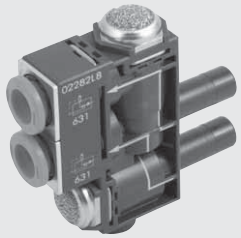






EB 80 QUICK-EXHAUST VALVE - VSR

It speeds up the relieving of air coming from the actuators to the EB 80 and releases it into the atmosphere.
If the air coming from the actuators is polluted, it prevents it from entering into the EB 80 island, where it could risk to damage the valves.
Air relieving can be either silenced with a stainless steel wire or conveyed via an automatic fitting.



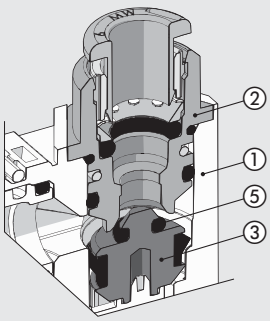
TECHNICAL DATA

Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Operating pressure	bar	1 to 10			
	MPa	0.1 to 1			
	psi	14.5 to 145			
Inlet flow rate at 6.3 bar ΔP 1 bar	Nl/min	90	210	270	210
Exhaust flow rate at 6.3 bar	Nl/min	330	700	750	700

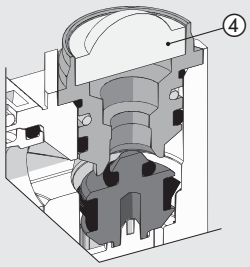
COMPONENTS

① BODY: technopolymer
② INSERT: nickel-plated brass
③ VALVE: brass
④ SILENCER: stainless steel wire
⑤ GASKET: NBR

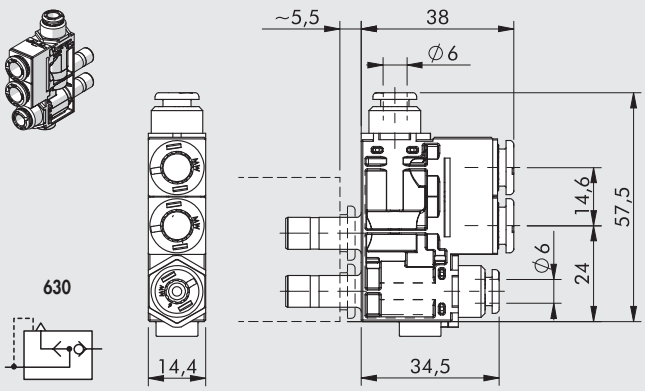
CONVEYED VERSION



SILENCED VERSION



CONVEYED VERSION DIMENSIONS



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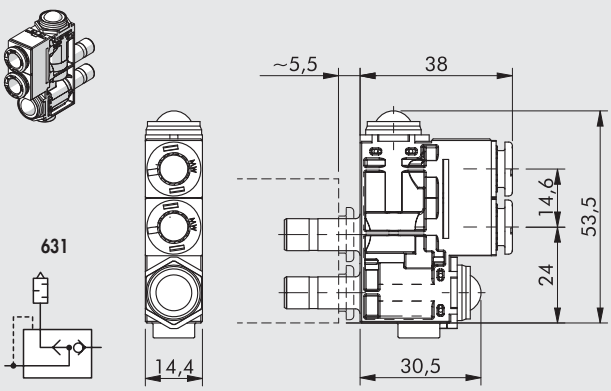


EB 80 QUICK-EXHAUST VALVE WITH FLOW REGULATOR - VSRR

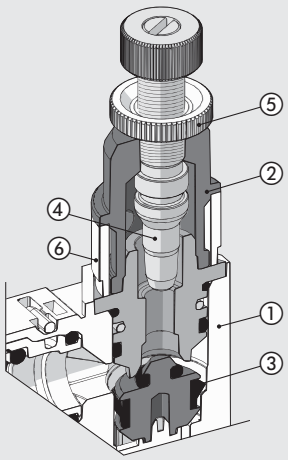
It speeds up the relieving of air coming from the actuators to the EB 80, releases it into the atmosphere and regulates the flow rate. It relieves the air coming from the utilities and regulates the quality of flow precisely by operating the knob provided.

TECHNICAL DATA

Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Operating pressure	bar	1 to 10			
	MPa	0.1 to 1			
	psi	14.5 to 145			
Inlet flow rate at 6.3 bar ΔP 1 bar	Nl/min	90	210	270	210
Max flow rate on exhaust at 6.3 bar	Nl/min	450	530	560	530
Adjustment		Manual or using a screwdriver			
Internal system		Tapered needle			

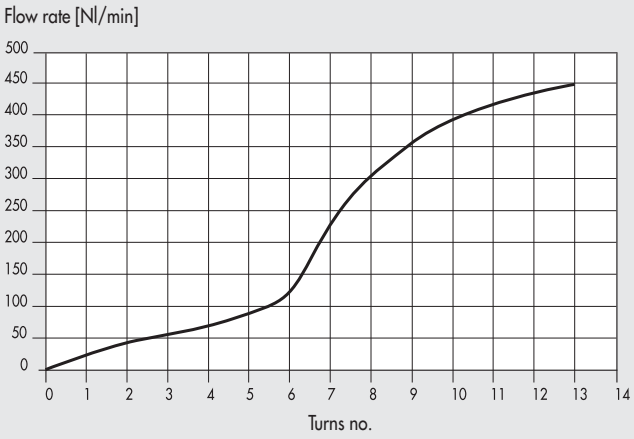
COMPONENTS

① BODY: technopolymer
② SEAL SUPPORT: nickel-plated brass
③ GASKET: NBR
④ ADJUSTING NEEDLE: brass
⑤ NEEDLE RING NUT: nickel-plated brass
⑥ SILENCER: sintered bronze

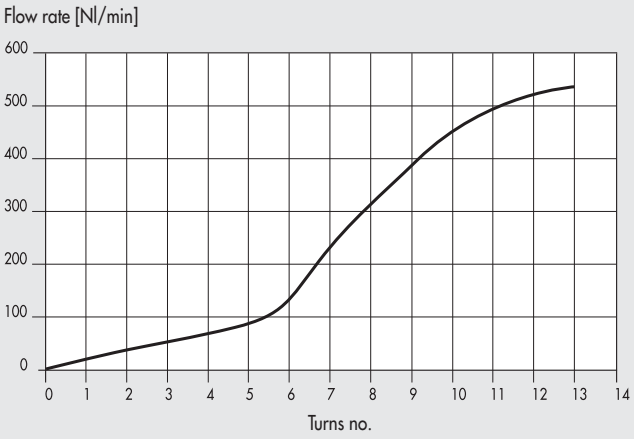


EXHAUST FLOW CHARTS AT 6.3 bar DEPENDING ON THE TURNS EFFECTED BY THE REGULATION OF THE NEDDLE

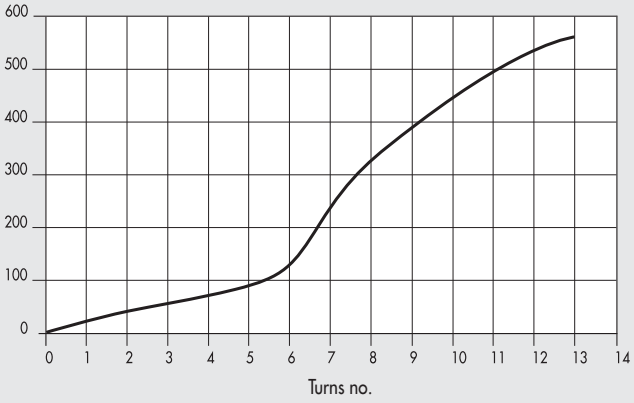
VSRR Ø4



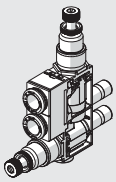
VSRR Ø6 - Ø1/4



VSRR Ø8



DIMENSIONS



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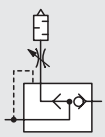
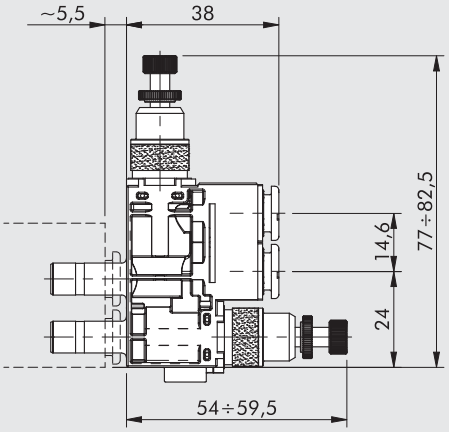




EB 80 UNIDIRECTIONAL 2-WAY PNEUMATIC VALVE – P2V

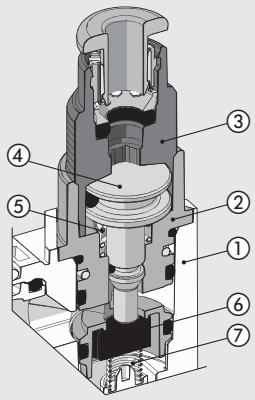
Unidirectional normally closed 2/2 valve pneumatically driven via a Ø 4 pipe.
Can intercept the flow of air coming from the EB 80 valve.
When enabled, it opens the flow; when disabled it closes the pressurised circuit.
N.B.: Given the direction of the flow, it cannot be used to block the flow of air coming out of a cylinder.

TECHNICAL DATA

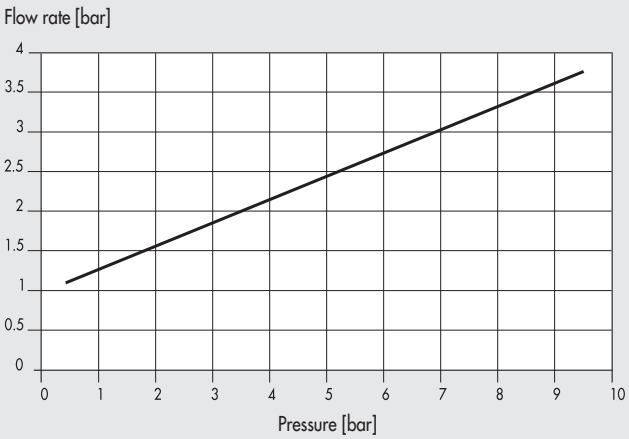
Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Max. operating pressure	bar	10			
	MPa	1			
	psi	145			
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	110	370	420	370
Minimum pilot pressure		See graph			

COMPONENTS

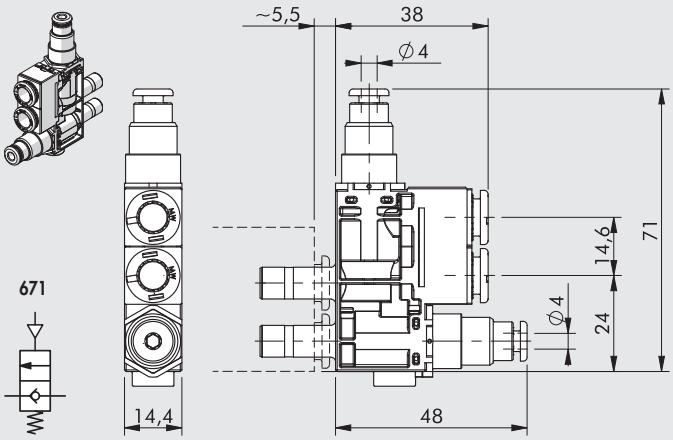
① BODY: technopolymer
② INSERT: nickel-plated brass
③ PILOT INSERT: nickel-plated brass
④ PISTON ROD: brass
⑤ CLAMPING SPRING: stainless steel
⑥ SEAL: NBR
⑦ POPPET SPRING: stainless steel



MINIMUM PILOT PRESSURE



DIMENSIONS



EB 80 CHECK VALVE - VNR

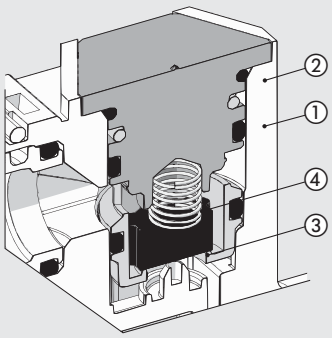
Check valve. Full flow from the EB 80 valve to the utility. It prevents the air flow from reversing downstream the VNR.

TECHNICAL DATA

Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Operating pressure	bar	0.5 to 10			
	MPa	0.05 to 1			
	psi	7.2 to 145			
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	350	420	450	420

COMPONENTS

① BODY: technopolymer
② INSERT: nickel-plated brass
③ VALVE: NBR
④ VALVE COMPRESSION SPRING: stainless steel



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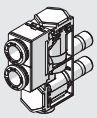

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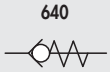
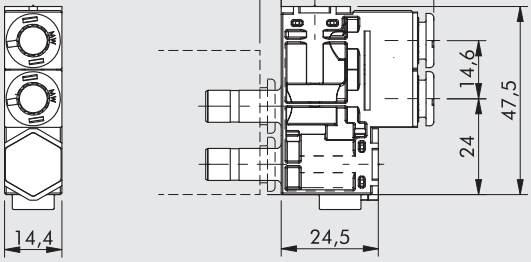




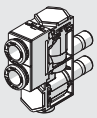
EB 80 NO FUNCTION - NF

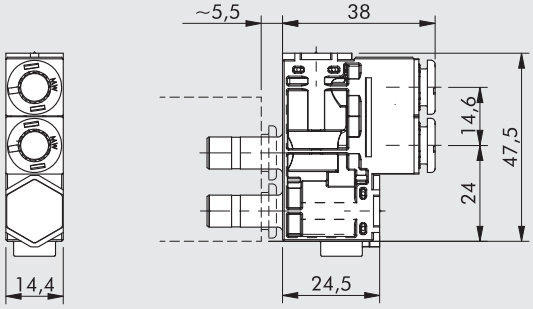
To be used when, on one of the two-way network, no pneumatic function is required.
The flow conveys directly from the inlet to the output fitting without any variation.

TECHNICAL DATA

Ø of cartridge fitting		Ø 4 (5/32")	Ø 6	Ø 8 (5/16")	Ø 1/4"
Max. operating pressure	bar		10		
	MPa		1		
	psi		145		
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	130	500	600	500

DIMENSIONS

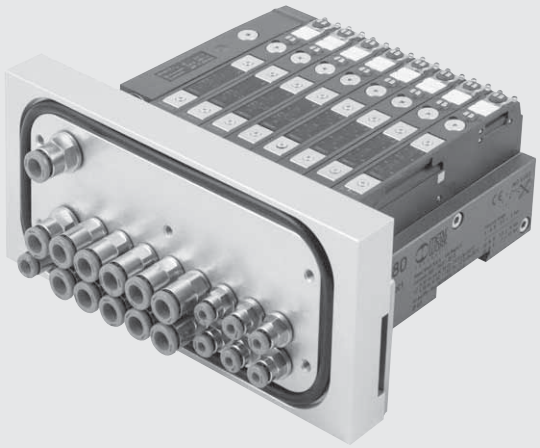




NOTES

EB 80 SPLASH AREA

The splash-area assembly kits have been designed and developed for the Food & Beverage industry and, in general, for use in all the situations in which it is advisable to separate the solenoid valves from areas where there are fluids.
The kit can be used to fix a standard EB 80 island to a sheet metal plate, perforated by the customer, with compressed air fittings and pipes installed downstream.
Two models are available, one designed to accommodate 3-8 valves and one 8-12 valves. Other configurations can be made on specific request.
The plate is available in two optional materials: anticorodal 6082 anodized aluminium and AISI 304 stainless steel.
Threaded holes are provided in the splash-area side of the plate for air supply, relief, control and utilities.
The EB 80 islands of any type can be fixed to the kit, with either multi-pin or fieldbus connection and signal modules, provided that they have one pneumatic supply source to avoid changing the pitch between valves, and the ports 2 and 4 have Ø 8 fittings and the ports 1 and 3 have Ø 12 fittings.
The valve island can be used with silenced relief provided that the threaded port of the plate is closed.

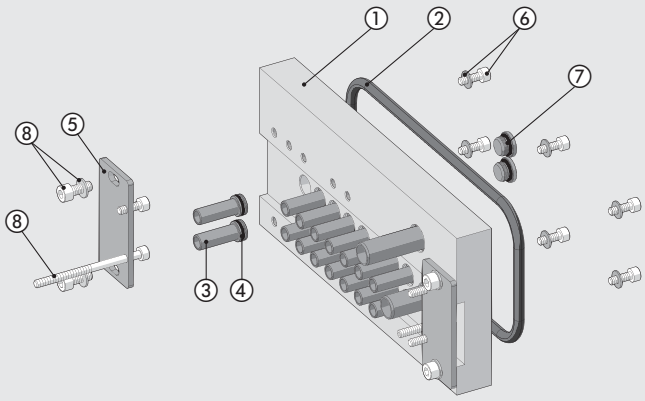


TECHNICAL DATA	
General technical data	See page **B2**.4
Protection rating at the splash-area side	IP67
Versions	3 to 8 positions; 8 to 12 positions
Bases configurable with this number of valves	For maximum 8-position version: 3, 4, 6, 7, 8 valves
	For the maximum 12-position version: 8, 9, 10, 11, 12 valves
Pneumatic fittings	1/4" supply and discharge
	M5 piloting
	1/8" delivery

N.B.: The valve island to be used with the splash-area must be configured with Ø8 mm fittings on ports 2 and 4 and Ø12 mm fittings on ports 1, 3 and 5.

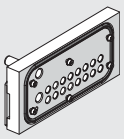
COMPONENTS

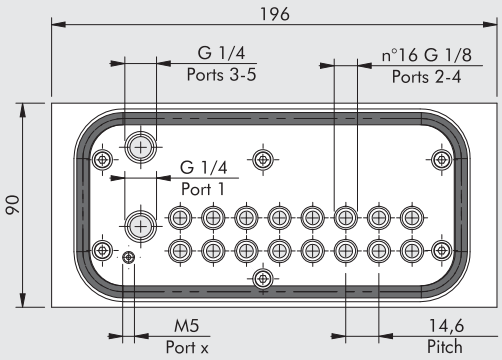
① SPLASH-AREA PLATE: 6082 anodized aluminium or AISI 304 stainless steel
② SPLASH-AREA GASKET: NBR
③ EXTENSIONS: nickel-plated brass
④ GASKETS: NBR
⑤ FIXING BRACKET: AISI 304 stainless steel
⑥ SCREWS AND WASHERS: stainless steel
⑦ 1/8" PLUGS: nickel-plated brass (to cover unused outputs)
⑧ SCREWS AND WASHERS: galvanized steel

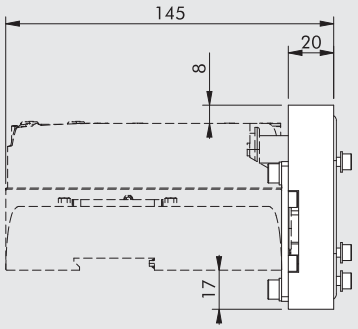


DIMENSIONS AND ORDERING CODES

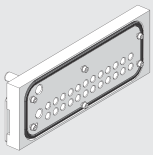
3 to 8 POSITION

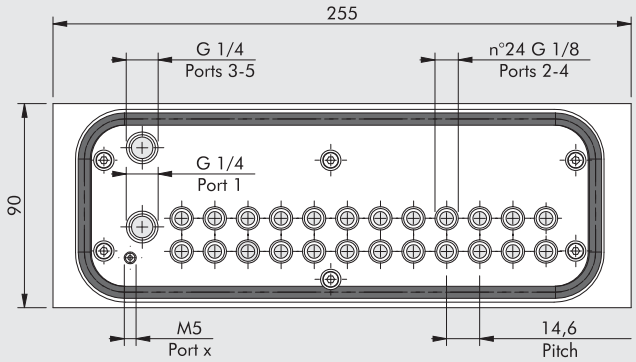






8 to 12 POSITION





Code	Description	Weight [g]
02282**R7080**	EB 80 splash-area kit 3-8 positions aluminum	919
02282**R7081**	EB 80 splash-area kit 3-8 positions stainless steel	2354
02282**R7120**	EB 80 splash-area kit 8-12 positions aluminum	1189
02282**R7121**	EB 80 splash-area kit 8-12 positions stainless steel	3046

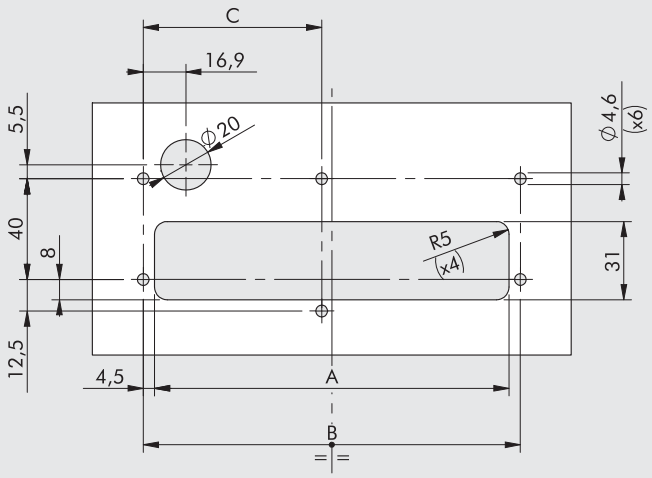
DIMENSIONS FOR THE DRILLING OF THE FIXING INTERFACE

3 to 8 POSITION

A	B	C
140.6	149.9	70.8

8 to 12 POSITION

A	B	C
199	208	100



KEY TO CODES

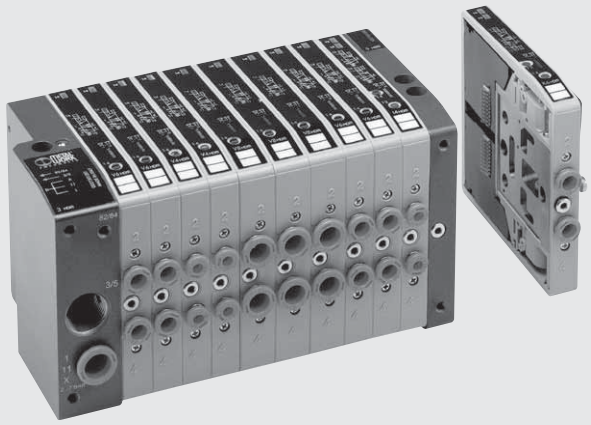
02282	R	7	08	0
FAMILY	**CATEGORY**	**SUBSYSTEM**	**NUMBER OF POSITIONS**	**MATERIAL**
02282 EB 80	**R** Spares and accessories	**7** Splash-area	**08** 8 positions **12** 12 positions	**0** Anodized aluminum plate 6082 **1** Plate AISI 304

METAL WORK PNEUMATIC

NOTES

HDM + MULTI-POLE CONNECTION

HDMs are the ideal solution for those requiring the unbeatable performance, flexibility and modularity of Multimach valves combined with sturdy mechanics and a high degree of protection against external agents. Each valve is enclosed in a reinforced technopolymer protective shell that acts as a shock-absorber and prevents the infiltration of dirt. The class of protection is IP65.
The smooth, rounded design makes HDMs ideal for applications requiring frequent washing without the deposit of residues. All the pneumatic connections are on one side, with built-in push-in fittings. The user interface is on another side so that the fitter and the service engineer have everything at hand.
Flexibility is total: there are 1-16 valves, input and output terminals for pipes of different sizes and intermediate modules for separate inputs and outputs.
One very important new feature is that valves of different capacities can be mounted as required. Three different valve sizes can be combined at will.
This means a valve can be replaced at any time by another one offering a different performance. It only takes a few seconds to replace or add a valve.
To do this, merely loosen the two grub screws fixing the valve to the adjacent ones. Since the electrical signal is relayed from one valve to the next by means of gold-plated contacts connected to an electronic board, the electrical connections are entirely automatic.
The ratio of the HDM's flow rate to its dimensions is unrivalled – miniaturisation and efficiency have reached a peak.

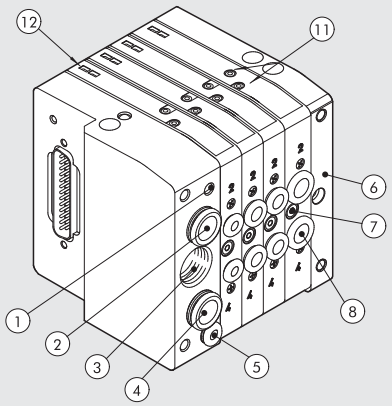


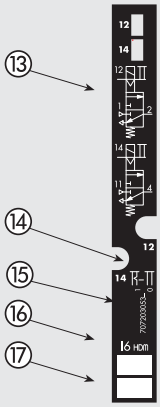
TECHNICAL DATA

Valve port connections		Ø 4,6,8,10 mm automatic fitting for ports 2 and 4 / power supply port for Ø10 or Ø 12 mm automatic fitting / 3/8 thread for exhaust port, M5 thread for exhaust pilot port				
Connection on the end-plate for the supply of pilots		Automatic fitting Ø 4 mm				
Maximum number of pilots		16				
Maximum number of valves		16 (same as the max. no. of pilots)				
Operating temperature range	°C	-10 to +60				
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous				
Pressure range	bar	X (pilot supply)			1-11 (valve supply)	
	Terminal 1-1	3 to 7			vacuum at 10	
	Terminal 1	3 to 7				
Voltage range		24VDC ± 10%				
Power	W	0.9				
Control		PNP o NPN				
Insulation class		F155				
Degree of protection		IP65 (with conveyed exhust)				
Solenoid rating		100% ED				
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	11.5 mm Ø 4	11.5 mm Ø 6	14 mm Ø 8	23 mm Ø 8	23 mm Ø 10
	version 5/2 and 3/2	200	500	650	1000	1200
	version 5/3	200	300	300	500	500
TRA/TRR 2x3/2 monostable at 6 bar	ms	8 / 45			8 / 60	
TRA/TRR 5/2 monostable at 6 bar	ms	8 / 33			9 / 60	
TRA/TRR 5/2 bistable at 6 bar	ms	20 / 20			8 / 8	
TRA/TRR 5/3 cc monostable at 6 bar	ms	20 / 20			15 / 15	
Note on use		Insert the pipes in the fittings, before passing air through the valves, otherwise the basket may be pulled out of its seat by the flow of air.				
Compatibility with oils		See **chapter Z1**				

COMPONENTS

① Exhaust - Solenoid pilot 82/84
② Valve supply - port 1
③ Threaded connection of exhausts 3/5
④ Valve supply - port 11
⑤ Electrical control supply X
⑥ Blind end-plate or right end-plate 1-11
⑦ Screw for valve wall-mounting
⑧ Utility port for pipe Ø 4, 6, 8 or 10 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number

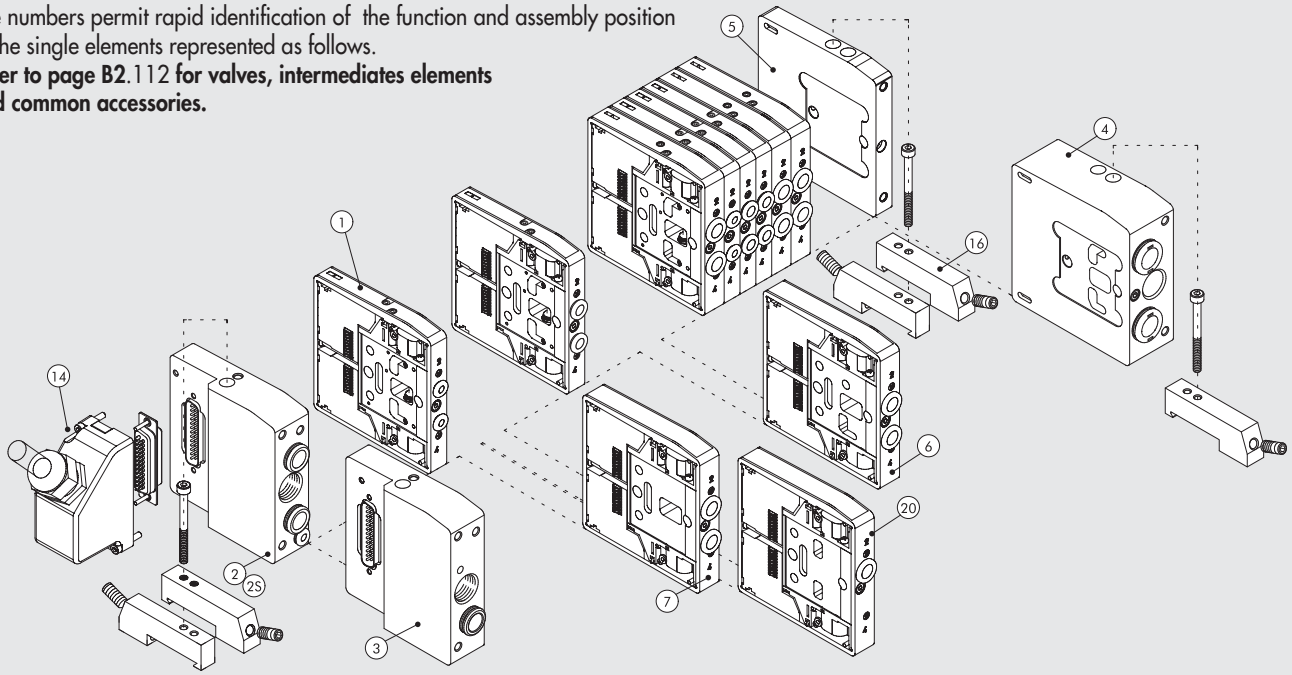




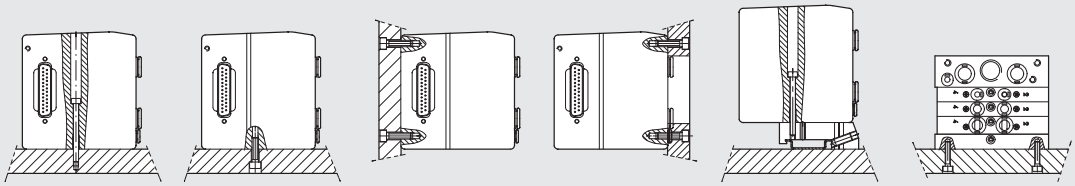
METAL WORK PNEUMATIC

THE MULTIMACH WORLD: FLEXIBILITY

The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.112 **for valves, intermediates elements and common accessories.**



FIXING THE BASE



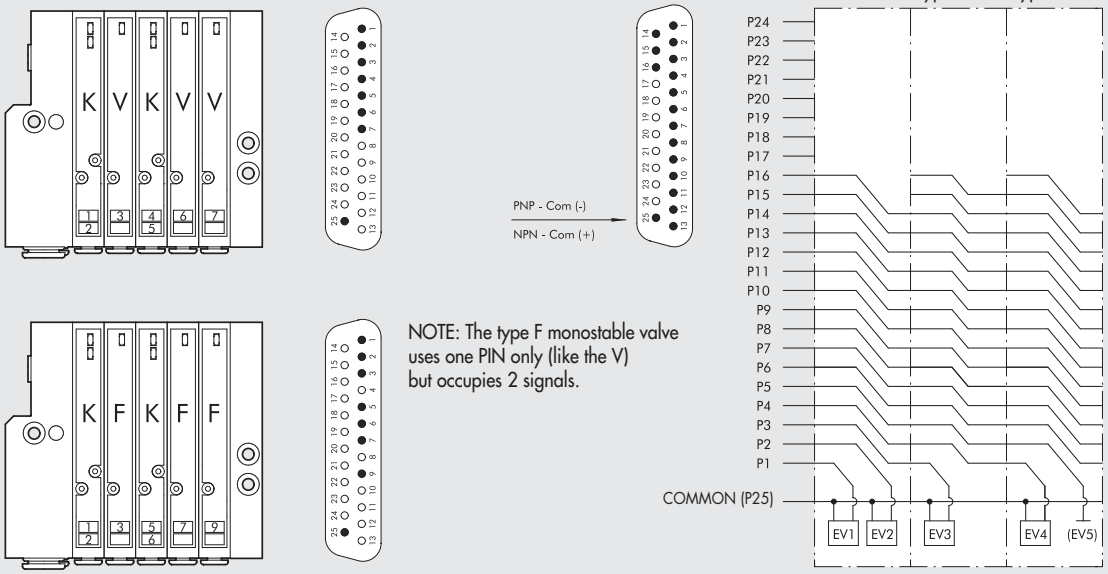
Ⓐ Fixing from above using the 1 or 1-11 input terminal and the blind terminal.
Ⓑ Ⓒ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the bottom and the rear of the terminals.
Ⓓ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the front of the terminals. An opening for the pipes is made in the plate.
Ⓔ Fixing on the DIN bar with end-plate 1 or 1-11 and blind and plate, using the push-in bracket code 0227301600.
Ⓕ Lateral fixing using the blind terminal, and its the M4 threads on the side lateral.
Note: The sole fixing admitted is the one showed.

SYNOPTIC, SIZES AND VERSIONS

H D M VALVE	2 INPUT END-PLATE	8 ELECTRICAL BASE	M MANUAL TYPE	I6 - W 8 - W 6 - O 4 - L 8 - 5 TYPE OF VALVE	1 4 - 1 6 FURTHER DETAILS
Heavy duty Multimach IP65	**2** End-plate 1-11 pipe Ø 10 **3** End-plate 1 pipe Ø 10 **2S** End-plate 1-11 pipe Ø 12	**8** D-Sub 25 wire	**M** Monostable manual control **B** Bistable manual control	**I** n° 2 3/2 NC **W** n° 2 3/2 NO **L** 3/2 NO + 3/2 NC **V** 5/2 monostable **K** 5/2 bistable **O** 5/3 monostable ***F** 5/2 monostable **4** right-end-plate 1-11 pipe Ø12 **5** blind end-plate **6** Passing-intermede **7** Blind intermediate **20** Exhaust section **4** Cartridge 4 **6** Cartridge 6 **8** Cartridge 8 - 14 mm **8S** Cartridge 8 - 23 mm **10** Cartridge 10	**14** IP65 25-wire shell **16** n° 2 brackets for DIN bar

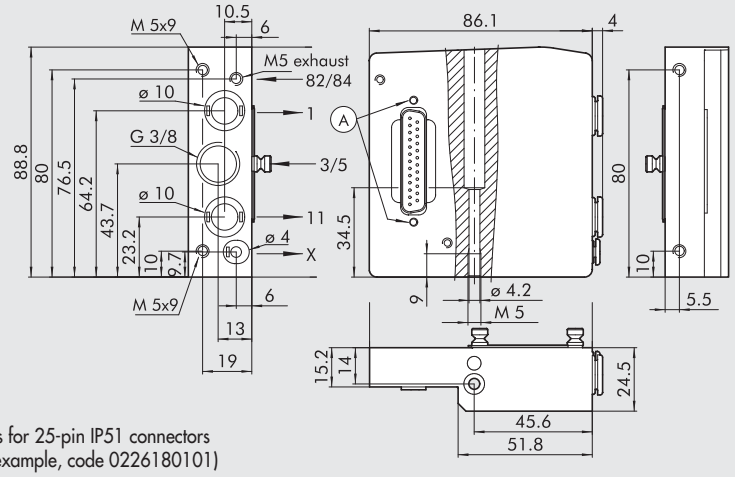
* Uses a single PIN (like the V) and occupies 2 signals.

WIRING DIAGRAM



NOTE: The type F monostable valve uses one PIN only (like the V) but occupies 2 signals.

② END-PLATE 1-11-25D - PIPE Ø10

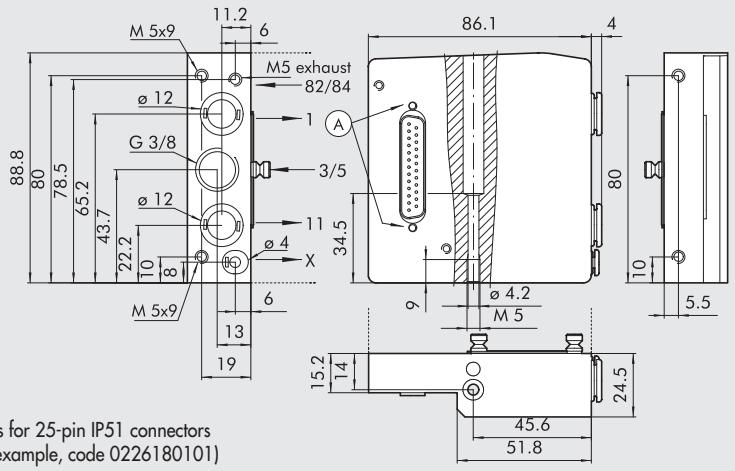


Ⓐ = Holes for 25-pin IP51 connectors (for example, code 0226180101)

Code	Description	Weight [g]
0227301200	End-plate HDM 1-11-25D Ø10	370

This end-plate allows for supplies to be differentiated
- Port 2
- Port 4
- Pilot supply

2S END-PLATE 1-11-25D - PIPE Ø12



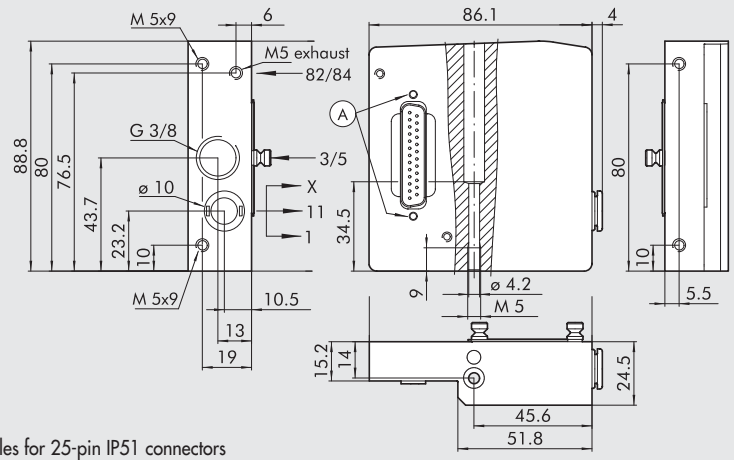
Ⓐ = Holes for 25-pin IP51 connectors (for example, code 0226180101)

Code	Description	Weight [g]
0227301220	End-plate HDM 1-11-25D Ø12	370

This end-plate allows for supplies to be differentiated
- Port 2
- Port 4
- Pilot supply

METAL WORK PNEUMATIC

③ END-PLATE 1-25D - PIPE Ø10

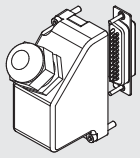


Ⓐ = Holes for 25-pin IP51 connectors (for example, code 0226180101)

Code	Description	Weight [g]
0227301201	End-plate HDM 1-25D Ø10	370

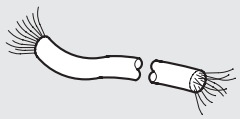
ACCESSORIES

⑭ 45° CONNECTOR KIT, 25 WIRES IP65



Code	Description	Weight [g]
0226180107	45° connector kit, 25 wires IP 65	65

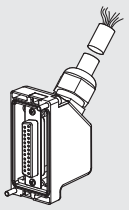
CABLES



Code	Description	Weight [g]
0226107201	10-wire cable	86
0226107101	19-wire cable	122
0226107102	25-wire cable	130

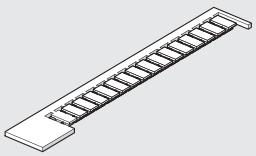
Specify the number of metres desired.

PRE-WIRED 45° CONNECTOR KIT, 25 WIRES IP65



Code	Description	Weight [g]
0226960100	Connector IP 65 + 25-wire 45° cable L = 1 m	190
0226960250	Connector IP 65 + 25-wire 45° cable L = 2.5 m	390
0226960500	Connector IP 65 + 25-wire 45° cable L = 5 m	740

IDENTIFICATION PLATE KIT



Code	Description
0226107000	Identification plate kit

Comes in 16-pc. packs

WIRING DIAGRAM FOR PRE-WIRED PLUG CONNECTOR

25 PIN

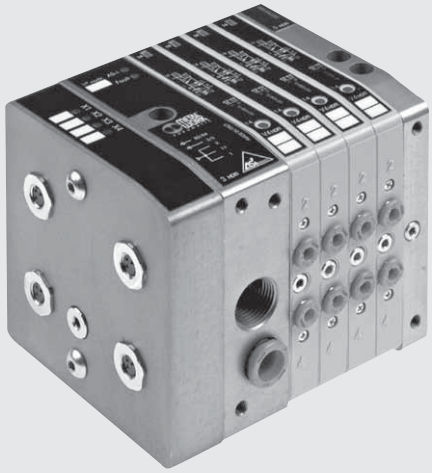
Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire
1	blue/black	9	red/black	17	orange/white	25	green/black
2	red/brown	10	brown/white	18	green		
3	white/black	11	red/orange	19	yellow/black		
4	red/blue	12	light blue	20	white		
5	black/orange	13	yellow/white	21	blue/white		
6	yellow/red	14	yellow	22	brown		
7	black/brown	15	red/green	23	green/white		
8	white/red	16	orange	24	red		

HDM + AS-Interface

The HDM+AS-Interface system has been designed in such a way that the pneumatic input terminal contains all the electronics, signals and AS-I connectors. It is a very compact and sturdy system where everything is housed in a thick casing aluminium to protect the delicate components against impact. The valves and accessories are HDM standard, which means that you only need to replace the input terminal to convert the valve island with multiple connector into an AS-I island. All the advantages of the HDM system can be exploited: the possibility of mounting valves of different size, with fittings for pipes 4, 6, 8 or 10; the insertion of intermediate modules with separate power supply or outlets; aluminium valves with chemical nickel plating enclosed in a protective casing in reinforced technopolymer, with an index of protection IP65. The arrangement of the functions continues the traditional optimisation of the HDMs: the user interface of the valves and bus all on one side, so that the fitter and service engineer have everything within easy reach: all compressed air connections on the other side; the connectors for AS-I cables on the opposite side longitudinally, so that several valve islands can be arranged in line, fixed on a DIN bar.
There are many AS-I terminal variants to meet all possible requirements:

- with 1 node, for controlling up to 4 valve solenoid pilots;
- with 2 nodes, for controlling up to 8 solenoid pilots;
- with 1 note for output and input for controlling up to 4 solenoid pilots and receiving up to 4 input signals. The input connectors are M8 or M12;
- with 2 nodes for output and input for controlling up to 8 solenoid pilots and receiving up to 8 input signals with M8 connectors;
- power supply with the AS-I yellow cable only;
- power supply with two cables: the yellow AS-I cable and the black power supply cable.
- traditional V.2.1 addressing or extended AB V.3.0 address for an increase in the node numbers which can be connected up to 62 and for a better diagnostics

Note: if you use valves 8S type or 10 exploiting their flow capacity it is necessary that the feeding pressure is at least 6 bar (to avoid the pressure to decrease too much on the pilots).

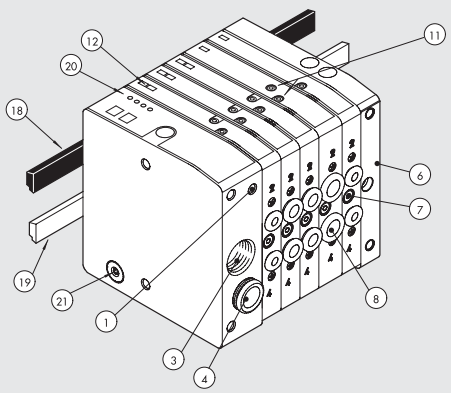


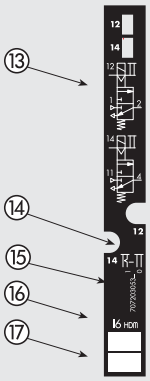
TECHNICAL DATA

Valve port connections		Ø 4,6,8,10 mm automatic fitting for ports 2 and 4 / power supply port for Ø10 or 12* automatic fitting / 3/8 thread for exhaust port, M5 thread for exhaust pilot port				
Maximum number of pilots		Terminal with 1 node = 4 / terminal with 2 node = 8				
Maximum number of valves		Terminal with 1 node = 4 (same as the max. no. of pilots) / terminal with 2 node = 8 (same as the max. no. of pilots)				
Operating temperature range	°C	-10 to +60				
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous				
Pressure range		X (pilot supply)		1-11 (valve supply)		
	Terminal 1-11	3 to 7 bar		vacuum at 10 bar		
	Terminal 1	3 to 7 bar				
Voltage range		24VDC ±10%				
Power for each pilot	W	0.9				
Solenoid Pilot Insulation class		F155				
Degree of protection		IP 65 (with conveyed exhaust, and unused INPUTS sealed with caps/plugs)				
Solenoid rating		100% ED				
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	11.5 mm Ø 4	11.5 mm Ø 6	14 mm Ø 8	23 mm Ø 8	23 mm Ø 10
	version 5/2 and 3/2	200	500	650	1000	1200
	version 5/3	200	300	300	500	500
TRA/TRR 2x3/2 monostable at 6 bar	ms	8 / 45			8 / 60	
TRA/TRR 5/2 monostable at 6 bar	ms	8 / 33			9 / 60	
TRA/TRR 5/2 bistable at 6 bar	ms	20 / 20			8 / 8	
TRA/TRR 5/3 cc monostable at 6 bar	ms	20 / 20			15 / 15	
Note on use		Insert the pipes in the fittings, before passing air through the valves, otherwise the basket may be pulled out of its seat by the flow of air. *with right-end-plate 1-11				
Compatibility with oils		See **chapter Z1**				

COMPONENTS

① Exhaust - Solenoid pilot 82/84
③ Threaded connection of exhausts 3/5
④ Valve supply - port 1-11-X
⑥ Blind end-plate or right-end-plate 1-11
⑦ Screw for valve wall-mounting
⑧ Utility port for pipe Ø 4, 6, 8, 10 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number
⑱ Black cable for 24V (if present)
⑲ AS-INTERFACE yellow cable
⑳ AS-INTERFACE led

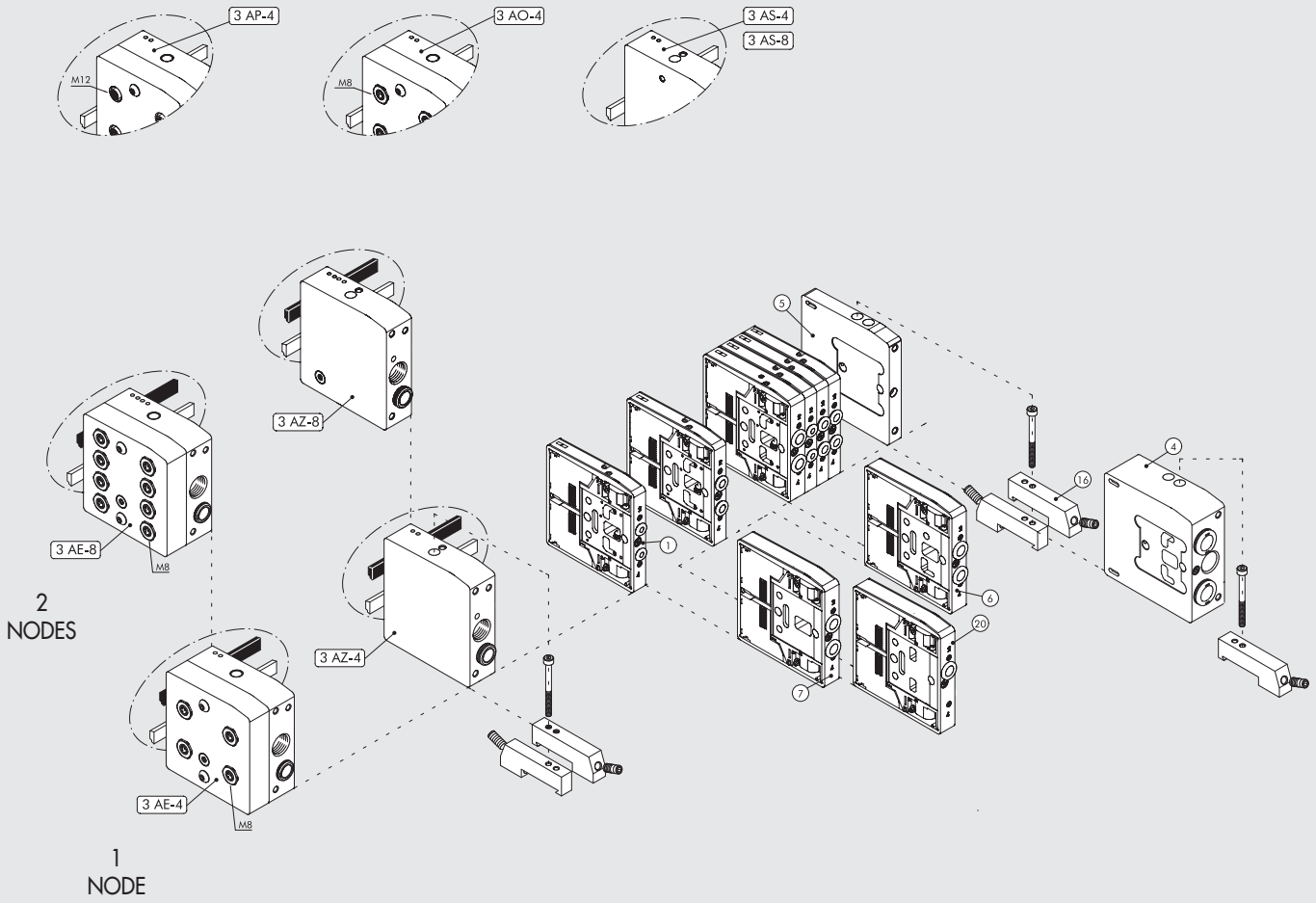




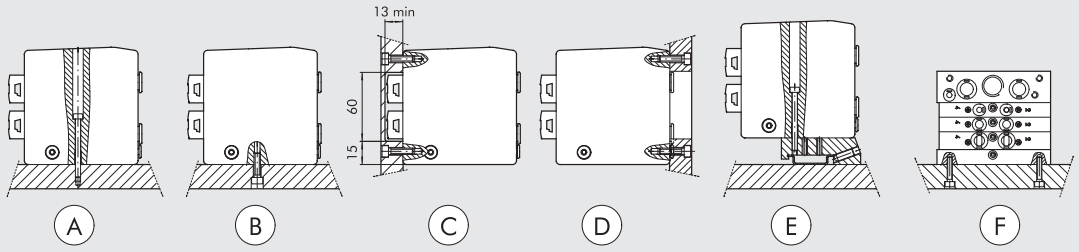
METAL WORK PNEUMATIC

THE MULTIMACH WORLD: FLEXIBILITY

The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.112 **for valves, intermediates elements and common accessories.**



FIXING THE BASE



Ⓐ Fixing from above using the 1 or 1-11 input terminal and the blind terminal.
Ⓑ Ⓒ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the bottom and the rear of the terminals.
Ⓓ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the front of the terminals. An opening for the pipes is made in the plate.
Ⓔ Fixing on the DIN bar with end-plate 1 or 1-11 and blind and plate, using the push-in bracket code 0227301600.
Ⓕ Lateral fixing using the blind terminal, and its the M4 threads on the side lateral.
Note: The sole fixing admitted is the one showed.

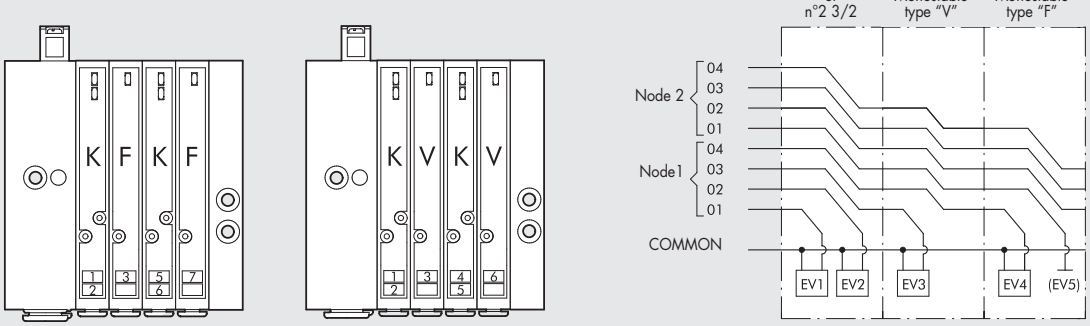
SYNOPTIC, SIZES AND VERSIONS

H D M	3	A S - 4	M	I6 - W 8 - 5	1 6
VALVE	**INPUT END-PLATE**	**ELECTRICAL BASE**	**MANUAL TYPE**	**TYPE OF VALVE**	**FURTHER DETAILS**
Heavy duty Multimach IP65	**3** End-plate 1	Version with standard address **AS-4** 1 node, 4 out, yellow cable **AS-8** 2 nodes, 8 out, yellow cable **AO-4** 1 node, 4 out e 4 in M8, yellow cable **AP-4** 1 node, 4 out e 4 in M12, yellow cable **AZ-4** 1 node, 4 out, yellow cable and black cable **AZ-8** 2 nodes, 8 out, yellow cable and black cable **AE-4** 1 node, 4 out e 4 in M8, yellow cable and black cable **AE-8** 2 nodes, 8 out e 8 in M8, yellow cable and black cable	**M** Monostable manual control **B** Bistable manual control	**I** n° 2 3/2 NC **W** n° 2 3/2 NO **L** 3/2 NO + 3/2 NC **V** 5/2 monostable **K** 5/2 bistable **O** 5/3 monostable ***F** 5/2 monostable **4** right-end-plate 1-11 pipe Ø12 **5** blind end-plate **6** Passing-intermede **7** Blind intermediate **20** Exhaust section **4** Cartridge 4 **6** Cartridge 6 **8** Cartridge 8 - 14 mm **8S** Cartridge 8 - 23 mm **10** Cartridge 10	**16** n° 2 brackets for DIN bar

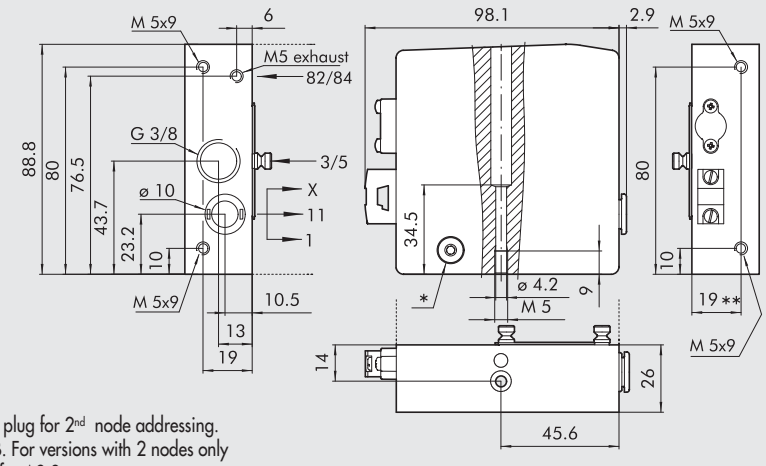
* Uses a single PIN (like the V) and occupies 2 signals

WIRING DIAGRAM

NOTE: The type f monostable valve uses one PIN only (like the V) but occupies 2 signals.



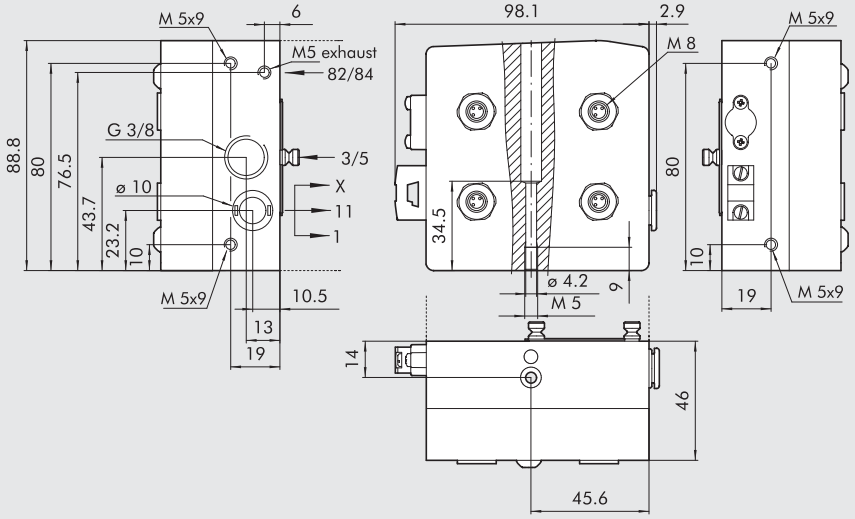
③ END-PLATE 1 AS-4, AS-8



* M7 plug for 2nd node addressing.
N.B. For versions with 2 nodes only
** 21 for AS-8

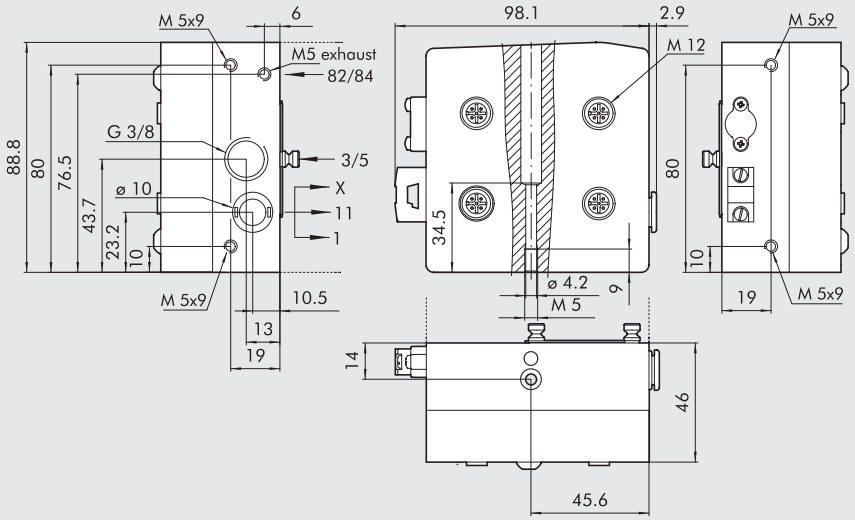
Code	Description	Weight [g]
0227301202	End-plate HDM 1 AS-4 1 node, 4 Out, yellow cable	465
0227301208	End-plate HDM 1 AS-8 2 nodes, 8 Out, yellow cable	454

③ END-PLATE 1 AO-4, M8



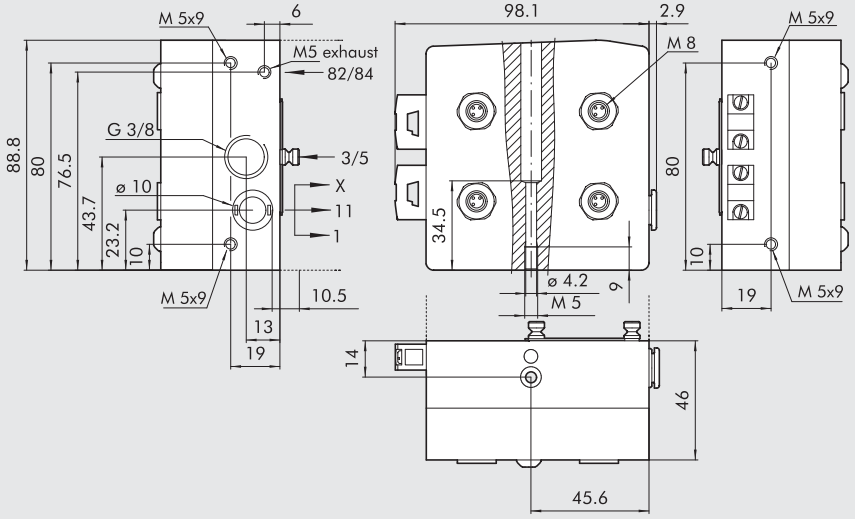
Code	Description	Weight [g]
0227301218	End-plate HDM 1 AO-4 1 node, 4 Out and 4 In M8, yellow cable	759

③ END-PLATE 1 AP-4, M12



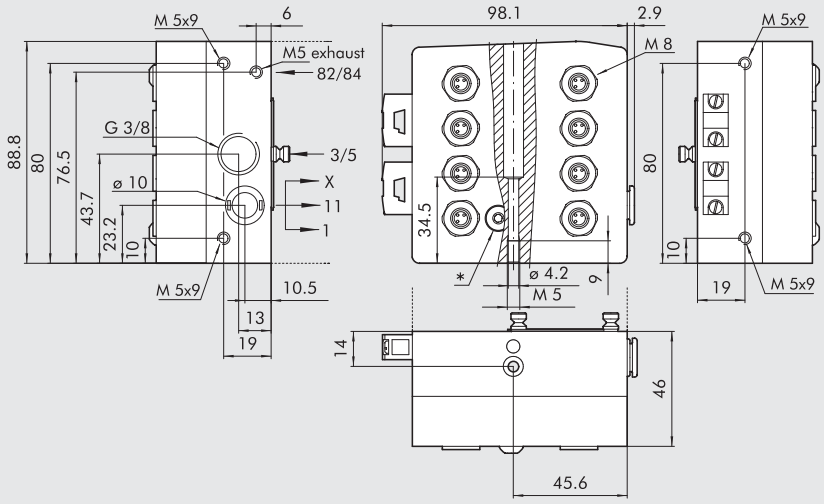
Code	Description	Weight [g]
0227301212	End-plate HDM 1 AP-4 1 node, 4 Out and 4 In M12, yellow cable	756

③ END-PLATE 1 AE-4, M8



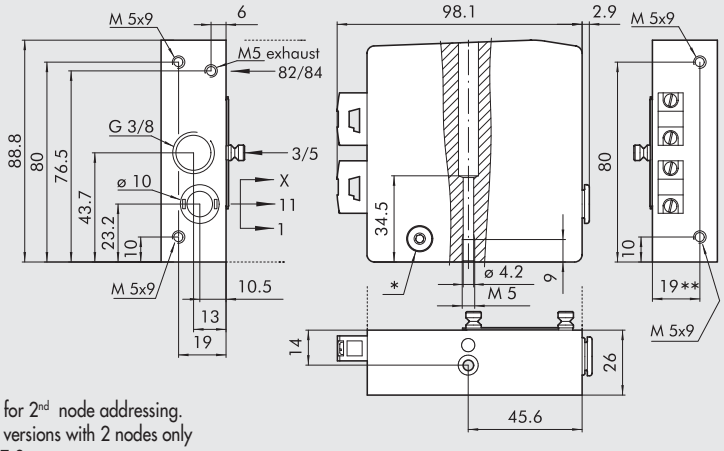
Code	Description	Weight [g]
0227301214	End-plate HDM 1 AE-4 1 node, 4 Out and 4 In M8, yellow cable and black cable	761

③ END-PLATE 1 AE-8, M8



Code	Description	Weight [g]
0227301216	End-plate HDM 1 AE-8 2 nodes, 8 Out and 8 In M8, yellow cable and black cable	773

③ END-PLATE 1 AZ-4, AZ-8

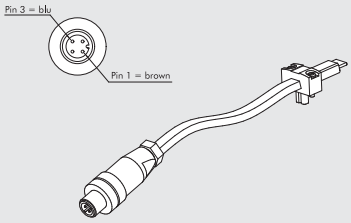


Code	Description	Weight [g]
0227301204	End-plate HDM 1 AZ-4 1 node, 4 Out, yellow cable and black cable	467
0227301210	End-plate HDM 1 AZ-8 2 nodes, 8 Out, yellow cable and black cable	456

* M7 plug for 2nd node addressing.
N.B. For versions with 2 nodes only
** 21 for AZ-8

ACCESSORIES

AS-interface ADDRESS CONNECTOR KIT



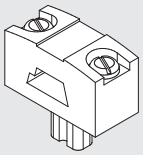
Code	Description
0226950150	AS-interface address connector cable L = 1 m

M8 - M12 PLUG

Code	Description
0240009039	PLUG M8
0240009040	PLUG M12

SPARES

AS-interface CONNECTOR KIT



Code	Description
0226950151	AS-interface connector kit

HDM + PROFIBUS-DP

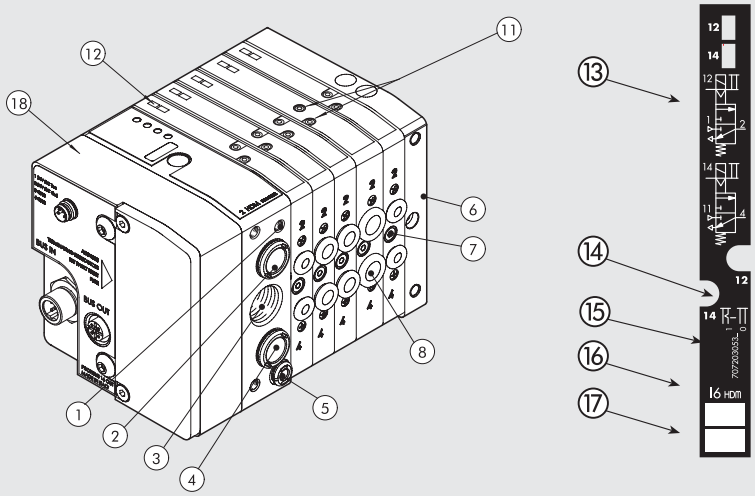
METAL WORK PNEUMATIC

The HDM+PROFIBUS system has been designed in such a way that the pneumatic input terminal contains all the electronics, signals and connectors. It is a very compact and sturdy system where everything is housed in a thick casing aluminium to protect the delicate components against impact.
The valves and accessories are HDM standard, which means that you only need to replace the input terminal to convert the valve island with multiple connector into an PROFIBUS island. All the advantages of the HDM system can be exploited: the possibility of mounting valves of different size, with fittings for pipes 4, 6, 8 or 10; the insertion of intermediate modules with separate power supply or outlets; aluminium valves with chemical nickel plating enclosed in a protective casing in reinforced technopolymer, with an index of protection IP65.
The arrangement of the functions continues the traditional optimisation of the HDM: the user interface of the valves and bus all on one side, so that the fitter and service engineer have everything within easy reach: all compressed air connections are on the other side, and the electrical connectors and selectors are at the end of the island.
It is advisable to earth the system to prevent electrical or electrostatic discharge from damaging the electronic circuit.

TECHNICAL DATA						
Valve port connections		Ø 4,6,8,10 mm automatic fitting for ports 2 and 4 / power supply port for Ø10 or 12* automatic fitting / 3/8 thread for exhaust port, M5 thread for exhaust pilot port				
Connection on the end-plate 1-11 for the supply of pilots		Automatic fitting Ø 4 mm				
Maximum number of pilots		16				
Maximum number of valves		16 (same as the max. no. of pilots)				
Operating temperature range	°C	-10 to +60				
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous				
Pressure range		X (pilot supply)			1-11 (valve supply)	
	Terminal 1-11	3 to 7 bar			vacuum at 10 bar	
	Terminal 1	3 to 7 bar				
Voltage range		24 VDC ±10%				
		(slave protected against overload and reverse polarity)				
Power for each pilot	W	0.9				
Solenoid Pilot Insulation class		F155				
Degree of protection		IP65 (with conveyed exhust, and that - in case of no use - the BUS OUT connector gets plugged)				
Solenoid rating		100% ED				
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	11.5 mm Ø 4	11.5 mm Ø 6	14 mm Ø 8	23 mm Ø 8	23 mm Ø 10
	version 5/2 and 3/2	200	500	650	1000	1200
	version 5/3	200	300	300	500	500
TRA/TRR 2x3/2 monostable at 6 bar	ms	8 / 45			8 / 60	
TRA/TRR 5/2 monostable at 6 bar	ms	8 / 33			9 / 60	
TRA/TRR 5/2 bistable at 6 bar	ms	20 / 20			8 / 8	
TRA/TRR 5/3 cc monostable at 6 bar	ms	20 / 20			15 / 15	
Note on use		Insert the pipes in the fittings, before passing air through the valves,otherwise the gasket may be pulled out of its seat by the flow of air.				
		*with right-end-plate 1-11				
Compatibility with oils		See **chapter Z1**				
Profibus-DP module for HDM valves						
Protection		Outputs protected against overloads and shortcircuits				
Max input power (all valves ON)		~500 mA				
Addressing		By rotary selectors				
Highest settable address number		99				
Default address		3				
Peripheral defect diagnosis		Local LED indicator and relay to Master				
Defects reported		Output shortcircuit or overload.				
		Auxiliary power supply failure.				
Module status in the event of peripheral defect		Profibus communication active.				
		The "peripheral defect" bit is active and accessible at the master station.				
Data bit value		0 = not enabled				
		1 = enabled				
Output status in the absence of communication		Disabled				

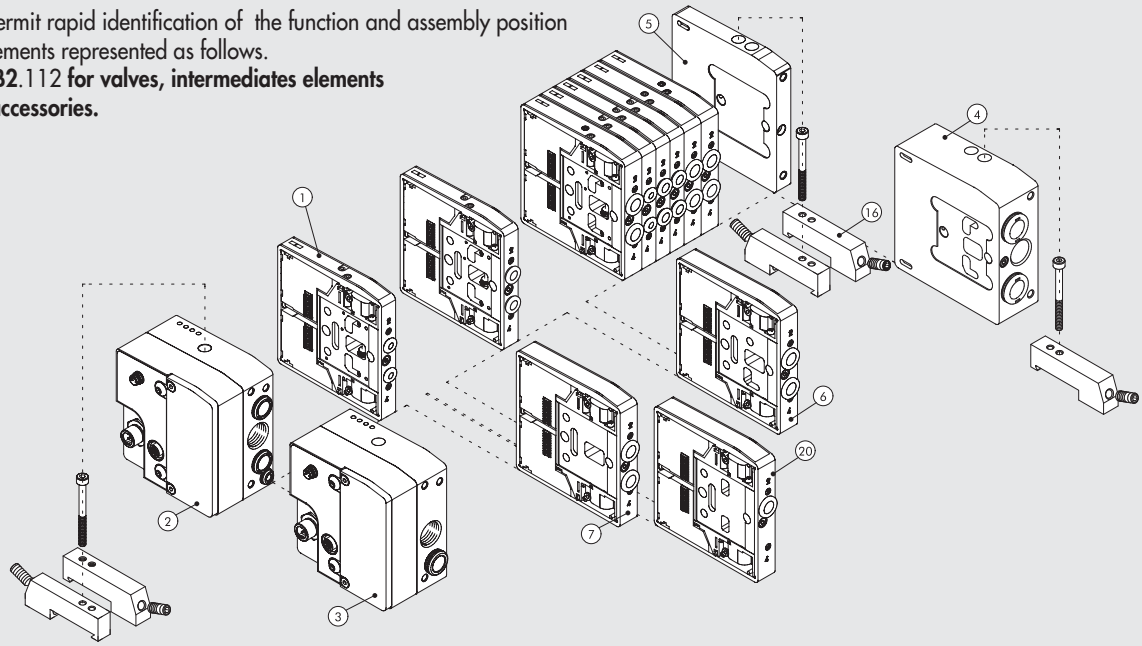
COMPONENTS

① Exhaust - Solenoid pilot 82/84
② Valve supply - port 1
③ Threaded connection of exhausts 3/5
④ Valve supply - port 11
⑤ Electrical control supply X
⑥ Blind end-plate or right-end-plate-1-11
⑦ Screw for valve wall-mounting
⑧ Utility port for pipe Ø 4, 6, 8 or 10 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number
⑱ Profibus terminal

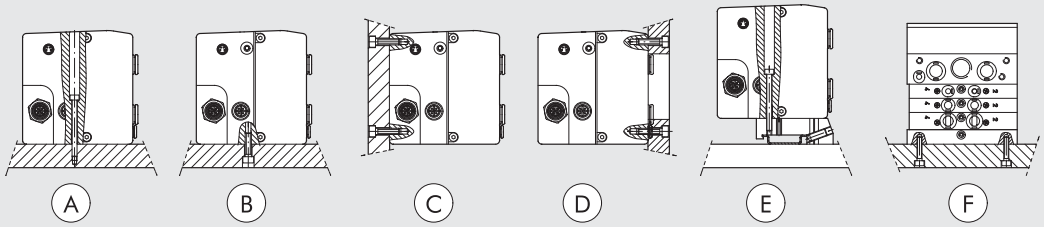


THE MULTIMACH WORLD: FLEXIBILITY

The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.112 **for valves, intermediates elements and common accessories.**



FIXING THE BASE



Ⓐ Fixing from above using the 1 or 1-11 input terminal and the blind terminal.
Ⓑ Ⓒ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the bottom and the rear of the terminals.
Ⓓ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the front of the terminals. An opening for the pipes is made in the plate.
Ⓔ Fixing on the DIN bar with end-plate 1 or 1-11 and blind and plate , using the push-in bracket code 0227301600.
Ⓕ Lateral fixing using the blind terminal, and its the M4 threads on the side lateral.
Note: The sole fixing admitted is the one showed.

METAL WORK PNEUMATIC

SYNOPTIC, SIZES AND VERSIONS

H D M	2	P	M	I6 - W8 - W6 - O4 - L8 - 5	1 6
VALVE	**INPUT END-PLATE**	**ELECTRICAL BASE**	**MANUAL TYPE**	**TYPE OF VALVE**	**FURTHER DETAILS**
Heavy duty Multimach IP65	**2** End-plate 1-11 **3** End-plate 1	**P** Profibus-DP	**M** Monostable manual control **B** Bistable manual control	**I** n° 2 3/2 NC **W** n° 2 3/2 NO **L** 3/2 NO + 3/2 NC **V** 5/2 monostable **K** 5/2 bistable **O** 5/3 monostable ***F** 5/2 monostable **4** right-end-plate 1-11 pipe Ø12 **5** blind end-plate **6** Passing-intermede **7** Blind intermediate **20** Exhaust section **4** Cartridge 4 **6** Cartridge 6 **8** Cartridge 8 - 14 mm **8S** Cartridge 8 - 23 mm **10** Cartridge 10	**16** n° 2 brackets for DIN bar

* Uses a single PIN (like the V) and occupies 2 signals.

WIRING DIAGRAM

1 = +24V bus (brown)
2 = +24V valve (white)
3 = GND (blue)
4 = GND (black)

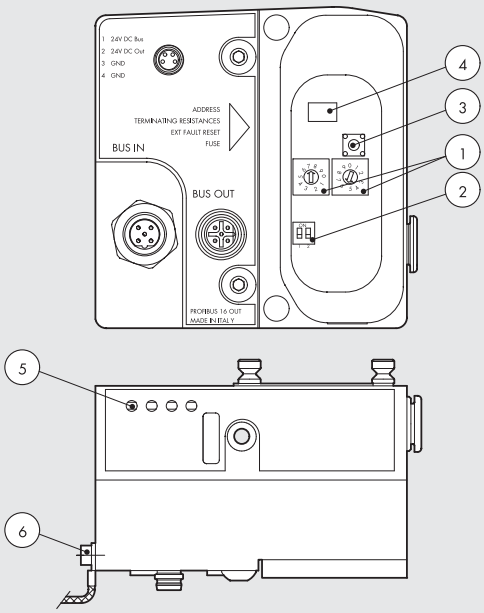
POWER SUPPLY (M8)

BUS OUT (female connector) (M12 COD. B)

BUS IN (male connector) (M12 COD. B)

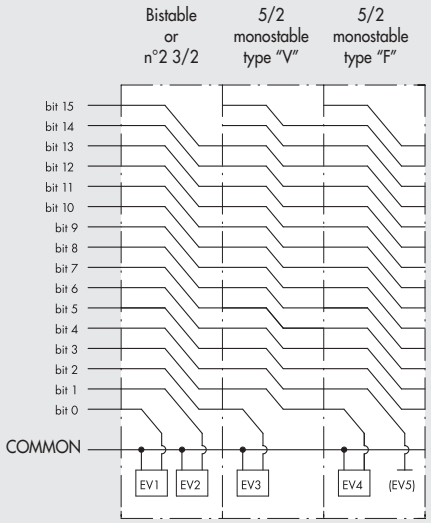
1 = +5V *
2 = A
3 = OV*
4 = B
4 = Shield

* DO NOT CONNECT PIN 1 and PIN 3: to be used only for feeding of the external terminating resistors.
- For correct communication, use Profibus cables at least 1 metre long.
- The shield should be evenly distributed around the thread. Should this not be possible, the shield can be connected to prin 5. Both of these methods can also be used in combination.

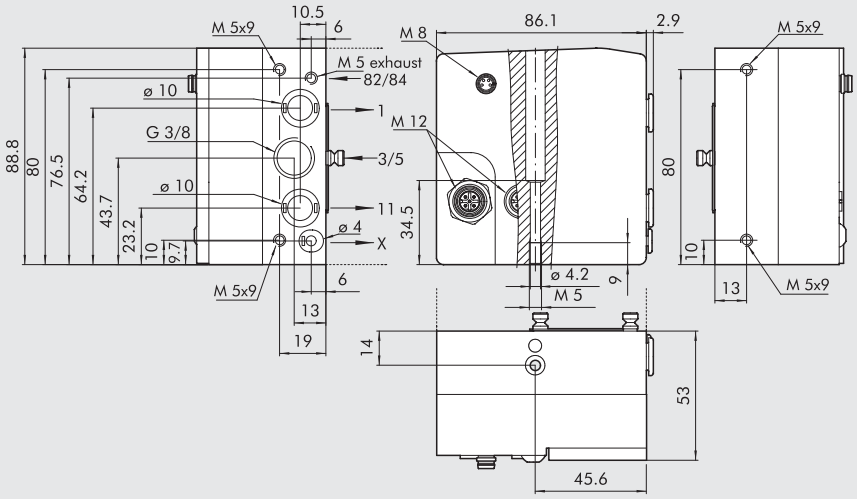


❶ Adressing
❷ Terminal resistances
❸ Reset button faulty
❹ Resettable fuse
❺ Indicator Led
❻ Grounding

NOTE: The type F monostable valve uses one PIN only (like the V) but occupies 2 signals.

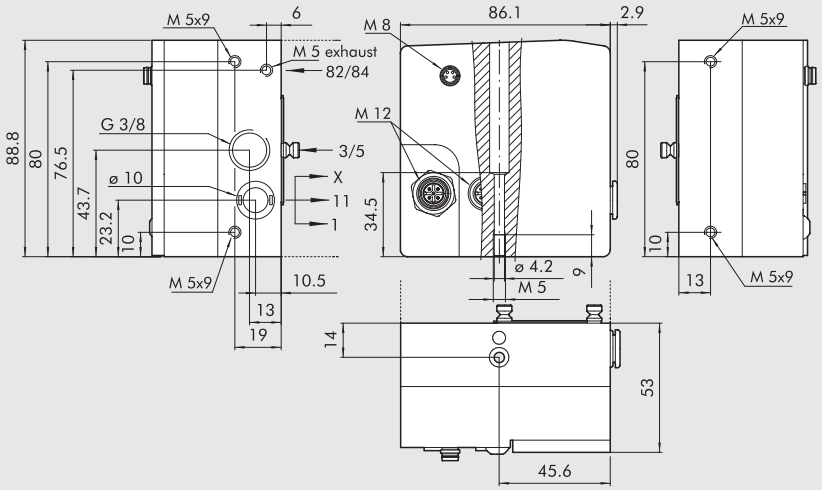


② END-PLATE 1-11 PROFIBUS-DP



Code	Description	Weight [g]
0227301231	End-plate HDM 1-11 PROFIBUS	730

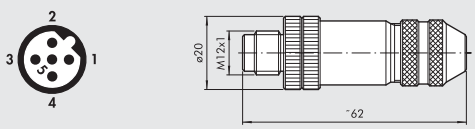
③ END-PLATE 1 PROFIBUS-DP



Code	Description	Weight [g]
0227301230	End-plate HDM 1 PROFIBUS	730

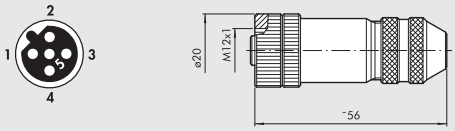
ACCESSORIES

M12 MALE CONNECTOR OUT-BUS



Code	Description
0240009035	M12 male connector B coding

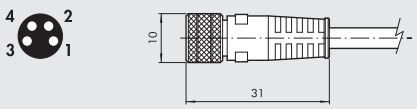
M12 FEMALE CONNECTOR IN-BUS



Code	Description
0240009036	M12 female connector B coding

M8 CONNECTOR FOR POWER SUPPLY

Pin	Cable color
1	Brown
2	White
3	Blue
4	Black



Code	Description
0240009060	M8 4-pin female connector for power supply, cable L = 3 m
0240009037	M8 4-pin female connector for power supply, cable L = 5 m
0240009058	M8 4-pin female connector for power supply, cable L = 10 m
0240009059	M8 4-pin female connector for power supply, cable L = 15 m

M8 - M12 PLUG

Code	Description
0240009039	Plug M8
0240009040	Plug M12

HDM + EtherNet/IP

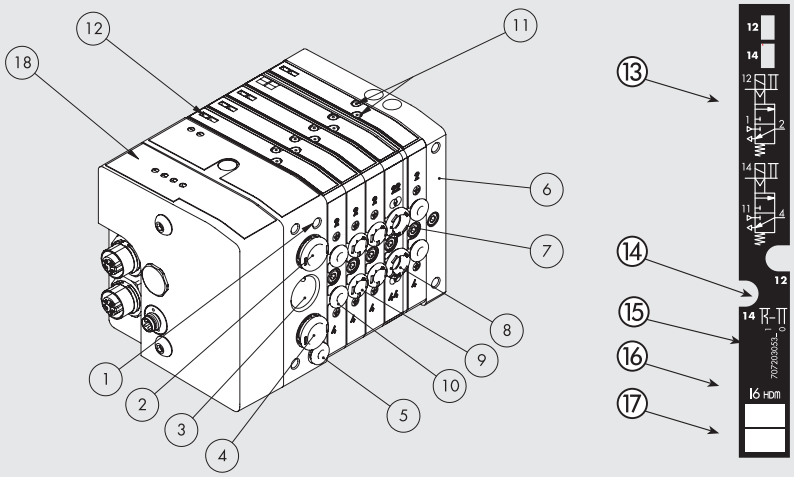
METAL WORK PNEUMATIC

The HDM+EtherNet/IP system has been designed in such a way that the pneumatic input terminal contains all the electronics, signals and connectors. It is a very compact and sturdy system where everything is housed in a thick casing aluminium to protect the delicate components against impact.
The valves and accessories are HDM standard, which means that you only need to replace the input terminal to convert the valve island with multiple connector into an EtherNet/IP island. All the advantages of the HDM system can be exploited: the possibility of mounting valves of different size, with fittings for pipes 4, 6, 8 or 10; the insertion of intermediate modules with separate power supply or outlets; aluminium valves with chemical nickel plating enclosed in a protective casing in reinforced technopolymer, with an index of protection IP65.
The arrangement of the functions continues the traditional optimisation of the HDM: the user interface of the valves and bus all on one side, so that the fitter and service engineer have everything within easy reach: all compressed air connections are on the other side, and the electrical connectors and selectors are at the end of the island.
It is advisable to earth the system to prevent electrical or electrostatic discharge from damaging the electronic circuit.

TECHNICAL DATA							
Valve port connections		Ø 4,6,8,10 mm automatic fitting for ports 2 and 4 / power supply port for Ø10 or 12* automatic fitting / 3/8 thread for exhaust port, M5 thread for exhaust pilot port					
Connection on the end-plate 1-11 for the supply of pilots		Automatic fitting Ø 4 mm					
Maximum number of pilots		16					
Maximum number of valves		16 (same as the max. no. of pilots)					
Operating temperature range	°C	-10 to +60					
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous					
Pressure range		X (pilot supply)			1-11 (valve supply)		
	Terminal 1-11	3 to 7 bar			vacuum at 10 bar		
	Terminal 1	3 to 7 bar					
Voltage range		24 VDC ±10%					
		(slave protected against overload and reverse polarity)					
Power for each pilot	W	0.9					
Solenoid Pilot Insulation class		F155					
Degree of protection		IP65 (with conveyed exhust, and that - in case of no use - the BUS OUT connector gets plugged)					
Solenoid rating		100% ED					
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	11.5 mm Ø 4	11.5 mm Ø 6	14 mm Ø 8	23 mm Ø 8	23 mm Ø 10	
	version 5/2 and 3/2	200	500	650	1000	1200	
	version 5/3	200	300	300	500	500	
TRA/TRR 2x3/2 monostable at 6 bar	ms	8 / 45			8 / 60		
TRA/TRR 5/2 monostable at 6 bar	ms	8 / 33			9 / 60		
TRA/TRR 5/2 bistable at 6 bar	ms	20 / 20			8 / 8		
TRA/TRR 5/3 cc monostable at 6 bar	ms	20 / 20			15 / 15		
Note on use		Insert the pipes in the fittings, before passing air through the valves,otherwise the gasket may be pulled out of its seat by the flow of air.					
		*with right-end-plate 1-11					
Compatibility with oils		See **chapter Z1**					
EtherNet/IP module for HDM valves							
Field buses		EtherNet/IP - 10/100 Mbit/s - Half-duplex - Full-duplex - Supports Auto-Negotiation					
Factory settings		Module name: Cmseries - Address IP 192.168.192.30					
Addressing		Software DHCP/BOOTP					
Voltage range		24VDC ± 10%					
Maximum number of pilots (Out)		16					
Maximum number of valves		16 (depending on the maximum number of solenoids)					
Icc bus supply current		Nominal Icc 120 mA - Instantaneous Icc (< 2 ms) 450 mA					
Maximum absorption of a valve distribution block with 16 mono-stable valves		Nominal Icc with 120mA OFF valves - Nominal Icc with 580 mA ON valves					
Protections		Module protected against overload and polarity reversal. Outputs protected against overloads and short-circuits					
Connections		Field bus: 2 M12 Female, D-coded, internal switch					
		Supply: M8 4 pin - input: M8 3 pin					
Data bit value		0 = not enabled - 1 = enabled					
Output status in the absence of communication		Disabled					

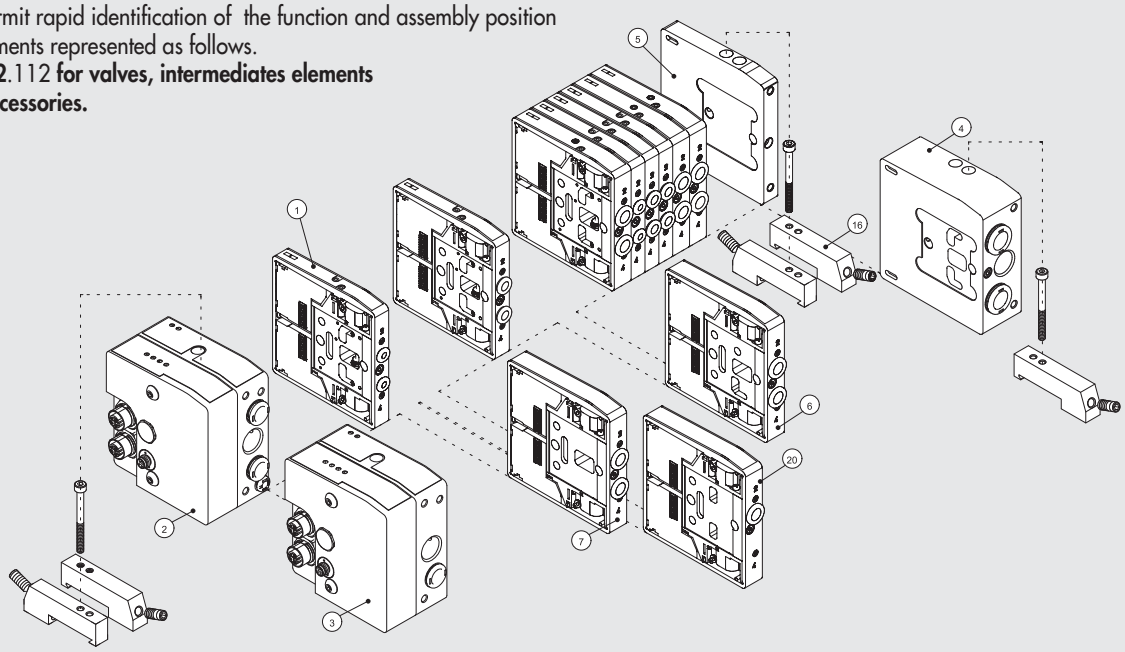
COMPONENTS

① Exhaust - Solenoid pilot 82/84
② Valve supply - port 1
③ Threaded connection of exhausts 3/5
④ Valve supply - port 11
⑤ Electrical control supply X
⑥ Blind end-plate or right-end-plate-1-11
⑦ Screw for valve wall-mounting
⑧ Utility port for pipe Ø 4, 6, 8 or 10 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number
⑱ Profibus EtherNet/IP

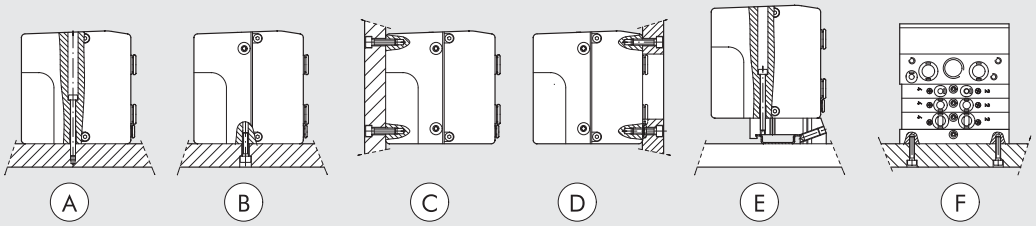


THE MULTIMACH WORLD: FLEXIBILITY

The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.112 **for valves, intermediates elements and common accessories.**



FIXING THE BASE



Ⓐ Fixing from above using the 1 or 1-11 input terminal and the blind terminal.
Ⓑ Ⓒ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the bottom and the rear of the terminals.
Ⓓ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the front of the terminals. An opening for the pipes is made in the plate.
Ⓔ Fixing on the DIN bar with end-plate 1 or 1-11 and blind and plate , using the push-in bracket code 0227301600.
Ⓕ Lateral fixing using the blind terminal, and its the M4 threads on the side lateral.
Note: The sole fixing admitted is the one showed.

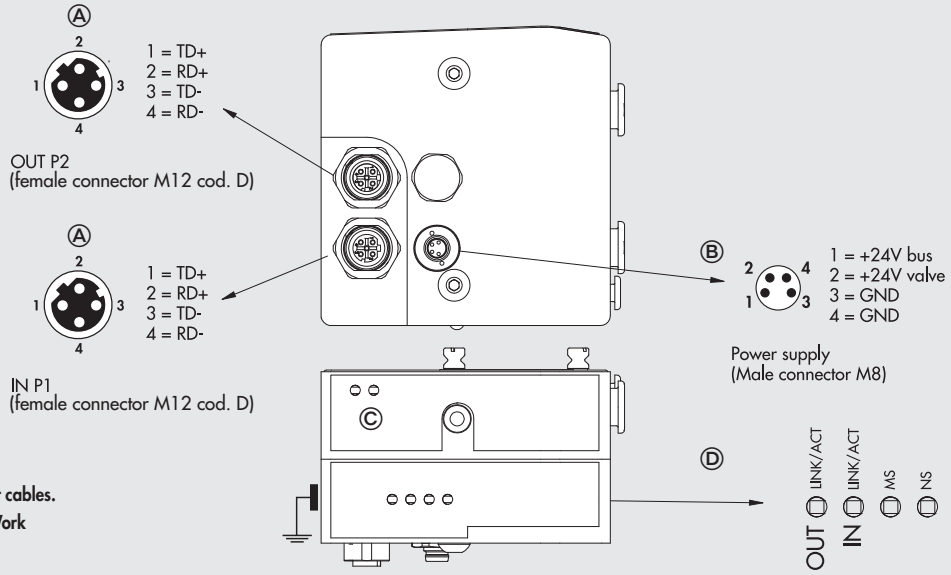
SYNOPTIC, SIZES AND VERSIONS

H D M	2	EN	M	I6 - W8 - W6 - O4 - L8 - 5	1 6
VALVE	**INPUT END-PLATE**	**ELECTRICAL BASE**	**MANUAL TYPE**	**TYPE OF VALVE**	**FURTHER DETAILS**
Heavy duty Multimach IP65	**2** End-plate 1-11 **3** End-plate 1	**EN** EtherNet/IP	**M** Monostable manual control **B** Bistable manual control	**I** n° 2 3/2 NC **W** n° 2 3/2 NO **L** 3/2 NO + 3/2 NC **V** 5/2 monostable **K** 5/2 bistable **O** 5/3 monostable ***F** 5/2 monostable **4** right-end-plate 1-11 pipe Ø12 **5** blind end-plate **6** Passing-intermede **7** Blind intermediate **20** Exhaust section **4** Cartridge 4 **6** Cartridge 6 **8** Cartridge 8 - 14 mm **8S** Cartridge 8 - 23 mm **10** Cartridge 10	**16** n° 2 brackets for DIN bar

* Uses a single PIN (like the V) and occupies 2 signals.

WIRING DIAGRAM

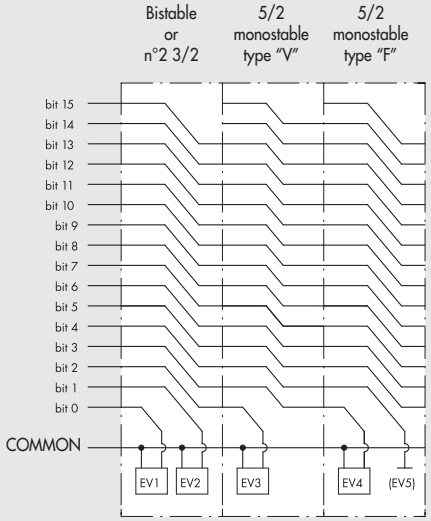
Ⓐ Connection to the EtherNet/IP network
Ⓑ Connection for node supply and auxiliary valve supply
Ⓒ HDM diagnostics indicator light
Ⓓ EtherNet/IP diagnostics indicator light



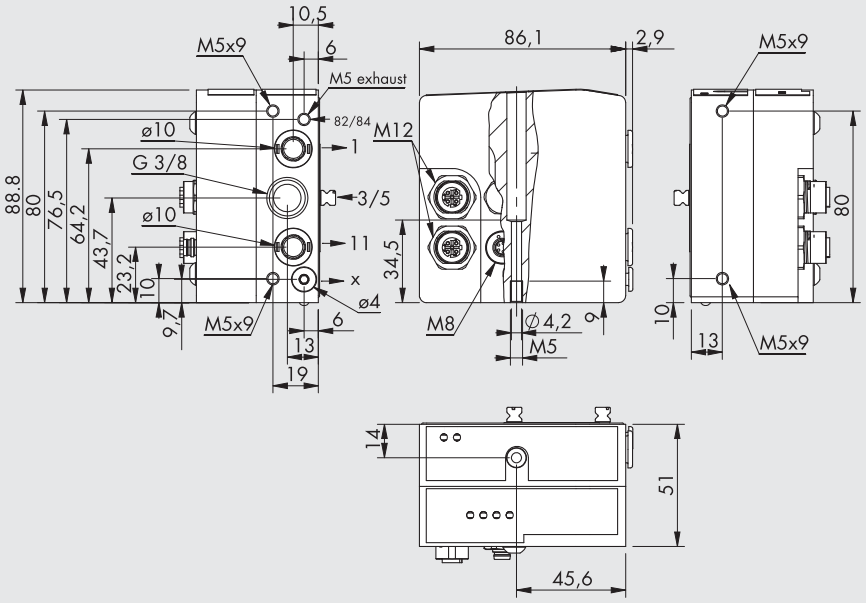
WARNING

For correct communication use only Industrial Ethernet cables. Cat. 5 / Class D 100 MHz, like the one in the Metal Work catalogue.

NOTE: The type F monostable valve uses one PIN only (like the V) but occupies 2 signals.

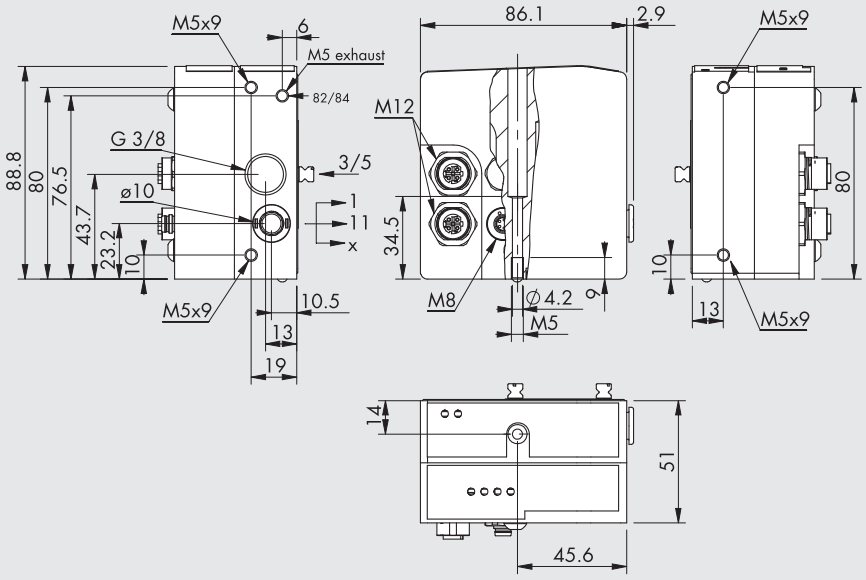


② END-PLATE 1-11 EtherNet/IP



Code	Description	Weight [g]
0227301242	End-plate HDM 1-11 EtherNet/IP	730

③ END-PLATE 1 EtherNet/IP

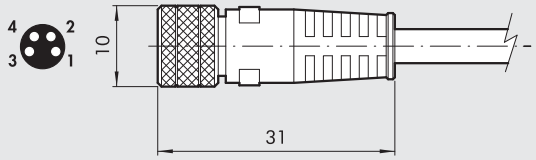


Code	Description	Weight [g]
0227301243	End-plate HDM 1 EtherNet/IP	730

ACCESSORIES

M8 CONNECTOR FOR POWER SUPPLY

Pin	Cable color
1	Brown
2	White
3	Blue
4	Black

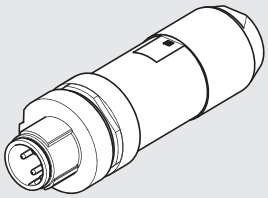


Code	Description
0240009060	M8 4-pin female connector for power supply, cable L = 3 m
0240009037	M8 4-pin female connector for power supply, cable L = 5 m
0240009058	M8 4-pin female connector for power supply, cable L = 10 m
0240009059	M8 4-pin female connector for power supply, cable L = 15 m

M12 PLUG

Code	Description
0240009040	Plug M12

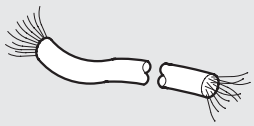
M12 BUS CONNECTOR, D-CODED



Code	Description
0240005051	M12 BUS connector, D-coded

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP....)

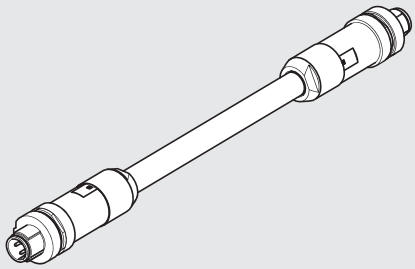
BUS CABLE



Code	Description
0240005220	BUS cable L = 20 m

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP....)

STRAIGHT CONNECTOR FOR M12-M12 BUS, D-CODED

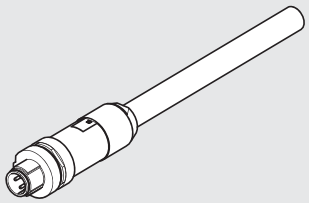


Code	Description
0240005103	Straight connector for M12-M12 BUS, D-coded, with 3 m cable
0240005105	Straight connector for M12-M12 BUS, D-coded, with 5 m cable
0240005110	Straight connector for M12-M12 BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP....)

STRAIGHT CONNECTOR FOR M12 BUS, D-CODED

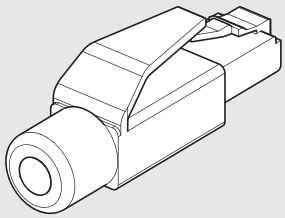
Pin	Cable color
1	Yellow
2	White
3	Red
4	Blue



Code	Description
0240005093	Straight connector for M12 BUS, D-coded, with 3 m cable
0240005095	Straight connector for M12 BUS, D-coded, with 5 m cable
0240005100	Straight connector for M12 BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

RJ45 CONNECTOR



Code	Description
0240005050	RJ45 connector with 4 contacts according to IEC 60 603-7

NOTES

HDM + CANopen

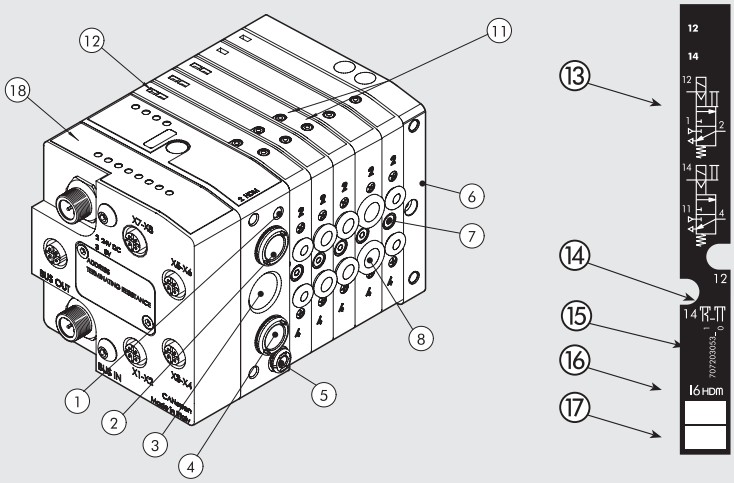
METAL WORK PNEUMATIC

The HDM+CANopen system has been designed in such a way that the pneumatic input terminal contains all the electronics, signals and connectors. It is a very compact and sturdy system where everything is housed in a thick casing aluminium to protect the delicate components against impact.
Two versions of end-plate are available: one can handle up to 16 controls (16 Out) and one up to 16 controls and 8 inputs (16 Out + 8 In).
The input connectors are M12. Two inputs can be connected to each connector. The functions are arranged to ensure the same optimisation as the HDMs. The user interface is all on one side to facilitate the work of the fitter and service engineer. All pneumatic connections are on one side; the electrical connectors and selectors are on top of the island.

TECHNICAL DATA						
Valve port connections		Ø 4,6,8,10 mm automatic fitting for ports 2 and 4 / power supply port for Ø10 or 12* automatic fitting / 3/8 thread for exhaust port, M5 thread for exhaust pilot port				
Connection on the end-plate 1-11 for the supply of pilots		Automatic fitting Ø 4 mm				
Maximum number of pilots		16				
Maximum number of valves		16 (same as the max. no. of pilots)				
Operating temperature range	°C	-10 to +60				
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous				
Pressure range		X (pilot supply)			1-11 (valve supply)	
	Terminal 1-11	3 to 7 bar			vacuum at 10 bar	
	Terminal 1	3 to 7 bar				
Voltage range		24VDC ±10% (slave protected against overload and reverse polarity)				
Power for each pilot	W	0.9				
Solenoid Pilot Insulation class		F155				
Degree of protection		IP65 (with conveyed exhausts and with not used connectors plugged)				
Solenoid rating		100% ED				
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	11.5 mm Ø 4	11.5 mm Ø 6	14 mm Ø 8	23 mm Ø 8	23 mm Ø 10
	version 5/2 and 3/2	200	500	650	1000	1200
	version 5/3	200	300	300	500	500
TRA/TRR 2x3/2 monostable at 6 bar	ms	8 / 45			8 / 60	
TRA/TRR 5/2 monostable at 6 bar	ms	8 / 33			9 / 60	
TRA/TRR 5/2 bistable at 6 bar	ms	20 / 20			8 / 8	
TRA/TRR 5/3 cc monostable at 6 bar	ms	20 / 20			15 / 15	
Note on use		Insert the pipes in the fittings, before passing air through the valves,otherwise the gasket may be pulled out of its seat by the flow of air. * with right-end-plate 1-11				
Compatibility with oils		See **chapter Z1**				
CANopen module for HDM valves						
Protection		Outputs protected against overloads and shortcircuits				
Max input power (all valves ON)		~800 mA				
Addressing		By DIP SWITCH				
Highest settable address number		127				
Default address		1				
Peripheral defect diagnosis		Local LED indicator and relay to Master				
Defects reported		Output shortcircuit or overload. Auxiliary power supply failure.				
Module status in the event of peripheral defect		CANopen communication active. The "peripheral defect" bit is active and accessible at the master station.				
Data bit value		0 = not enabled 1 = enabled				
Output status in the absence of communication		Disabled				
INPUT module for HDM valves						
Sensor supply voltage		24 VDC ±10% (depending on the supply of the CANopen module)				
Max sensor power (distribuited over eight connectors)	mA	40				
Type of input		PNP for sensor 2-3 wires according to EN 60947-5-2				
Protection		Protected inputs against overload and short-circuit				
Active INPUT signalling		One LED for each INPUT				

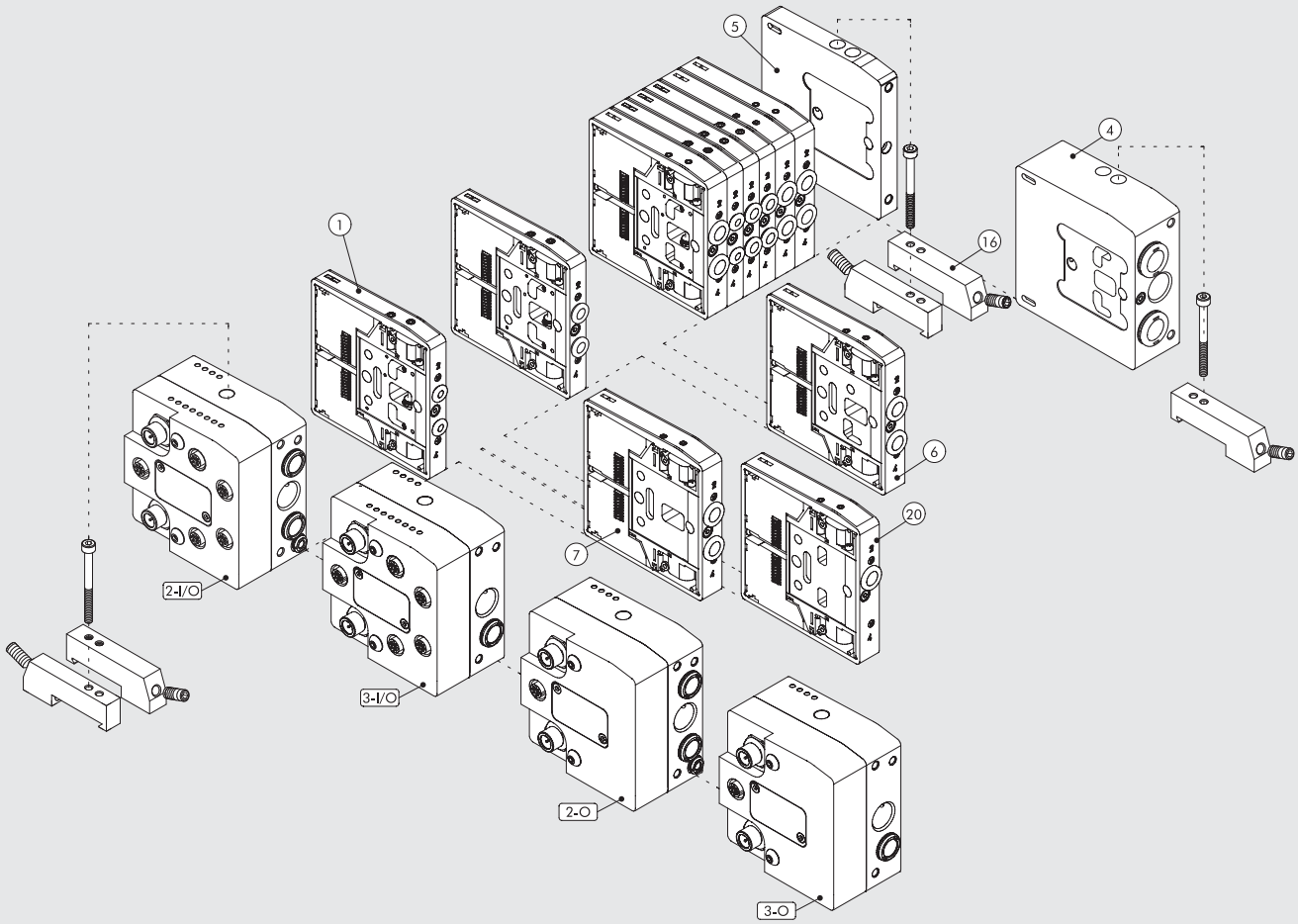
COMPONENTS

① Exhaust - Solenoid pilot 82/84
② Valve supply - port 1
③ Threaded connection of exhausts 3/5
④ Valve supply - port 11
⑤ Electrical control supply X
⑥ Blind end-plate or right-end-plate 1-11
⑦ Screw for valve wall-mounting
⑧ Utility port for pipe Ø 4, 6, 8 or 10 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number
⑱ CANopen terminal



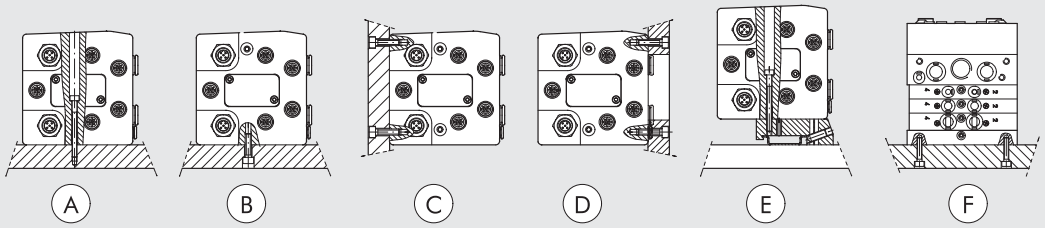
THE MULTIMACH WORLD: FLEXIBILITY

The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.112 **for valves, intermediates elements and common accessories.**



METAL WORK PNEUMATIC

FIXING THE BASE



Ⓐ Fixing from above using the 1 or 1-11 input terminal and the blind terminal.
Ⓑ Ⓒ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the bottom and the rear of the terminals.
Ⓓ Fixing from above using the 1 or 1-11 input terminal and the blind terminal, using the M5 threads on the front of the terminals. An opening for the pipes is made in the plate.
Ⓔ Fixing on the DIN bar with end-plate 1 or 1-11 and blind and plate , using the push-in bracket code 0227301600.
Ⓕ Lateral fixing using the blind terminal, and its the M4 threads on the side lateral.
Note: The sole fixing admitted is the one showed.

SYNOPTIC, SIZES AND VERSIONS

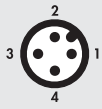
H D M	2	CAN O	M	I6 - W 8 - W 6 - O 4 - L 8 - 5	1 6
VALVE	**INPUT END-PLATE**	**ELECTRICAL BASE**	**MANUAL TYPE**	**TYPE OF VALVE**	**FURTHER DETAILS**
Heavy duty Multimach IP65	**2** End-plate 1-11 **3** End-plate 1	**CAN O** CANopen 16 OUTPUT **CAN I/O** CANopen 8 INPUT e 16 OUTPUT	**M** Monostable manual control **B** Bistable manual control	**I** n° 2 3/2 NC **W** n° 2 3/2 NO **L** 3/2 NO + 3/2 NC **V** 5/2 monostable **K** 5/2 bistable **O** 5/3 monostable ***F** 5/2 monostable **4** right-end-plate 1-11 pipe Ø12 **5** blind end-plate **6** Passing-intermede **7** Blind intermediate **20** Exhaust section **4** Cartridge 4 **6** Cartridge 6 **8** Cartridge 8 - 14 mm **8S** Cartridge 8 - 23 mm **10** Cartridge 10	**16** n° 2 brackets for DIN bar

* Uses a single PIN (like the V) and occupies 2 signals.

WIRING DIAGRAM

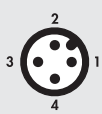
POWER SUPPLY
(Male connector M12 cod. A)

1 = NC
2 = +24V
3 = 0V
4 = NC
5 = NC



BUS IN
(Male connector M12 cod. A)

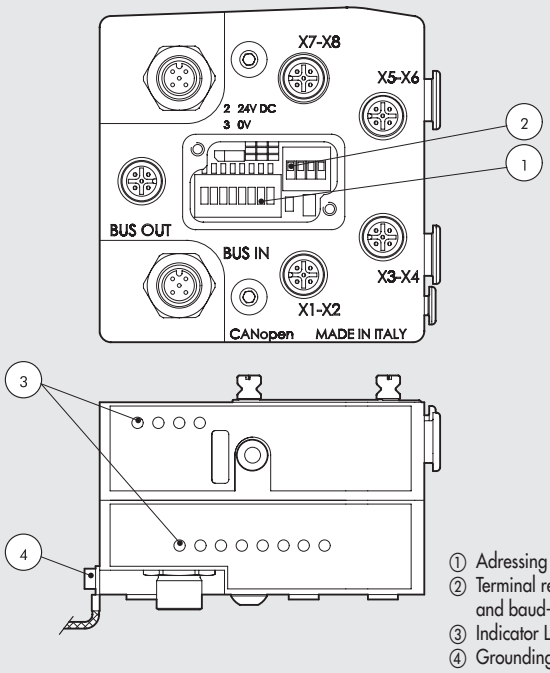
1 = CAN-SHLD
2 = CAN V+
3 = CAN-GND
4 = CAN-H
5 = CAN-L



BUS OUT
(Female connector M12 cod. A)

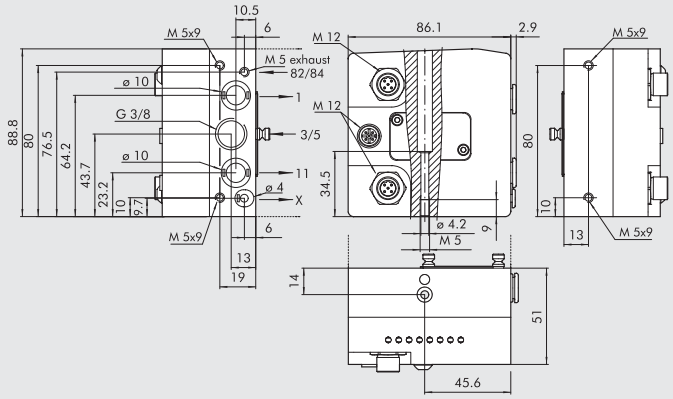
CONN. INPUT
(Female connector M12 cod. A)

1 = +24V
2 = IN 2 - 4 - 6 - 8
3 = 0V
4 = IN 1 - 3 - 5 - 7
5 = NC



① Adressing
② Terminal resistances and baud-rate setting
③ Indicator LED
④ Grounding

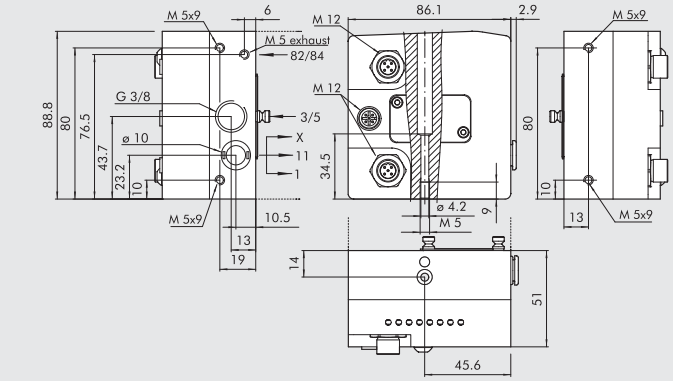
2 - O END-PLATE 1-11 CANopen O



Code	Description	Weight [g]
0227301251	End-plate 1-11 HDM CANopen OUTPUT	745

Handles 16 OUTPUTS (solenoid pilots)

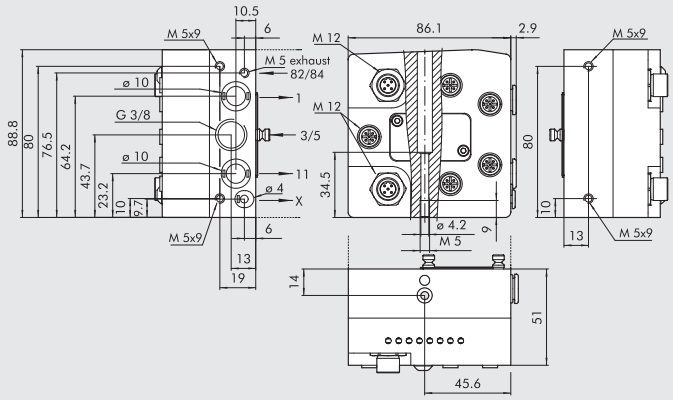
3 - O END-PLATE 1 CANopen O



Code	Description	Weight [g]
0227301253	End-plate 1 HDM CANopen OUTPUT	746

Handles 16 OUTPUTS (solenoid pilots)

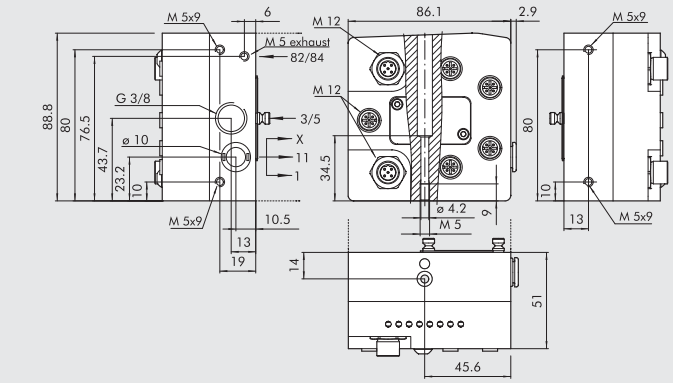
2 - I/O END-PLATE 1-11 CANopen I/O



Code	Description	Weight [g]
0227301250	End-plate 1-11 HDM CANopen IN-OUT	734

Handles 16 OUTPUTS (solenoid pilots)

3 - I/O END-PLATE 1 CANopen I/O

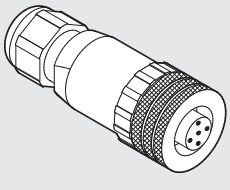


Code	Description	Weight [g]
0227301252	End-plate 1 HDM CANopen IN-OUT	735

Handles 16 OUTPUTS (solenoid pilots)

ACCESSORIES

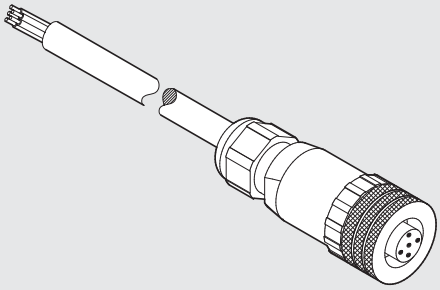
STRAIGHT CONNECTOR FOR CANopen POWER SUPPLY



Code	Description
W0970513001	5-pin M12x1 straight connector

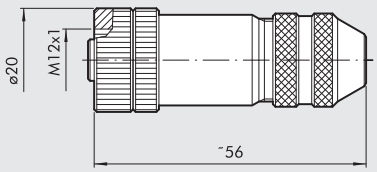
STRAIGHT CONNECTOR WITH CANopen POWER CABLE

Pin	Cable color
1	Brown
2	White
3	Blue
4	Black
5	Grey



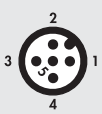
Code	Description
W0970513002	5-pin M12x1 straight connector with wire L = 5 m

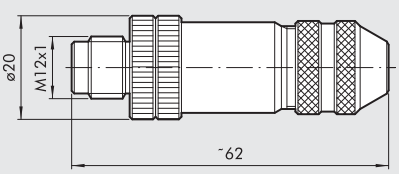
FEMALE CONNECTOR FOR CANopen BUS-IN



Code	Description
0240009055	M12 female connector, A coding

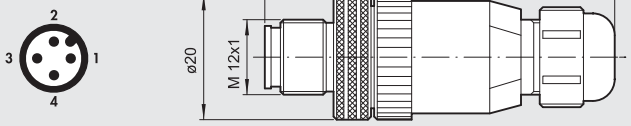
MALE CONNECTOR FOR CANopen BUS-OUT





Code	Description
0240009038	Male connector Bus A coding

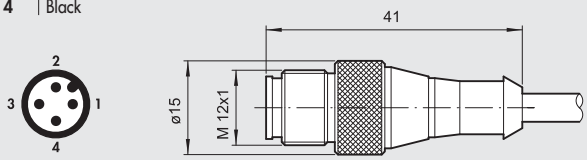
STRAIGHT CONNECTOR WITHOUT CABLE FOR CANopen INPUT



Code	Description
0240009021	Straight fitting without cable

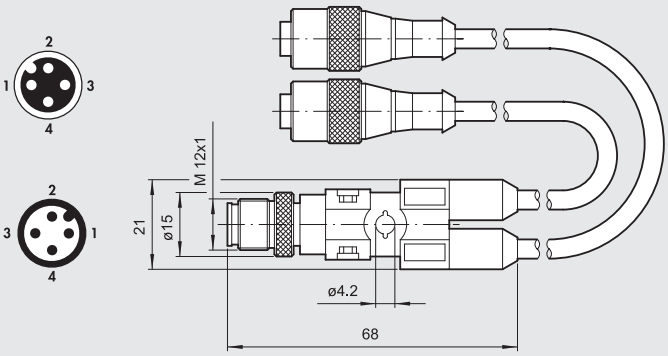
STRAIGHT CONNECTOR WITH CABLE FOR CANopen INPUT

Pin	Cable colour
1	Brown
2	White
3	Blue
4	Black



Code	Description
0240009002	Straight, with 1.5 m cable
0240009003	Straight, with 5 m cable

Y-DISTRIBUTOR WITH CABLE AND M12 STRAIGHT CONNECTORS FOR CANopen INPUT



Code	Description
0240009031	Y-Distributor cable 0.6 m
0240009032	Y-Distributor cable 1.5 m

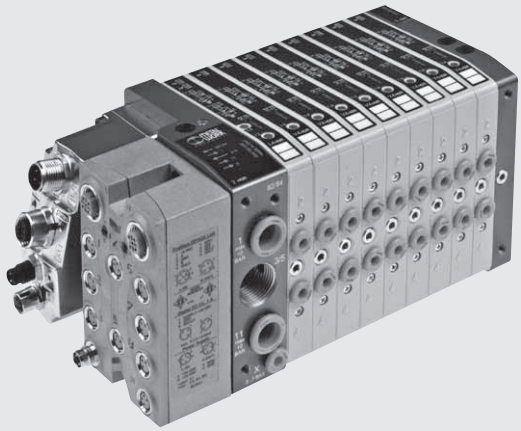
M12 PLUG FOR BUS OUT E INPUT CANopen

Code	Description
0240009040	Plug M12

HDM + B&R

METAL WORK PNEUMATIC

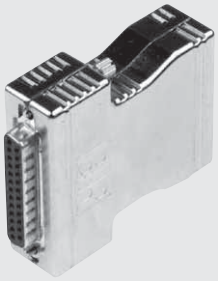
An advanced field bus system interfacing with the Multimach world.
B&R has developed a new standard for automation, called FORMULA X.
For further details about features, functions and qualities of this system, reference must be made to the B&R documentation, also available on the web site www.br-automation.com
An overview is given below.
The X-system is a system handling analogue and digital inputs and outputs for local or remote use, which B&R defines as decentralised backplane.
Different types of modules are available. We present those designed for connection with Multimach and HDM valve islands. We only indicate the B&R's code root, since each type of module comes in different variants, that differ by number of signals handled, that can be 8, 16 or 24, and by type of signal, that can be input, output or input/output indifferently.
Common to all the modules is the presence of 4 connections: a signal input, a signal output for the following modules, a power input (24V DC), a power output for the following modules.



B&R CONNECTORS AND MODULES

IP20 7XV---50-11 SMART CONNECTOR

It is a plug connector with IP20 protection that contains the X system electronics. It can be connected with HDM islands, using the special input end-plate, type 1, code 0227301207 or the special input end-plate type 1-11, code 0227301206.



IP67 7XV---50-51 SMART CONNECTOR

It is a plug connector with IP67 protection, that contains the X system electronics. It can be connected with HDM islands, using the special input end-plate type 1, code 0227301207, or the special input end-plate, type 1-11 code 0227301206.

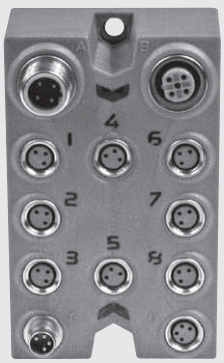
X67 1/O SYSTEM MODULES

These are modules with IP67 protection, connected to the X system, for handling inputs and outputs. It is interesting to note that their size is such that they can be fixed directly to the HDM input end-plate type 1-11, code 0227301206
(N.B. NOT to be fixed to the HDM end-plate type 1, code 0227301207).

X67 BUS CONTROLLER MODULES

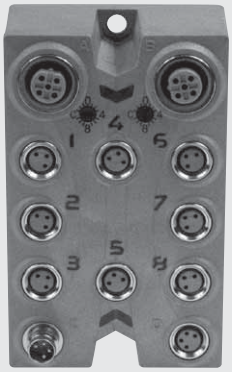
These are modules with protection IP67, receiving a signal according to one of the DP Profibus, CAN open, Device Net, Ethernet Powerlink protocols (the module code differs obviously according to the protocol being controlled). The output signal is according to the X-system.
These are gateways converting the signals of a field bus into an X-system. These modules control the inputs and/or outputs via the M8 connectors provided. They can be fixed directly to the HDM input end-plate type 1-11, code 0227301206
(N.B. NOT to be fixed to the HDM end-plate, type 1, code 0227301207).

X2X →



X2X →

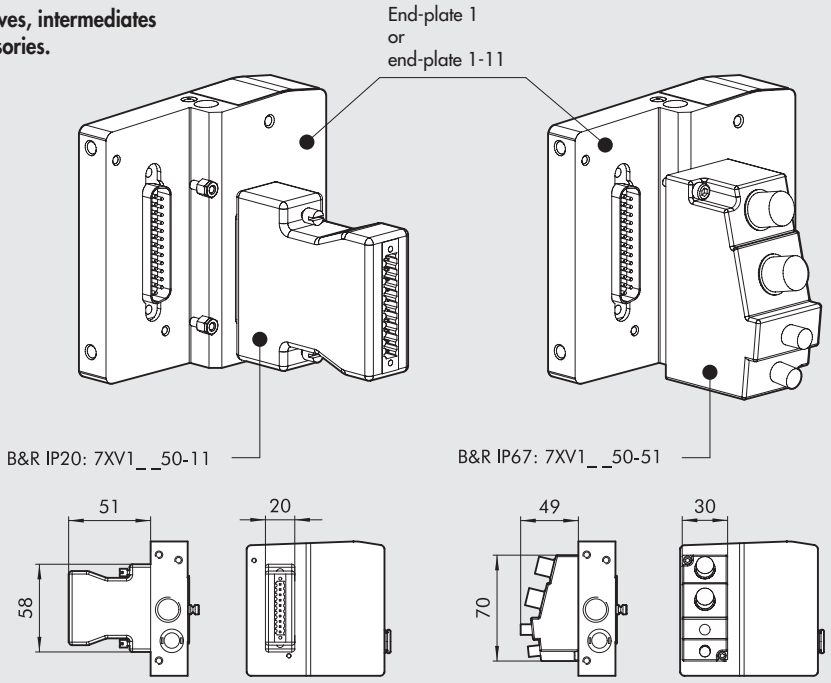
PROFIBUS-DP
DEVICE-NET
CAN-OPEN
ETHERNET →



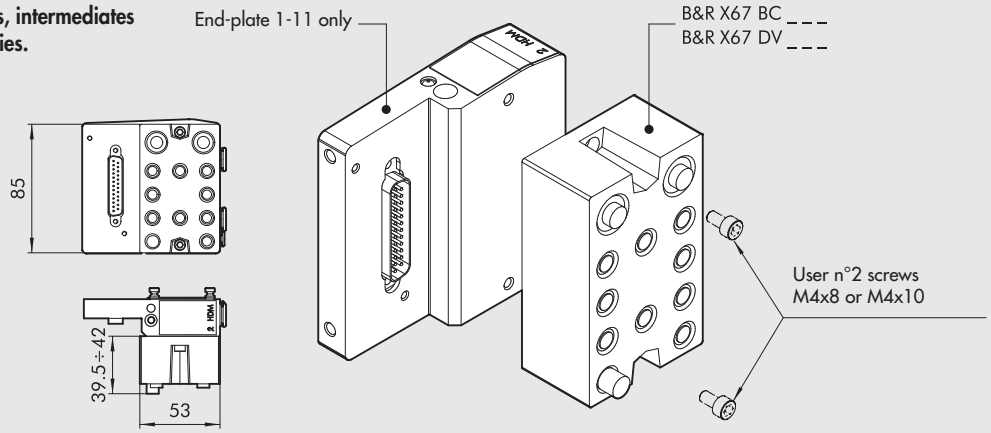
X2X →

APPLICATIONS OF B&R MODULES TO HDM END-PLATES

Refer to page B2.112 **for valves, intermediates elements and common accessories.**



Refer to page B2.112 **for valves, intermediates elements and common accessories.**

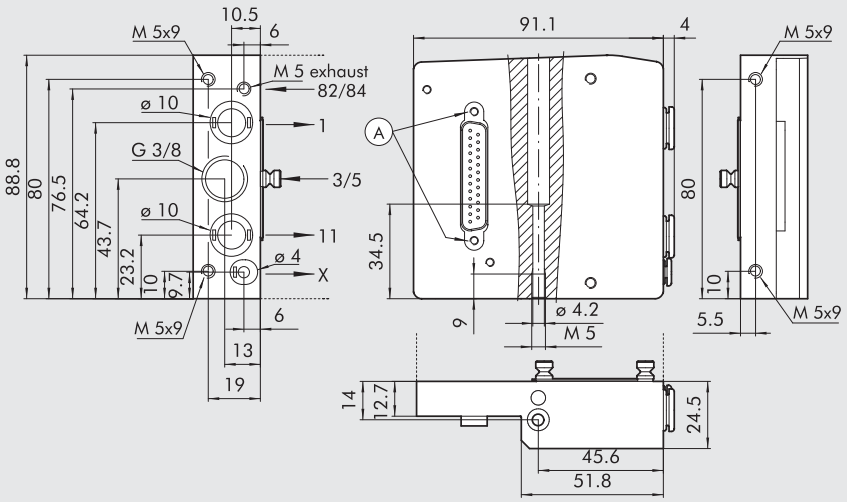


SYNOPTIC, SIZES AND VERSIONS

H D M	2	B & R	M	I6 - W 8 - W 6 - O 4 - L 8 - 5	1 6
VALVE	**INPUT END-PLATE**	**ELECTRICAL BASE**	**MANUAL TYPE**	**TYPE OF VALVE**	**FURTHER DETAILS**
Heavy duty Multimach IP65	**2** End-plate 1-11 **3** End-plate 1	**B&R** Fit for B&R	**M** Monostable manual control **B** Bistable manual control	**I** n° 2 3/2 NC **W** n° 2 3/2 NO **L** 3/2 NO + 3/2 NC **V** 5/2 monostable **K** 5/2 bistable **O** 5/3 monostable ***F** 5/2 monostable **4** Right-end-plate 1-11 pipe Ø12 **5** Blind end-plate **6** Passing-intermede **7** Blind intermediate **20** Exhaust section **4** Cartridge 4 **6** Cartridge 6 **8** Cartridge 8 - 14 mm **8S** Cartridge 8 - 23 mm **10** Cartridge 10	**16** n° 2 brackets for DIN bar

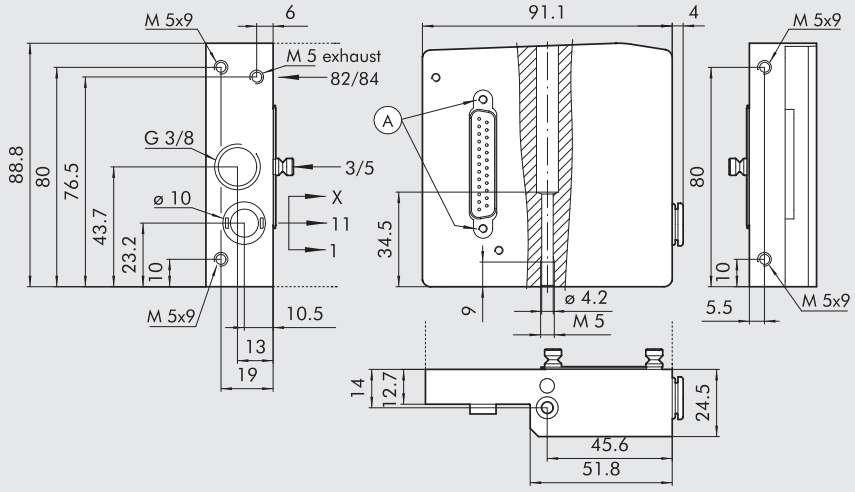
* Uses a single PIN (like the V) and occupies 2 signals.

HDM 1-11 END-PLATE FOR B&R



Code	Description	Weight [g]
0227301206	HDM 1-11 end-plate kit for B&R	340

HDM 1 END-PLATE FOR B&R



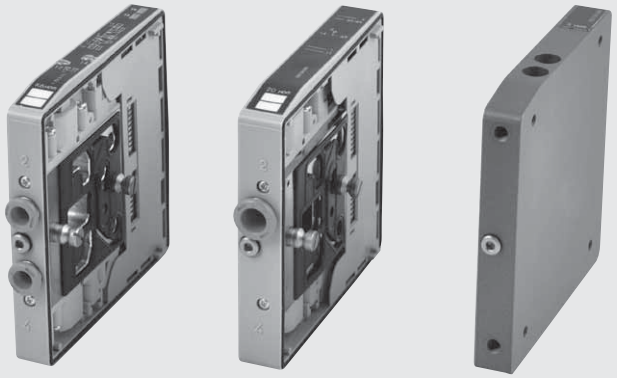
Code	Description	Weight [g]
0227301207	HDM 1 end-plate kit for B&R	380

NOTES

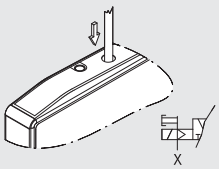
HDM - VALVES, INTERMEDIATES ELEMENTS AND ACCESSORIES

HDM valve can be included in islands with any available input terminal. The same valve can be connected to the multiple connection end-plate and all the field bus end-plates.

Note: if you use valves 8S type or 10 exploiting their flow capacity, it is appropriate to choose the inlet end plate 1-11 type by feeding the pilots separately (to avoid the pressure to decrease too much on the pilots). If you use simultaneously more than one valve 8S or 10 it is necessary to potentiate the pneumatic feeding by inserting end plates having 12 mm pipe and/or through intermediate modules



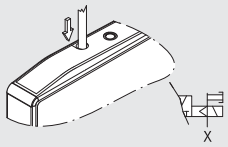
MANUAL CONTROLS



MONOSTABLE OVERRIDE PORT 2
servo-assisted

- Press and hold the manual control in position (not necessary for bistable type K valve)
- Release the manual control:
  - The manual control returns to the home position.
  - Valves type I, W, L, V, F, and O reposition.
  - The type K valve remains switched

N.B.: The pilot power supply X must be present.



MONOSTABLE OVERRIDE PORT 4
servo-assisted

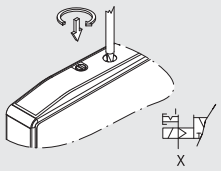
- Press and hold the manual control in position (not necessary for bistable type K valve)
- Release the manual control:
  - The manual control returns to the home position.
  - Valves type I, W, L, V and F reposition.
  - The type K valve remains switched

With type F and V valves, this manual control is not present.

N.B.: The pilot power supply X must be present.

- The reference code for the monostable control ends in 0 (2 for type F).

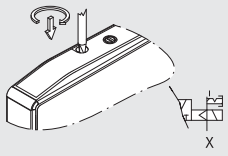
Example: 707203053 – 1 / 0



BISTABLE OVERRIDE PORT 2
servo-assisted

- Press the manual control right in then turn it clockwise 90 degrees and Leave it in position.
- Rotate the manual control 90 degrees anticlockwise, and then release it.
  - The manual control returns to the home position.
  - Valves type I, W, L, V, F, and O reposition.
  - The type K valve remains switched

N.B.: The pilot power supply X must be present.



BISTABLE OVERRIDE PORT 4
servo-assisted

- Press the manual control right in then turn it 90 degrees clockwise and Leave it in position.
- Rotate the manual control 90 degrees anticlockwise, and then release it:
  - The manual control returns to the home position.
  - Valves type I, W, L and O reposition.
  - The type K valve remains switched

With type F and V valves, this manual control is not present.

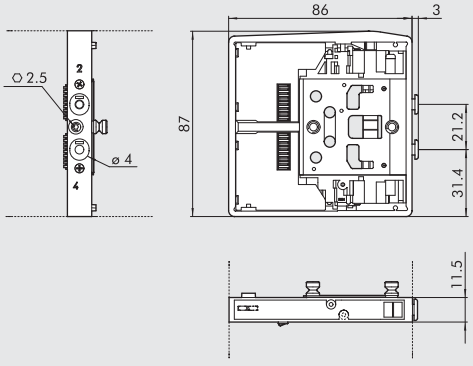
N.B.: The pilot power supply X must be present.

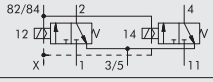
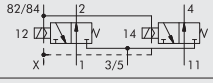
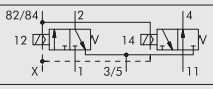
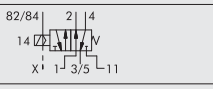
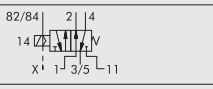
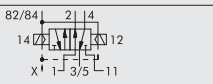
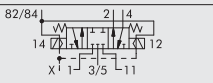
- The reference code for the monostable control ends in 1 (3 for type F).

Example: 707203053 – 1 / 0

① VALVE DIMENSIONS HDM Ø 4

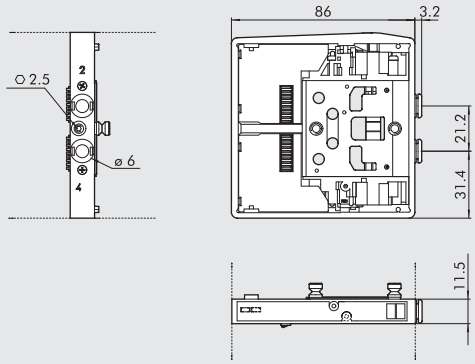
*uses a single PIN (like the V) and occupies 2 signals

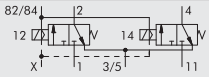
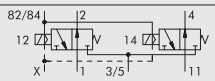
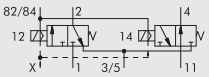
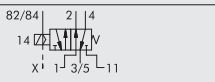
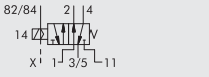
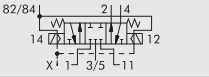


Symbol		Code	Manual control	Weight [g]
HDM I4		7071030530	monostable	130
		7071030531	bistable	
HDM W4		7071030630	monostable	130
		7071030631	bistable	
HDM L4		7071030730	monostable	130
		7071030731	bistable	
HDM V4		7071030130	monostable	115
		7071030131	bistable	
HDM *F4		7071030132	monostable	115
		7071030133	bistable	
HDM K4		7071030110	monostable	130
		7071030111	bistable	
HDM O4		7071030210	monostable	130
		7071030211	bistable	

① VALVE DIMENSIONS HDM Ø 6

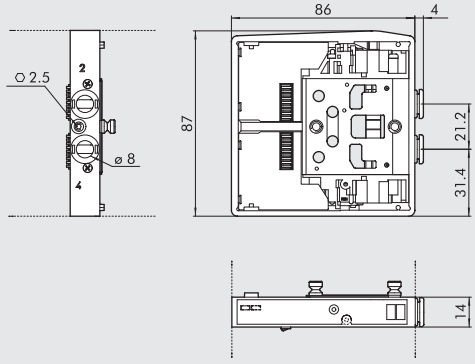
*uses a single PIN (like the V) and occupies 2 signals

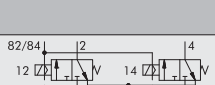
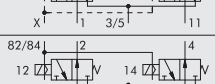
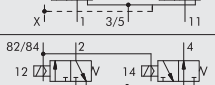
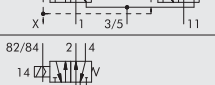
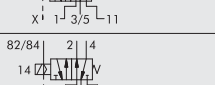
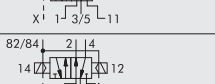
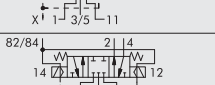


Symbol		Code	Manual control	Weight [g]
HDM I6		7072030530 7072030531	monostable bistable	130
HDM W6		7072030630 7072030631	monostable bistable	130
HDM L6		7072030730 7072030731	monostable bistable	130
HDM V6		7072030130 7072030131	monostable bistable	115
HDM *F6		7072030132 7072030133	monostable bistable	115
HDM K6		7072030110 7072030111	monostable bistable	130
HDM O6		7072030210 7072030211	monostable bistable	130

① VALVE DIMENSIONS HDM Ø 8

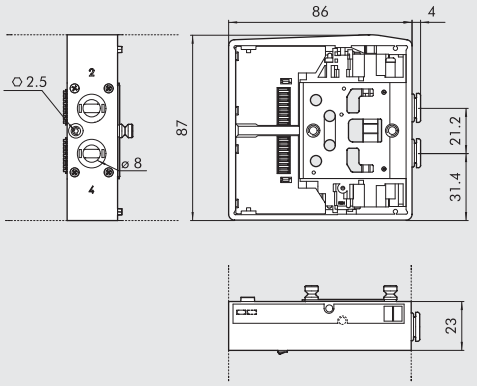
*uses a single PIN (like the V) and occupies 2 signals

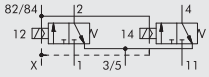
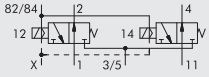
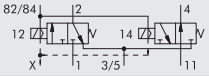
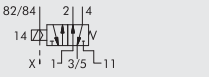
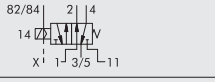
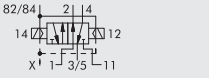
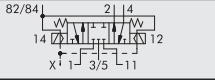


Symbol		Code	Manual control	Weight [g]
HDM I8		7073030530 7073030531	monostable bistable	140
HDM W8		7073030630 7073030631	monostable bistable	140
HDM L8		7073030730 7073030731	monostable bistable	140
HDM V8		7073030130 7073030131	monostable bistable	130
HDM *F8		7073030132 7073030133	monostable bistable	130
HDM K8		7073030110 7073030111	monostable bistable	140
HDM O8		7073030210 7073030211	monostable bistable	140

① VALVE DIMENSIONS HDM Ø 8S

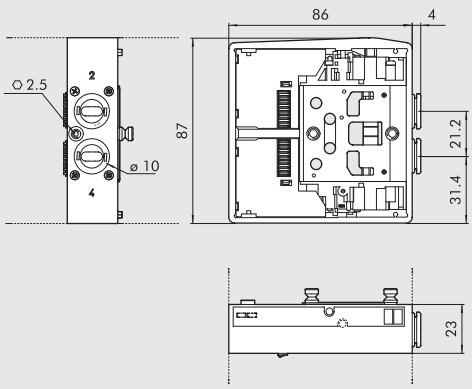
*uses a single PIN (like the V) and occupies 2 signals

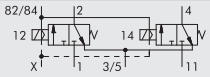
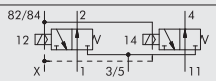
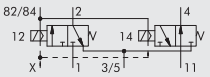
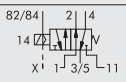
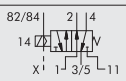
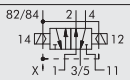
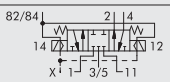


Symbol		Code	Manual control	Weight [g]
HDM I8S		7077030530 7077030531	monostable bistable	260
HDM W8S		7077030630 7077030631	monostable bistable	260
HDM L8S		7077030730 7077030731	monostable bistable	260
HDM V8S		7077030130 7077030131	monostable bistable	241
HDM *F8S		7077030132 7077030133	monostable bistable	241
HDM K8S		7077030110 7077030111	monostable bistable	253
HDM O8S		7077030210 7077030211	monostable bistable	262

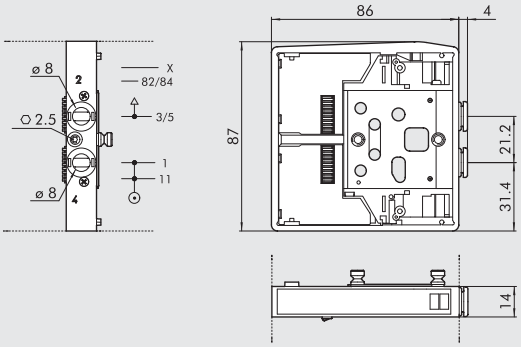
① VALVE DIMENSIONS HDM Ø 10

*uses a single PIN (like the V) and occupies 2 signals



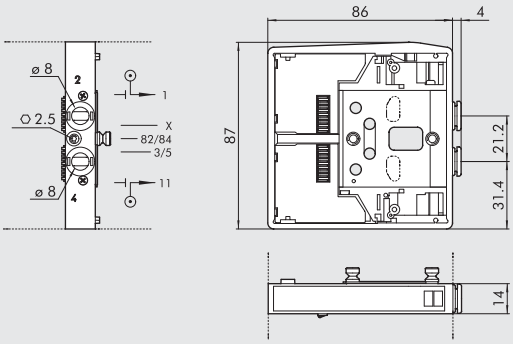
Symbol		Code	Manual control	Weight [g]
HDM I10		7078030530 7078030531	monostable bistable	250
HDM W10		7078030630 7078030631	monostable bistable	250
HDM L10		7078030730 7078030731	monostable bistable	250
HDM V10		7078030130 7078030131	monostable bistable	231
HDM *F10		7078030132 7078030133	monostable bistable	231
HDM K10		7078030110 7078030111	monostable bistable	243
HDM O10		7078030210 7078030211	monostable bistable	252

⑥ INTERMEDIATE THROUGH



Code	Description	Weight [g]
0227301301	Intermediate through HDM	120

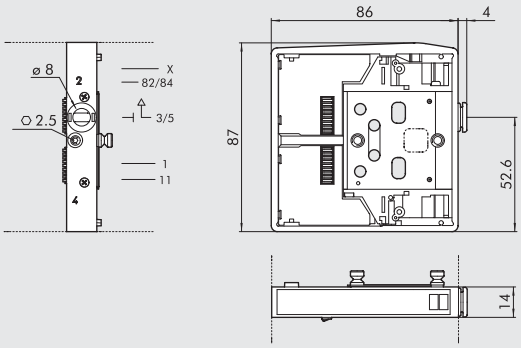
⑦ INTERMEDIATE BLIND



Code	Description	Weight [g]
0227301302	Intermediate blind HDM	117

⑳ INTERMEDIATE EXHAUST SWITCH

Code	Description	Weight [g]
0227301303	Intermediate exhaust switch HDM	125

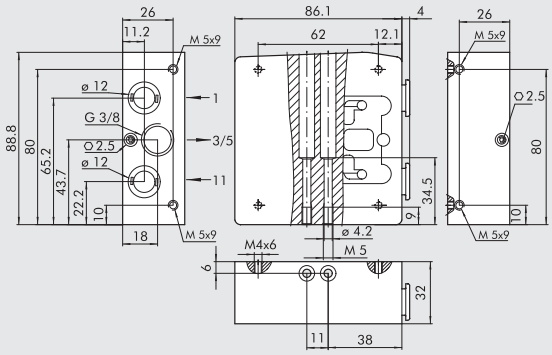


④ RIGHT-END-PLATE 1-11 PIPE Ø 12

Code	Description	Weight [g]
0227301221	Rigth-end-plate HDM 1-11 Ø 12	630

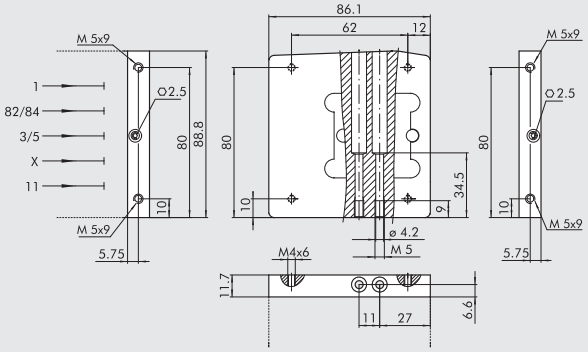
This end-plate allows for supplies to be differentiated:

- Port 2
- Port 4



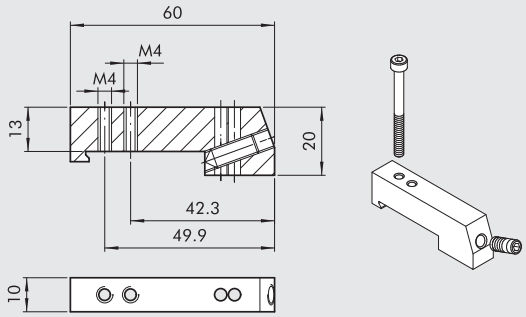
⑤ BLIND END-PLATE

Code	Description	Weight [g]
0227301500	Blind end-plate HDM	230



ACCESSORIES

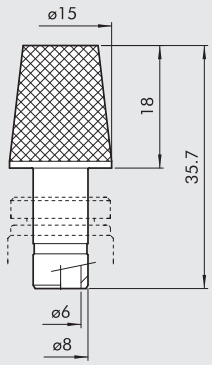
⑯ CONNECTION BRACKETS ON DIN BAR



Code	Description	Weight [g]
0227301600	Connection brackets on din bar HDM/CM	30

Supplied complete with one M4x45 screws and one M6 grub screw
Individually packed

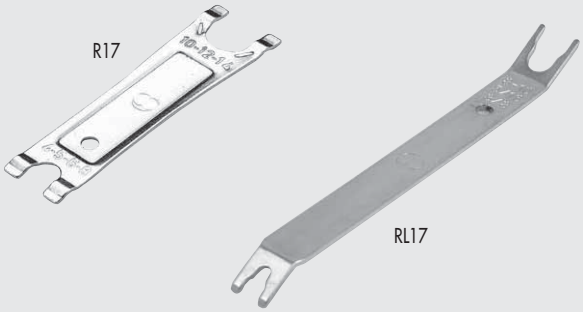
SILENCER FOR FITTING, Ø 8



Code	Description	Weight [g]
W0970530084	Silencer for fitting, Ø 8	15

At the 3/5-exhaust port of the intermediate throughreference 6 and of the exhaust switch reference 20

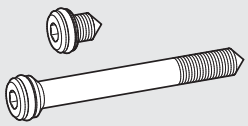
R17 - PIPE RELEASE SPANNER



Code	Rif.	Length [mm]	Ø Tube
2L17001	RL17	140	from 3 to 10
2017001	R17	95	from 4 to 14

SPARES

GRUB SCREW KIT



Code	Description
0227301800	Grub screw for Multimach HDM/CM

Comes in 1 + 1 pc. packs

CM CLEVER MULTIMACH

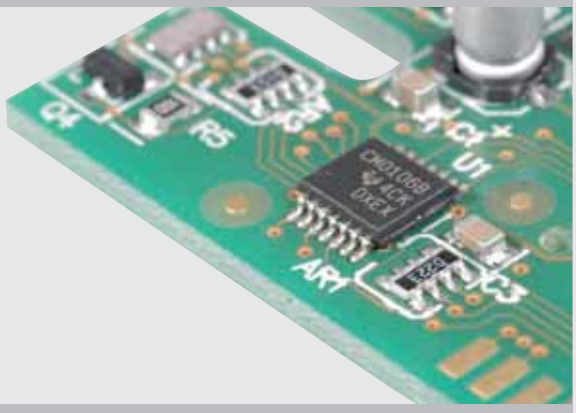
METAL WORK PNEUMATIC

THE VALVE IN DETAIL

Clever Multimach valves can be used to form autonomous and intelligent valve island subsystems. Each valve has a microchip that performs a series of functions connected with operation and dialogue with the valves before and after it. Valves communicate via serial transmission. CM refers to the communication protocol patented by Metal Work. It is a field-bus in its own right, designed specifically for very easy control of islands of pneumatic solenoid valves. CM valves have a diagnosis system that detects electrical faults. It can also be used to verify during installation that all connections are correct. Multi-pole connections and field buses with different communication protocols are available for controlling the valve distribution island. Addressing of single outputs is not required as the connection number of each solenoid pilot is assigned automatically based on the position occupied by the valve.

SMART VALVE

Each valve comes with a microchip that controls operation and dialogue with the other valves.



LOCAL DIAGNOSTICS

Each Clever Multimach valve has a LED diagnostic system that identifies immediately whether a pilot is energized, the contact is interrupted or there is a short-circuit.

LED 14	LED 12	DESCRIPTION OF THE FAUL
OFF ○	**OFF** ○	No fault, EV1-EV2=OFF
ON (green) ●	**OFF** ○	No fault, EV1=ON - EV2=OFF
ON (green) ●	**ON** (green) ●	No fault, EV1-EV2=ON
OFF ○	**ON** (green) ●	No fault, EV1=OFF - EV2=ON
RED (flashing) ✳	**OFF** ○	Solenoid pilot EV1 interrupted or disconnected
OFF ○	**RED** (flashing) ✳	Solenoid pilot EV2 interrupted or disconnected
ON (red) ●	**OFF** ○	Solenoid pilot EV1 short circuit
OFF ○	**ON** (red) ●	Solenoid pilot EV2 short circuit
GREEN (flashing) ✳	**OFF** ○	Data update time out, communication faulty

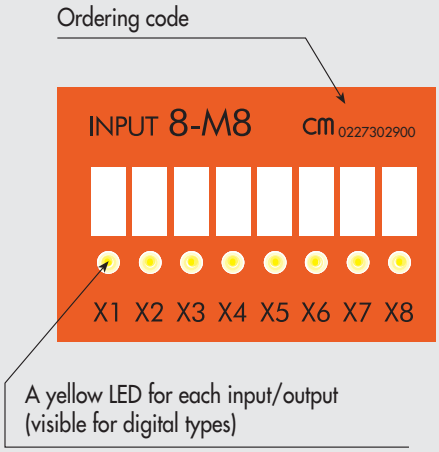
INPUT MODULES

With a suitably arranged Clever Center, you can insert add-on modules.
When connecting buses, the add-on modules can only be used for e PNP INPUTs.
With a multi-pole connection, the following INPUTs and OUTPUTs can be used:
- DIGITAL INPUTS, as cylinder sensors for example
- DIGITAL OUTPUTS
- ANALOGUE INPUTS (but the LEDs do not light up)
- ANALOGUE OUTPUTS (but the LEDs do not light up)

They can be combined, even on the same module. You can choose between PNP or NPN connections via a dip switch-type selector.
All the INPUTS/OUTPUTS must be the same type, i.e. all PNP or NPN.

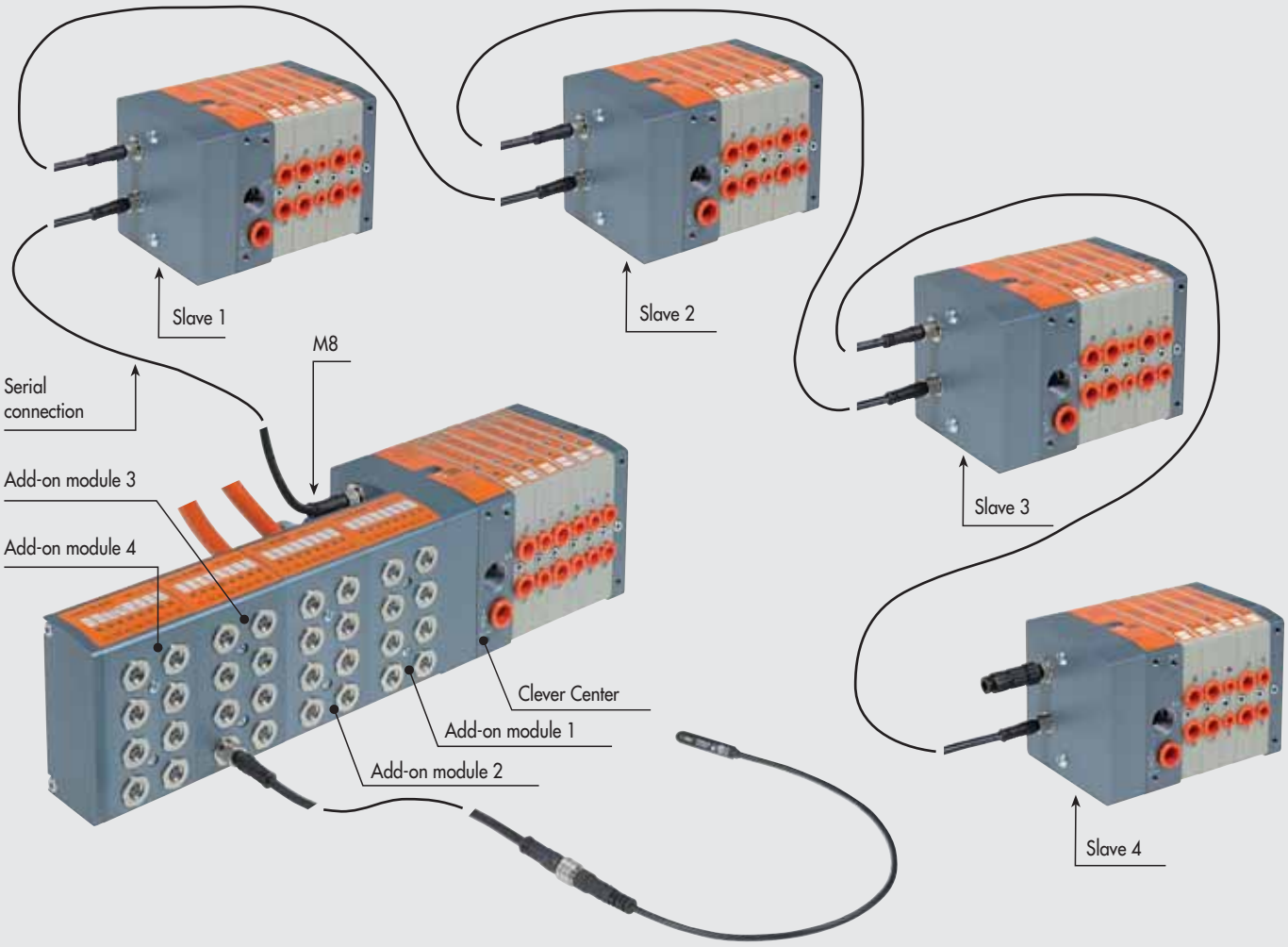
MAXIMUM EXTENSION OF ADD-ON MODULES

Up to 4 modules can be connected, giving a total of 32 input signals.



EXAMPLE OF A CM LAYOUT

The Clever Center can relay command signals to other islands of "slaves". Transmission, in serial mode, is via a cable with M8 connectors. Commands can be sent from the first slave island to other slave islands in cascade, again via cables with M8 connectors. Addresses are assigned automatically, based on intuitive sequential logic. This means that other slaves can be added downstream at any time, until all available outputs are in use.

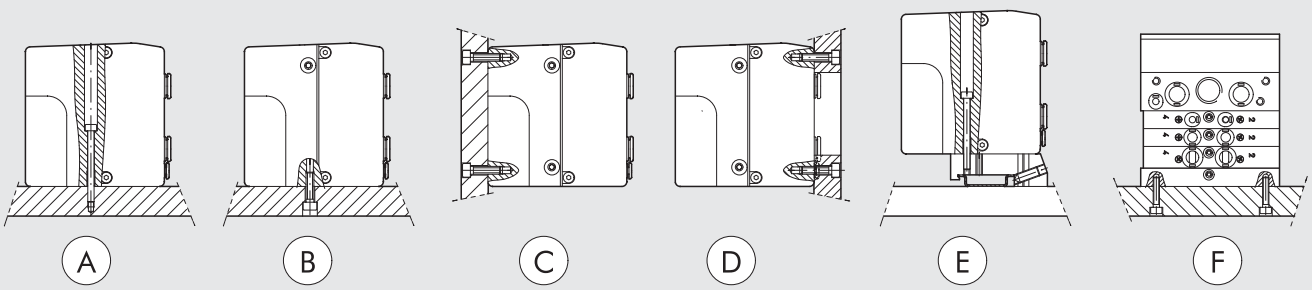


NOTES

TECHNICAL DATA

Valve port connections		Ø 4,6,8 mm automatic fitting for ports 2 and 4 / power supply port for Ø10 automatic fitting / 3/8 thread for exhaust port, M5 thread for exhaust pilot port			
Connection on the end-plate 1-11 for the supply of pilots		Automatic fitting Ø 4 mm			
Maximum number of pilots		See input end-plate technical data			
Maximum number of valves		See input end-plate technical data			
Operating temperature range	°C	-10 to +60			
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous			
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	11.5 mm Ø 4	11.5 mm Ø 6	14 mm Ø 8	
	version 5/2 and 3/2	200	500	650	
	version 5/3	200	300	300	
Pressure range		X (pilot supply)		1-11 (valve supply)	
	end-plate 1-11	3 to 7 bar		vacuum at 10 bar	
	end-plate 1	3 to 7 bar			
Voltage range		24 VDC ±10%			
		(slave protected against overload and reverse polarity)			
Power for each pilot	W	0.9			
Solenoid Pilot Insulation class		F155			
Degree of protection		IP65 (with conveyed exhust, and that - in case of no use)			
Diagnostics and protections		Local via PC/PLC fault led. For defects signalled look at the manual.			
		Outlets protected against overload and short-circuit			
Solenoid rating		100% ED			
Maximum latency time of the serial transmission	ms	<10			
TRA/TRR 2x3/2 monostable at 6 bar	ms	8 / 45			
TRA/TRR 5/2 monostable at 6 bar	ms	8 / 33			
TRA/TRR 5/2 bistable at 6 bar	ms	20 / 20			
TRA/TRR 5/3 cc monostable at 6 bar	ms	20 / 20			
Note on use		Insert the pipes in the fittings, before passing air through the valves, otherwise the gasket may be pulled out of its seat by the flow of air.			
Compatibility with oils		See **chapter Z1**			
Add-on module					
Sensor supply voltage		24 VDC ±10%			
Maximum current for each single connector	mA	200			
Maximum current for each module	mA	400			
Maximum total current of all the modules	mA	1000			
Input impedance	KΩ	3.9			
Max input voltage	Vcc	-5 to +30			
Type of input		With field bus: PNP			
		With multi-pole connection: PNP/NPN configurable via DIP SWITCH			
Protection		Protected inputs against overload and short-circuit			
Active input signalling		One LED for each INPUT			

FIXING THE BASE



Ⓐ Fixing from above using the 1 or 1-1 input end-plate and the blind end-plate.
Ⓑ Ⓒ Fixing from above using the 1 or 1-1 input end-plate and the blind end-plate, using the M5 threads on the bottom and the rear of the end-plates.
Ⓓ Fixing from above using the 1 or 1-1 input end-plate and the blind end-plate, using the M5 threads on the front of the end-plates. An opening for the pipes is made in the plate.
Ⓔ Fixing on the DIN bar with end-plate 1 or 1-11 and blind end-plate, using the push-in bracket code 0227301600.
Ⓕ Lateral fixing using the blind end-plate, and its the M4 threads on the side lateral.
Note: The sole fixing admitted is the one showed.

KEY TO CODES – CLEVER MULTIMACH CM

C M	2	I / O	M	I6 - W8 - W6 - O4 - L8 - 5	M8 - M8 - 15 - 16
VALVE	**INPUT END-PLATE**	**FUNCTION**	**MANUAL TYPE**	**TYPE OF VALVE**	**FURTHER DETAILS**
Clever Multimach	**2** End-plate 1-11 **3** End-plate 1	**O** Multi-pole connection, valves only **I/O** Multi-pole connection, valves and inputs **ADD** Additional (slave) valves only **PN O** Profinet IO, valves only **PN I/O** Profinet IO, valves and inputs **EC O** EtherCAT, valves only **EC I/O** EtherCAT, valves and inputs **EN O** EtherNet/IP, valves only **EN I/O** EtherNet/IP, valves and inputs **CAN O** CANopen, valves only **CAN I/O** CANopen, valves and inputs	**M** Monostable manual control **B** Bistable manual control	**I** n° 2 3/2 NC **W** n° 2 3/2 NO **L** 3/2 NO + 3/2 NC **V** 5/2 monostable **K** 5/2 bistable **O** 5/3 monostable **5** Blind end-plate **6** Passing-intermede **7** Blind intermediate **20** Exhaust section **4** Cartridge 4 **6** Cartridge 6 **8** Cartridge 8	● **M8** Module 8 input M8 ✱ **14** Shell 44 pin ✱ **15** Shell 44 + 44 pin **16** n° 2 brackets for DIN bar

● Not applicable with (add-on) ADD end-plate
✱ For multi-pole connection only

NOTES

CM + MULTI-POLE CONNECTION

CM end-plates + multi-pole connection can be used for connection to the PC/PLC using a 44-pin cable and connector.
The end-plates with provisions for INPUT/OUTPUT add-on modules are connected using an extra 44-pin cable.
Both valves and INPUTs/OUTPUTs can be PNP or NPN configured.

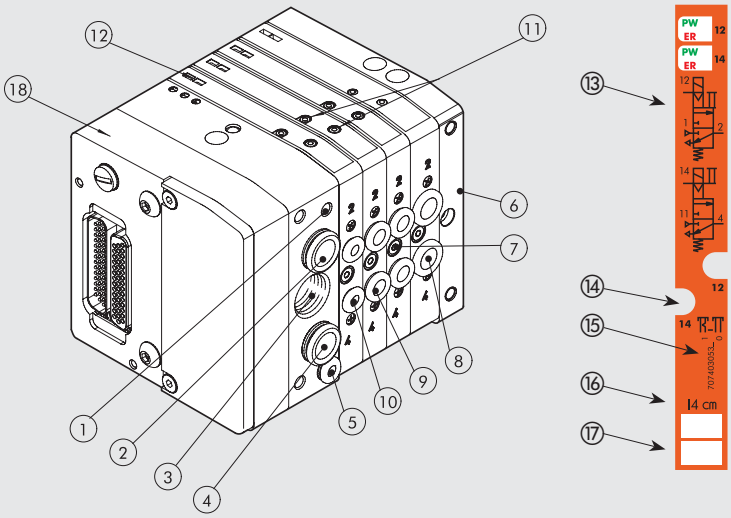
TECHNICAL DATA

Maximum number of pilots		32
Maximum number of valves		32 (same as the max. no. of pilotos)
Voltage range		24VDC ±10%
DC input current without valve modules		Nominal Icc 30 mA - Instantaneous Icc (≤25 ms) 650 mA
Max input current with all valves ON	A	1.5

Refer to page B2.120 **for general technical data**

COMPONENTS

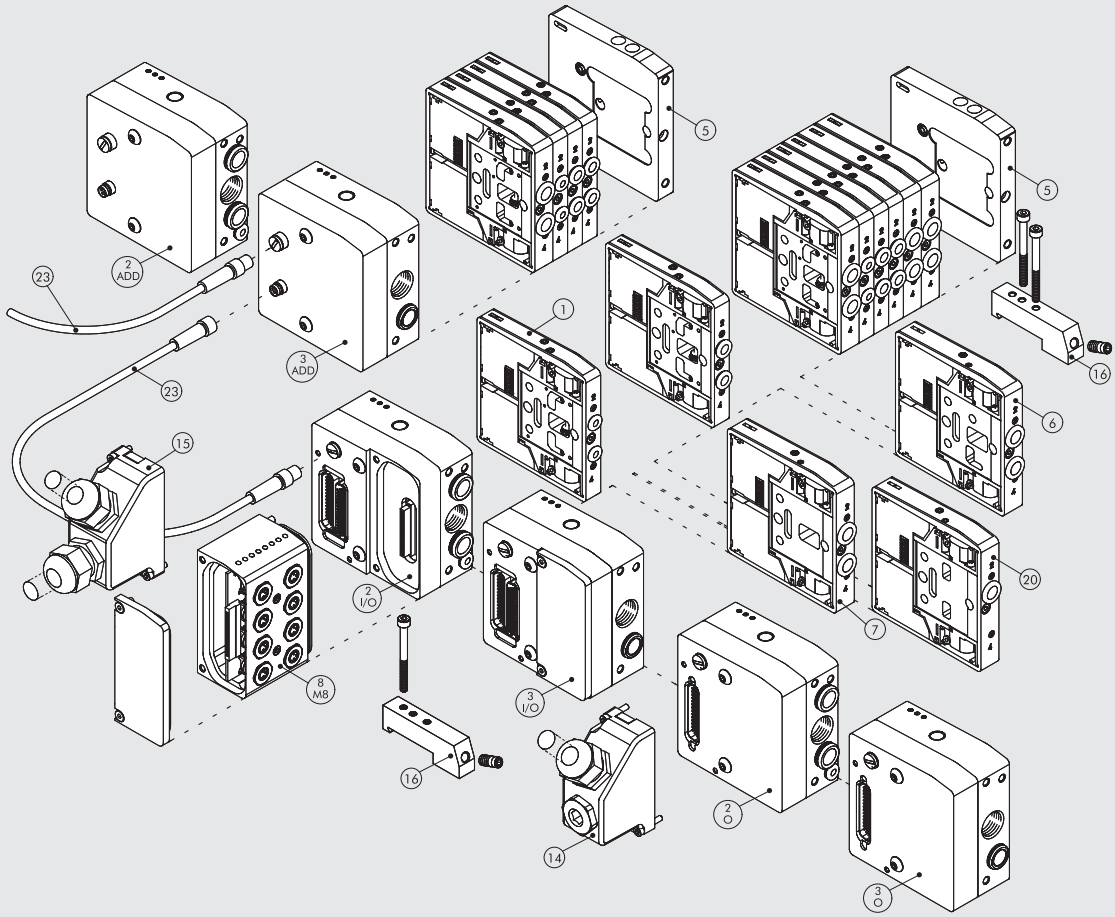
① Exhaust - Solenoid pilot 82/84
② Valve supply - port 1
③ Threaded connection of exhausts 3/5
④ Valve supply - port 11
⑤ Electrical control supply X
⑥ Blind end-plate
⑦ Screw for valve wall-mounting
⑧ ⑨ ⑩ Utility port for pipe Ø 4, 6 or 8 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number
⑱ Clever Center end-plate multi-pole connection



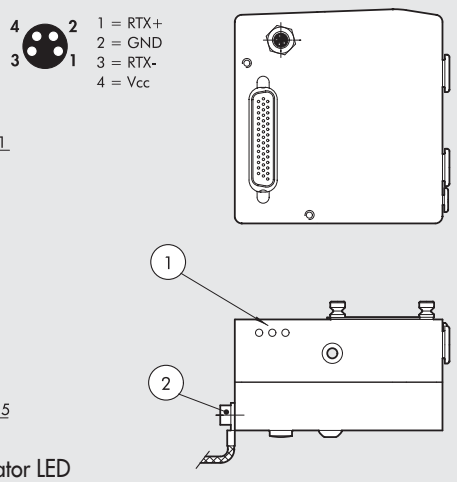
METAL WORK PNEUMATIC

VALVE ISLAND CONFIGURATION

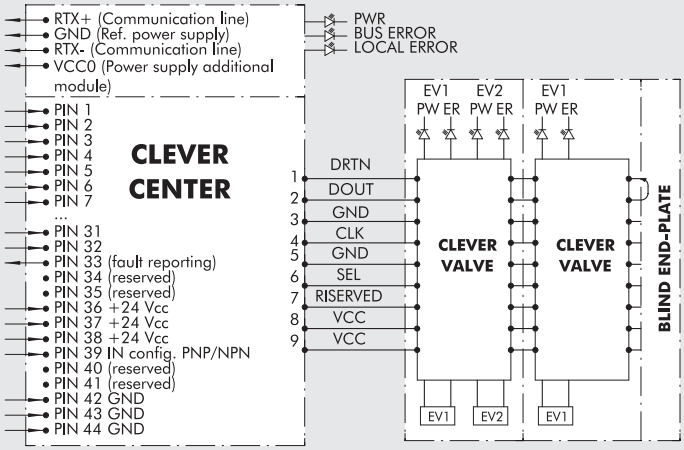
The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.142 **for valves, intermediates elements and common accessories.**



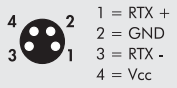
WIRING DIAGRAM FOR THE CLEVER CENTER TERMINAL - VALVES ONLY



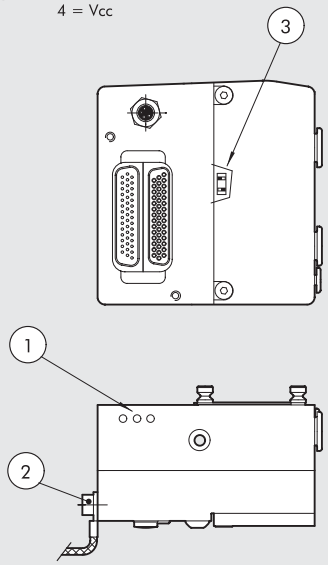
① Indicator LED
② Grounding

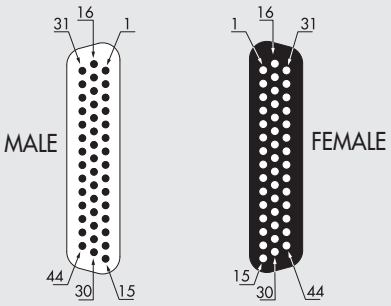


WIRING DIAGRAM FOR THE CLEVER CENTER TERMINAL FOR VALVES AND INPUTS/OUTPUTS

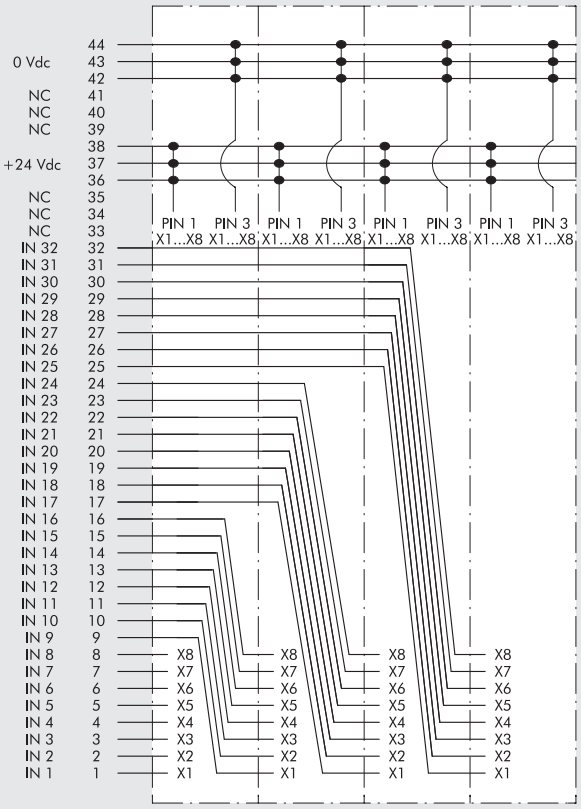


1 = RTX +
2 = GND
3 = RTX -
4 = Vcc



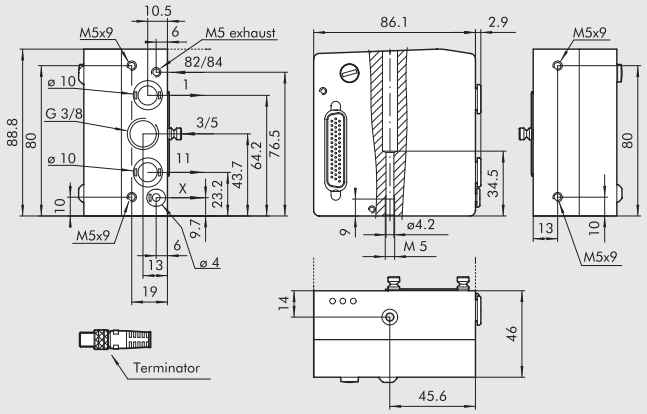


INPUT CONNECTION DIAGRAM



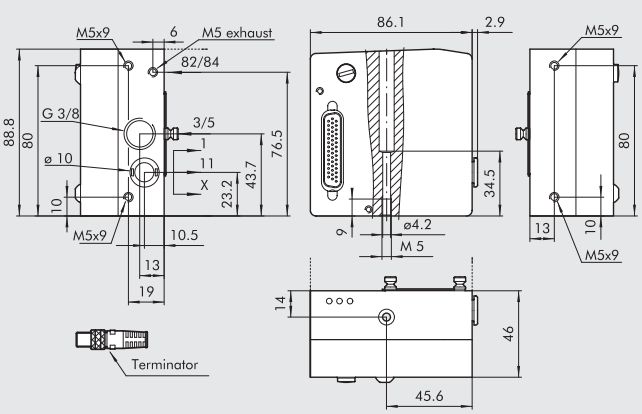
① Indicator LED
② Grounding
③ Input selector type PNP/NPN

2 - O OUTPUT END-PLATE 1-11



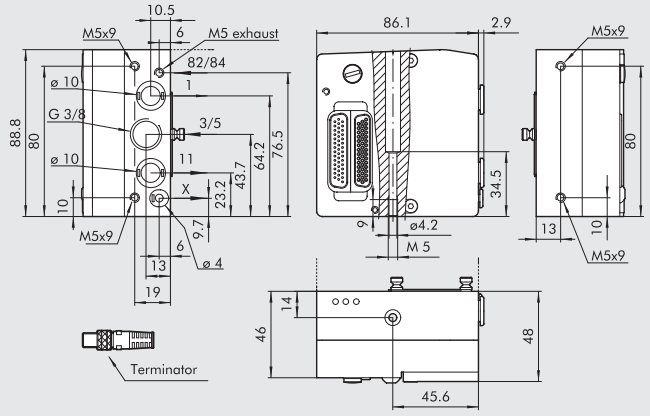
Code	Description	Weight [g]
0227302200	End-plate CM kit 1-11 OUT	722
This end-plate allows for supplies to be differentiated: port 2, port 4 and pilot supply Note: terminator included		

3 - O OUTPUT END-PLATE 1



Code	Description	Weight [g]
0227302201	End-plate CM kit 1 OUT	722
Note: terminator included		

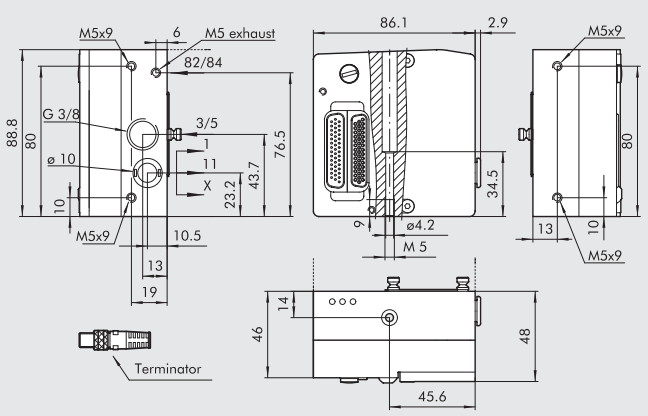
2 - I/O INPUT/OUTPUT END-PLATE 1-11



Code	Description	Weight [g]
0227302223	End-plate CM kit 1-11 IN/OUT	722

This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply
Note: terminator included

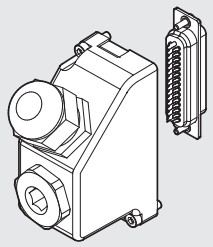
3 - I/O INPUT/OUTPUT END-PLATE 1



Code	Description	Weight [g]
0227302225	End-plate CM kit 1 IN/OUT	722

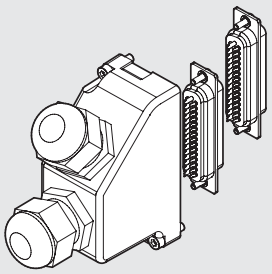
Note: terminator included

14 44-PIN CUP CONNECTOR KIT IP 65



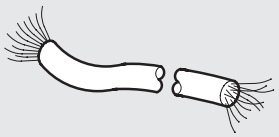
Code	Description	Weight [g]
0226180108	44-pin cup connector kit IP 65	60

15 44+44 PIN CUP CONNECTOR KIT IP 65 FOR I/O



Code	Description	Weight [g]
0226180109	44+44 pin cup connector kit IP 65 for I/O	80

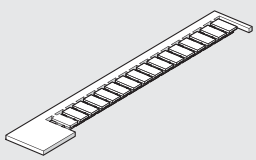
CABLES



Code	Description	Weight [g/m]
0226107201	10-wire cable	86
0226107101	19-wire cable	122
0226107102	25-wire cable	130
0226107103	44-wire cable	160

Specify the number of metres desired

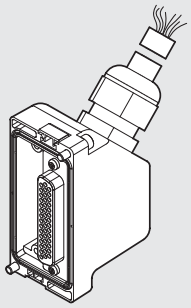
IDENTIFICATION PLATE KIT FOR 44-PIN CONNECTOR



Code	Description
0226107000	Identification plate kit

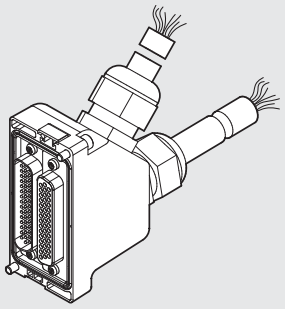
Comes in 16-pc. packs

44-PIN PRE-WIRED CUP CONNECTOR



Code	Description	Weight [g]
0226950500	Connet. IP 65 + cable 44-wire L = 5 m	740

44+44-PIN PRE-WIRED CUP CONNECTOR



Code	Description	Weight [g]
0226980500	Connet. IP 65 + cable 44 + 44-wire L = 5 m	1550

WIRING DIAGRAM FOR THE 44-PIN CUP CONNECTOR KIT

44 PIN FEMALE PRE-WIRED FOR VALVE

Position of electrical contact	Corresponding wire colour	Function
1	white	Out 1
2	brown	Out 2
3	green	Out 3
4	yellow	Out 4
5	gray	Out 5
6	pink	Out 6
7	blue	Out 7
8	violet	Out 8
9	gray + pink ring	Out 9
10	red + blue ring	Out 10
11	white + green ring	Out 11
12	brown + green ring	Out 12
13	white + yellow ring	Out 13
14	yellow + brown ring	Out 14
15	white + gray ring	Out 15
16	gray + brown ring	Out 16
17	white + pink ring	Out 17
18	pink + brown ring	Out 18
19	white + blue ring	Out 19
20	brown + blue ring	Out 20
21	white + red ring	Out 21
22	brown + red ring	Out 22
23	white + black ring	Out 23
24	brown + black ring	Out 24
25	gray + green ring	Out 25
26	yellow + gray ring	Out 26
27	pink + green ring	Out 27
28	yellow + pink ring	Out 28
29	green + blue ring	Out 29
30	yellow + blue ring	Out 30
31	green + red ring	Out 31
32	yellow + red ring	Out 32
33	green + black ring	Fault reporting
34	gray + blue ring	NC
35	gray + red ring	NC
36	red + green ring	+24VDC
37	red + brown ring	+24VDC
38	red + black ring	+24VDC
39	yellow + black ring	Config. PNP/NPN
40	pink + red ring	NC
41	pink + blue ring	NC
42	black + green ring	0 VDC
43	black + pink ring	0 VDC
44	black + red ring	0 VDC

44 PIN MALE PRE-WIRED FOR INPUT/OUTPUT

Position of electrical contact	Corresponding wire colour	Function
1	white	In 1
2	brown	In 2
3	green	In 3
4	yellow	In 4
5	gray	In 5
6	pink	In 6
7	blue	In 7
8	violet	In 8
9	gray + pink ring	In 9
10	red + blue ring	In 10
11	white + green ring	In 11
12	brown + green ring	In 12
13	white + yellow ring	In 13
14	yellow + brown ring	In 14
15	white + gray ring	In 15
16	gray + brown ring	In 16
17	white + pink ring	In 17
18	pink + brown ring	In 18
19	white + blue ring	In 19
20	brown + blue ring	In 20
21	white + red ring	In 21
22	brown + red ring	In 22
23	white + black ring	In 23
24	brown + black ring	In 24
25	gray + green ring	In 25
26	yellow + gray ring	In 26
27	pink + green ring	In 27
28	yellow + pink ring	In 28
29	green + blue ring	In 29
30	yellow + blue ring	In 30
31	green + red ring	In 31
32	yellow + red ring	In 32
33	green + black ring	NC
34	gray + blue ring	NC
35	gray + red ring	NC
36	red + green ring	+24VDC
37	red + brown ring	+24VDC
38	red + black ring	+24VDC
39	yellow + black ring	NC
40	pink + red ring	NC
41	pink + blue ring	NC
42	black + green ring	0 VDC
43	black + pink ring	0 VDC
44	black + red ring	0 VDC

CM + Profinet IO

METAL WORK PNEUMATIC

The CM + Profinet IO system has been designed with a pneumatic input end-plate that can contain all the electronic equipment, indicators and connectors. This system is very compact and sturdy and is housed in a thick aluminium body that protects sensitive components from impact and falls.
The end-plate is available in two electric versions: one handling up to 64 solenoids (64 OUTs) and one handling up to 64 solenoids (64 OUTs) and 32 inputs (32 INs).
Grounding is recommended to protect the electronic circuit against electric or electrostatic charges.
N.B. For the system to handle more than 32 pilots (33 to 64), it must be made up of valves bearing a label marked 64. If one or more valves are not marked 64, each island cannot handle more than 32 pilots.

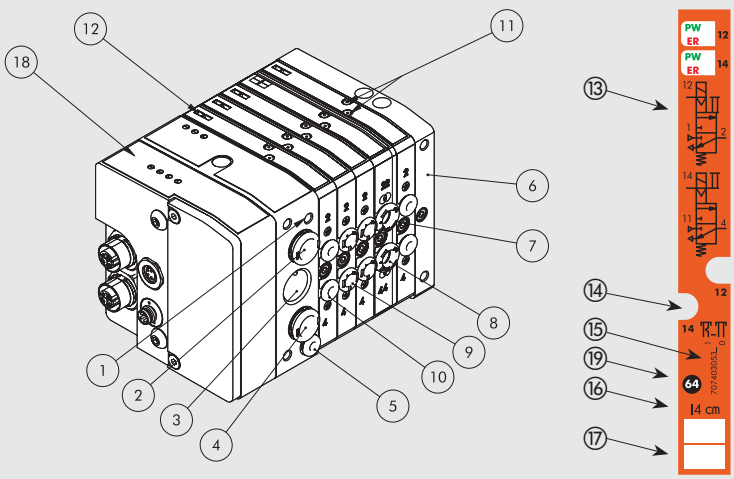
TECHNICAL DATA

Field buses	Profinet IO - 100 Mbit/s - Full-duplex
	Supports RT communication, Shared Device, Identification & Maintenance 1-4
Factory settings	Module name: Cmseries
	Address IP 0.0.0.0
Addressing	Software DCP
Voltage range	24VDC ± 10%
Maximum number of pilots (Out)	64
Maximum number of valves	64 (same as the max. no. of pilotos)
Maximum number of inputs (INs)	32
Icc bus supply current	Nominal Icc 120 mA - Instantaneous Icc (< 2 ms) 450 mA
Icc valve supply current	Instantaneous Icc (< 2 ms) 900 mA
Maximum absorption of a valve island with 64 monostable valves	Nominal Icc with 900 mA OFF valves – nominal Icc with 2700 mA ON valves
Protections	Module protected against overload and polarity reversal. Outputs protected against overloads and short-circuits
Connections	Field bus: 2 M12 Female, D-coded, internal switch
	supply: M8 4 pin
	input: M8 3 pin
BUS diagnostics	Using local LEDs and software messages
	Outputs: using local LEDs and status bytes
	Inputs: using local LEDs and status bytes
	N.B.: Refer to the user manual for a detailed description
Data bit value	0 = not enabled
	1 = enabled
Output status in the absence of communication	Disabled

See page B2.120 for general technical data

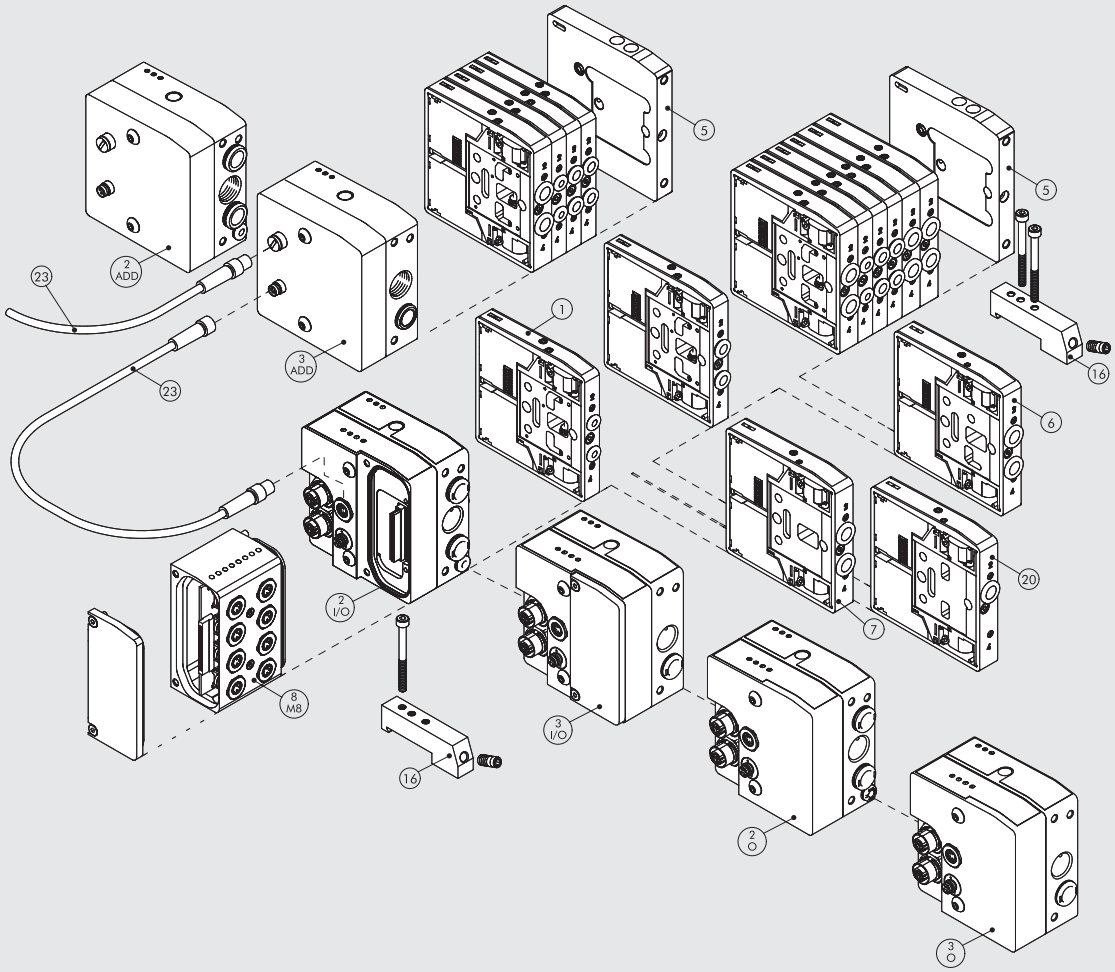
COMPONENTS

① Exhaust - Solenoid pilot 82/84
② Valve supply - port 1
③ Threaded connection of exhausts 3/5
④ Valve supply - port 11
⑤ Electrical control supply X
⑥ Blind end-plate
⑦ Screw for valve wall-mounting
⑧ ⑨ ⑩ Utility port for pipe Ø 4, 6 or 8 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number
⑱ CM Profinet IO end-plate
⑲ 64 = when present, it means that the valve is suitable for installation on islands with a field bus with up to 64 pilots, otherwise the limit is 32 pilots.

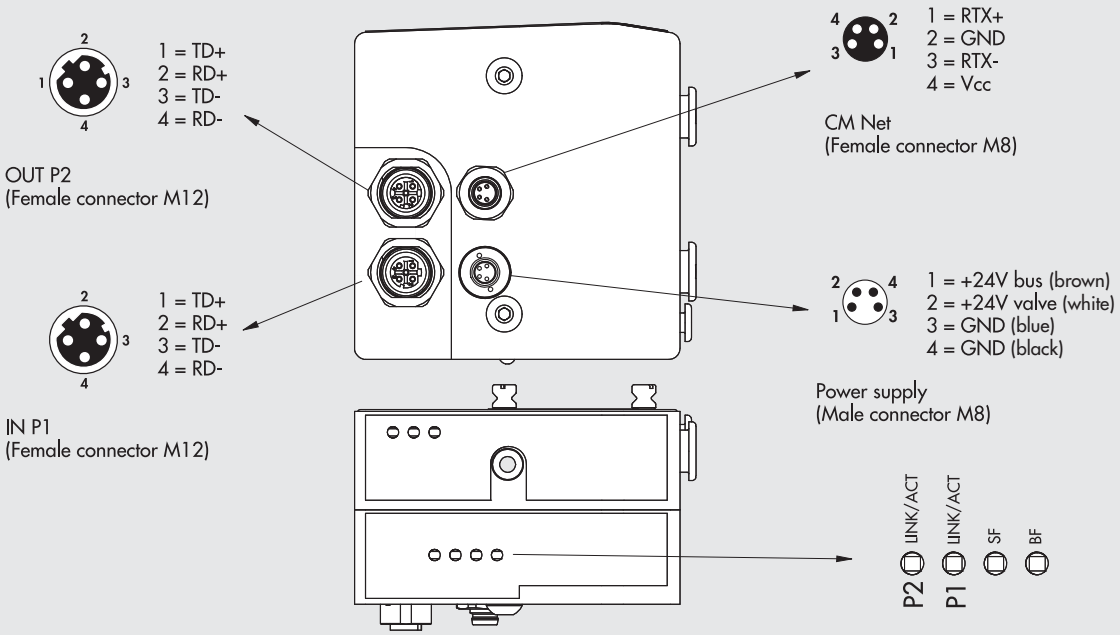


VALVE ISLAND CONFIGURATION

The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.142 **for valves, intermediates elements and common accessories.**

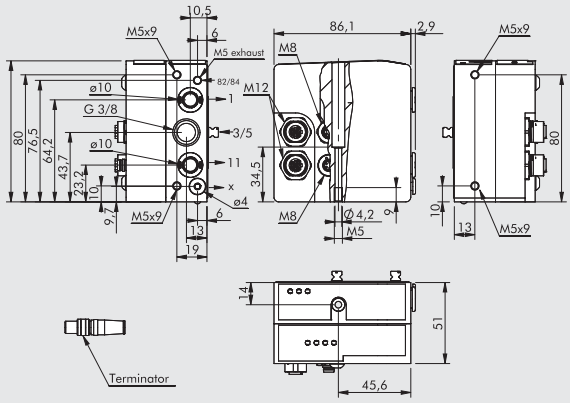


WIRING DIAGRAM



METAL WORK PNEUMATIC

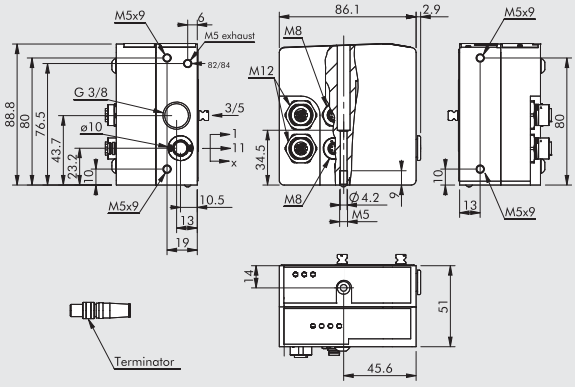
2 - O END-PLATE 1-11 Profinet IO OUTPUT



Code	Description	Weight [g]
0227302230	End-plate CM 1-11 Profinet IO OUTPUT	683

This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply
Note: terminator included

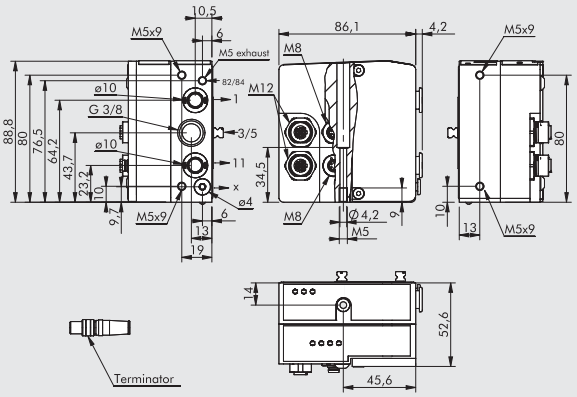
3 - O END-PLATE 1 Profinet IO OUTPUT



Code	Description	Weight [g]
0227302231	End-plate CM 1 Profinet IO OUTPUT	686

Note: terminator included

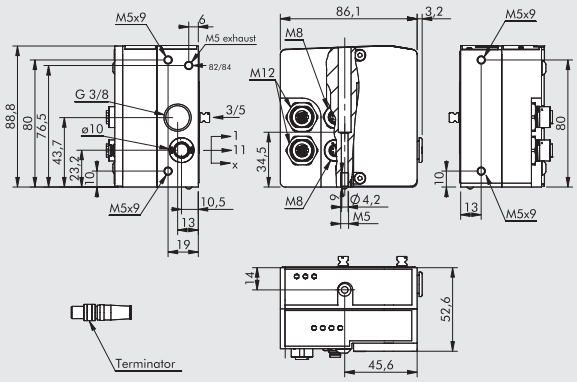
2 - I/O END-PLATE 1-11 Profinet IO INPUT/OUTPUT



Code	Description	Weight [g]
0227302232	End-plate CM 1-11 Profinet IO IN/OUT	643

This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply
Note: terminator included

3 - I/O END-PLATE 1 Profinet IO INPUT/OUTPUT

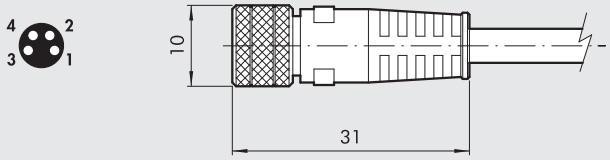


Code	Description	Weight [g]
0227302233	End-plate CM 1 Profinet IO IN/OUT	645

Note: terminator included

M8 CONNECTOR FOR POWER SUPPLY

Pin	Cable colour
1	brown
2	white
3	blue
4	black

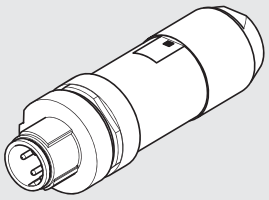


Code	Description
0240009060	M8 4-pin female connector for power supply, cable L = 3 m
0240009037	M8 4-pin female connector for power supply, cable L = 5 m
0240009058	M8 4-pin female connector for power supply, cable L = 10 m
0240009059	M8 4-pin female connector for power supply, cable L = 15 m

M12 PLUG

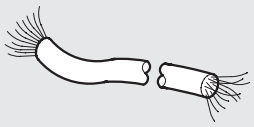
Code	Description
0240009040	Plug M12

M12 BUS CONNECTOR, D-CODED



Code	Description
0240005051	M12 BUS connector, D-coded

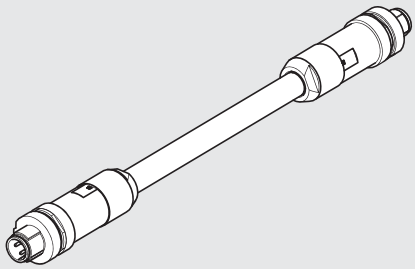
BUS CABLE



Code	Description
0240005220	BUS cable L = 20 m

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

STRAIGHT CONNECTOR FOR M12-M12 BUS, D-CODED

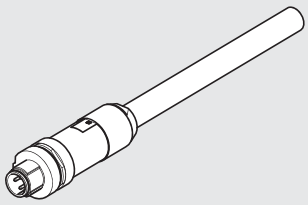


Code	Description
0240005103	Straight connector for M12-M12 BUS, D-coded, with 3 m cable
0240005105	Straight connector for M12-M12 BUS, D-coded, with 5 m cable
0240005110	Straight connector for M12-M12 BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

STRAIGHT CONNECTOR FOR M12 BUS, D-CODED

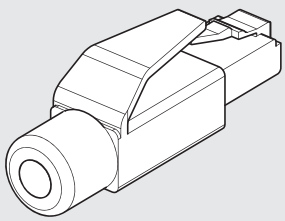
Pin	Cable color
1	Yellow
2	White
3	Red
4	Blue



Code	Description
0240005093	Straight connector for M12 BUS, D-coded, with 3 m cable
0240005095	Straight connector for M12 BUS, D-coded, with 5 m cable
0240005100	Straight connector for M12 BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

RJ45 CONNECTOR



Code	Description
0240005050	RJ45 connector with 4 contacts according to IEC 60 603-7

NOTES

CM + EtherCAT

METAL WORK PNEUMATIC

The CM + EtherCAT system has been designed with a pneumatic input end-plate that can contain all the electronic equipment, indicators and connectors.
This system is very compact and sturdy and is housed in a thick aluminium body that protects sensitive components from impact and falls.
The end-plate is available in two electric versions: one handling up to 64 solenoids (64 OUTs) and one handling up to 64 solenoids (64 OUTs) and 32 inputs (32 INs). Grounding is recommended to protect the electronic circuit against electric or electrostatic charges.
N.B. For the system to handle more than 32 pilots (33 to 64), it must be made up of valves bearing a label marked 64. If one or more valves are not marked 64, each island cannot handle more than 32 pilots.

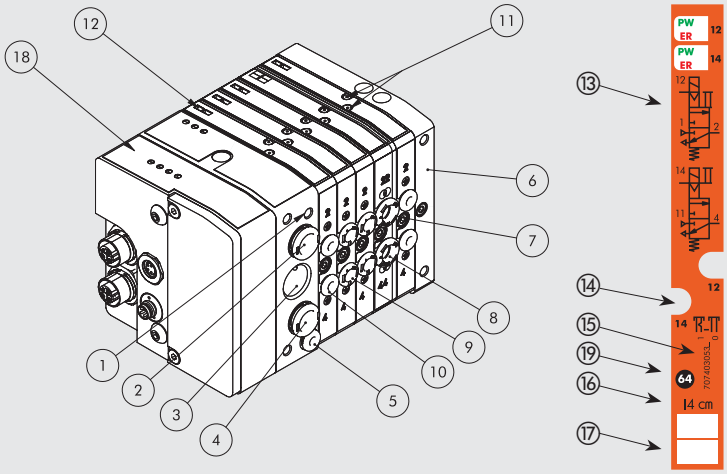
TECHNICAL DATA

Field buses	EtherCAT - 100 Mbit/s - Full-duplex - Supports auto-negotiation
Factory settings	Module name: Cmseries
Minimum cycle time	100 µS
Addressing	Autoincrement Address - Second Slave Address
Voltage range	24VDC ± 10%
Maximum number of pilots (Out)	64 (8 byte)
Maximum number of valves	64 (same as the max. no. of pilotos)
Maximum number of inputs (INs)	32 (4 byte + 1 status byte)
Icc bus supply current	Nominal Icc 120 mA - Instantaneous Icc (< 2 ms) 450 mA
Icc valve supply current	Instantaneous Icc (< 2 ms) 900 mA
Maximum absorption of a valve island with 64 monostable valves	Nominal Icc with 900 mA OFF valves – nominal Icc with 2700 mA ON valves
Protections	Module protected against overload and polarity reversal. Outputs protected against overloads and short-circuits
Connections	Field bus: 2 M12 Female, D-coded, internal switch
	supply: M8 4 pin
	input: M8 3 pin
BUS diagnostics	Using local LEDs and software messages
	Outputs: using local LEDs and status bytes
	Inputs: using local LEDs and status bytes
	N.B.: Refer to the user manual for a detailed description
Data bit value	0 = not enabled
	1 = enabled
Output status in the absence of communication	Disabled

See page B2.120 **for general technical data**

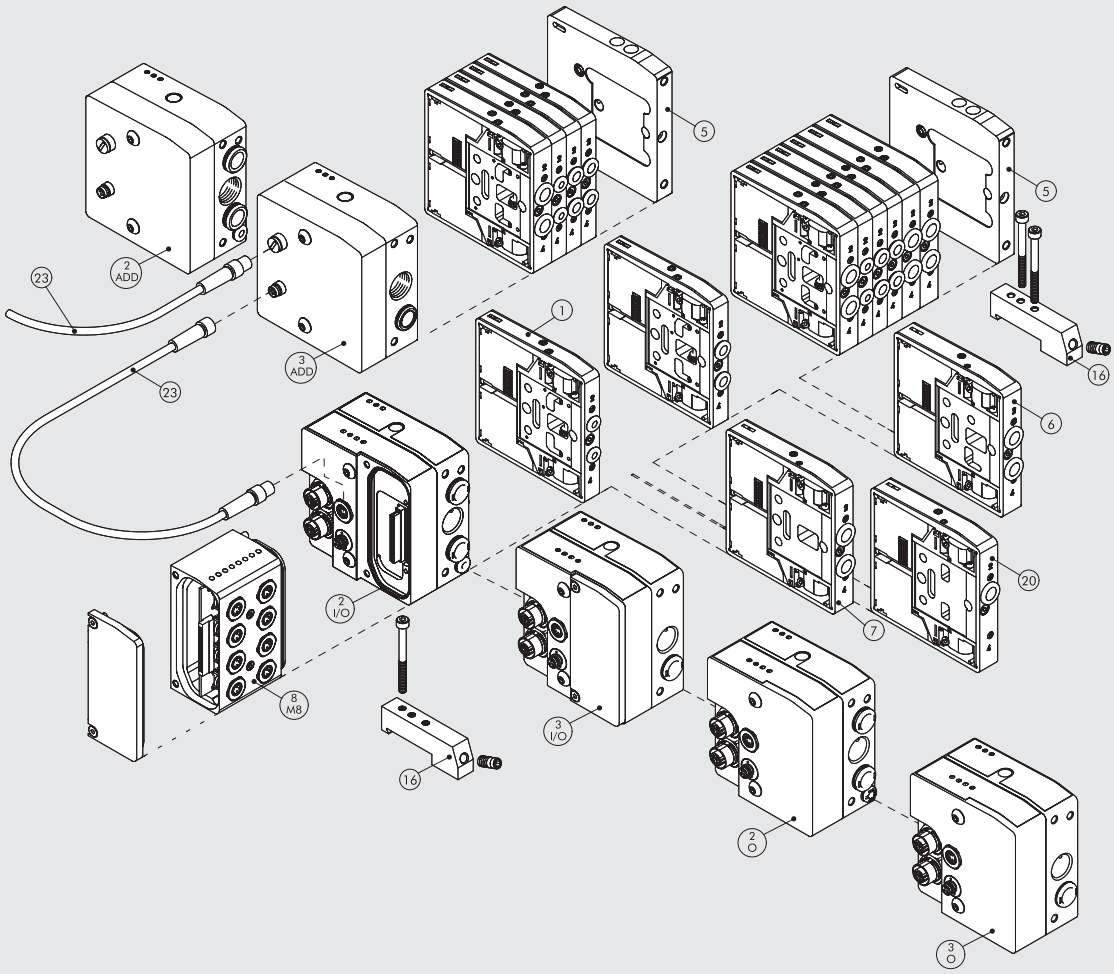
COMPONENTS

① Exhaust - Solenoid pilot 82/84
② Valve supply - port 1
③ Threaded connection of exhausts 3/5
④ Valve supply - port 11
⑤ Electrical control supply X
⑥ Blind end-plate
⑦ Screw for valve wall-mounting
⑧ ⑨ ⑩ Utility port for pipe Ø 4, 6 or 8 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number
⑱ CM EtherCAT end-plate
⑲ 64 = when present, it means that the valve is suitable for installation on islands with a field bus with up to 64 pilots, otherwise the limit is 32 pilots.

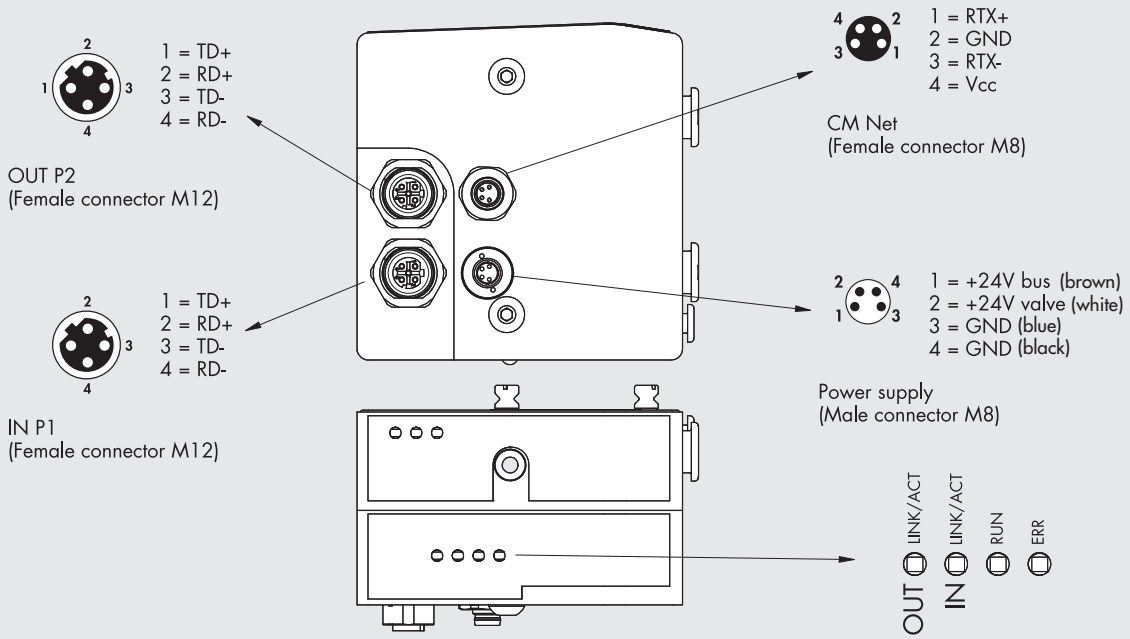


VALVE ISLAND CONFIGURATION

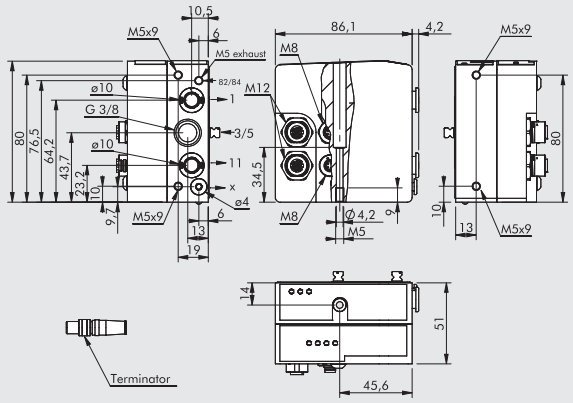
The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.142 **for valves, intermediates elements and common accessories.**



WIRING DIAGRAM



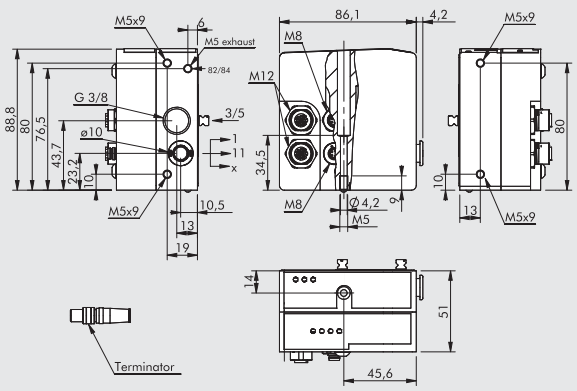
2 - O END-PLATE 1-11 EtherCAT OUTPUT



Code	Description	Weight [g]
0227302234	End-plate CM 1-11 EtherCAT OUTPUT	683

This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply
Note: terminator included

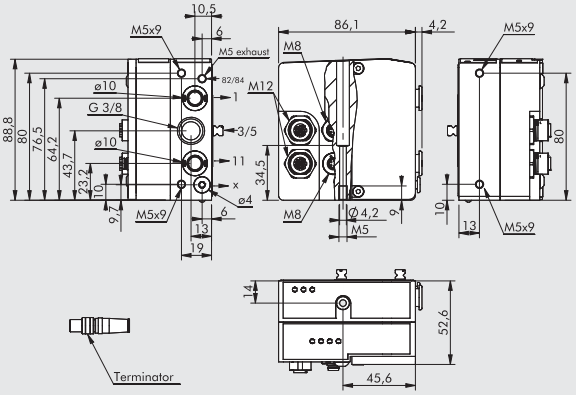
3 - O END-PLATE 1 EtherCAT OUTPUT



Code	Description	Weight [g]
0227302235	End-plate CM 1 EtherCAT OUTPUT	686

Note: terminator included

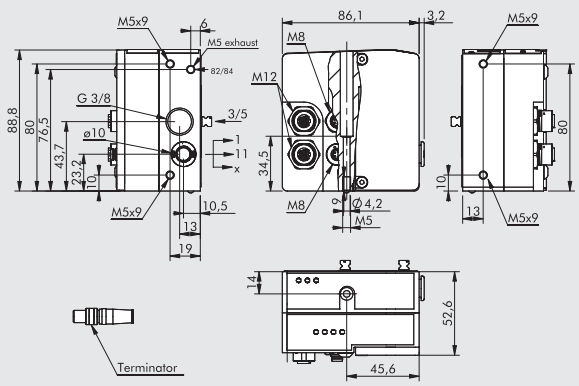
2 - I/O END-PLATE 1-11 EtherCAT INPUT/OUTPUT



Code	Description	Weight [g]
0227302236	End-plate CM 1-11 EtherCAT IN/OUT	643

This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply
Note: terminator included

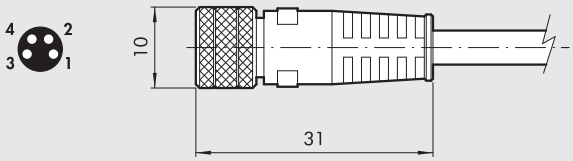
3 - I/O END-PLATE 1 EtherCAT INPUT/OUTPUT



Code	Description	Weight [g]
0227302237	End-plate CM 1 EtherCAT IN/OUT	645

Note: terminator included

M8 CONNECTOR FOR POWER SUPPLY



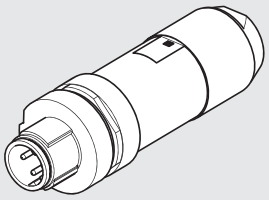
Pin	Cable colour
1	brown
2	white
3	blue
4	black

Code	Description
0240009060	M8 4-pin female connector for power supply, cable L = 3 m
0240009037	M8 4-pin female connector for power supply, cable L = 5 m
0240009058	M8 4-pin female connector for power supply, cable L = 10 m
0240009059	M8 4-pin female connector for power supply, cable L = 15 m

M12 PLUG

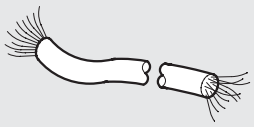
Code	Description
0240009040	Plug M12

M12 BUS CONNECTOR, D-CODED



Code	Description
0240005051	M12 BUS connector, D-coded

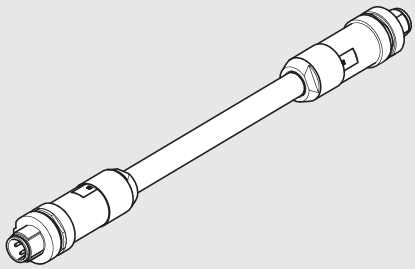
BUS CABLE



Code	Description
0240005220	BUS cable L = 20 m

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

STRAIGHT CONNECTOR FOR M12-M12 BUS, D-CODED

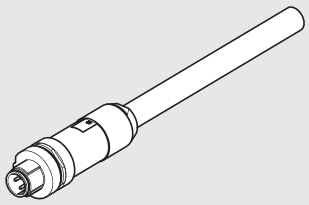


Code	Description
0240005103	Straight connector for M12-M12 BUS, D-coded, with 3 m cable
0240005105	Straight connector for M12-M12 BUS, D-coded, with 5 m cable
0240005110	Straight connector for M12-M12 BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

STRAIGHT CONNECTOR FOR M12 BUS, D-CODED

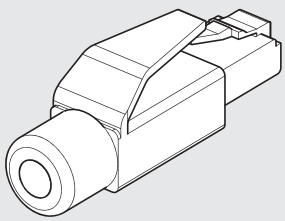
Pin	Cable color
1	Yellow
2	White
3	Red
4	Blue



Code	Description
0240005093	Straight connector for M12 BUS, D-coded, with 3 m cable
0240005095	Straight connector for M12 BUS, D-coded, with 5 m cable
0240005100	Straight connector for M12 BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

RJ45 CONNECTOR



Code	Description
0240005050	RJ45 connector with 4 contacts according to IEC 60 603-7

NOTES

CM + EtherNet/IP

METAL WORK PNEUMATIC

The CM + Ether/IP system has been designed with a pneumatic input end-plate that can contain all the electronic equipment, indicators and connectors. This system is very compact and sturdy and is housed in a thick aluminium body that protects sensitive components from impact and falls.
The end-plate is available in two electric versions: one handling up to 64 solenoids (64 OUTs) and one handling up to 64 solenoids (64 OUTs) and 32 inputs (32 INs).
Grounding is recommended to protect the electronic circuit against electric or electrostatic charges.
N.B. For the system to handle more than 32 pilots (33 to 64), it must be made up of valves bearing a label marked 64. If one or more valves are not marked 64, each island cannot handle more than 32 pilots.

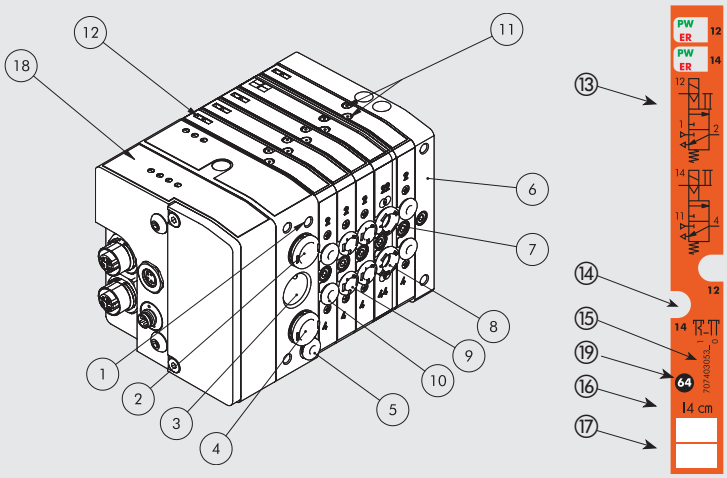
TECHNICAL DATA

Field buses	EtherNet/IP - 10/100 Mbit/s - Half-duplex - Full-duplex - Supports auto-negotiation
Factory settings	Module name: Cmseries
	Address IP 0.0.0.0
Addressing	Software DCP
Voltage range	24VDC ± 10%
Maximum number of pilots (Out)	64
Maximum number of valves	64 (same as the max. no. of pilotos)
Maximum number of inputs (INs)	32
Icc bus supply current	Nominal Icc 120 mA - Instantaneous Icc (< 2 ms) 450 mA
Icc valve supply current	Instantaneous Icc (< 2 ms) 900 mA
Maximum absorption of a valve island with 64 monostable valves	Nominal Icc with 900 mA OFF valves – nominal Icc with 2700 mA ON valves
Protections	Module protected against overload and polarity reversal. Outputs protected against overloads and short-circuits
Connections	Field bus: 2 M12, D-coded, internal switch
	supply: M8 4 pin
	input: M8 3 pin
BUS diagnostics	Using local LEDs and software messages
	Outputs: using local LEDs and status bytes
	Inputs: using local LEDs and status bytes
	N.B.: Refer to the user manual for a detailed description
Data bit value	0 = not enabled
	1 = enabled
Output status in the absence of communication	Disabled

See page B2.120 **for general technical data**

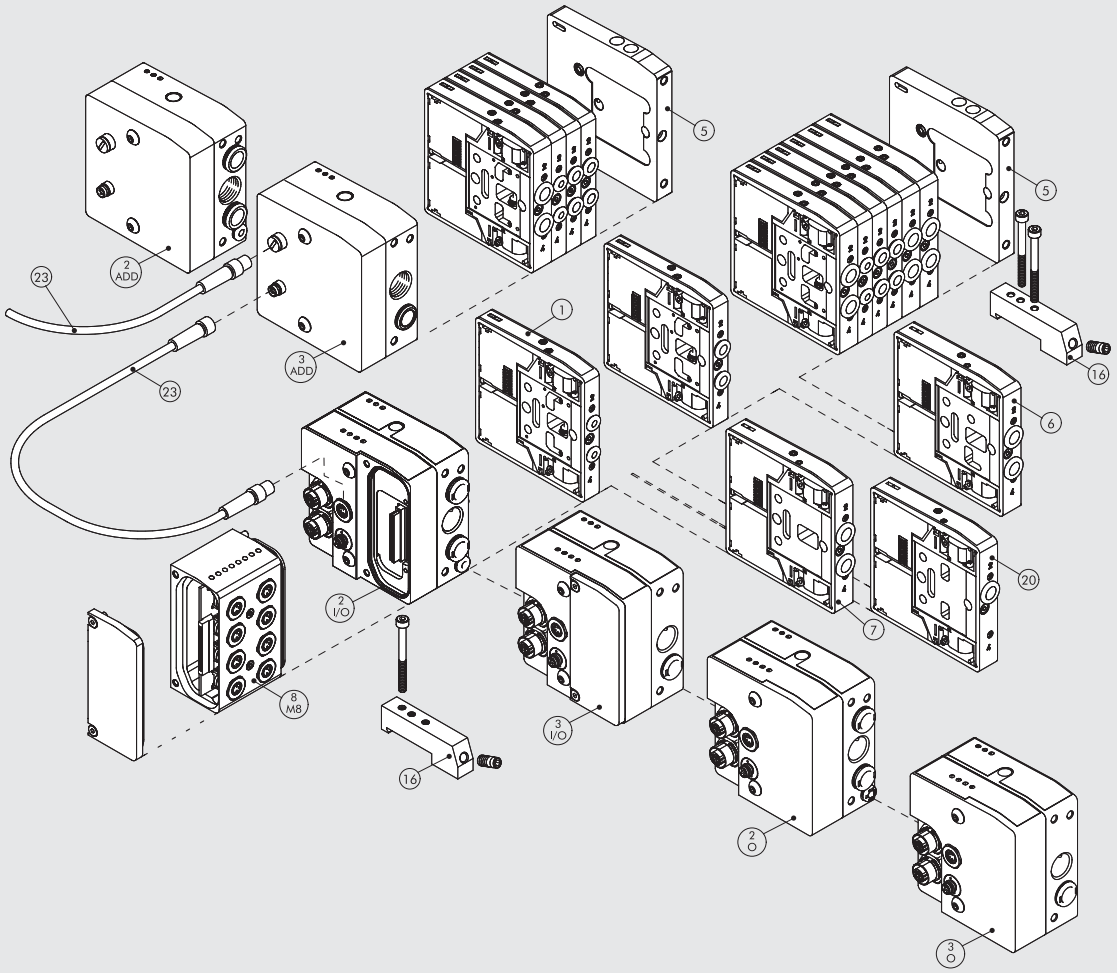
COMPONENTS

① Exhaust - Solenoid pilot 82/84
② Valve supply - port 1
③ Threaded connection of exhausts 3/5
④ Valve supply - port 11
⑤ Electrical control supply X
⑥ Blind end-plate
⑦ Screw for valve wall-mounting
⑧ ⑨ ⑩ Utility port for pipe Ø 4, 6 or 8 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number
⑱ CM EtherNet/IP end-plate
⑲ 64 = when present, it means that the valve is suitable for installation on islands with a field bus with up to 64 pilots, otherwise the limit is 32 pilots.

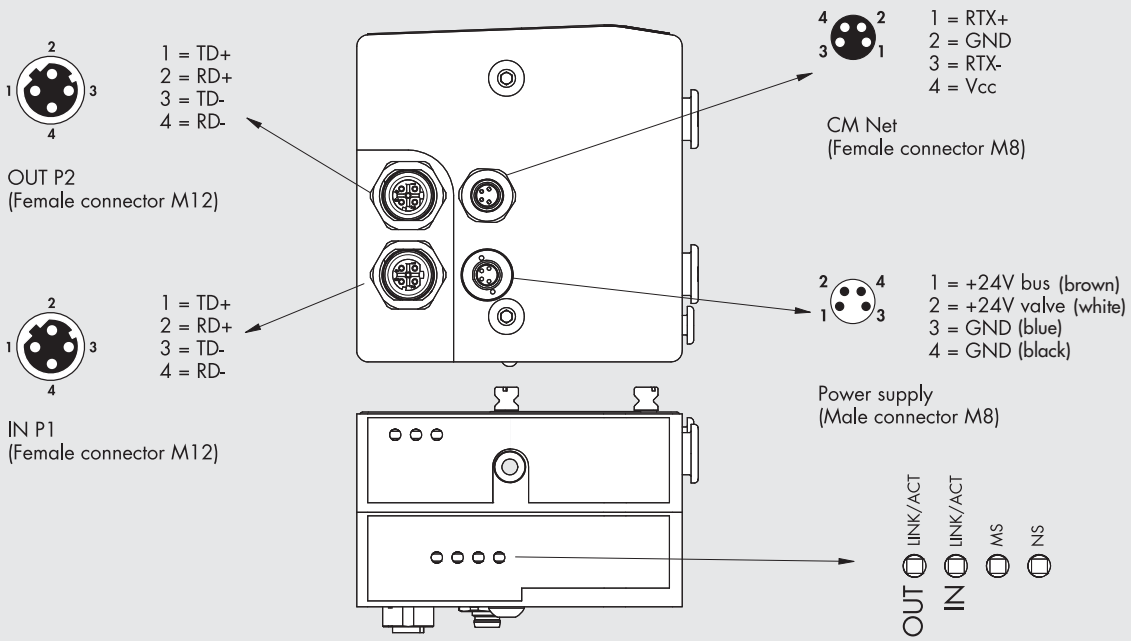


VALVE ISLAND CONFIGURATION

The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.142 **for valves, intermediates elements and common accessories.**

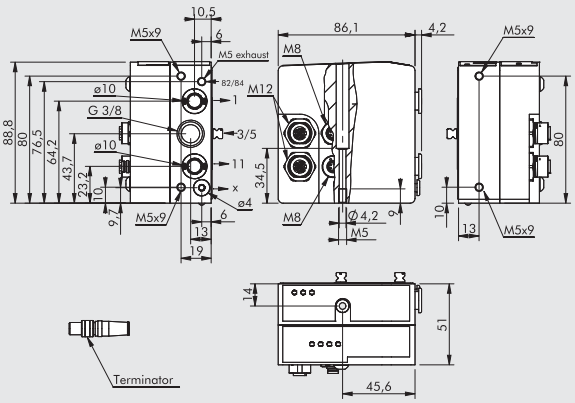


WIRING DIAGRAM



METAL WORK PNEUMATIC

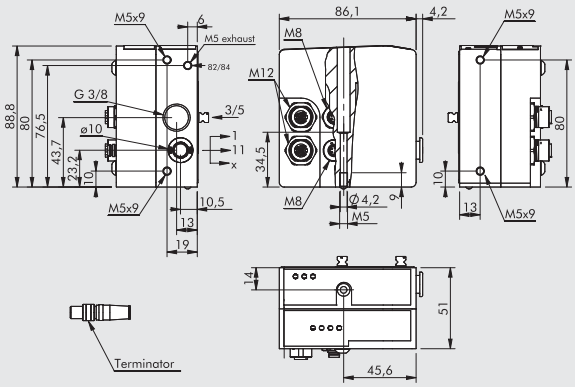
2 - O END-PLATE 1-11 EtherNet/IP OUTPUT



Code	Description	Weight [g]
0227302242	End-plate CM 1-11 EtherNet/IP OUTPUT	683

This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply
Note: terminator included

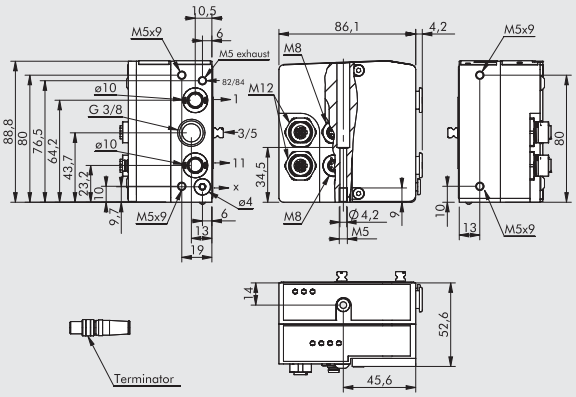
3 - O END-PLATE 1 EtherNet/IP OUTPUT



Code	Description	Weight [g]
0227302243	End-plate CM 1 EtherNet/IP OUTPUT	686

Note: terminator included

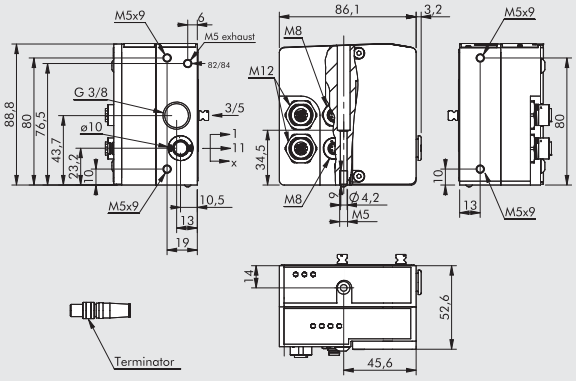
2 - I/O END-PLATE 1-11 EtherNet/IP INPUT/OUTPUT



Code	Description	Weight [g]
0227302244	End-plate CM 1-11 EtherNet/IP IN/OUT	643

This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply
Note: terminator included

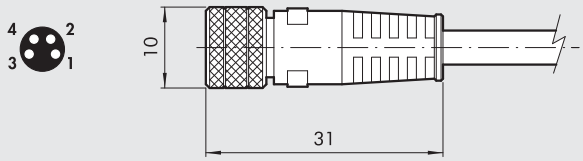
3 - I/O END-PLATE 1 EtherNet/IP INPUT/OUTPUT



Code	Description	Weight [g]
0227302245	End-plate CM 1 EtherNet/IP IN/OUT	645

Note: terminator included

M8 CONNECTOR FOR POWER SUPPLY



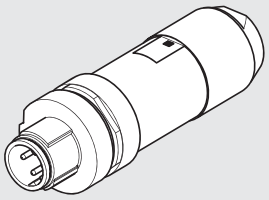
Pin	Cable color
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009060	M8 4-pin female connector for power supply, cable L = 3 m
0240009037	M8 4-pin female connector for power supply, cable L = 5 m
0240009058	M8 4-pin female connector for power supply, cable L = 10 m
0240009059	M8 4-pin female connector for power supply, cable L = 15 m

M12 PLUG

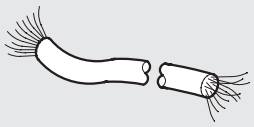
Code	Description
0240009040	Plug M12

M12 BUS CONNECTOR, D-CODED



Code	Description
0240005051	M12 BUS connector, D-coded

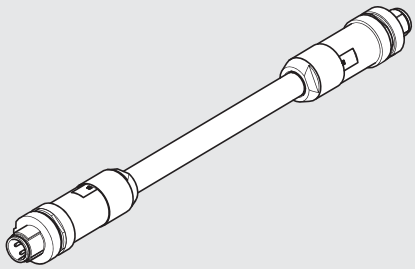
BUS CABLE



Code	Description
0240005220	BUS cable L = 20 m

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

STRAIGHT CONNECTOR FOR M12-M12 BUS, D-CODED

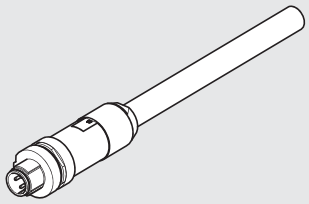


Code	Description
0240005103	Straight connector for M12-M12 BUS, D-coded, with 3 m cable
0240005105	Straight connector for M12-M12 BUS, D-coded, with 5 m cable
0240005110	Straight connector for M12-M12 BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

STRAIGHT CONNECTOR FOR M12 BUS, D-CODED

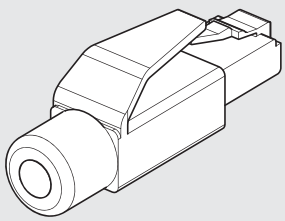
Pin	Cable color
1	Yellow
2	White
3	Red
4	Blue



Code	Description
0240005093	Straight connector for M12 BUS, D-coded, with 3 m cable
0240005095	Straight connector for M12 BUS, D-coded, with 5 m cable
0240005100	Straight connector for M12 BUS, D-coded, with 10 m cable

Note: Can be used for BUS units in the EtherNet family (Profinet IO, EtherCAT, EtherNet/IP….)

RJ45 CONNECTOR



Code	Description
0240005050	RJ45 connector with 4 contacts according to IEC 60 603-7

NOTES

CM + CANopen

The CM+CANopen system has been designed with a pneumatic input end-plate that can contain all the electronic equipment, indicators and connectors. This system is very compact and sturdy and is housed in a thick aluminium body that protects sensitive components impact and falls.
The end-plate is available in two electric versions: one handling up to 64 solenoids (64 OUTs) and one handling up to 64 solenoids (64 OUTs) and 32 inputs (32 INs).
Grounding is recommended to protect the electronic circuit against electric or electrostatic charges.
N.B. For the system to handle more than 32 pilots (33 to 64), it must be made up of valves bearing a label marked 64. If one or more valves are not marked 64, each island cannot handle more than 32 pilots.

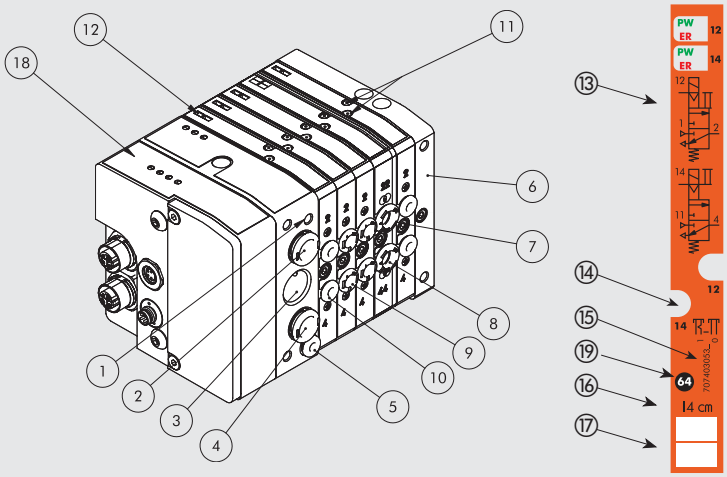
TECHNICAL DATA

Field buses	CANopen - Complies with CiA DS401 specifications
Factory settings	Module name: Cmseries
	Address 4
Addressing	Hardware via dip Switch
Voltage range	24VDC ± 10%
Maximum number of pilots (Out)	64
Maximum number of valves	* 64 (same as the max. no. of pilotos)
Maximum number of inputs (INs)	32
Icc bus supply current	Nominal Icc 30 mA - Instantaneous Icc (< 5 ms) 640 mA
Icc valve supply current	Instantaneous Icc (< 5 ms) 1100 mA
Maximum absorption of a valve island with 64 monostable valves	Nominal Icc with 900 mA OFF valves – nominal Icc with 2700 mA ON valves
Protections	Module protected against overload and polarity reversal. Outputs protected against overloads and short-circuits
Connections	Field bus: M12 Male inputs, 5 pins, A-coded; M12 Female outputs, 5 poles, A-coded
	supply: M8 4 pin
	input: M8 3 pin
BUS diagnostics	Using local LEDs and software messages
	Outputs: using local LEDs and status bytes
	Inputs: using local LEDs and status bytes
	N.B.: Refer to the user manual for a detailed description
Data bit value	0 = not enabled
	1 = enabled
Output status in the absence of communication	Disabled

*** N.B.: In case of "slaves" islands, the CANopen "clever center" can contain up to 34 valves (pilots can be even up to 64).**
See page B2.120 **for general technical data**

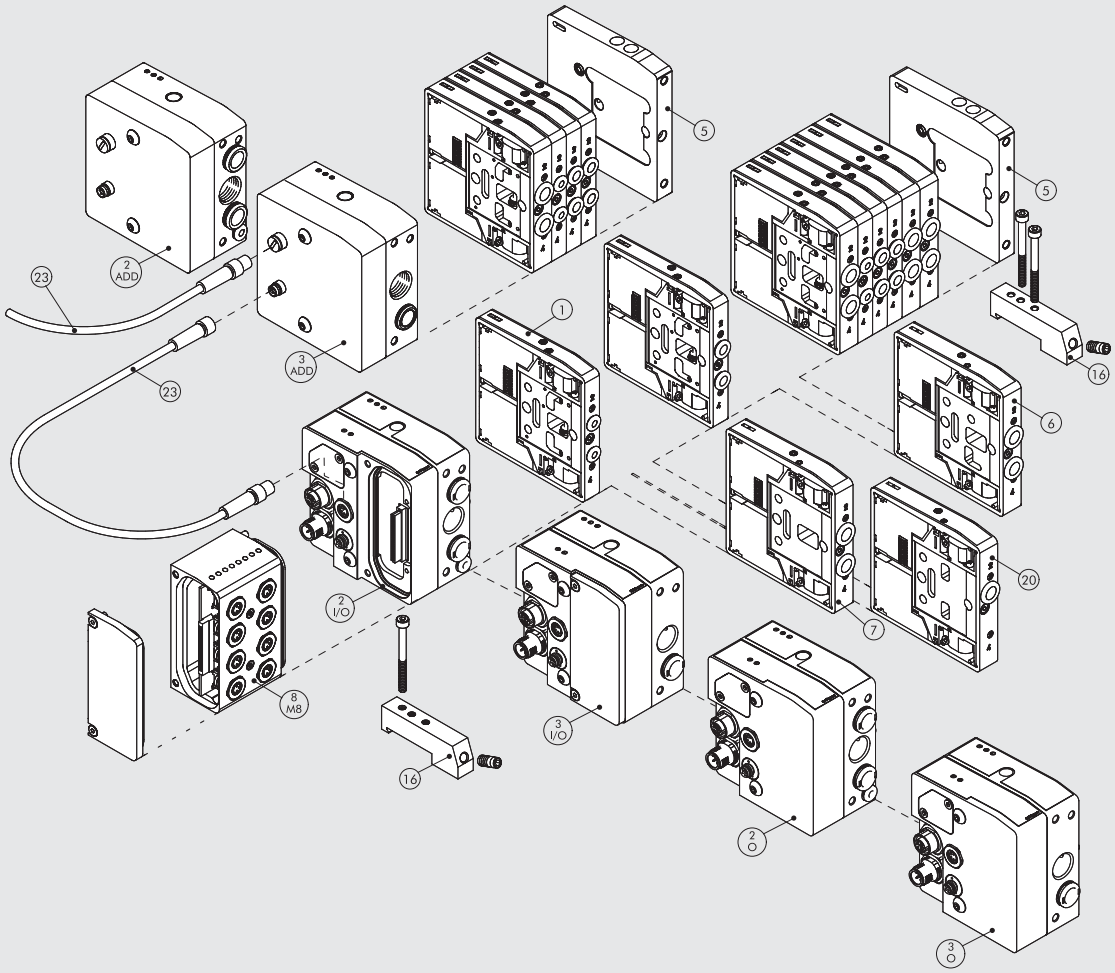
COMPONENTS

① Exhaust - Solenoid pilot 82/84
② Valve supply - port 1
③ Threaded connection of exhausts 3/5
④ Valve supply - port 11
⑤ Electrical control supply X
⑥ Blind end-plate
⑦ Screw for valve wall-mounting
⑧ ⑨ ⑩ Utility port for pipe Ø 4, 6 or 8 mm
⑪ Manual control
⑫ LED (LED on, solenoid valve energised)
⑬ Pneumatic symbol
⑭ Identification of the monostable or bistable manual control
⑮ Valve ordering code
⑯ Valve identification code
⑰ Blank space for valve number
⑱ CM CANopen end-plate
⑲ 64 = when present, it means that the valve is suitable for installation on islands with a field bus with up to 64 pilots, otherwise the limit is 32 pilots.

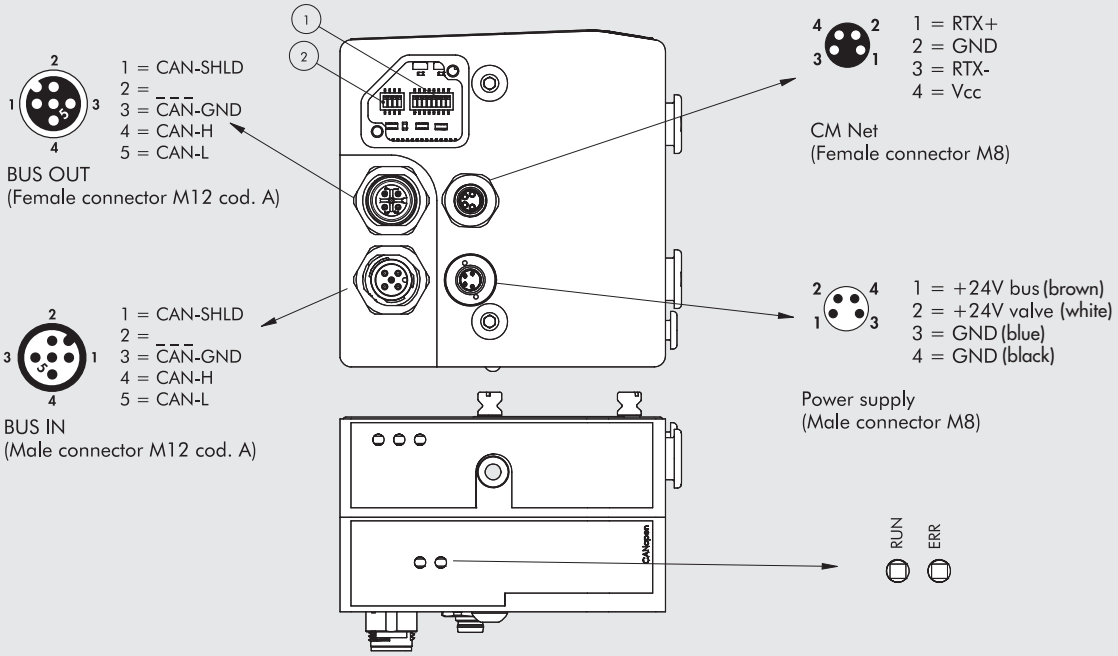


VALVE ISLAND CONFIGURATION

The numbers permit rapid identification of the function and assembly position of the single elements represented as follows.
Refer to page B2.142 **for valves, intermediates elements and common accessories.**

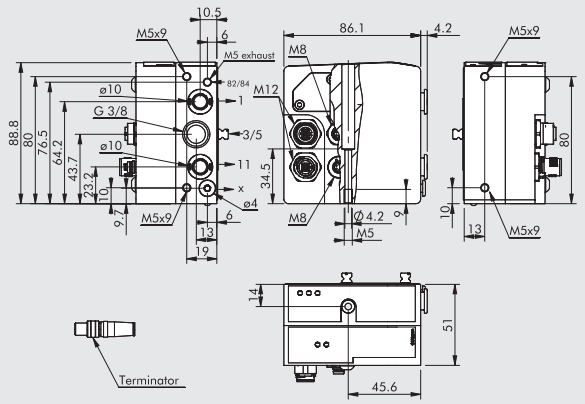


WIRING DIAGRAM



METAL WORK PNEUMATIC

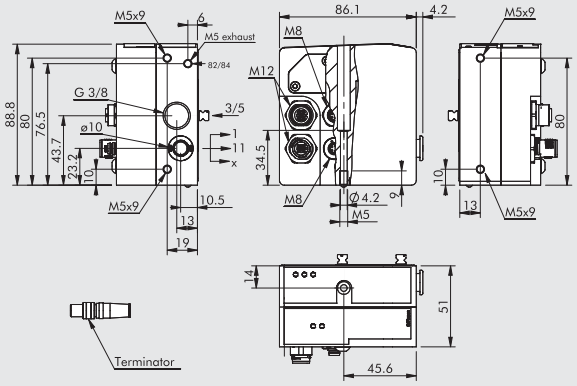
2 - O END-PLATE 1-11 CANopen OUTPUT



Code	Description	Weight [g]
0227302238	End-plate CM 1-11 CANopen OUTPUT	678

This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply
Note: terminator included

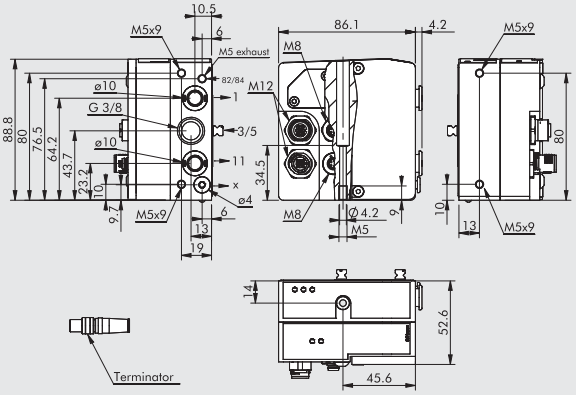
3 - O END-PLATE 1 CANopen OUTPUT



Code	Description	Weight [g]
0227302239	End-plate CM 1 CANopen OUTPUT	680

Note: terminator included

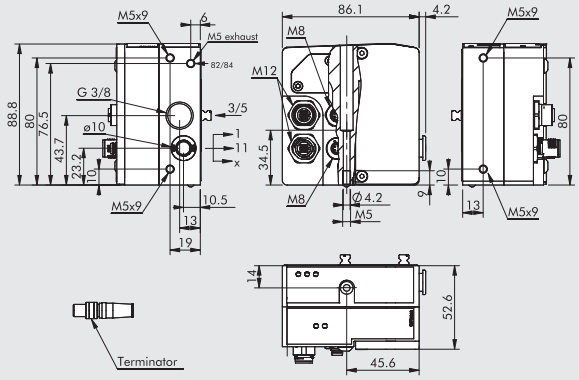
2 - I/O END-PLATE 1-11 CANopen INPUT/OUTPUT



Code	Description	Weight [g]
0227302240	End-plate CM 1-11 CANopen IN/OUT	632

This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply
Note: terminator included

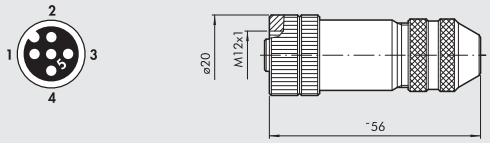
3 - I/O END-PLATE 1 CANopen INPUT/OUTPUT



Code	Description	Weight [g]
0227302241	End-plate CM 1 CANopen IN/OUT	635

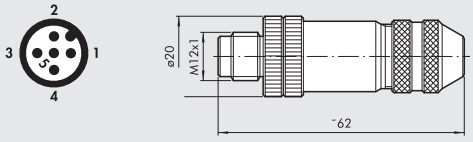
Note: terminator included

FEMALE CONNECTOR FOR CANopen BUS-IN



Code	Description
0240009055	M12 female connector, A-coded

MALE CONNECTOR FOR CANopen BUS-OUT



Code	Description
0240009038	M12 male connector, A-coded

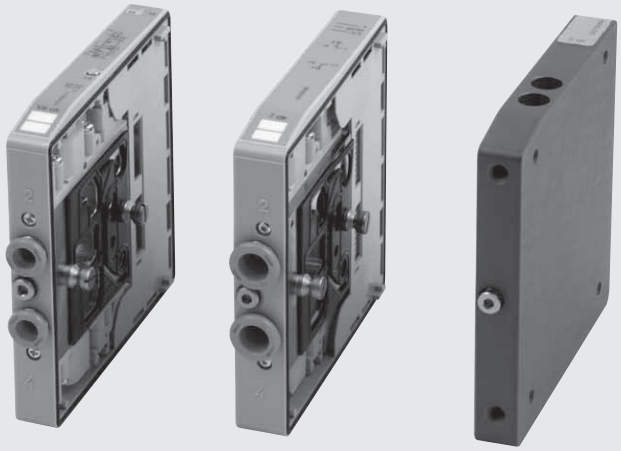
CABLE FOR CANopen BUS

Code	Description
0240005250	Cable for CANopen bus 20 m

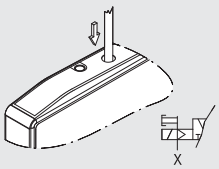
NOTES

CM - VALVES, INTERMEDIATES ELEMENTS AND ACCESSORIES

CM valve can be included in islands with any available input terminal.
The same valve can be connected to the multiple connection end-plate and all the field bus end-plates.



MANUAL CONTROLS



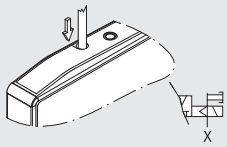
MONOSTABLE OVERRIDE PORT 2
servo-assisted

- Press and hold the manual control in position (not necessary for bistable type K valve)
- Release the manual control:
  - The manual control returns to the home position.
  - Valves type I, W, L, V and O reposition.
  - The type K valve remains switched

N.B.: The pilot power supply X must be present.

- The reference code for the monostable control ends in "0".

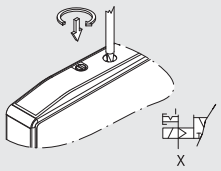
Example: 707403053 – 0



MONOSTABLE OVERRIDE PORT 4
servo-assisted

- Press and hold the manual control in position (not necessary for bistable type K valve)
- Release the manual control:
  - The manual control returns to the home position.
  - Valves type I, W, L, V and O reposition.
  - The type K valve remains switched

N.B.: The pilot power supply X must be present.



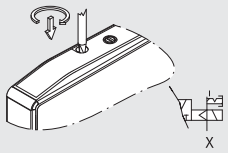
BISTABLE OVERRIDE PORT 2
servo-assisted

- Press the manual control right in then turn it clockwise 90 degrees and Leave it in position.
- Rotate the manual control 90 degrees anticlockwise, and then release it.
  - The manual control returns to the home position.
  - Valves type I, W, L, V and O reposition.
  - The type K valve remains switched

N.B.: The pilot power supply X must be present.

- The reference code for the monostable control ends in "1".

Example: 707403053 – 1

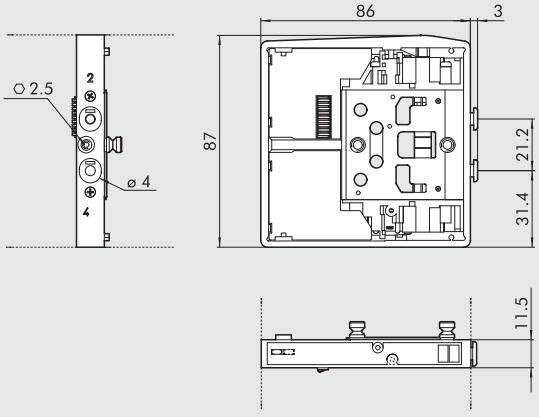


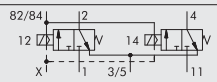
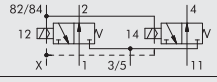
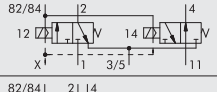
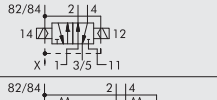
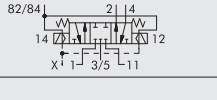
BISTABLE OVERRIDE PORT 4
servo-assisted

- Press the manual control right in then turn it 90 degrees clockwise and Leave it in position.
- Rotate the manual control 90 degrees anticlockwise, and then release it:
  - The manual control returns to the home position.
  - Valves type I, W, L and O reposition.
  - The type K valve remains switched

N.B.: The pilot power supply X must be present.

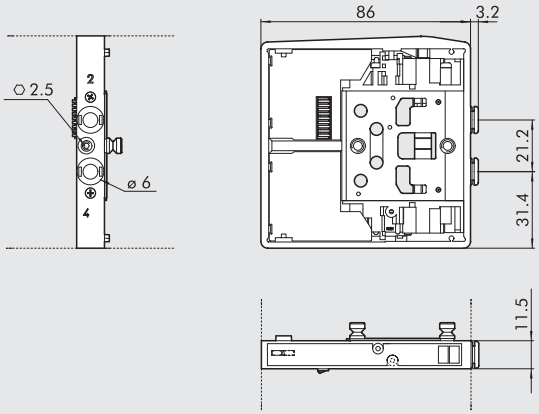
① VALVE DIMENSIONS CM Ø 4

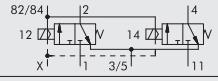
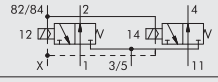
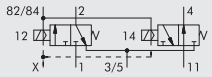
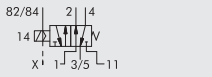
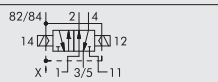
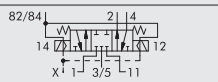


Symbol		Code	Manual control	Weight [g]
CM I4		7074030530 7074030531	monostable bistable	130
CM W4		7074030630 7074030631	monostable bistable	130
CM L4		7074030730 7074030731	monostable bistable	130
CM V4		7074030130 7074030131	monostable bistable	115
CM K4		7074030110 7074030111	monostable bistable	130
CM O4		7074030210 7074030211	monostable bistable	130

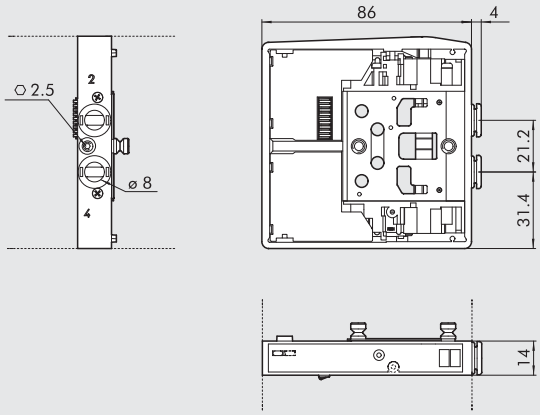
METAL WORK PNEUMATIC

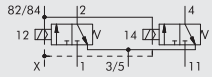
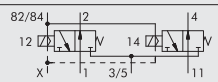
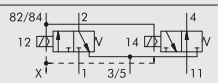
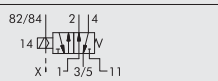
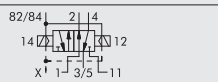
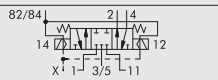
① VALVE DIMENSIONS CM Ø 6



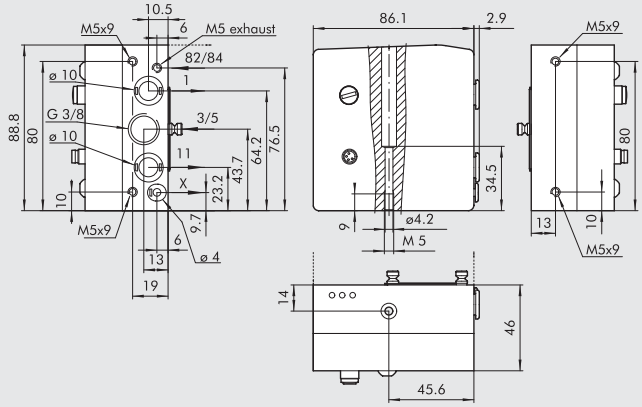
Symbol		Code	Manual control	Weight [g]
CM I6		7075030530 7075030531	monostable bistable	130
CM W6		7075030630 7075030631	monostable bistable	130
CM L6		7075030730 7075030731	monostable bistable	130
CM V6		7075030130 7075030131	monostable bistable	115
CM K6		7075030110 7075030111	monostable bistable	130
CM O6		7075030210 7075030211	monostable bistable	130

① VALVE DIMENSIONS CM Ø 8



Symbol		Code	Manual control	Weight [g]
CM I8		7076030530 7076030531	monostable bistable	140
CM W8		7076030630 7076030631	monostable bistable	140
CM L8		7076030730 7076030731	monostable bistable	140
CM V8		7076030130 7076030131	monostable bistable	130
CM K8		7076030110 7076030111	monostable bistable	140
CM O8		7076030210 7076030211	monostable bistable	140

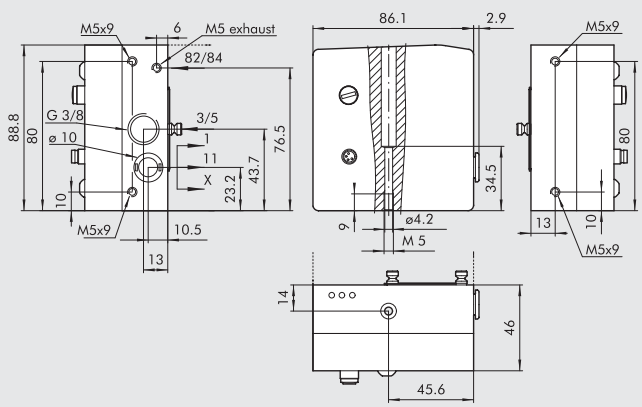
2 - ADD ADDITIONAL END-PLATE 1-11



Code	Description	Weight [g]
0227302224	End-plate CM kit 1-11 ADD	770

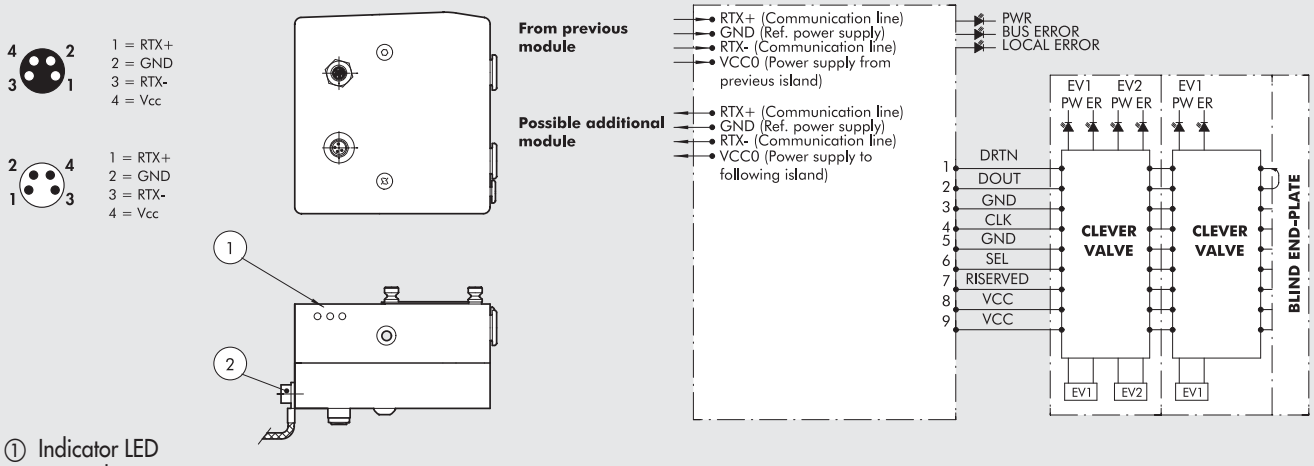
This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply

3 - ADD ADDITIONAL END-PLATE 1



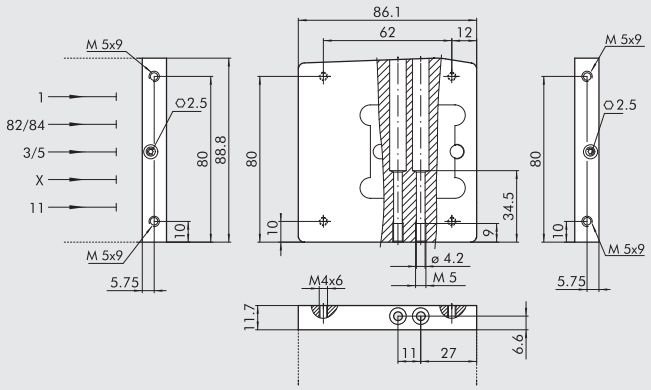
Code	Description	Weight [g]
0227302226	End-plate CM kit 1 ADD	770

WIRING DIAGRAM FOR THE ADDITIONAL TERMINAL



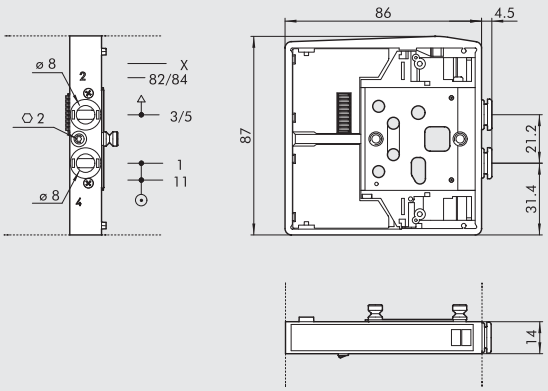
① Indicator LED
② Grounding

⑤ BLIND EN-PLATE



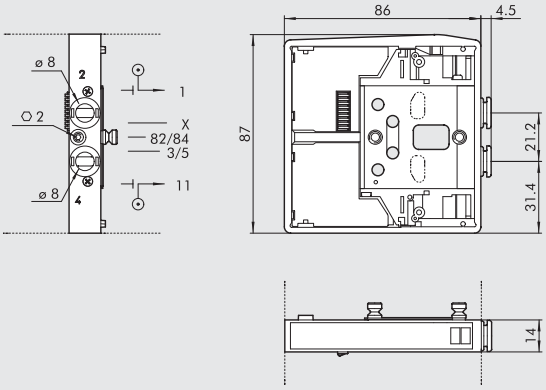
Code	Description	Weight [g]
0227302500	Blind en-plate CM	230

⑥ INTERMEDIATE THROUGHT



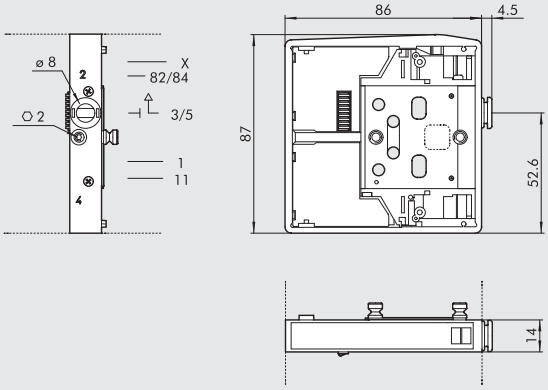
Code	Description	Weight [g]
0227302301	Intermediate throught CM	120

⑦ INTERMEDIATE BLIND



Code	Description	Weight [g]
0227302302	Intermediate blind CM	117

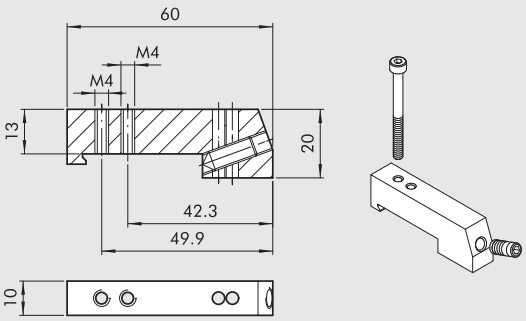
⑳ INTERMEDIATE EXHAUST SWITCH



Code	Description	Weight [g]
0227302303	Intermediate exhaust switch CM	125

METAL WORK PNEUMATIC

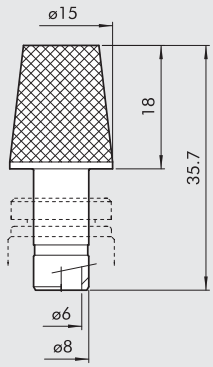
⑯ CONNECTION BRACKETS ON DIN BAR



Code	Description	Weight [g]
0227301600	Connection brackets on din bar HDM/CM	30

Supplied complete with one M4x45 screws and one grub screw
Individually packed

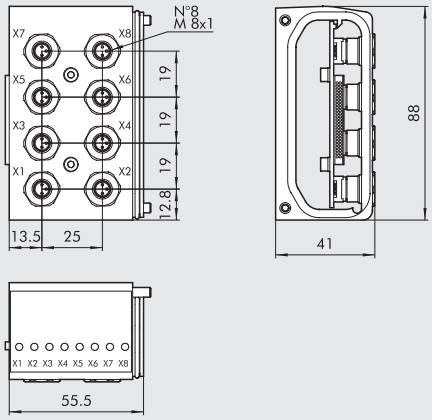
SILENCER FOR FITTING, Ø 8



Code	Description	Weight [g]
W0970530084	Silencer for fitting, Ø 8	15

At the 3/5-exhaust port of the intermediate through reference 6
and the exhaust switch reference 20

8 - M8 8-INPUT M8 ADD-ON MODULE (for BUS) – INPUTs / OUTPUTs (for multi-pole connection)



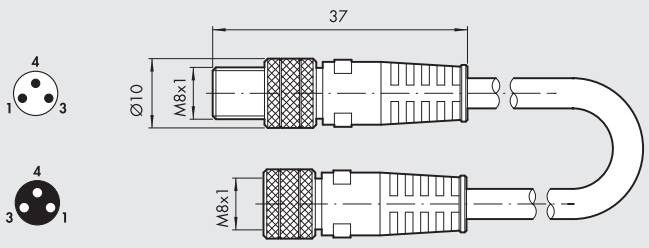
Code	Description	Weight [g]
0227302900	M8 8-input module CM	273

FIELD BUS CONNECTION	MULTI-POLE CONNECTION	
INPUT PNP 1 = + 24 VDC 3 = 0VDC 4 = INPUT	INPUT PNP 1 = + 24 VDC 3 = 0VDC 4 = INPUT	INPUT NPN 1 = + 24 VDC 3 = 0VDC 4 = INPUT
	OUTPUT PNP 1 = + 24 VDC 3 = 0VDC 4 = INPUT	OUTPUT NPN 1 = + 24 VDC 3 = 0VDC 4 = INPUT
	DIP SWITCH ON OFF	DIP SWITCH ON OFF
	OUTPUT ANALOGIC PLC 4 OUT 3 0 V 1 24 V	INPUT ANALOGIC INPUT 4 TRSD 0 V 3 24 V 1

M8 PLUG

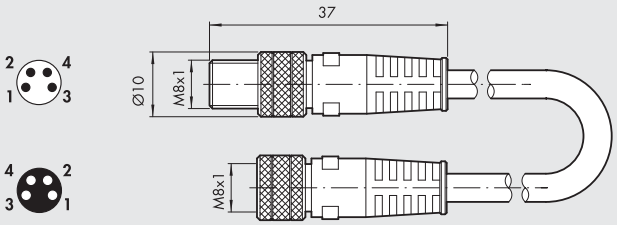
Code	Description
0240009039	Plug M8

M8 INPUT CONNECTOR



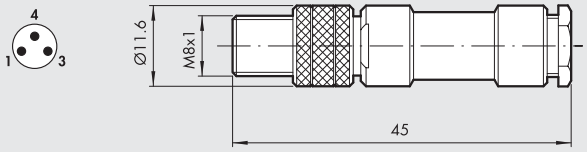
Code	Description
0240009009	M8-M8 straight connector with 3 m cable

(23) M8 PREWIRED CONNECTOR FOR VALVE ISLANDS CONNECTIONS



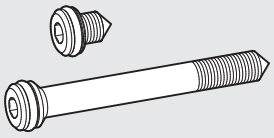
Code	Description
0240005003	M8 prewired connector for valve islands conn. CM L = 5 m
0240005005	M8 prewired connector for valve islands conn. CM L = 1 m
0240005006	M8 prewired connector for valve islands conn. CM L = 3 m
0240005008	M8 prewired connector for valve islands conn. CM L = 10 m

DISTRIBUTORS M8 INPUT CONNECTOR



Code	Description
0240009010	M8 3-pin straight connector

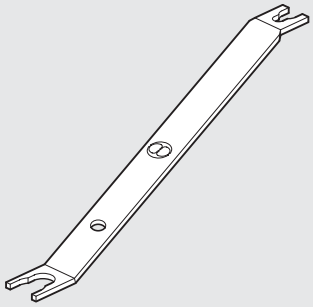
GRUB SCREW KIT



Code	Description
0227301800	Grub screw for Multimach HDM/CM

Comes 1 + 1 packs

R17 - DISASSEMBLY KEY



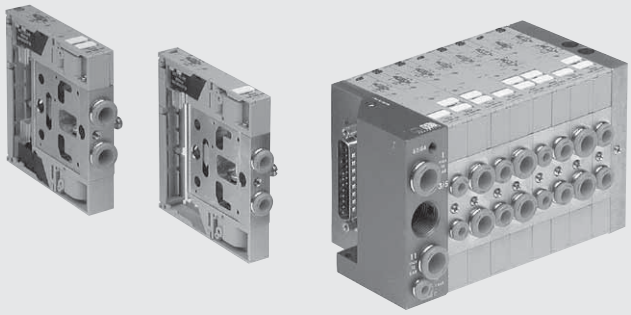
Lenght = 140 mm

Code	Description	Ø Tube	Tube
2L17001	RL17	from Ø 3 to Ø 10	For R fitting and Fox fitting

NOTES

MULTIMACH

Multimach is not a mere valve, it is an electropneumatic distribution "island" - a single block ready for connection to power and air delivery pipes and a multi-pin cable.
All the pneumatic connections are situated on one side with built-in push-in fittings. The user interface is on the other side so that the fitter or serviceman has everything within an easy reach: manual controls, active valve signalling lights, compressed air system diagram, valve identification plates.
The user can count on four different orientations for the electric connector.
Multimach provides full flexibility in the application of valves: 1 to 24 valves, power plates and drain for pipes of various sizes, electric 9- or 25-pin plug connector. But the real novelty, is the possibility of mounting valves of different flow rates: three different valves can be mounted at a time and a valve can be replaced with another of a different flow rate. This revolutionary concept enables the user to optimise space and costs and adapt the unit to different performance requirements.
The ratio between the flow rate of the Multimach system and sizes is incomparable: the top in terms of miniaturisation and efficiency.

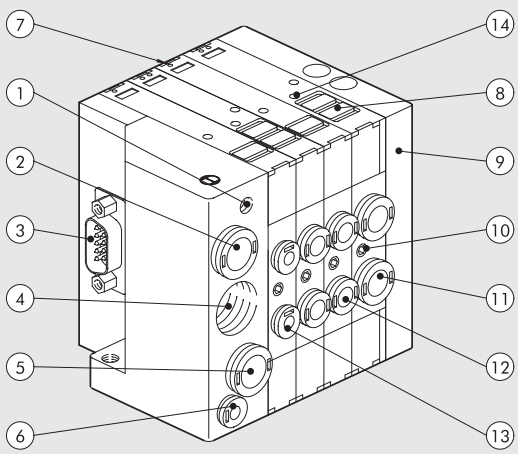


TECHNICAL DATA

Valve port connections			Ø 4,6,8 mm automatic fitting for ports 2 and 4 / power supply port for Ø8 or Ø10 automatic fitting / 3/8 thread for exhaust port, M5 thread for exhaust pilot port		
Connection on the end-plate for the supply of pilots			Automatic fitting Ø 4		
Operating temperature range		°C	-10 to +60		
Fluid			Filtered air without lubrication; lubrication, if used, must be continuous		
Screw for valve - wall-mounting			According to the end-plate used: see page **B2**.148	11 mm Ø 4: 200	11 mm Ø 6: 500 14 mm Ø 8: 700
Flow rate at 6 bar ΔP 1bar		Nl/min	24 VDC ±10%		
Voltage range			1.2		
Power		W	F155		
Insulation class			IP51		
Degree of protection			100% ED		
Solenoid rating			X (pilot supply)	1-11 (valve supply)	
Pressure range			3 to 7 max	vacuum at 10 bar	
	Terminal 1-11	bar	3 to 7		
	Terminal 1	bar	3 to 7		
	Terminal 1 reduced	bar	8 / 45		
TRA/TRR 2x3/2 monostable at 6 bar		ms	8 / 33		
TRA/TRR 5/2 monostable at 6 bar		ms	20 / 20		
TRA/TRR 5/2 bistable at 6 bar		ms	20 / 20		
TRA/TRR 5/3 cc monostable at 6 bar		ms	Insert the pipes in the fittings, before passing air through the valves, otherwise the basket may be pulled out of its seat by the flow of air.		
Note on use			See **chapter Z1**		
Compatibility with oils					

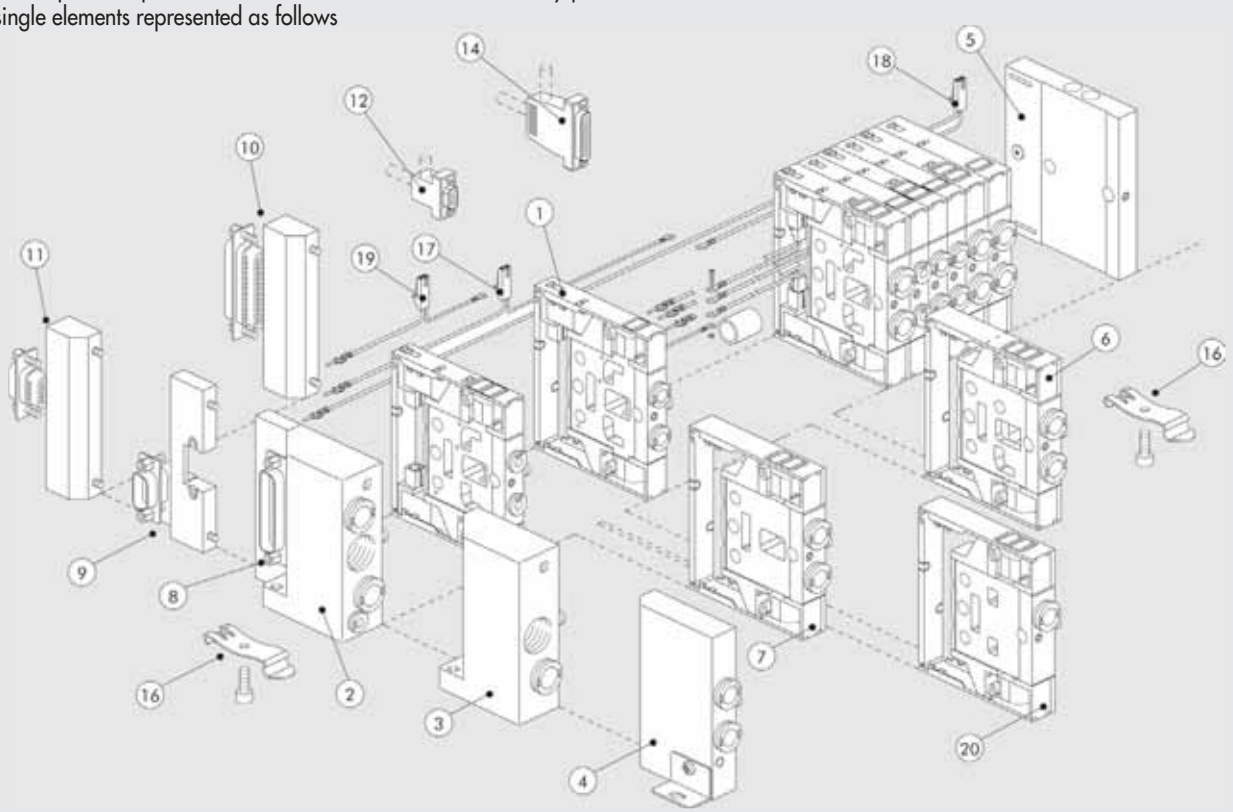
COMPONENTS

① Exhaust – Solenoid pilot
② Valve supply - port 1
③ Electrical multiple connection with 9 or 25 pins
④ Threaded connection of exhausts 3/5
⑤ Valve supply
⑥ Electrical control supply
⑦ LED (LED on, solenoid valve energised)
⑧ Removable identification labels
⑨ Blind end-plate
⑩ Screw for valve wall-mounting
⑪ Utility port for pipe Ø 8 mm
⑫ Utility port for pipe Ø 6 mm
⑬ Utility port for pipe Ø 4 mm
⑭ Manual control

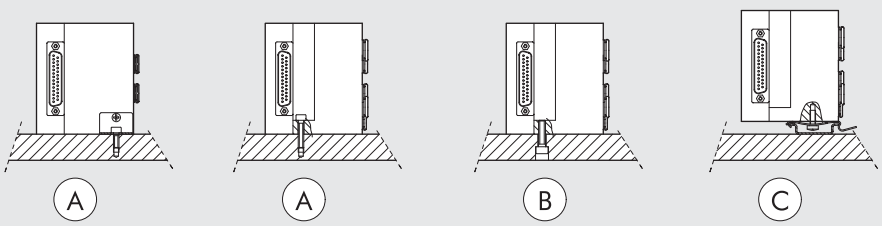


THE MULTIMACH WORLD: FLEXIBILITY

The numbers permit rapid identification of the function and assembly position of the single elements represented as follows



FIXING THE BASE



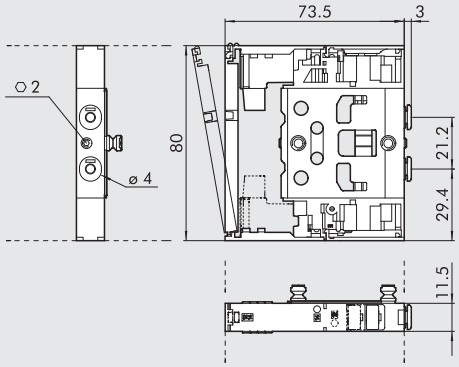
Ⓐ Fixing with reduced end-plate 1, CODE 0227300300, supplied complete with bracket
Ⓑ Fixing with end-plate 1-11 CODE 0227300200 or with end-plate CODE 0227300201
Ⓒ Fixing with end-plate 1-11 CODE 0227300200 or with end-plate 1 CODE 0227300201 using the M4-thread found on the M5 end-plate
Ⓓ Fixing on the DIN bar with end-plate 1-11 CODE 0227300 using the reduced end-plate 1 CODE 0227300300 or end-plate CODE 0227300201 using the push-in bracket CODE 0227300600.
If you have to remove the base from the bar, this is rapid and can be performed without using any tools.

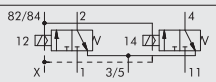
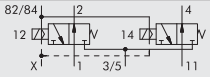
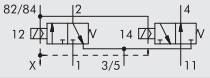
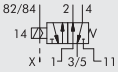
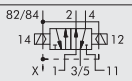
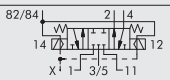
SYNOPTIC, SIZES AND VERSIONS

M 5 1	2	8	I6 - W 8 - W 6 - O 4 - L 8 - 5	1 4
VALVE	**INPUT END-PLATE**	**ELECTRICAL BASE**	**TYPE OF VALVE**	**FURTHER DETAILS**
Multimach IP51	**2** End-plate 1-11	**8** Axial 25-wire connector base	**I** n° 2 3/2 NC	**12** 9-wire connector
	3 End-plate 1	**9** Axial 9-wire connector base	**W** n° 2 3/2 NO	**14** 25-wire connector
	4 Reduced End-plate 1	**10** 25-wire rear connector base	**L** 3/2 NO + 3/2 NC	**16** Brackets for DIN bar
		11 9-wire rear connector base	**V** 5/2 monostable	
			K 5/2 bistable	
			O 5/3 monostable	
			5 Blind end-plate	
			6 Passing-intermede	
			7 Blind intermediate	
			20 Exhaust section	
			4 Cartridge 4	
			6 Cartridge 6	
			8 Cartridge 8	

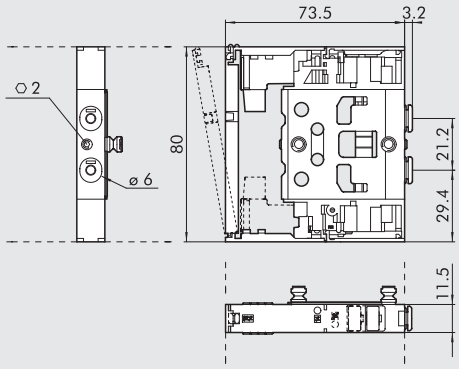
METAL WORK PNEUMATIC

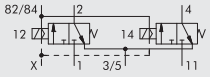
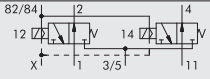
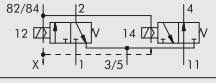
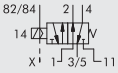
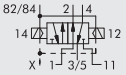
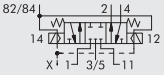
① VALVE DIMENSIONS Ø 4



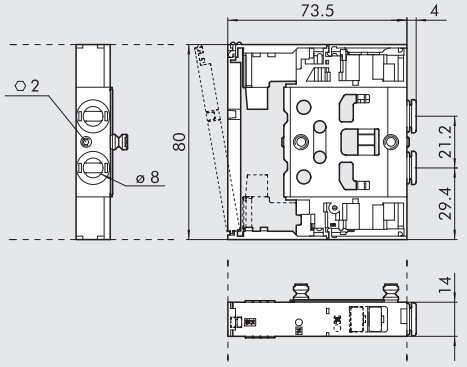
Symbol		Code	Manual control	Weight [g]
I4		7068030532	monostable	118
W4		7068030632	monostable	118
L4		7068030732	monostable	118
V4		7068030132	monostable	100
K4		7068030112	monostable	114
O4		7068030212	monostable	115

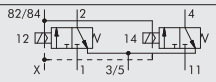
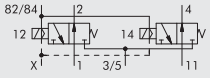
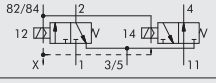
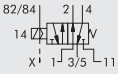
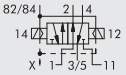
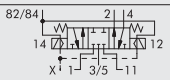
① VALVE DIMENSIONS Ø 6



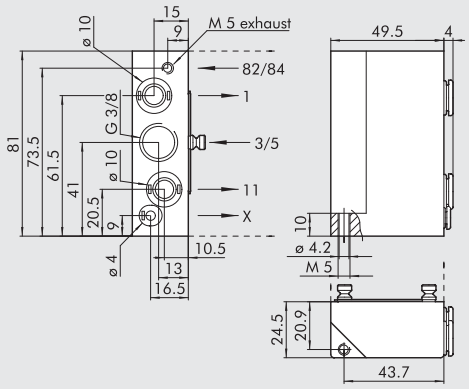
Symbol		Code	Manual control	Weight [g]
I6		7069030532	monostable	110
W6		7069030632	monostable	110
L6		7069030732	monostable	110
V6		7069030132	monostable	90
K6		7069030112	monostable	107
O6		7069030212	monostable	108

① VALVE DIMENSIONS Ø 8



Symbol		Code	Manual control	Weight [g]
I8		7070030532	monostable	124
W8		7070030632	monostable	124
L8		7070030732	monostable	124
V8		7070030132	monostable	105
K8		7070030112	monostable	120
O8		7070030212	monostable	121

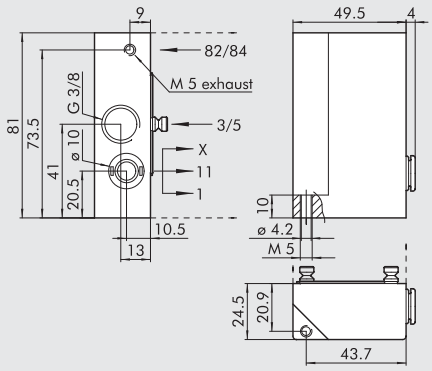
② END-PLATE 1-11



Code	Description	Weight [g]
0227300200	End-plate kit 1-11	223

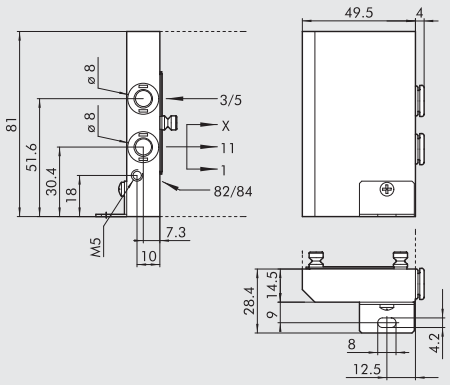
This end-plate allows for supplies to be differentiated:
port 2, port 4 and pilot supply

③ END-PLATE 1



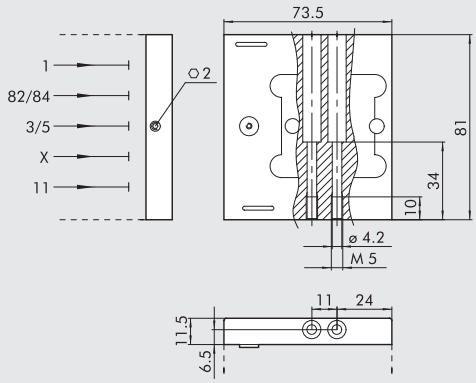
Code	Description	Weight [g]
0227300201	End-plate kit 1	224

④ REDUCED END-PLATE 1



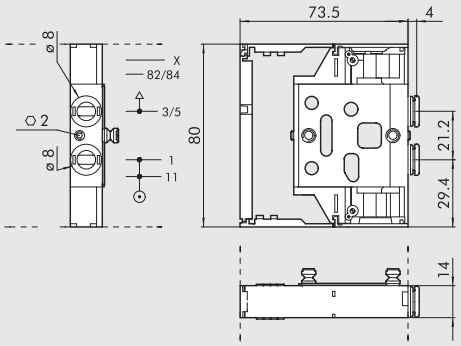
Code	Description	Weight [g]
0227300300	Reduced end-plate kit 1	148

⑤ BLIND END-PLATE



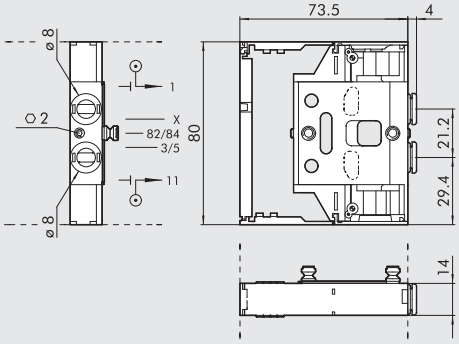
Code	Description	Weight [g]
0227300500	Blind end-plate	168

⑥ INTERMEDIATE THROUGH



Code	Description	Weight [g]
0227300301	Intermediate through	92

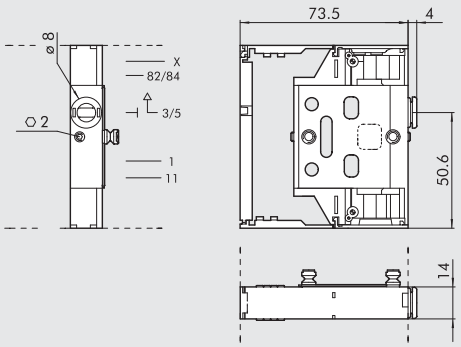
⑦ INTERMEDIATE BLIND



Code	Description	Weight [g]
0227300302	Intermediate blind	89

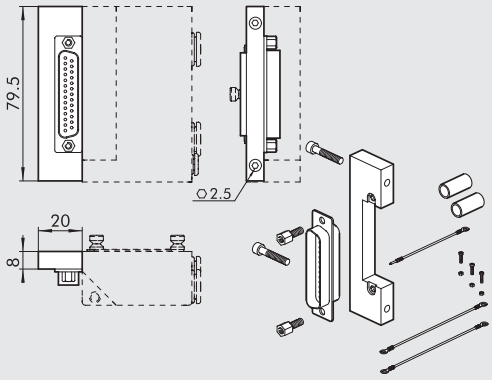
METAL WORK PNEUMATIC

⑳ INTERMEDIATE EXHAUST SWITCH



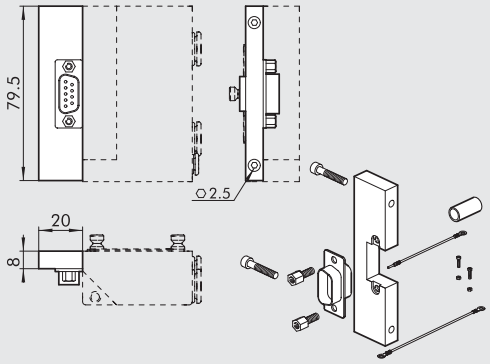
Code	Description	Weight [g]
0227300303	Intermediate exhaust switch	95

⑧ AXIAL CONNECTOR BASE, 25 WIRES



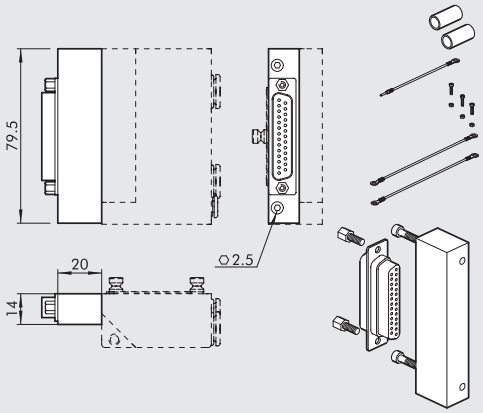
Code	Description	Weight [g]
0226180001	Axial connector base kit, 25 wires	54

⑨ AXIAL CONNECTOR BASE, 9 WIRES



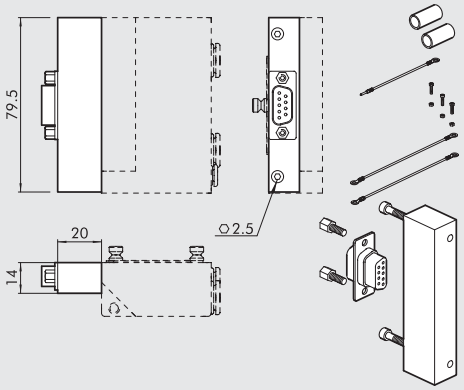
Code	Description	Weight [g]
0226180002	Axial connector base kit, 9 wires	51

⑩ REAR CONNECTOR BASE, 25 WIRES



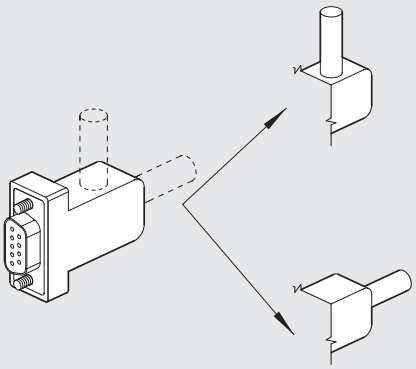
Code	Description	Weight [g]
0226180003	Rear connector base kit, 25 wires	73

⑪ REAR CONNECTOR BASE, 9 WIRES



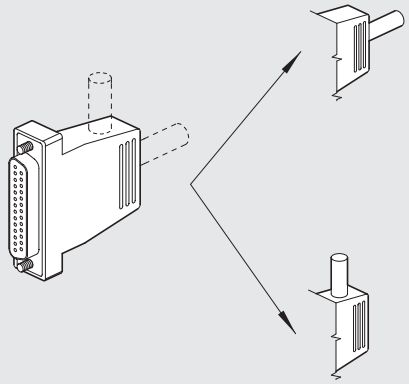
Code	Description	Weight [g]
0226180004	REAR CONNECTOR BASE KIT, 9 WIRES	77

⑫ STRAIGHT AND 90° CONNECTOR KIT, 9 WIRES



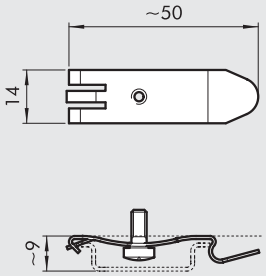
Code	Description	Weight [g]
0226180102	Straight and 90° connector kit, 9 wires	31

⑭ STRAIGHT AND 90° CONNECTOR KIT, 25 WIRES



Code	Description	Weight [g]
0226180101	Straight and 90° connector kit, 25 wires	48

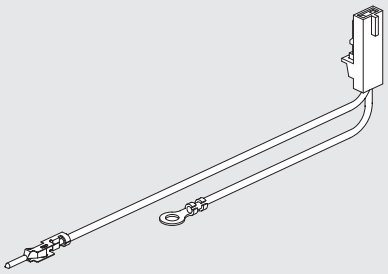
⑯ CONNECTION BRACKETS ON THE BAR OMEGA (DIN EN 50022)



Code	Description	Weight [g]
0227300600	Connection brackets on din bar	8

Individually packed

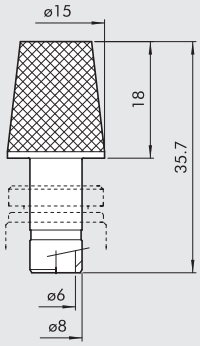
⑰ ⑱ ⑲ CONNECTOR KIT + WIRE



Code	Description	Weight [g]
0226180399	Connector kit + wire 1-6*	3
0226180400	Connector kit + wire 7-12**	4
0226180401	Connector kit + wire13-30***	5

* For valve connection from 1st to 6th position counting from the connector
** For valve connection from 7th to 12th position, counting from the connector
*** For valve connection from 13th to 30th position, counting from the connector

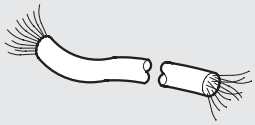
SILENCER FOR FITTING, Ø 8



Code	Description	Weight [g]
W0970530084	Silencer for fitting, Ø 8	15

At the 3/5-exhaust port of the reduced end-plate 1 ref. 4
and of the intermediate through of the exhaust switch ref. 20

CABLES



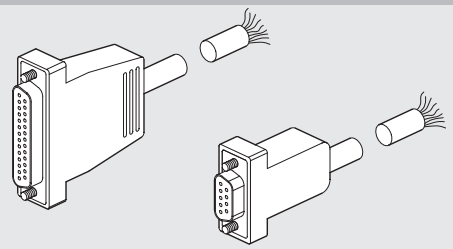
Cod.	Description	Weight [g]
0226107201	10-wire cable	86
0226107101	19-wire cable	122
0226107102	25-wire cable	130

Specify the number of metres desired

NOTES

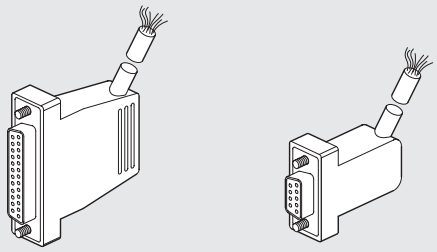
METAL WORK PNEUMATIC

STRAIGHT PRE-WIRED CONNECTOR KIT



Code	Description	Weight [g]
0226900100	Connector + 9-wire axial cable L = 1 m	90
0226900250	Connector + 9-wire axial cable L = 2.5 m	220
0226900500	Connector + 9-wire axial cable L = 5 m	434
0226920100	Connector + 25-wire axial cable L = 1 m	132
0226920250	Connector + 25-wire axial cable L = 2.5 m	320
0226920500	Connector + 25-wire axial cable L = 5 m	636

PRE-WIRED 90° CONNECTOR

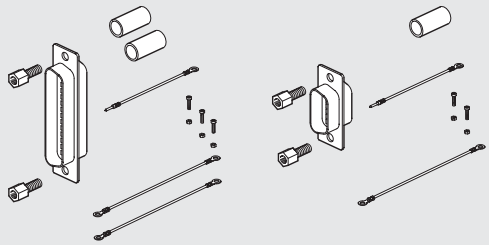


Code	Description	Weight [g]
0226910100	Connector + 9-wire 90° cable L = 1 m	90
0226910250	Connector + 9-wire 90° cable L = 2.5 m	220
0226910500	Connector + 9-wire 90° cable L = 5 m	434
0226930100	Connector + 25-wire 90° cable L = 1 m	132
0226930250	Connector + 25-wire 90° cable L = 2.5 m	320
0226930500	Connector + 25-wire 90° cable L = 5 m	636

WIRING DIAGRAM FOR PRE-WIRED PLUG CONNECTORS

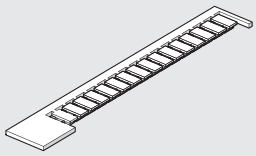
25 PIN						9 PIN	
Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire
1	blue/black	10	brown/white	19	yellow/black	1	green/black
2	red/brown	11	red/orange	20	white	2	white
3	white/black	12	light blue	21	blue/white	3	blue/black
4	red/blue	13	yellow/white	22	brown	4	blue
5	black/orange	14	yellow	23	green/white	5	yellow/black
6	yellow/red	15	red/green	24	red	6	yellow
7	black/brown	16	orange	25	green/black	7	red/black
8	white/red	17	orange/white			8	green
9	red/black	18	green			9	white/black

MALE CONNECTOR KIT + CONTACTS + COMMON TERMINAL



Code	Description
0226180201	Male connector kit - 25 pins
0226180202	Male connector kit - 9 pins

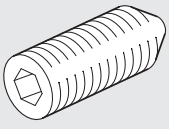
IDENTIFICATION PLATE KIT



Code	Description
0226107000	Identification plate kit

Comes in 16-pc. packs

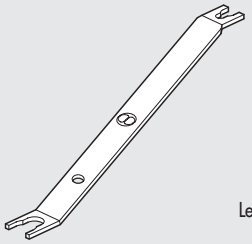
GRUB SCREW



Code	Description
0227300800	Grub screw for Multimach

Comes in 10-pc. pack

R17 - PIPE RELEASE SPANNER

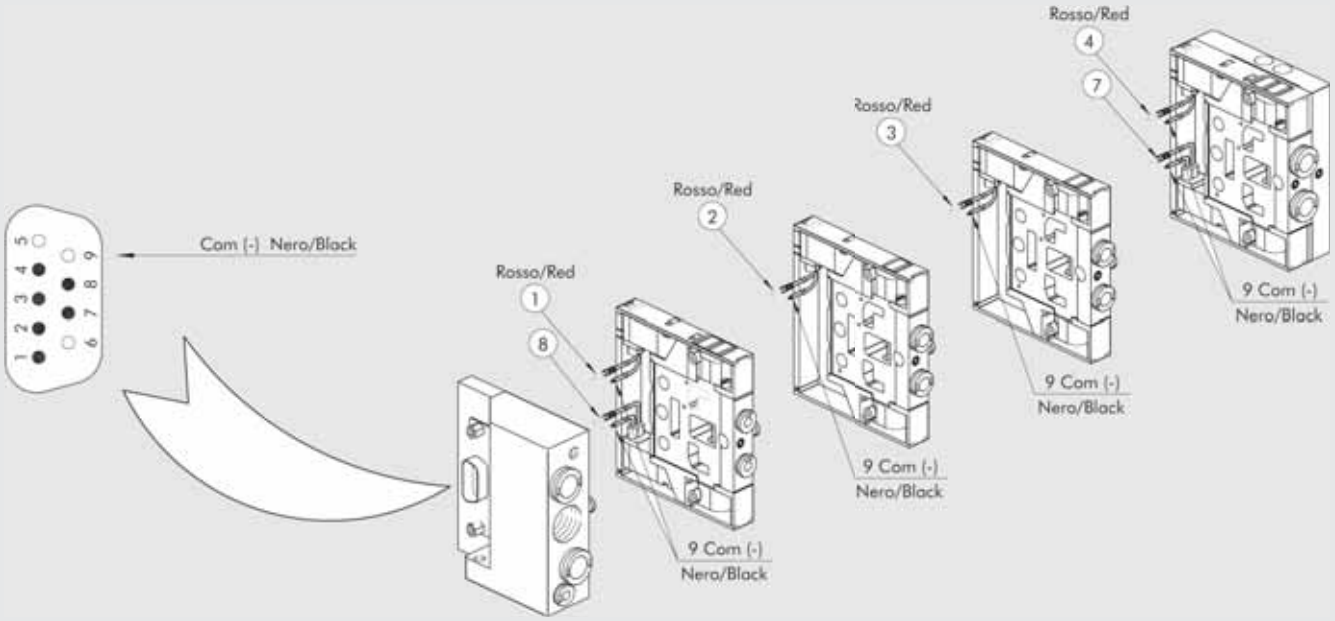


Lenght = 140 mm

Code	Description	Ø Tube
2L17001	RL17	from Ø 3 to Ø 10

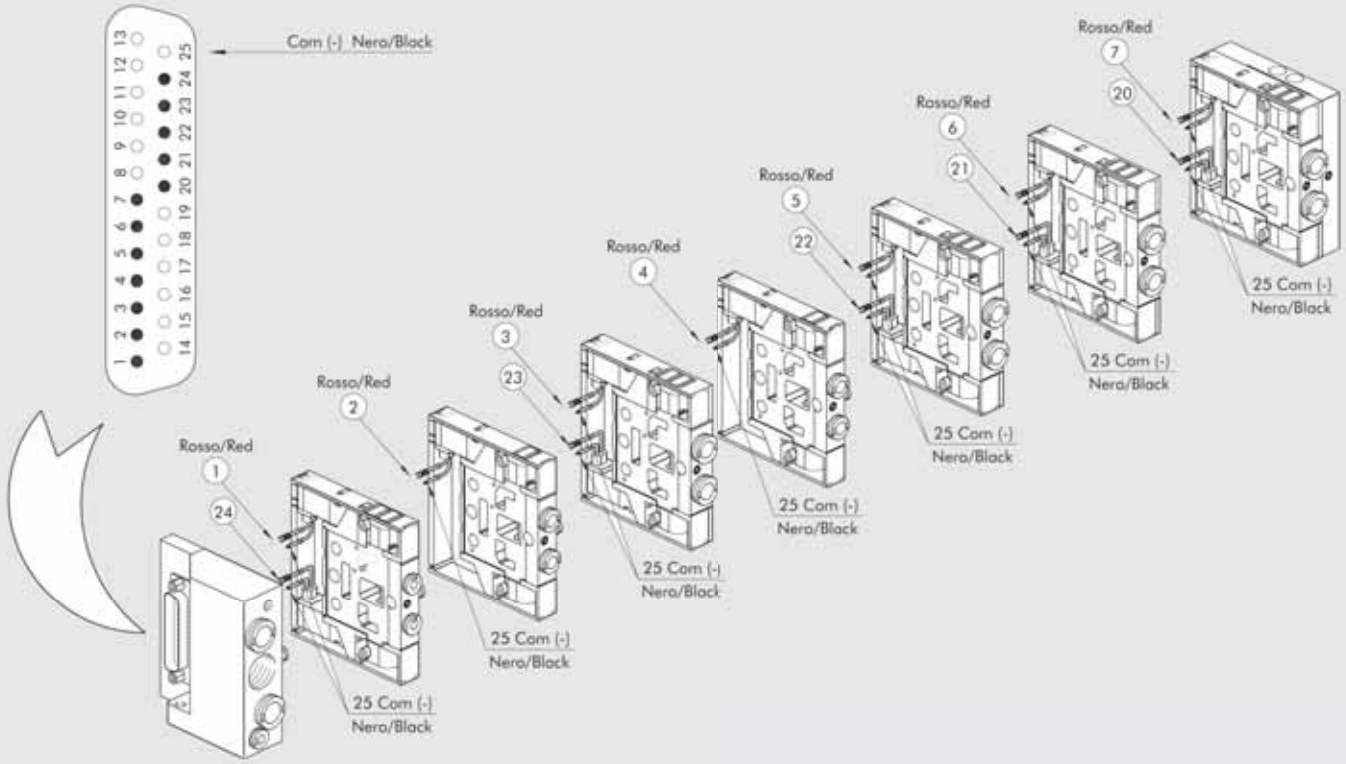
WIRING DIAGRAM OF THE 9-PIN CONNECTOR

Note: available with positive common wire on request.



WIRING DIAGRAM OF THE 25-PIN CONNECTOR

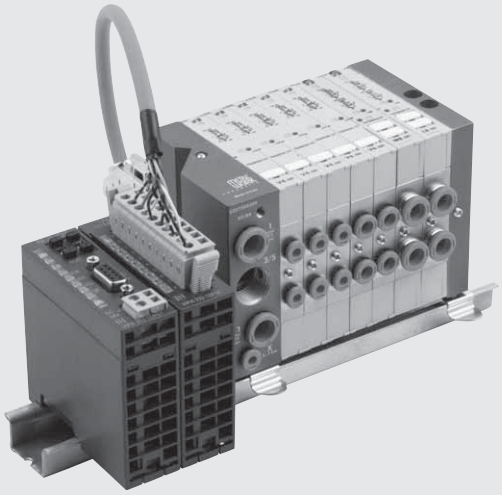
Note: available with positive common wire on request.



PROFIBUS-DP FOR MULTIMACH AND BASES FOR PLT-10 MULTIPLE CONNECTION

The expandable modular slaves for Multimach and bases for PLT-10 multiple connection follow the same application philosophy of total modularity common to the Multimach system. With full freedom, the slave can be configured by fitting the various modules offered:

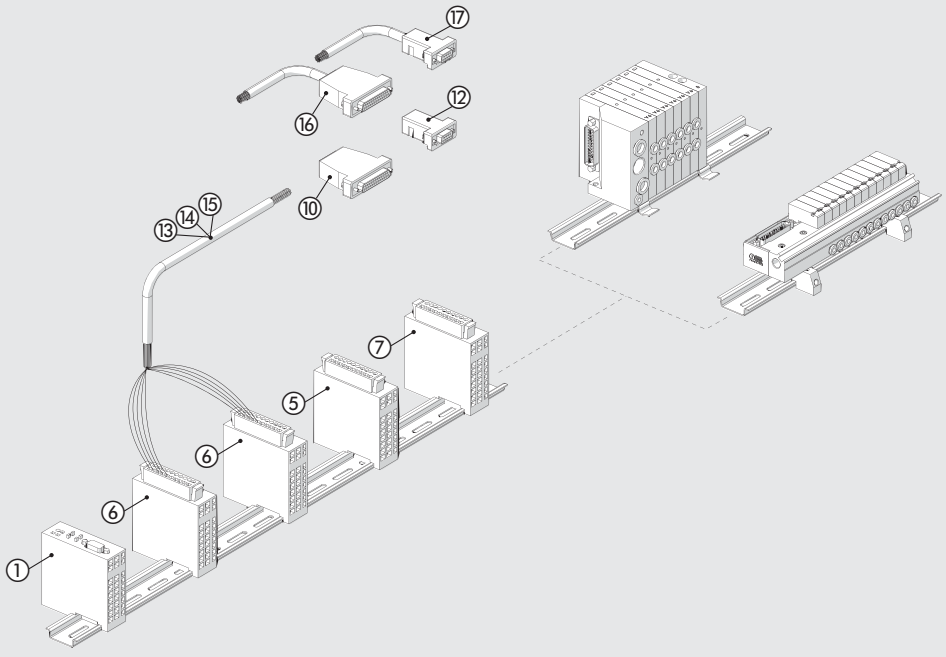
- The slave is mounted on a 35 mm DIN bar, next to the Multimach unit.
- The slave is connected to the island via the multiple spring connector of the digital 8-output modules with the 9-pin or 25-pin valve island plug connector, using multi-pin cables.
- Using 1, 2 or 3 digital 8-output modules, it is possible to manage 8, 16 or 24 controls of either one or different valve islands
- Up to 32 additional modules can be fitted alongside the digital 8-output modules to manage other inputs and outputs.
  These modules are electrically connected together, using a small plate-connector (housed under the modules, inside the DIN bar).
- There are 4 other types of modules available: for 8 digital inputs; for 8 digital outputs; for 4 analogue inputs and for 4 analogue outputs.
- With this system, a maximum of total 256 Inputs/Outputs can be managed with just one slave!



TECHNICAL DATA

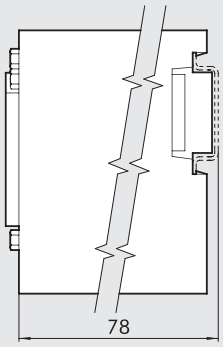
Supply voltage		24 VDC + 20% - 15%
EMC and ESD test		in compliance with IEC 801-2/IEC 801/4 (up to level 3: 8kV/2kV)
Resistance to vibration and impacts test		according to IEC68-2-6/IEC 68-2-27 (1g/12g)
Operating temperature range	°C	0 to 60
Storage temperature	°C	-40 to + 85
Admitted relative humidity		95%
Assembly		On Omega bar (DIN EN 50022) size 35 x 7 or 35 x 15

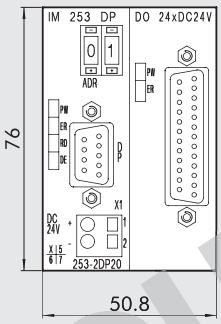
THE MULTIMACH WORLD: SLAVES, INPUTS AND OUTPUTS

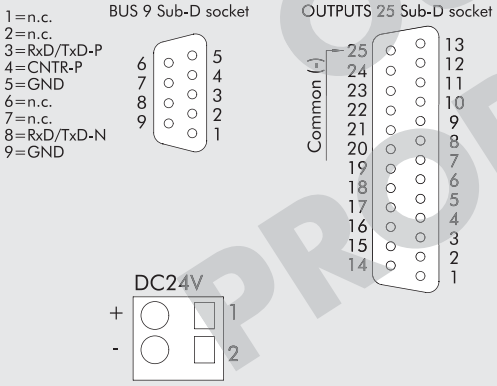


For the connection of the solenoid valve island to the Profibus ① system, the cables ⑬, ⑭, ⑮ must be electrically connected to the digital 8-output modules ⑥. If the number of valve controls is less than or equal to 8, use the 10-pin cable and one module ⑥. If it is less than or equal to 16, use the 19-pin cable and two modules ⑥. With up to 24 valve controls, use 25-pin plug connectors ⑪, the 9-pin plug connector ⑫ or pre-wired connectors ⑯ or ⑰.
You can connect each DIGITAL 8-OUTPUT module ⑥ to a solenoid valve island.

① SLAVE PROFIBUS-DP 24 OUTPUT





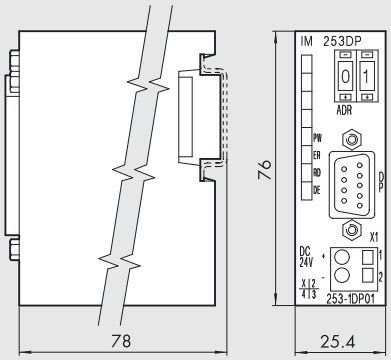


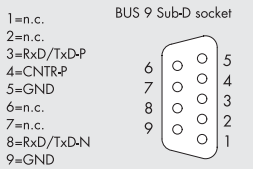
Code	Slave kit
0240004002	Slave PROFIBUS+DO24xDC24V

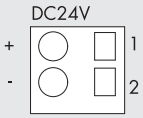
Technical data	
PROFIBUS-Interface	RS485: 9 pins SubD
Transmission speed	9.6 kBaud up to 12 Mbaud
Max number of modules which can be connected	31 (depending on the maximun corrent)
Output interface	25 pins SubD
Number of outputs	24
Output data	4 Byte (3used +1)
Nominal supply voltage	24 VDC
Maximum current for each output	1A, max total 4A
Absorption 24V (out excluded)	800 mA

OUT OF PRODUCTION

① SLAVE PROFIBUS-DP



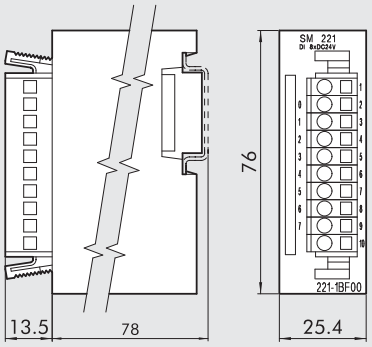




Code	Description
0240004003	Slave PROFIBUS-DP

Technical data	
PROFIBUS-DP Interface	RS485: 9 pins SubD
Transmission speed	9.6 kBaud up to 12 Mbaud
Max number of modules which can be connected	32 (depending on the maximun corrent)
Nominal supply voltage	24 VDC
Absorption 24V	70 mA

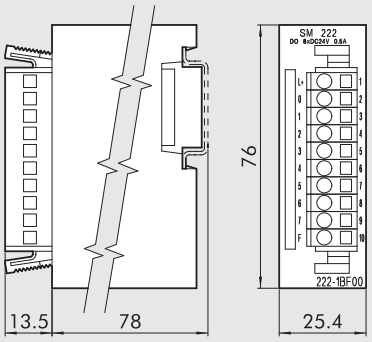
⑤ 8-DIGITAL INPUT MODULE



Code	Description
0240004053	DI 8XDC24V unit

Technical data	
Nominal input voltage	24 VDC
Number of inputs	8
Input data	1 Byte
Input voltage at "1"	15...28.8V
Output voltage at "0"	0...5V
Response time	3 ms
Internal Bus voltage	5V
Absorption 5V BUS	20 mA

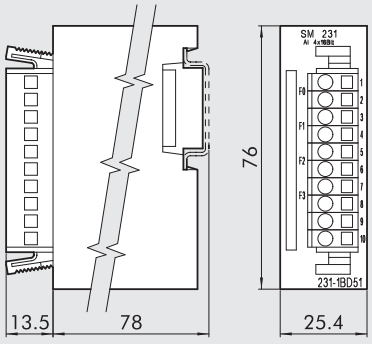
⑥ 8-DIGITAL OUTPUT MODULE



Code	Description
0240004051	DO 8XDC24V 0.5A unit

Technical data	
Nominal voltage	24 VDC
Number of outputs	8
Output data	1 Byte
Absorption for each channel	1A (max 8A)
Internal Bus voltage	5V
Absorption 5V BUS	70 mA

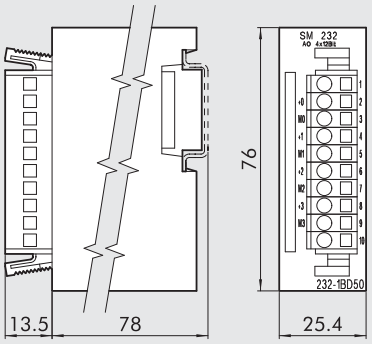
⑦ 4-ANALOG INPUT MODULE



Code	Description
0240004054	AL 4X16 BIT unit

Technical data	
Number of Inputs	4
Input data	8 Byte
Input range	Voltage 0 to 50 mV, 0...10V, ± 4 mV, ± 4V, ± 10V, Current 0/4...20 mA, +/-20 mA Temperature Pt100, Pt1000, Ni100, Ni1000 Resistance 60 Ω, 600 Ω, 3000 Ω, 16000 Ω Thermoelements J, K, N, R, T, S
Resolution	12/16 Bit
Input resistance	20M Ω voltage, 85 Ω current
Time	5...70 ms
Internal Bus voltage	5 V
Absorption 5V BUS	280 mA

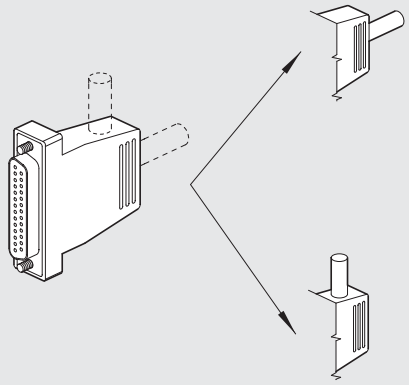
⑧ 4-ANALOG OUTPUT MODULE



Code	Description
0240004055	AO 4X12 BIT unit

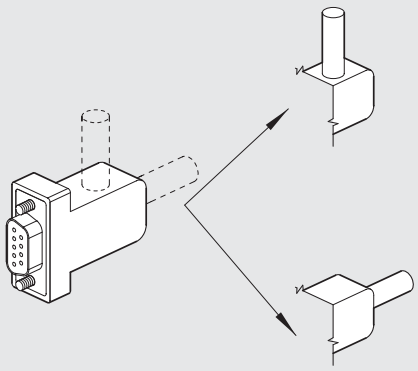
Technical data	
Number of outputs	4
Output data	8 Byte
Output range	Voltage 0…10V, ±10V, 1…5V
	Current 0…20 mA, 4…20 mA, ±20 mA
Resolution	12 BIT
Output resistance	Minimum voltage 1 kΩ, Maximum current 500 Ω
Conversion time	0.45 ms
Internal Bus voltage	5 V
Absorption 5V BUS	75 mA

⑪ 25-PIN PLUG CONNECTOR KIT



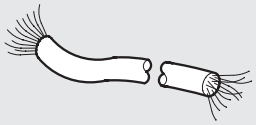
Code	Description	Weight [g]
0226180101	25-pin plug connector	48

⑫ 9-PIN PLUG CONNECTOR, STRAIGHT OR 90°



Code	Description	Weight [g]
0226180102	9-pin plug connector	31

⑬ ⑭ ⑮ CABLES

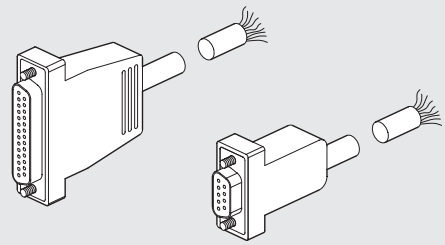


Code	Description	Weight [g]
0226107201	10-wire cable	86
0226107101	19-wire cable	122
0226107102	25-wire cable	130

Indicate the desired length in metres

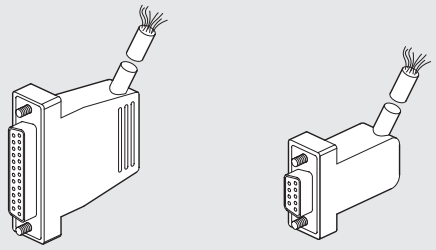
NOTES

⑯ ⑰ STRAIGHT PRE-WIRED CONNECTOR KIT



Code	Description	Weight [g]
0226900100	Connector + 9-wire axial cable L = 1 m	90
0226900250	Connector + 9-wire axial cable L = 2.5 m	220
0226900500	Connector + 9-wire axial cable L = 5 m	434
0226920100	Connector + 25-wire axial cable L = 1 m	132
0226920250	Connector + 25-wire axial cable L = 2.5 m	320
0226920500	Connector + 25-wire axial cable L = 5 m	636

⑯ ⑰ PRE-WIRED 90° CONNECTOR



Code	Description	Weight [g]
0226910100	Connector + 9-wire 90° cable L = 1 m	90
0226910250	Connector + 9-wire 90° cable L = 2.5 m	220
0226910500	Connector + 9-wire 90° cable L = 5 m	434
0226930100	Connector + 25-wire 90° cable L = 1 m	132
0226930250	Connector + 25-wire 90° cable L = 2.5 m	320
0226930500	Connector + 25-wire 90° cable L = 5 m	636

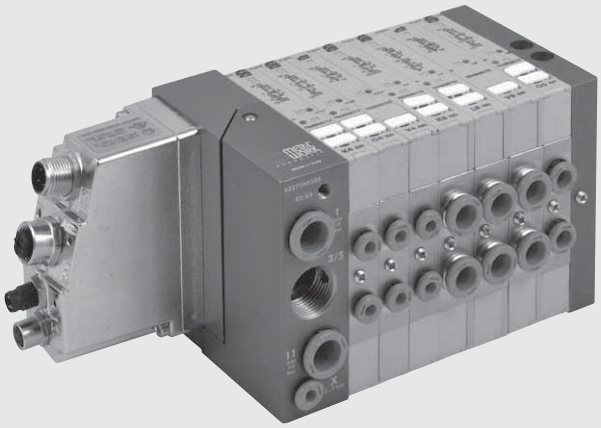
WIRING DIAGRAM FOR PRE-WIRED PLUG CONNECTORS

25 POLI						9 POLI	
Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire	Position of electrical contact	Colour of the corresponding wire
1	blue/black	10	brown/white	19	yellow/black	1	green/black
2	red/brown	11	red/orange	20	white	2	white
3	white/black	12	light blue	21	blue/white	3	blue/black
4	red/blue	13	yellow/white	22	brown	4	blue
5	black/orange	14	yellow	23	green/white	5	yellow/black
6	yellow/red	15	red/green	24	red	6	yellow
7	black/brown	16	orange	25	green/black	7	red/black
8	white/red	17	orange/white			8	green
9	red/black	18	green			9	white/black

NOTES

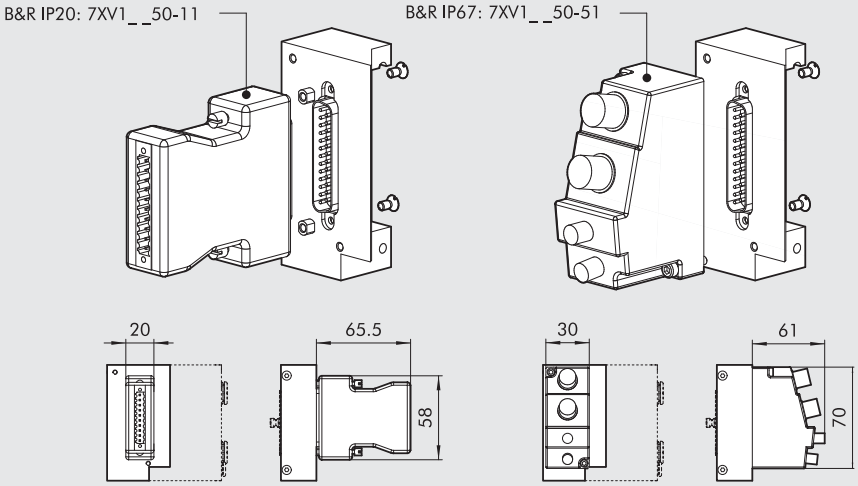
MULTIMACH + B&R

An advanced field bus system interfacing with the Multimach world.
B&R has developed a new standard for automation, called FORMULA X.
For further details about features, functions and qualities of this system, reference must be made to the B&R documentation, also available on the web site www.br-automation.com
Refer to page **B2**.109 for details of IP20 and IP67 intelligent connectors and X67 modules.
B&R smart connectors can be connected to Multimach islands using the Multimach connector support for B&R presented below.

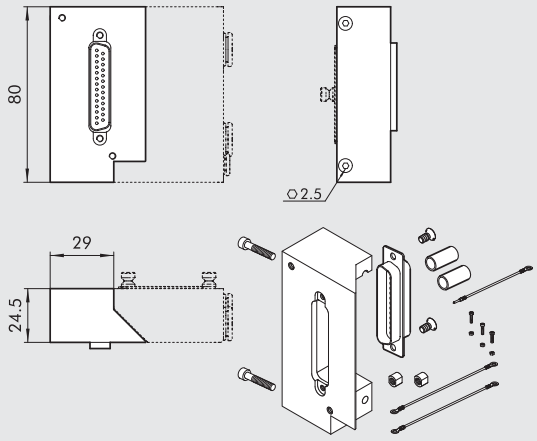


APPLICATIONS OF B&R MODULES TO THE MULTIMACH CONNECTOR SUPPORT

Refer to page **B2**.149 for valves, intermediates elements and common accessories.



MULTIMACH CONNECTOR SUPPORT FOR B&R



Code	Description	Weight [g]
0226180005	25-pin connector support kit for B&R	140

INPUT/OUTPUT PROFIBUS-DP IP 67 M12

METAL WORK PNEUMATIC

The Profibus-DP IP 67 is a robust metallic slave that can be connected flexibly sing M12 connectors to outputs and solenoid valves and/or inputs.
Each connector can be used freely for:
- 1 Output + 1 diagnostic Input
- 2 Outputs
- 1 Output + 1 Input
- 2 Inputs
- 1 Input + 1 diagnostic Input

Each slave can handle a total of 16 signals, each according to one of the above combinations.
Diagnostics provides information on the type and location of the error of each channel with:
- de-activation of the coupling point "involved" and not the complete module;
- signal to the controller;
- display with local LEDs.

One single slave or an island of solenoid valves complete with slave and connectors can be ordered. The catalogue shows the 1/8" and 1/4" valve islands in the 70 series and the ISO5599 valve islands, size 1 and size 2.

TECHNICAL DATA

Application		8 inputs or outputs + 8 inputs or outputs or diagnostic
Supply voltage		24 VDC (18V.....30,2V), according to EN 61131-2
Degree of protection		IP67
Temperature		0 to 55°C (32 to 131° F)
Field Bus Data	Transmission protocol	Profibus-DP EN 50170
	Transmission mode	synchronous or Freeze-Mode
	Transmission speed	12MBit/s
	Addresses	rotating switches BCD, 0.....99
Inputs Output Technical Data	Type	pnp proximnity sensors or EN 61131-2 compatable mechanical limit switch
	Supply	24 VDC (18-30.2V) to EN 61131-2; ≥ 200 mA for M12 coupling point.
	Indicator	One LED for each
Output Technical Data	Voltage	24 VDC (18-30.2V) output, to EN 61131-2; cumulative I ≥ 9A
	Maximum current for each actuator	1.6 A, system protected by fuse in case of short-circuit
	Maximum current contemporary	10W
	Maximum signal exchange frequency	20 Hz Ohm, 20 Hz induction
	Indicator LED	One LED for each output
Autotest	Field bus	RUN-LED
	Insufficient voltage signal	LED + alarm signal to master
	Short-circuit sensor INPUT or OUTPUTS	Red LED for channel on M12 coupling point
Autotest	Desina® (pin 2)	PIN 2 diagnostic with red LED for M12 coupling point and signal to master
		N.B.: for the disposition of the contact, please look at the connectors at the following pages

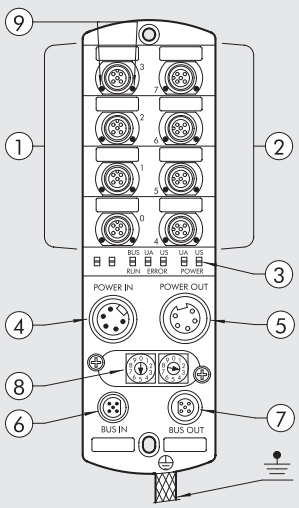
COMPONENTS

① ② IN-OUT diagnostic connectors
③ Led Power, Error, Run
④ IN feeding connector
⑤ OUT feeding connector
⑥ IN BUS connector
⑦ OUT BUS connector
⑧ Rotaring switches for addressing
⑨ Diagnostic LED for single channel

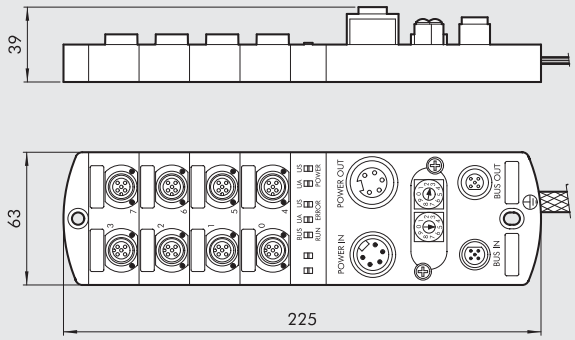
BUS IN/OUT
1 = VP
2 = A (green)
3 = DGN
4 = B (red)
5 = Sch
Thread, Sch

POWER-SUPPLY IN/OUT
1 = GND
2 = GND
3 = PE
4 = Sensor feeding
5 = Actuator feeding

IN/OUT CONNECTORS
1 = +24 VDC
2 = Diagnostic input
Digital input -> Closure contact
Opening contact
Digital output
3 = O VDC
4 = Digital input -> Closure contact
Opening contact
Digital output
5 = PE

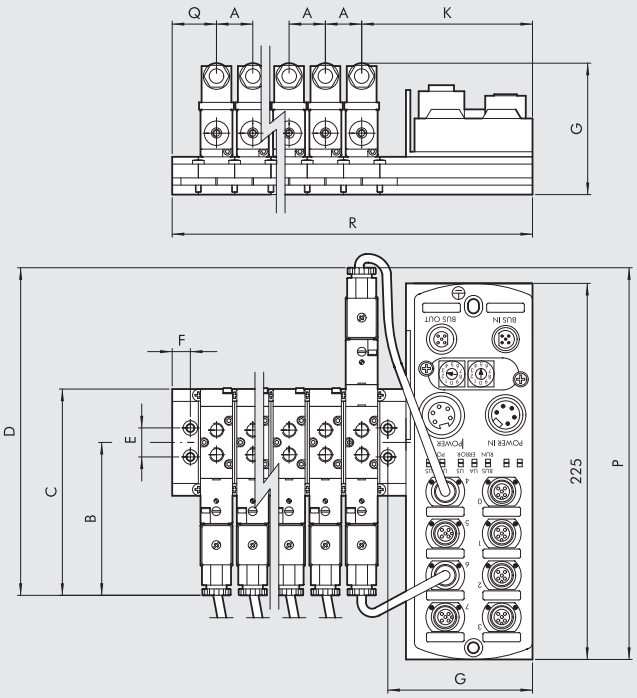


SLAVE IP67



Code	Description
0240008001	8 I/O + 8 I/O/autotest Profibus

IP67 SLAVE, COMPLETE WITH SERIES 70 VALVES



A	B	C	D	E	F	G	K	P	Q	R
1/8" Manifold										
25	105	142	225	20	12.5	85.8	103.5	230	305	Q + K + (A x *n°-1)
1/8" Multiple										
25	105	142	225	20	7	98	115	230	24	Q + K + (A x *n°-1)
1/4" Manifold										
27	112	156	239	25	10	85.5	104.5	237	31.5	Q + K + (A x *n°-1)
1/4" Multiple										
27	112	156	239	25	7	98	118	237	27	Q + K + (A x *n°-1)

***n** = number of mounted valves

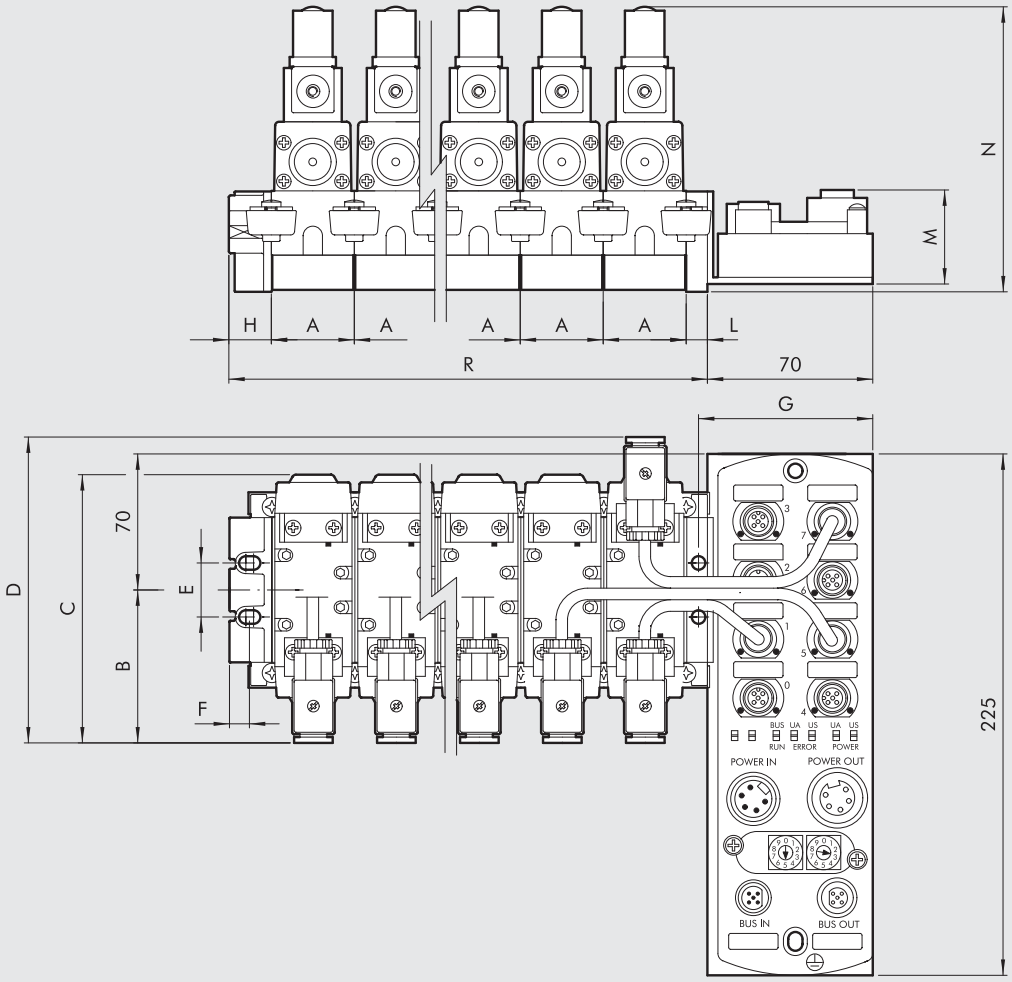
N.B.: the unit is supplied complete with cables for valves

SYNOPTIC, SIZES AND VERSIONS

B U S	P	V	B	O	0 2	D D
	P Profibus	**V** IP67	**B** 70 1/8" **C** 70 1/4"	**O** Multiple base	**02** 2 positions **04** 4 positions **06** 6 positions **08** 8 positions **10** 10 positions **12** 12 positions **14** 14 positions **16** 16 positions	**D** SOV 23 SOS NO - SOV 33 SOS NO **H** SOV 23 SOS NC - SOV 33 SOS NC **Z** SOV 23 SOB 00 - SOV 33 SOB 00 **M** SOV 25 SOS 0 - SOV 35 SOS 00 **J** SOV 25 SOB 00 - SOV 35 SOB 00 **G** SOV 26 SOS CC - SOV 36 SOS CC **E** SOV 26 SOS OC - SOV 36 SOS OC **B** SOV 26 SOS PC - SOV 36 SOS PC **A** Blanking plate

METAL WORK PNEUMATIC

IP67 SLAVE, COMPLETE WITH ISO VALVES



	A	B	C	D	E	F	G	H	L	M	N	P	R
ISO1	43	80	140	158	28	10.5	76.4	22	11	47	150	230	H + L + (A x *n°)
ISO2	56	90	165	180	35	12.5	77.5	26	14	61	178	240	H + L + (A x *n°)

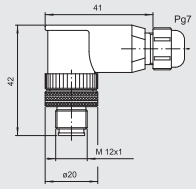
***n** = number of mounted valves
N.B.: the unit is supplied complete with cables for valves

SYNOPTIC, SIZES AND VERSIONS

B U S	P	V	D	1	0 2	M M
	P Profibus	**V** IP67	**D** ISO1 **E** ISO2	**1** Manifold base side	**02** 2 positions **04** 4 positions **06** 6 positions **08** 8 positions **10** 10 positions **12** 12 positions **14** 14 positions **16** 16 positions	**M** ISV 55 SOS 00 - ISV 65 SOS 00 **J** ISV 55 SOB 00 - ISV 65 SOB 00 **G** ISV 56 SOS CC - ISV 66 SOS CC **E** ISV 56 SOS OC - ISV 66 SOS OC **B** ISV 56 SOS PC - ISV 66 SOS PC **A** Blanking plate

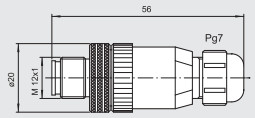
ACCESSORIES

90° ELBOW WITHOUT CABLE



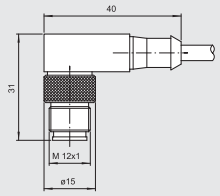
Code	Description
0240009001	90° Elbow without cable

STRAIGHT FITTING WITHOUT CABLE



Code	Description
0240009021	Straight fitting without cable

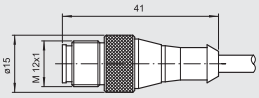
90° ELBOW WITH CABLE



Pin	Cable color
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009022	90° curve with cable 1.5 m
0240009023	90° curve with cable 5 m

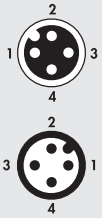
STRAIGHT FITTING WITH CABLE

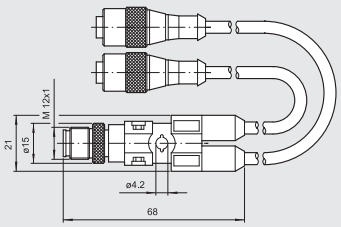


Pin	Cable color
1	Brown
2	White
3	Blue
4	Black

Code	Description
0240009002	Straight, with 1.5 m cable
0240009003	Straight, with 5 m cable

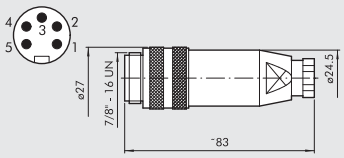
Y-DISTRIBUTOR WITH CABLE AND M12 STRAIGHT CONNECTORS





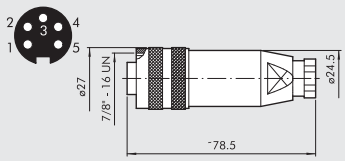
Code	Description
0240009031	Y-Distributor cable 0.6 m
0240009032	Y-Distributor cable 1.5 m

MALE CONNECTOR FOR FEEDING "IN"



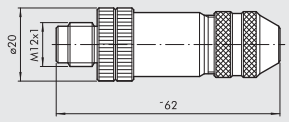
Code	Description
0240009033	Male connector "IN" feeding

FEMALE CONNECTOR FOR FEEDING "OUT"



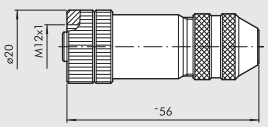
Code	Description
0240009034	Female connector "OUT" feeding

M12 MALE CONNECTOR OUT-BUS



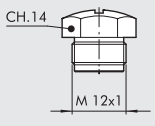
Code	Description
0240009035	M12 male connector B coding

M12 FEMALE CONNECTOR IN-BUS



Code	Description
0240009036	M12 female connector B coding

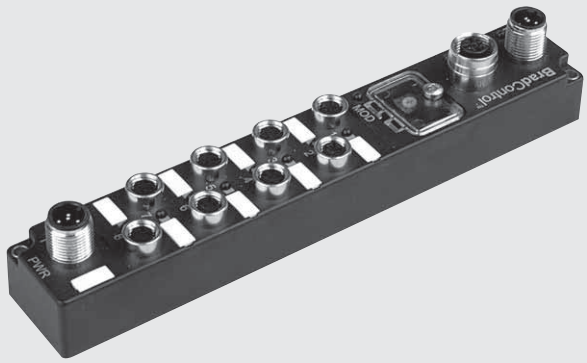
PLUG M12



Code	Description
0240009040	M12 plug

INPUT PROFIBUS-DP IP67 M8

The Profibus-DP "COMPACT" input module is a sturdy and compact IP67 slave that can be used for connecting up to 8 inputs. A series of diagnostic functions provides information on the state of operation through lights and signals to the controller.

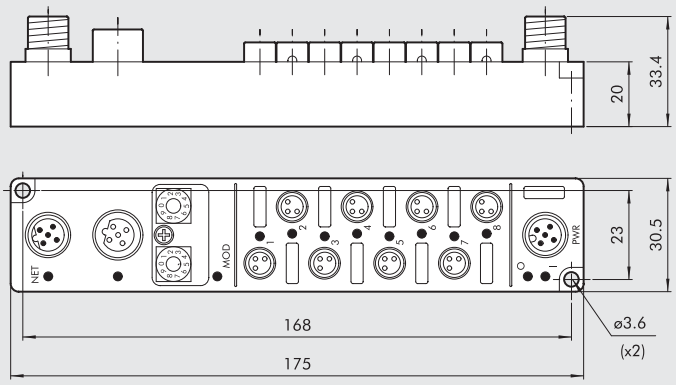


TECHNICAL DATA

Application		8 PNP inputs
Power supply		24 VDC (13-28 V)
Index of protection		IP67
Temperature range		-20 to +70°C RH 5-95% - no condensate
Field Bus technical data	Transmission protocol	DP-VO Profibus to EN 50170
	Transmission mode	Synchronous or Freeze-Mode
	Transfer rate	Up to 12 MBit/s
	Addresses	Rotary switches, 1...99
Input technical data	Type	PNP proximity sensors or IEE 1131-2 compact mechanical stop
	Power supply	24 VDC (18 to 28 V)
	Signal	One green LED for each input
	Input 0 signal voltage	2...5 V
	Input 1 signal voltage	10...30 V
Diagnosis	Field bus	"NET" LED+alarm signal to master
	INPUT short-circuit sensor	Red LED for each channel at M8 connection point M8 (600 mA)

SLAVE IP67

Code	Description
0240008002	IP67 M8 PROFIBUS INPUT

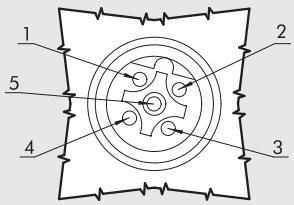


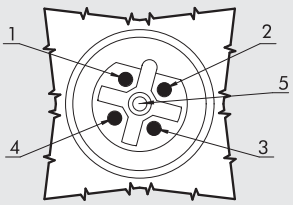
PIN ASSIGNMENT

PROFIBUS CONNECTORS

BUS OUT
M12 female connector
B coding for profibus

1 - 5 VDC power
2 - Bus A
3 - GND
4 - Bus B
5 - Shield





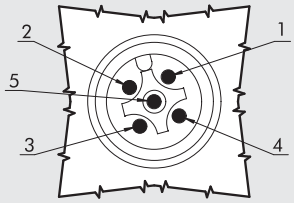
BUS IN
M12 male connector
B coding for profibus

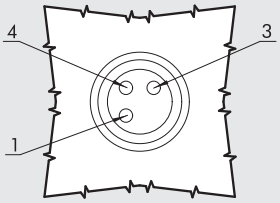
1 - 5 VDC power
2 - Bus A
3 - GND
4 - Bus B
5 - Shield

POWER CONNECTOR

M12 male connector
A coding

1 - Power supply module and input
2 - NC
3 - GND
4 - GND
5 - Grounding





INPUT CONNECTORS

M8 three-pole female connector
A coding

1 - 24VDC
3 - GND
4 - INPUT

LED ASSIGNMENT

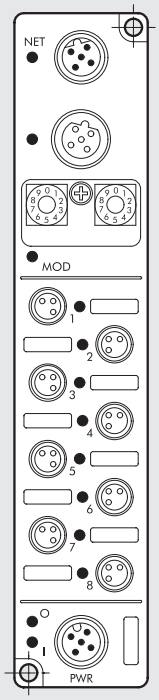
NETWORK
- (red): slave not configured or not communicating with master
- (green): slave configured and communicating with master

MODULE FAILURE
- (red): check signal LEDs

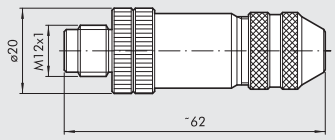
Channel LEDs (inputs)
- (green): input enabled
- (red): sensor faulty, +24V power supply short-circuit

NOT USED

INPUT MODULE POWER SUPPLY
- (green): on

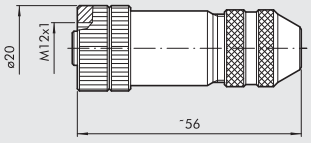


M12 BUS-OUT MALE CONNECTOR



Code	Description
0240009035	M12 male connector, B coding

M12 BUS-IN FEMALE CONNECTOR

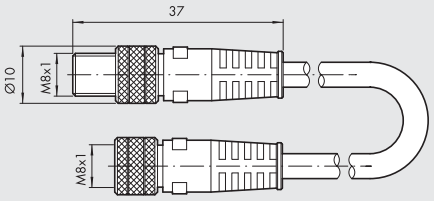


Code	Description
0240009036	M12 female connector, B coding

M8-M12 PLUG

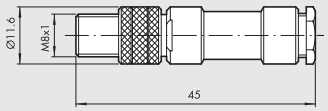
Code	Description
0240009039	M8 plug
0240009040	M12 plug

M8 INPUT CONNECTOR WITH CABLE



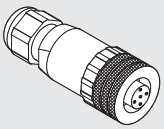
Code	Description
0240009009	M8-M8 straight connector with 3 m cable

M8 INPUT CONNECTOR



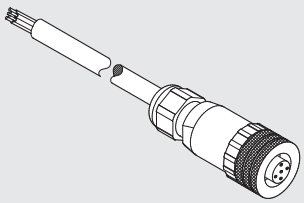
Code	Description
0240009010	M8 3-pin straight connector

M12 STRAIGHT SUPPLY CONNECTOR



Code	Description
W0970513001	5-pin M12x1 straight connector

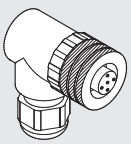
M12 STRAIGHT SUPPLY CONNECTOR WITH CABLE



Pin	Cable color
1	Brown
2	White
3	Blue
4	Black
5	Grey

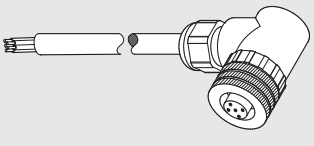
Code	Description
W0970513002	5-pin M12x1 straight connector with 5 m cable

M12 90° SUPPLY CONNECTOR



Code	Description
W0970513003	M12x1 5-pin 90°connector

M12 90° SUPPLY CONNECTOR WITH CABLE



Pin	Cable color
1	Brown
2	White
3	Blue
4	Black
5	Grey

Code	Description
W0970513004	M12x1 5-pin 90° connector with 5m cable

NOTE

NOTES

SUMMARY PROCESS VALVES MULTIPLE FLUIDS

- **MULTIPLE-FLUID PROCESS VALVES** B3.2

- **SOLENOID VALVES, SERIES EV-FLUID** B3.4

  - **SOLENOID VALVES, SERIES EV-FLUID, DIRECT ACTING** B3.5

  - **SOLENOID VALVES, SERIES EV-FLUID, SERVO-ASSISTED ACTION** B3.11

  - **SOLENOID VALVES, SERIES EV-FLUID, MIXED ACTION** B3.15

  - **COILS AND CONNECTORS FOR EV-FLUID SERIES SOLENOID VALVES** B3.17

MULTIPLE-FLUID PROCESS VALVES

There are products designed for normal operation with compressed air that are not suited for application in certain industrial sectors. Let's take, for example, fluid metering plants, steam-conveying plants or chemicals treatment plants. These applications, which are identified by the generic term of "process industry", require the use of component parts that are designed and manufactured with specific materials, undergo special treatments and engineered solutions, featuring particular requirements.
This section of the catalogue illustrates a vast range of products best suited to intercept and control the flow of fluids, such as water, steam, mineral oi and numerous chemicals.
More specifically, the range includes solenoid valves (series EV-FLUID), stopper pneumatic valves (series PV-FLUID*) and ball or butterfly valves with a rotary actuator (series RV-FLUID*).
Solenoid valves can be classified according to their function (2/2 NC, 2/2 NO, 3/2 NC and NO), type of operation (direct-acting, servo-assisted action or mixed action), the threading of ports, the size of the orifice, the material of the body (brass or stainless steel) and the gasket materials.
Ball-acting valves can be classified according to their function (2- or 3-way), the threading of ports, the orifice, the actuator interface (to ISO 5211), the material of the body (brass or stainless steel) and the gasket materials.
Butterfly valves, which can be the "Wafer" type for installation between pipes or the Lug type for installation at the end of the system, are generally made of painted cast iron and come with orifices in various diameters and gaskets in different materials.

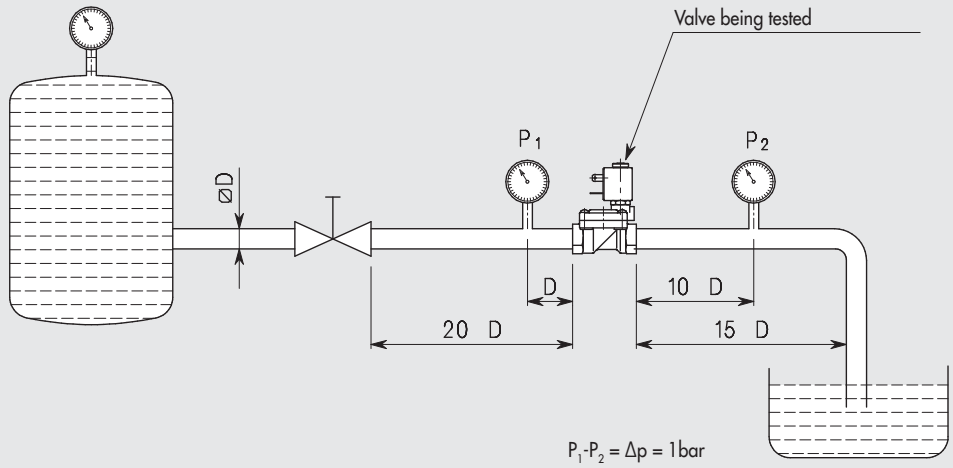
The main materials used for gaskets are NBR, FKM-FPM, EPDM and PTFE.
NBR is used at medium temperatures with water, air, mineral oils and hydrocarbon media; FKM.FPM is used at medium-high temperatures, with the exception of steam; EPDM is best suited for steam and detergents; PTFE is suite for general use at high temperatures. The precise temperature range is specified for each family. The compatibility table can be consulted by logging on to www.metalwork.it .

* Products available soon

CALCULATING THE FLOW RATE

Each valve has a flow coefficient kv.
Given the acceptable pressure drop, the media type and the working pressure, with this data it is possible to calculate the flow rate and the sizing.
This coefficient is determined by way of experimentation, according to the standard VDE 2173 and it represents the quantity of water passing through the valve with a differential pressure of 1 bar and a temperature between 5°C and 40°C.

kv coefficient measuring circuit



METAL WORK PNEUMATIC

kv	=	m^3/h	Hydraulic coefficient
Q	=	m^3/h	Flow rate
Q_n	=	m^3n/h	Portata normale (20°C 760 mmhg)
P_1	=	bar	Absolute upstream pressure (Gauge pressure +1)
P_2	=	bar	Absolute outlet pressure (gauge pressure +1)
Δp	=	bar	Pressure drop (differential pressure between inlet and outlet)
p	=	kg/dm^3	Relative density referred to water (water 4°C = 1)
p_n	=	kg/dm^3	Normal density referred to air
G	=	kg/h	Mass
t	=	°C	Inlet fluid temperature
V_1	=	m^3/kg	Inlet specific volume
V_2	=	m^3/kg	Outlet specific volume referred to pressure "P_2" and temperature "t"

Liquids: $Q = kv \sqrt{\frac{\Delta p}{\rho}}$

Gas: $\Delta p = \Delta p < P_1/2 \quad Q_n = 514 \times kv \sqrt{\frac{\Delta p \times P_2}{\rho_n \times (273 + t)}}$

$\Delta p = \Delta p > P_1/2 \quad Q_n = 257 \times kv \frac{P_1}{\sqrt{\rho_n (273 + t)}}$

Air: $\Delta p = \Delta p < P_1/2 \quad Q_n = 26 \times kv \sqrt{\Delta p \times P_2}$

$\Delta p = \Delta p > P_1/2 \quad Q_n = kv \times P_1 \times 13$

Vapour: $\Delta p = \Delta p < P_1/2 \quad G = 31.6 \times kv \sqrt{\frac{\Delta p}{V_2}}$

$\Delta p = \Delta p > P_1/2 \quad G = 31.6 \times kv \sqrt{\frac{P_1}{v_1}}$

Below are some examples of specific gravities of liquid substances, gases or vapours

Liquid substances

Liquid	Temperature °C	Specific weight kg/dm^3
Water, sea	77°F	1.025
Water, pure	4	1
Ethylene glycol	25	1.1
Milk	15	1.035

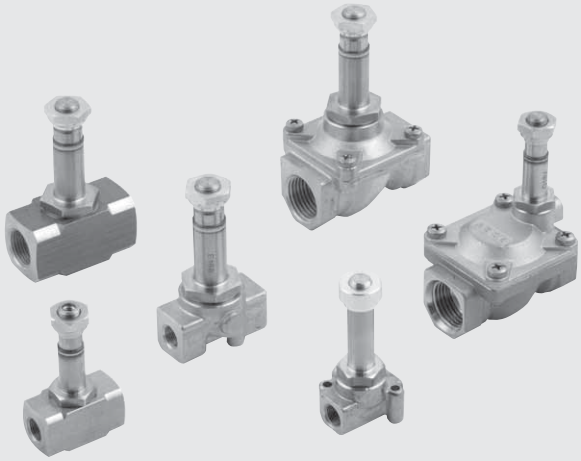
Gases and vapours at 20°C and 1atm*

Gases or vapours	Relative density to air	Specific weight gr/dm^3
Air *	1.00	1.205
nitrogen (atomospheric)	0.97	1.172
Water vapor	0.62	0.749

* NTP - Normal Temperature and Pressure - is defined as air at 20°C and 1 atm. Specific gravity is the ratio between the density (mass per unit volume) of the actual gas and the density of air, specific density has no dimension. The density of air at NTP is 1.205 kg/m^3.

SOLENOID VALVES, SERIES EV-FLUID

The EV-FLUID series consists of a vast range of solenoid valves, with a brass or stainless steel body, suited to intercept the different types of fluid. Available in 2/2 or 3/2, normally closed or normally open, and with different types of action: direct, servo-assisted or mixed (also called assisted-lift).
The size of the inlet and outlet threads, as well as that of the nominal orifice, can be chosen from among a vast range.
Versions with NBR, FKM/FPM, EPDM or PTFE gaskets are available, depending on the models.
The coils, which are designed and optimized specifically for this type of solenoid valves, are available for operation with different voltage ratings. They are divided by power and dimension into four types (type 2, type 3, type 4 and type 5). The coupling between each solenoid valve and the type of matching coil is illustrated in the dedicated section of the catalogue.



RESPONSE TIME

The Response time of a solenoid valve series EV-FLUID, is the period passing betweenthe energisation (or de-energisation) of the coil and the moment when the outlet pressure reaches the 50% of its peak.
The response time depends from the type of valve, the nature of the medium, the pressure and the current (AC or DC), if these value are measured at the moment of electrical connection or disconnection.

Tipologia	Response time [ms] at 6 bar		Notes
	Opening (TRA)	Closing (TRR)	
2 and 3 ways direct acting NC	8	25	with liquids +50% ÷ +150% depending on the viscosity
2 and 3 ways direct acting NO	25	8	
Servoassisted NC			
3/8" - 1/2"	30	50	
3/4" - 1"	50	70	
Servoassisted NO			
3/8" - 1/2"	50	30	
3/4" - 1"	70	50	
Servoassisted 1 1/4" - 1 1/2" - 2"	Adjustable time		

NOTES

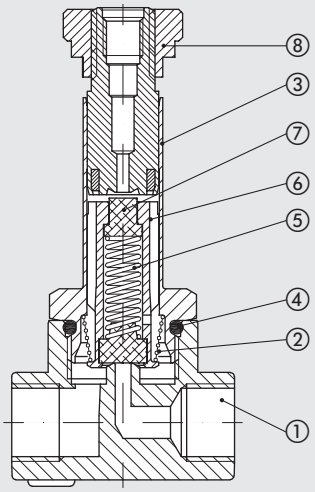
SOLENOID VALVES, SERIES EV-FLUID, DIRECT ACTING

In direct-acting EV-FLUID series solenoid valves the orifice is closed (or opened) by the movement of a rubber poppet placed on a moving core made of ferromagnetic steel.
The moving core, which is normally kept in the resting position by a spring, is moved thanks to the action of the magnetic field generated by the coil that is mounted on the valve. The sleeve supporting the coil can be retracted or incorporated into the valve body (depending on the model).
Available functions are 2/2 NC, 2/2 NO and 3/2 NC (3/2 NO available on request for some models)
These solenoid valves can operate at a minimum pressure of 0 bar.

TECHNICAL DATA		NBR	FPM/FKM	EPDM	PTFE
Max operating frequency (with air)	Hz	2			
Power consumption		DC: 5 - 6.5 -10 - 27 W / AC: 8 - 11 - 15 - 30 VA			
Voltage available		12 - 24VDC / 24 - 110 - 220 VAC 50/60 Hz			
Voltage tolerance	%	DC: ±10 / AC: –10 ÷ +15			
Type of protection		IP 65 with connector			
Fluid temperature	°C	-10 ÷ +90	-10 ÷ +140	-10 ÷ +140	-10 ÷ +180
Ambient temperature	°C	with coil C.I F: -10 ÷ +55; con with coil C.I H: -10 ÷ +80			
Maximum fluid viscosity		25 cSt (mm^2/s)			
Pressure range, flow rate, weight		See dimensions and ordering codes			
Maximum coil nut torque	Nm	1.5			
Usable fluids / Materials compatibility		Valves that can be used with neutral or slightly aggressive liquid and gas fluids. (Refer to the tables of chemical compatibility of materials in contact with the fluid on on www.metalwork.it or contact Metal Work technical service)			

COMPONENTS

① BODY: brass or stainless steel
② SPRING: stainless steel
③ SLEEVE
④ GASKET
⑤ MOLLA: stainless steel
⑥ MOBILE CORE
⑦ GASKET
⑧ RING NUT FOR COIL FIXING

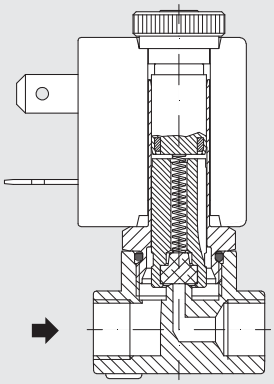


OPERATING CHART

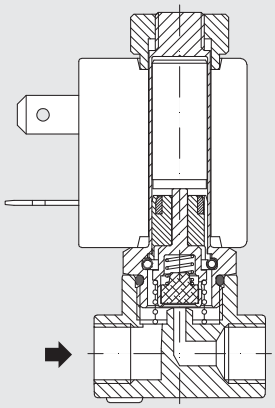
2-WAY DIRECT ACTING

Two-way solenoid valves have an inlet and an outlet connection in the valve body; the orifice is opened or closed by the poppet incorporated in the moving core.
Normally-closed version (2/2 NC): in the resting position, the fluid is intercepted by the poppet; when connected to an electrical supply, the orifice opens allowing the inlet to feed the user port.
Normally-open version (2/2 NO): in the resting position, the orifice is opened and the air is supplied through the user port. When connected to an electrical supply, the orifice closes. In both cases, operation only depends on the magnetic field produced by the passage of current through the coil. Solenoid valves can work at zero pressure.

NORMALLY CLOSED (NC)



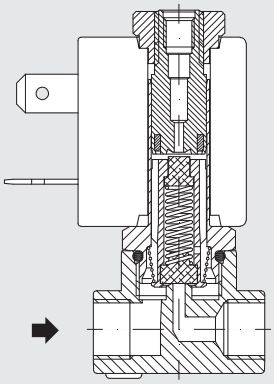
NORMALLY OPEN (NO)



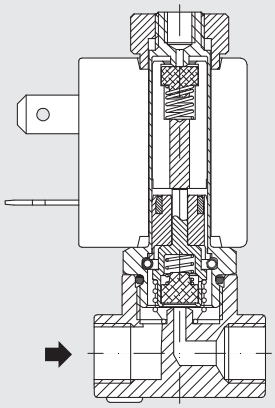
3-WAY DIRECT ACTING

Three-way solenoid valves have an inlet connection and a user port in the valve body, plus an exhaust connection in the fixed core; The inlet and outlet orifices are opened or closed directly by the poppets in the moving core.
Normally-closed version (3/2 NC): in the resting position, the incoming fluid is intercepted by the poppet and the user port communicates with the exhaust port. When connected to an electric supply, the inlet orifice closes, the open exhaust port communicates with the user port.
The exhaust port is closed.
Normally-open version (3/2 NO): in the resting position, the orifice is opened and the air is supplied through the user port. The exhaust port is closed.When connected to an electric supply, the inlet orifice closes and the open exhaust port communicates with the user port.
In both cases, operation only depends on the magnetic field produced by the coil.
Solenoid valves can work at zero pressure.

NORMALLY CLOSED (NC)



NORMALLY OPEN (NO)

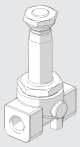


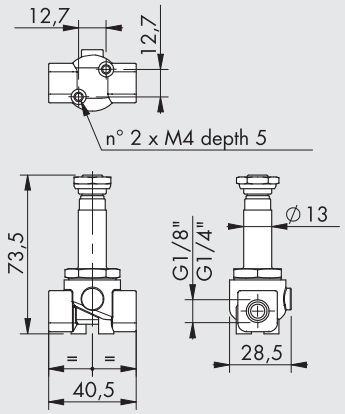
NOTES

DIMENSIONS AND ORDERING CODES

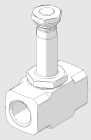
VERSION 2/2 NC, BRASS VALVE BODY

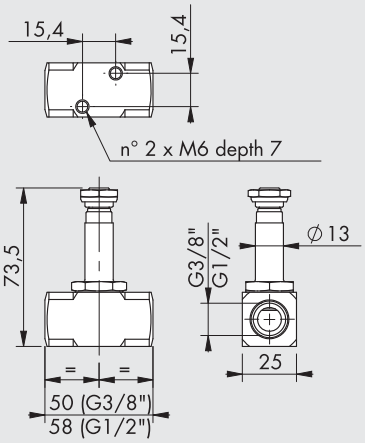
G1/8" - G1/4"

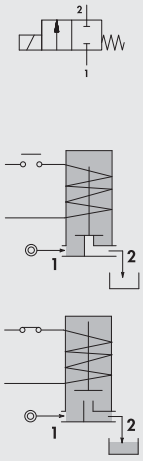




G3/8" - G1/2"





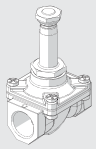


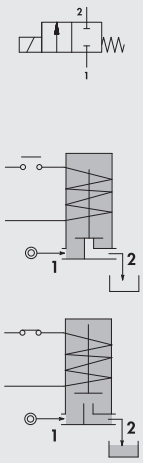
Code	Threaded port	Air hole Ø [mm]	kv factor [m³/h]	Type of coil	Operating pressure [bar] * AC	Operating pressure [bar] * DC	Weight [g]
W_910100001	1/8"	1.5	0.07	2	0 ÷ 30	0 ÷ 26	180
W_910100002	1/8"	2	0.1	2	0 ÷ 22	0 ÷ 20	180
W_910100010	1/4"	2.5	0.15	2	0 ÷ 16	0 ÷ 14	180
W_910100011	1/4"	3.5	0.32	2	0 ÷ 10	0 ÷ 8	180
W_910100012	1/4"	4.5	0.41	2	0 ÷ 6.5	0 ÷ 3.5	180
W_910100013	1/4"	5.2	0.47	5	0 ÷ 10	0 ÷ 9	180
W_910100017	1/4"	6.4	0.64	5	0 ÷ 5	0 ÷ 4.5	180
W_910100020	3/8"	4	0.36	2	0 ÷ 8	0 ÷ 5	240
W_910100021	3/8"	3.5	0.32	2	0 ÷ 10	0 ÷ 8	240
W_910100022	3/8"	4.5	0.41	2	0 ÷ 6.5	0 ÷ 3.5	240
W_910100030	1/2"	5.2	0.47	5	0 ÷ 10	0 ÷ 9	240
W_910100031	1/2"	6.4	0.64	5	0 ÷ 5	0 ÷ 4.5	240
W_910100032	1/2"	3.5	0.32	2	0 ÷ 10	0 ÷ 8	240

To complete the code enter:
0 for NBR gaskets
E for EPDM gaskets
V for FKM/FPM gaskets
T for PTFE gaskets

* The maximum allowable pressure for steam is 6 bar with PTFE gaskets and 2.5 bar with EPDM gaskets

VERSION 2/2 NC, BRASS VALVE BODY AND DIAPHRAGM POPPET





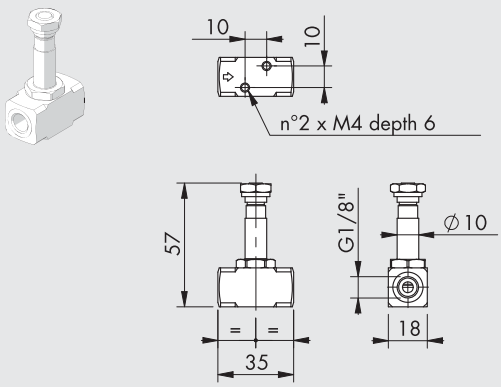
Code	Threaded port	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar] * AC	Operating pressure [bar] * DC	Weight [g]
W_910700001	1/2"	12	2.2	5	0 ÷ 0.8	0 ÷ 0.4	330
W_910700002	3/4"	18	4.5	5	0 ÷ 0.2	0 ÷ 0.12	630

To complete the code enter:
0 for NBR gaskets
E for EPDM gaskets
V for FKM/FPM gaskets

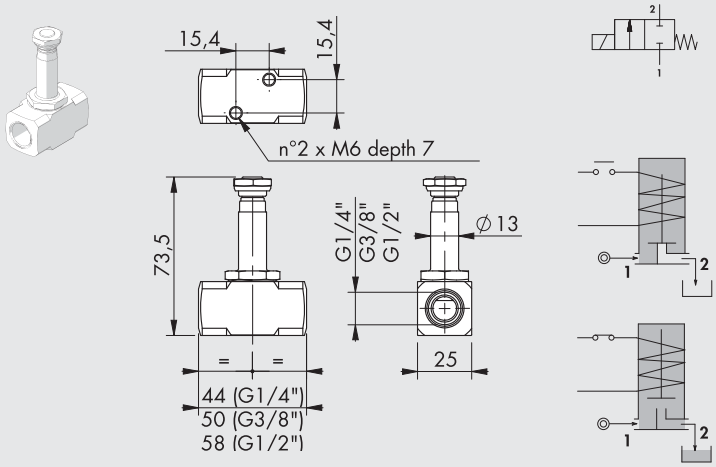
* The maximum allowable pressure for steam is 2.5 bar with EPDM gaskets

VERSION 2/2 NC, STAINLESS STEEL VALVE BODY

G1/8"



G1/4" - G3/8" - G1/2"



Code	Threaded port	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar] * AC	DC	Weight [g]
W_910300001	1/8"	1.5	0.06	3	0 ÷ 16	0 ÷ 16	100
W_910300002	1/8"	2.5	0.14	3	0 ÷ 8	0 ÷ 5.5	100
W_910300003	1/8"	3.1	0.19	4	0 ÷ 8	0 ÷ 4	100
W_910300010	1/4"	2	0.1	2	0 ÷ 22	0 ÷ 20	240
W_910300011	1/4"	3.5	0.32	2	0 ÷ 10	0 ÷ 8	240
W_910300020	3/8"	3.5	0.32	2	0 ÷ 10	0 ÷ 8	240
W_910300021	3/8"	5.2	0.47	5	0 ÷ 10	0 ÷ 9	240
W_910300022	3/8"	6.4	0.64	5	0 ÷ 5	0 ÷ 4.5	240
W_910300030	1/2"	5.2	0.47	5	0 ÷ 10	0 ÷ 9	240
W_910300031	1/2"	6.4	0.64	5	0 ÷ 5	0 ÷ 4.5	240
W_910300032	1/2"	3.5	0.32	2	0 ÷ 10	0 ÷ 8	240

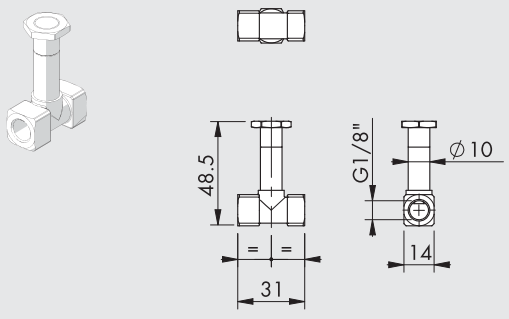
To complete the code enter:

0 for NBR gaskets
E for EPDM gaskets
V for FKM/FPM gaskets
T for PTFE gaskets

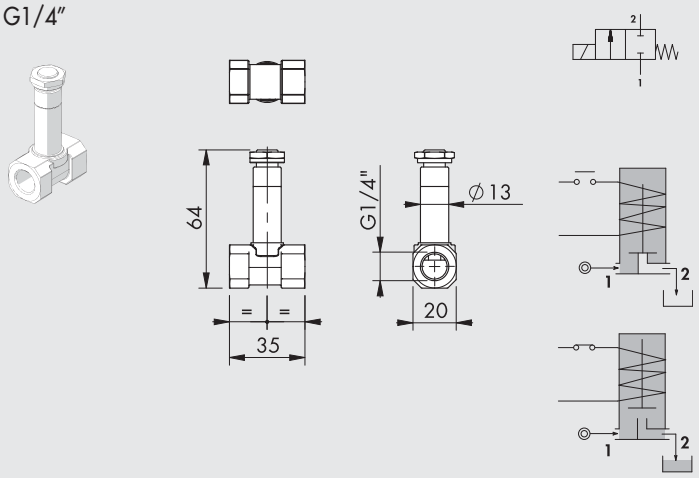
* The maximum allowable pressure for steam is 6 bar with PTFE gaskets and 2.5 bar with EPDM gaskets

VERSION 2/2 NC, BRASS BODY WITH BUILT-IN SLEEVE, FKM/FPM GASKETS

G1/8"



G1/4"

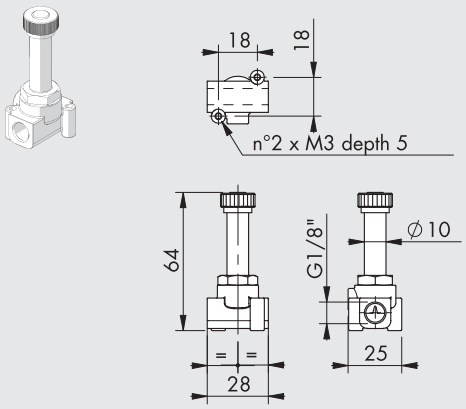


Code	Threaded port	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar] AC	DC	Weight [g]
WV910500001	1/8"	1.5	0.06	3	0 ÷ 14	0 ÷ 3	40
WV910500002	1/4"	3	0.18	2	0 ÷ 14	0 ÷ 6	100
WV910500003	1/4"	4	0.26	2	0 ÷ 7	0 ÷ 3	100

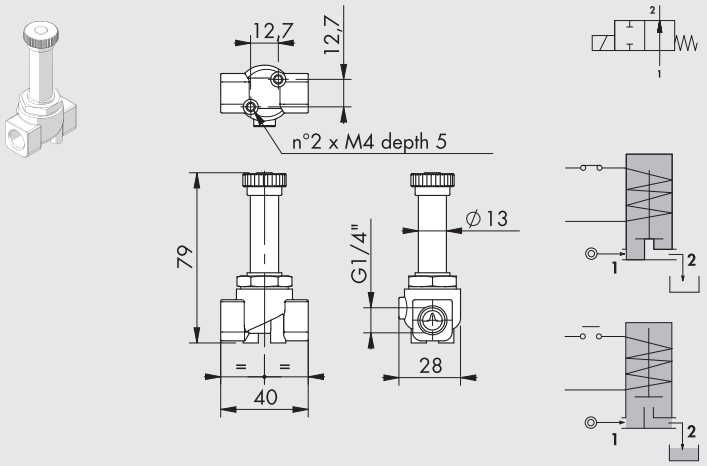
METAL WORK PNEUMATIC

VERSION 2/2 NO, BRASS VALVE BODY

G1/8"



G1/4"



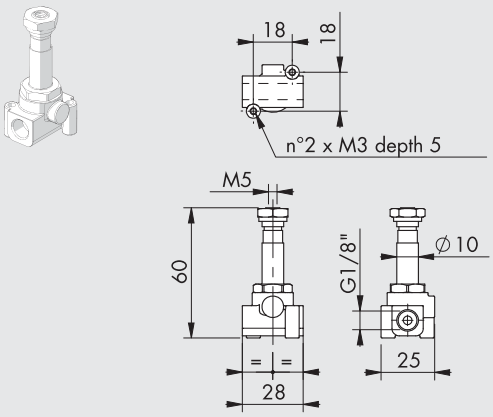
Code	Threaded port	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar] *		Weight [g]
					AC	DC	
W_910800003	1/8"	2	0.09	3	0 ÷ 8	0 ÷ 8	80
W_910800004	1/8"	2.5	0.14	3	0 ÷ 4.5	0 ÷ 4.5	80
W_910800008	1/4"	2.5	0.15	2	0 ÷ 12	-	180
W_910800009	1/4"	3.5	0.32	2	0 ÷ 7	-	180
W_910800010	1/4"	4.5	0.41	2	0 ÷ 4.5	-	180
W_910800011	1/4"	5.2	0.47	2	0 ÷ 3	-	180
W_910810009	1/4"	3.5	0.32	2	-	0 ÷ 4	180
W_910810010	1/4"	4.5	0.41	2	-	0 ÷ 3	180
W_910810011	1/4"	5.2	0.47	2	-	0 ÷ 2.2	180

To complete the code enter: **0** for NBR gaskets, **E** for EPDM gaskets, **V** for FKM/FPM gaskets

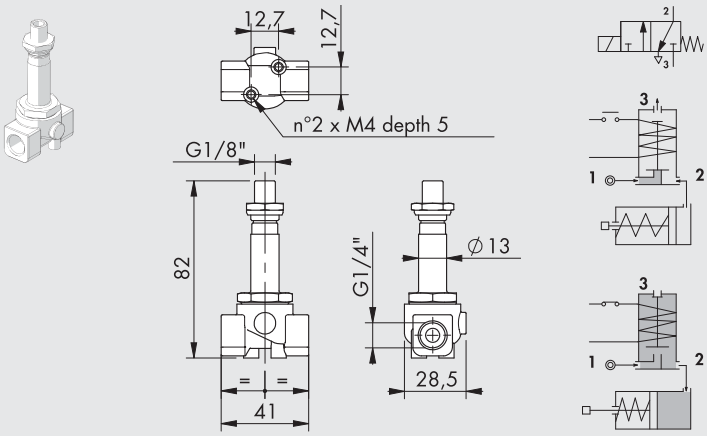
* The maximum allowable pressure for steam is 2.5 bar with EPDM gaskets

VERSION 3/2 NC, BRASS VALVE BODY

G1/8"



G1/4"



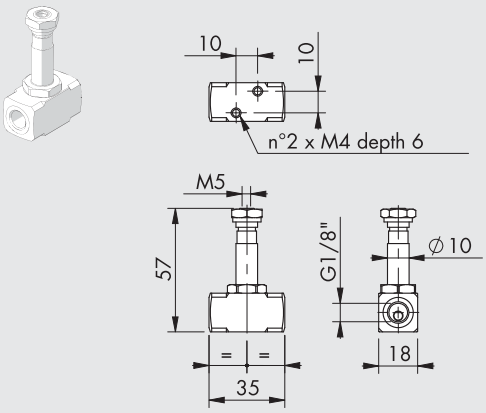
Code	Threaded port	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar] *		Weight [g]
					AC	DC	
W_911000002	1/8"	1.5	0.06	3	0 ÷ 10	0 ÷ 10	60
W_911000003	1/8"	2	0.09	3	0 ÷ 6	0 ÷ 6	60
W_911000004	1/4"	1.5	0.07	2	0 ÷ 20	0 ÷ 20	200
W_911000005	1/4"	2	0.11	2	0 ÷ 13	0 ÷ 13	200
W_911000006	1/4"	2.5	0.16	2	0 ÷ 10	0 ÷ 10	200

To complete the code enter: **0** for NBR gaskets, **E** for EPDM gaskets, **V** for FKM/FPM gaskets

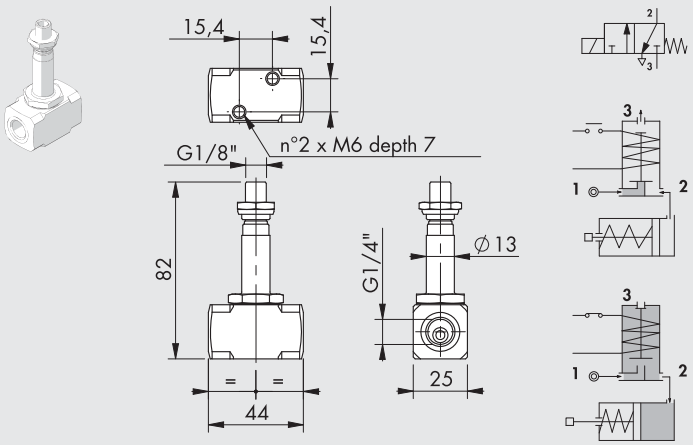
* The maximum allowable pressure for steam is 2.5 bar with EPDM gaskets

VERSION 3/2 NC, STAINLESS STEEL VALVE BODY

G1/8"



G1/4"



Code	Threaded port	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar] *		Weight [g]
					AC	DC	
W_911200002	1/8"	1.5	0.06	3	0 ÷ 10	0 ÷ 10	100
W_911200003	1/8"	2	0.09	3	0 ÷ 6	0 ÷ 6	100
W_911200005	1/4"	2	0.11	2	0 ÷ 20	0 ÷ 15	240
W_911200006	1/4"	2.5	0.16	2	0 ÷ 20	0 ÷ 15	240

To complete the code enter:

0 for NBR gaskets
E for EPDM gaskets

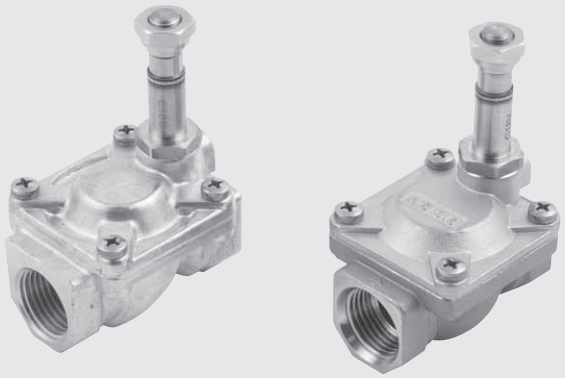
V for FKM/FPM gaskets

* The maximum allowable pressure for steam is 2.5 bar with EPDM gaskets

NOTES

SOLENOID VALVES, SERIES EV-FLUID, SERVO-ASSISTED ACTION

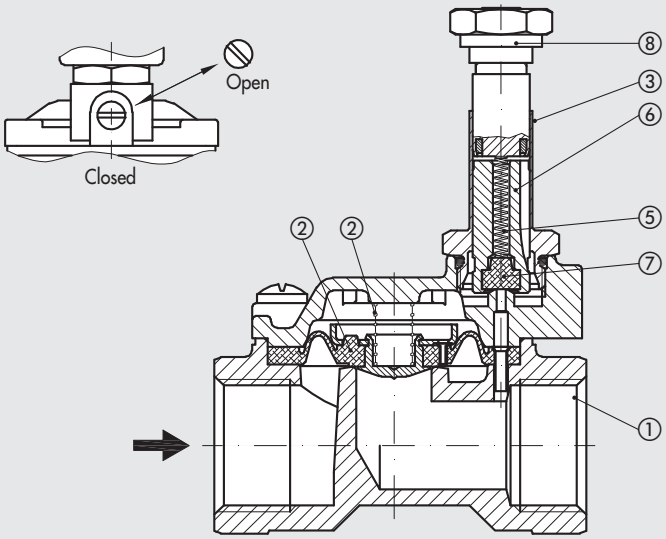
Le valvole ad azionamento assistito serie EV-FLUID vengono utilizzate quando si necessita un'apertura di passaggio di grandi dimensioni, senza comunque rinunciare alla pressione. Anzi, in questo tipo di valvole la pressione del fluido aiuta a mantenere chiusa la guarnizione.
Nella versione 2/2 NC, quando la bobina è diseccitata, la guarnizione collegata alla membrana mantiene chiuso il passaggio del fluido tra l'ingresso e l'uscita. La chiusura della membrana è assistita dalla pressione del fluido che, attraverso un piccolo foro, riempie la camera posta sopra la membrana.
Quando la bobina viene eccitata, l'elettropilota mette in scarico la camera superiore e la membrana si apre, consentendo il passaggio del fluido attraverso l'orifizio superiore.
Nella versione 2/2 NO, quando la bobina è diseccitata, il passaggio del fluido tra l'ingresso e l'uscita è aperto e la camera posta al di spora della membrana è vuota. Eccitando la bobina, l'elettropilota consente al fluido di fluire nella camera superiore alla membrana, permettendo in tal modo la chiusura dell'orifizio per mezzo della guarnizione collegata alla membrana.
Sono disponibili le funzioni 2/2 NC e 2/2 NO, corpo in ottone con guarnizioni in NBR; FKM/FPM o EPDM, oppure corpo inox con guarnizioni in FKM/FPM. In generale, queste elettrovalvole hanno una pressione minima di funzionamento superiore a 0 bar.



TECHNICAL DATA		NBR	FPM/FKM	EPDM
Max operating frequency (with air)	Hz	2		
Power consumption		DC: 6.5 -10 W / AC: 8 - 15 VA		
Voltage available		12 - 24VDC / 24 - 110 - 220 VAC 50/60 Hz		
Voltage tolerance	%	DC: ±10 / AC: –10 ÷ +15		
Type of protection		IP 65 with connector		
Fluid temperature	°C	-10 ÷ +90	-10 ÷ +140	-10 ÷ +140
Ambient temperature	°C	with coil C.I F: -10 ÷ +55; con with coil C.I H: -10 ÷ +80		
Maximum fluid viscosity		25 cSt (mm^2/s)		
Pressure range, flow rate, weight		See dimensions and ordering codes		
Maximum coil nut torque	Nm	1.5		
Usable fluids / Materials compatibility		Valves that can be used with neutral or slightly aggressive liquid and gas fluids. (Refer to the tables of chemical compatibility of materials in contact with the fluid on on www.metalwork.it or contact Metal Work technical service)		

COMPONENTS

① BODY: brass or stainless steel
② SPRING: stainless steel
③ SLEEVE
④ DIAPHRAGM
⑤ SPRING: stainless steel
⑥ MOBILE CORE
⑦ GASKET
⑧ RING NUT FOR COIL FIXING



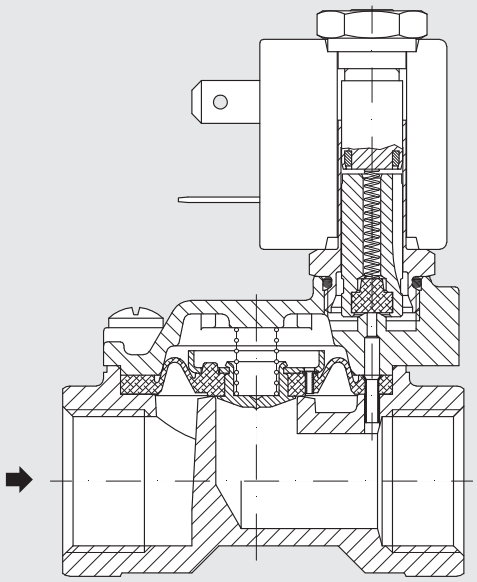
SERVO-ASSISTED ACTION DESIGN

With larger orifices, the static pressure to be controlled with the magnetic field produced by the coil increases: for this reason these models, in which the fluid helps the main poppet to open or close, are used.

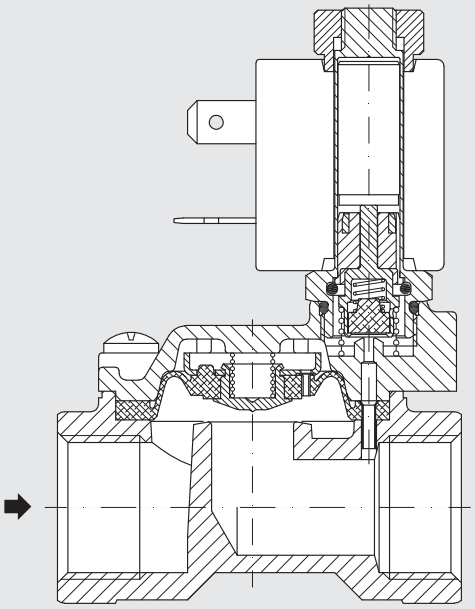
Normally closed (2/2 NC) version: with an inlet and outlet port in the valve body; when the coil is not energized, the fluid is intercepted by the main poppet that can be either a diaphragm or a piston.
In this mode, the fluid flows through a small hole in the diaphragm and acts on the two sides of the main poppet and helps to close it.
When connected to an electrical supply, the secondary, or piloting, orifice opens, thus allowing the fluid to exhaust, which closes the main poppet.
This generates increased force in the lower part of the main actuator, which acts on the opening, the poppet is raised from the orifice and the air supply is entirely connected to the user port.
Operation in these versions does not depend only on the magnetic field produced by the coil, it only needs a minimum input pressure that moves the diaphragm or piston, controlling its rigidity and keeping it raised from the main orifice (minimum working Δp).

Normally open version (2/2 NO): with an inlet port and a user port in the valve body; when the secondary poppet is not energized, it communicates with the user port; a minimum pressure difference between the air supply and the user port allows the main poppet to open. When connected to an electric supply, the secondary orifice closes and the balance between the pressures on the two sides of the main poppet closing on the main orifice is restored.
A minimum operating pressure is required in this version as well.

NORMALLY CLOSED (NC)

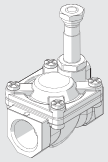


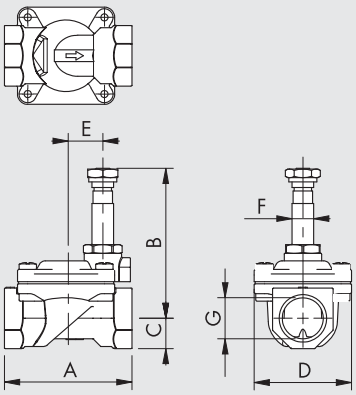
NORMALLY OPEN (NO)

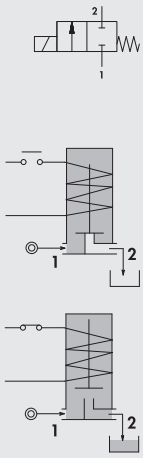


DIMENSIONS AND ORDERING CODES

VERSION 2/2 NC, BRASS VALVE BODY







Code	G	A	B	C	D	E	F	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar] *		Weight [g]
											AC	DC	
W_910200001	1/4"	49	65	11	32	16	10	10	1.5	3	0.15 ÷ 15	0.15 ÷ 15	180
W_910200002	3/8"	49	65	11	32	16	10	10	1.7	3	0.15 ÷ 15	0.15 ÷ 15	190
W_910200003	3/8"	59	70	14	45	16	10	12	2.2	3	0.15 ÷ 15	0.15 ÷ 15	370
W_910200004	1/2"	59	70	14	45	16	10	12	2.5	3	0.15 ÷ 15	0.15 ÷ 15	340
W_910200005	3/4"	79	76	18	55	16	10	18	5.5	3	0.15 ÷ 13	0.15 ÷ 13	600
W_910200006	1"	96	85	20	72	16	10	25	10.2	3	0.15 ÷ 10	0.15 ÷ 10	1000
W_910200007	1-1/4"	142	105	28	102	21	13	37	18	2	0.15 ÷ 10	0.15 ÷ 10	2880
W_910200008	1-1/2"	142	105	28	102	21	13	37	21	2	0.15 ÷ 10	0.15 ÷ 10	2730
W_910200009	2"	158	115	35	119	21	13	50	36	2	0.15 ÷ 10	0.15 ÷ 10	4180

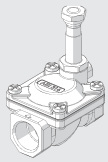
To complete the code enter:

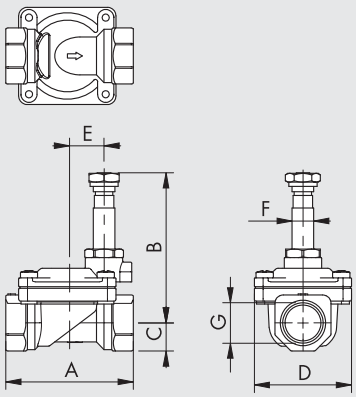
0 for NBR gaskets
E for EPDM gaskets

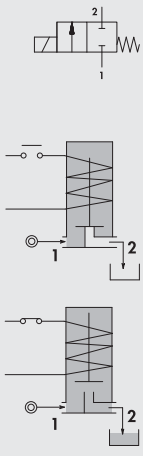
V for FKM/FPM gaskets

* The maximum allowable pressure for steam is 2.5 bar with EPDM gaskets

VERSION 2/2 NC, STAINLESS STEEL VALVE BODY, FKM/FPM GASKETS

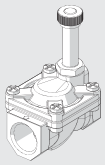


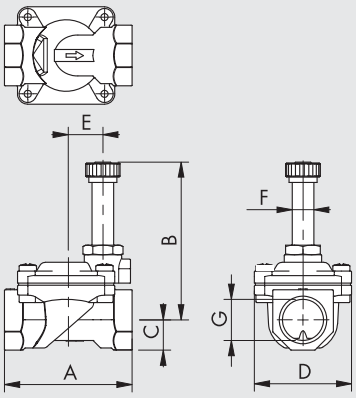


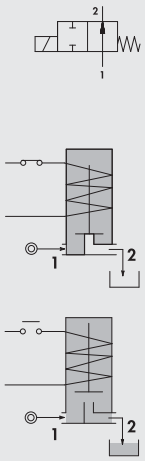


Code	G	A	B	C	D	E	F	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar]		Weight [g]
											AC	DC	
WV910400001	3/8"	59	70	11	45	16	10	12	2.2	3	0.15 ÷ 15	0.15 ÷ 15	250
WV910400002	1/2"	59	70	13	45	16	10	12	2.5	3	0.15 ÷ 15	0.15 ÷ 15	270
WV910400003	3/4"	79	76	18	55	16	10	18	5.5	3	0.15 ÷ 13	0.15 ÷ 13	500
WV910400004	1"	96	85	20	72	16	10	25	10.2	3	0.15 ÷ 10	0.15 ÷ 10	900

VERSION 2/2 NO, BRASS VALVE BODY







Code	G	A	B	C	D	E	F	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar] * AC	Operating pressure [bar] * DC	Weight [g]
W_910900001	1/4"	49	65	11	32	16	10	10	1.5	3	0.15 ÷ 15	0.15 ÷ 15	180
W_910900003	3/8"	59	73	14	45	16	10	12	1.7	3	0.15 ÷ 15	0.15 ÷ 15	370
W_910900004	1/2"	59	73	14	45	16	10	12	2.5	3	0.15 ÷ 15	0.15 ÷ 15	340
W_910900005	3/4"	79	76	18	55	16	10	18	5.5	3	0.15 ÷ 13	0.15 ÷ 13	600
W_910900006	1"	96	85	20	72	16	10	25	10.2	3	0.15 ÷ 10	0.15 ÷ 10	1000

To complete the code enter:

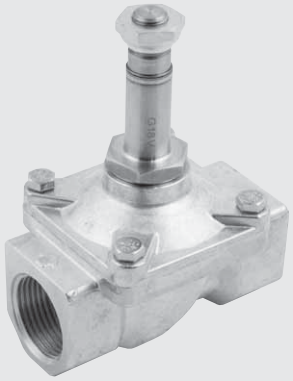
0 for NBR gaskets
E for EPDM gaskets
V for FKM/FPM gaskets

* The maximum allowable pressure for steam is 2.5 bar with EPDM gaskets

NOTES

SOLENOID VALVES, SERIES EV-FLUID, MIXED ACTION

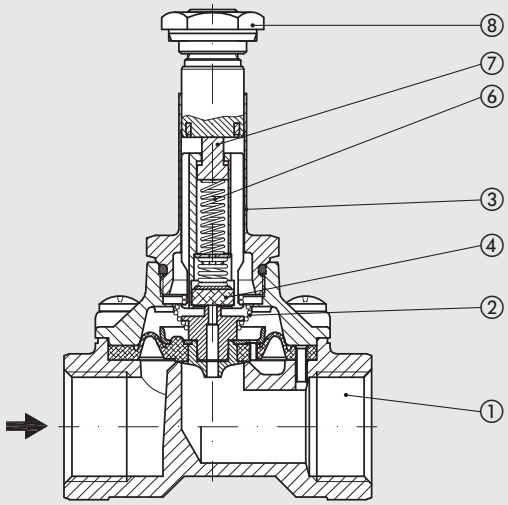
In this type of solenoid valve, the moving core is connected to the diaphragm and it directly intercepts the secondary orifice.
The same coil-actuated moving core drags the diaphragm that opens or closes the main orifice.
These two combined actions allow these two models to operate at a zero pressure.
These valves are available with 2/2 NC function, brass body and FKM/FPM or NBR gaskets.



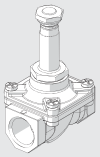
TECHNICAL DATA		FPM/FKM
Max operating frequency (with air)	Hz	2
Power consumption		DC: 27 W / AC: 30 VA
Voltage available		12 - 24VDC / 24 - 110 - 220 VAC 50/60 Hz
Voltage tolerance	%	DC: ±10 / AC: –10 ÷ +15
Type of protection		IP 65 with connector
Fluid temperature	°C	-10 ÷ +90
Ambient temperature	°C	with coil C.I H: -10 ÷ +80
Maximum fluid viscosity		25 cSt (mm^2/s)
Pressure range, flow rate, weight		See dimensions and ordering codes
Maximum coil nut torque	Nm	1.5
Usable fluids / Materials compatibility		Valves that can be used with neutral or slightly aggressive liquid and gas fluids. (Refer to the tables of chemical compatibility of materials in contact with the fluid on on www.metalwork.it or contact Metal Work technical service)

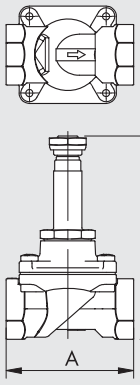
COMPONENTS

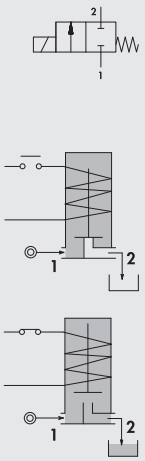
① BODY: brass
② SPRING: stainless steel
③ SLEEVE: stainless steel
④ GASKET
⑤ SPRING: stainless steel
⑥ MOBILE CORE: stainless steel
⑦ GASKET
⑧ RING NUT FOR COIL FIXING



VERSION 2/2 NC, BRASS VALVE BODY, FKM/FPM GASKETS







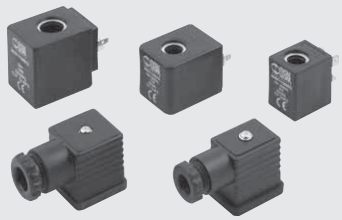
Code	G	A	B	C	D	E	F	Air hole Ø [mm]	Kv factor [m³/h]	Type of coil	Operating pressure [bar]		Weight [g]
											AC	DC	
WV910600003	3/8"	59	83	14	45	13	10	12	2	5	0 ÷ 12	0 ÷ 10	400
WV910600004	1/2"	59	83	14	45	13	10	12	2.2	5	0 ÷ 12	0 ÷ 10	370
WV910600005	3/4"	79	90	18	55	13	10	18	4.5	5	0 ÷ 9	-	610
WV910600006	1"	96	101	20	72	13	10	25	8.5	5	0 ÷ 7	-	1020
WV910610005	3/4"	96	85	20	72	16	10	18	4.5	5	-	0 ÷ 9	610
WV910610006	1"	96	85	20	72	16	10	25	8.5	5	-	0 ÷ 8	1020

NOTE

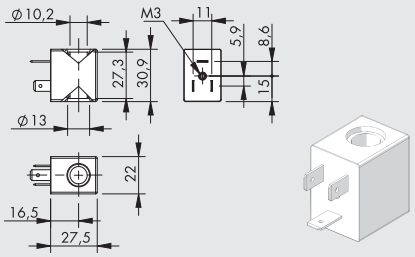
COILS AND CONNECTORS FOR EV-FLUID SERIES SOLENOID VALVES

METAL WORK PNEUMATIC

These coils have been optimized specifically for use with EV-Fluid series solenoid valves. They come in different voltage ratings and powers, depending on power supply needs and level of performance requested of the valve on which they are installed. They come into 4 types (type 2, type 3, type 4 and type 5). The types differ one from the other in terms of size, type of electrical connection, orifice and output power.
ATEX and UL versions are available on request



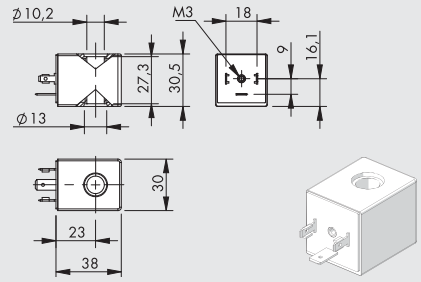
COILS SIDE 22 mm TYPE 3



- Voltage tolerance: –10% ÷ + 15% AC version / ± 10% DC version
- Degree of protection: IP65 EN60529 with connector
- Duty Cycle: 100%
- Connector: **DIN 43650 B**

Code	Abbrev.	Nominal voltage	Absorption	Index of protection
W0911100001	Coil 22 Ø10 Type 3, 6.5W 12VDC	12VDC	6.5W	F
W0911100002	Coil 22 Ø10 Type 3, 6.5W 24VDC	24VDC	6.5W	F
W0911100003	Coil 22 Ø10 Type 3, 8VA 24V 50/60Hz	24V 50/60Hz	8VA	F
W0911100004	Coil 22 Ø10 Type 3, 8VA 110V 50/60Hz	110V 50/60Hz	8VA	F
W0911100005	Coil 22 Ø10 Type 3, 8VA 220V 50/60Hz	220V 50/60Hz	8VA	F

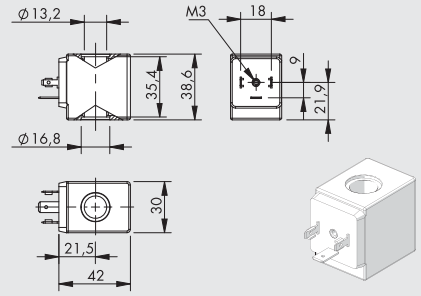
COILS SIDE 30 mm TYPE 4



- Voltage tolerance: –10% ÷ + 15% AC version / ± 10% DC version
- Degree of protection: IP65 EN60529 with connector
- Duty Cycle: 100%
- Connector: **DIN 43650 B**

Code	Abbrev.	Nominal voltage	Absorption	Index of protection
W0911100006	Coil 30 Ø10 Type 4, 5W 12VDC	12VDC	5W	F
W0911100007	Coil 30 Ø10 Type 4, 5W 24VDC	24VDC	5W	F
W0911100008	Coil 30 Ø10 Type 4, 11VA 24V 50/60Hz	24V 50/60Hz	11VA	F
W0911100009	Coil 30 Ø10 Type 4, 11VA 110V 50/60Hz	110V 50/60Hz	11VA	F
W0911100010	Coil 30 Ø10 Type 4, 11VA 220V 50/60Hz	220V 50/60Hz	11VA	F

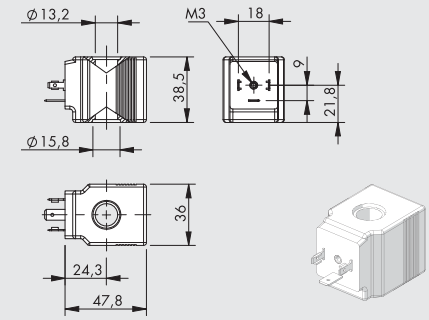
COILS SIDE 30 mm TYPE 2



- Voltage tolerance: –10% ÷ + 15% AC version / ± 10% DC version
- Degree of protection: IP65 EN60529 with connector
- Duty Cycle: 100%
- Connector: **DIN 43650 B**

Code	Abbrev.	Nominal voltage	Absorption	Classe isolamento
W0911100011	Coil 30 Ø13 Type 2, 10W 12VDC	12VDC	10W	F
W0911100012	Coil 30 Ø13 Type 2, 10W 24VDC	24VDC	10W	F
W0911100013	Coil 30 Ø13 Type 2, 15VA 24V 50/60Hz	24V 50/60Hz	15VA	F
W0911100014	Coil 30 Ø13 Type 2, 15VA 110V 50/60Hz	110V 50/60Hz	15VA	F
W0911100015	Coil 30 Ø13 Type 2, 15VA 220V 50/60Hz	220V 50/60Hz	15VA	F

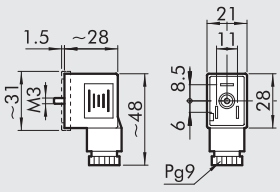
COILS SIDE 36 mm TYPE 5



- Voltage tolerance: –10% ÷ + 15% AC version / ± 10% DC version
- Degree of protection: IP65 EN60529 with connector
- Duty Cycle: 100%
- Connector: **DIN 43650 B**

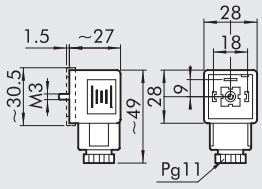
Code	Abbrev.	Nominal voltage	Absorption	Index of protection
W0911100016	Coil 36 Ø13 Type 5, 27W 12VDC	12VDC	27W	H
W0911100017	Coil 36 Ø13 Type 5, 27W 24VDC	24VDC	27W	H
W0911100018	Coil 36 Ø13 Type 5, 30VA 24V 50/60Hz	24V 50/60Hz	30VA	H
W0911100019	Coil 36 Ø13 Type 5, 30VA 110V 50/60Hz	110V 50/60Hz	30VA	H
W0911100020	Coil 36 Ø13 Type 5, 30VA 220V 50/60Hz	220V 50/60Hz	30VA	H

CONNECTOR FOR COILS SIDE 22 mm FOR COIL TYPE 3



Code	Type	Colour	Ø Cable
W0970510011	Standard	Black	PG9
W0970510012	LED 24V	Transparent	PG9
W0970510013	LED 110V	Transparent	PG9
W0970510014	LED 220V	Transparent	PG9
W0970510015	LED + VDR 24V	Transparent	PG9
W0970510016	LED + VDR 110V	Transparent	PG9
W0970510017	LED + VDR 220V	Transparent	PG9

CONNECTOR ON SIDE 30 mm PFOR COILS TYPE 2, 4, 5



Code	Type	Colour	Ø Cable
W0970520033	Standard	Black	PG11
W0970520034	LED 24V	Transparent	PG11
W0970520035	LED 110V	Transparent	PG11
W0970520036	LED 220V	Transparent	PG11
W0970520037	LED + VDR 24V	Transparent	PG11
W0970520038	LED + VDR 110V	Transparent	PG11
W0970520039	LED + VDR 220V	Transparent	PG11

NOTES

METAL WORK PNEUMATIC

NOTES

METAL WORK PNEUMATIC

UNITS

- SYNTESI C1
- BIT C2
- SKILLAIR C3
- NEW DEAL C4
- ONE C5
- PRECISION REGULATION AND PRESSURE CONTROL C6

SUMMARY SYNTESI®

	● GENERAL TECHNICAL DATA Syntesi®	C1.4
	● Syntesi® KEY TO CODES	C1.8
	● Syntesi® FILTER	C1.9
	● Syntesi® DEPURATOR	C1.12
	● Syntesi® ACTIVE CARBON FILTER	C1.15
	● Syntesi® REGULATOR	C1.18
	● Syntesi® IN-SERIES REGULATOR	C1.21
	● Syntesi® FILTER-REGULATOR	C1.24
	● Syntesi® LUBRICATOR	C1.29
	● Syntesi® SHUT-OFF-VALVE	C1.32
	● Syntesi® PROGRESSIVE STARTER	C1.35
	● Syntesi® PRESSURE SWITCHES	C1.37
	● Syntesi® AIR TAKE-OFF	C1.39

METAL WORK PNEUMATIC

- **FR + LUB Syntesi®** C1.41

- **V3V + FR + LUB Syntesi®** C1.44

- **FIL + DEP Syntesi®** C1.47

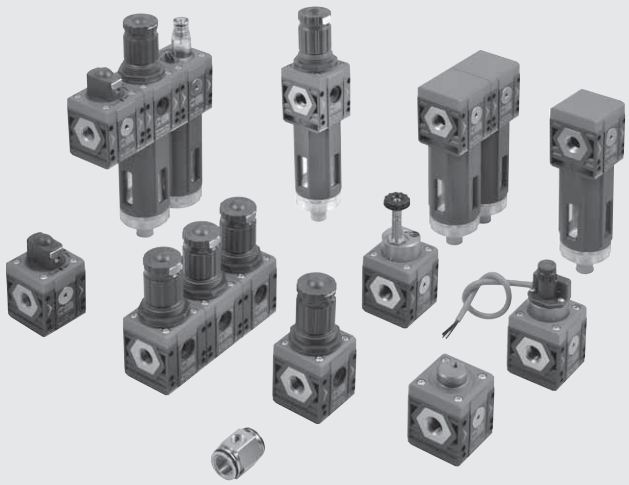
- **FIL + LUB Syntesi®** C1.49

- **Syntesi® ACCESSORIES** C1.51

- **Syntesi® SPARE PARTS** C1.54

GENERAL TECHNICAL DATA SYNTESI®

Syntesi® is an important milestone achieved by Metal Work, the result of thirty years' experience producing air-treatment units. It has been studied in minute detail to obtain the best possible performance in a reduced space and with limited weight. The capacity is much higher than that of other units of the same size.
This modular unit features a very simple yet effective system that requires no brackets, stay bolts or yoke for assembling the elements.
The basic version of Syntesi® incorporates numerous functions that are not provided or are only optional with traditional units. Examples are padlockable knobs, additional pneumatic ports on the front and back, flow options from left to right or vice versa, regulators with compensation system - which are accurate even when the upstream pressure changes, with rapid downstream pressure relief - full indelible marking, automatic condensate drain even in size 1, and 360° visual inspection of oil and condensate levels. The basic materials, technopolymer and nickel-plated brass have excellent corrosion resistance. An anti-corrosion version is available with stainless steel components (screws, plates) or Geomet®-treated ones (regulator springs).

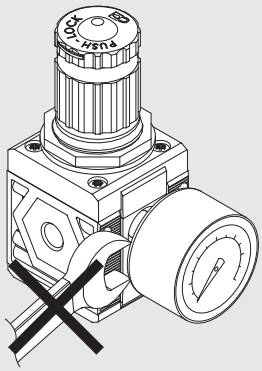


TECHNICAL DATA		SIZE 1			SIZE 2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Max. input pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Flow rate		See catalogue of the various elements						
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	from -10 to +50			from -10 to +50			
Padlockable knob		The knobs of the regulators, filter regulators and standard sectioning valves can all be padlocked						
Fluid		Compressed air or other inert gases						
Mounting position		See catalogue of the various elements						
Direction of flow		Flow options right to left or vice versa						
Additional air take-off, for pressure gauges or fittings		1/8", front and rear, on all modules			1/4", front and rear, on all modules			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Certification for potentially explosive atmosphere according to 94/9/CE		Ex II 3 GD c T5 T 100°C -20°C<Ta<50°C						

ANTI-CORROSION VERSION

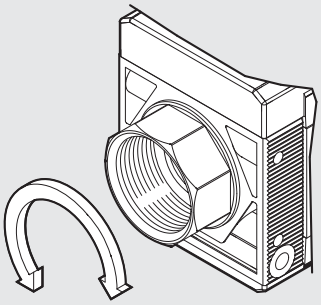
Differences compared to the standard version:
- stainless steel screws
- stainless steel plate for R, FR, V3V knobs
- Geomet®-treated regulator spring and filter-regulator

FIXING TO FRONT PORTS



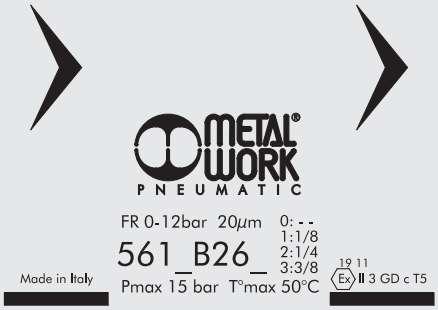
Do not use a spanner for fixing taper threaded elements to the front ports. Mount by hand and apply a liquid sealant (not teflon®).

ROTARY BUSHINGS



3/4" and 1" bushings in Size 2 rotate freely to facilitate assembly operations.

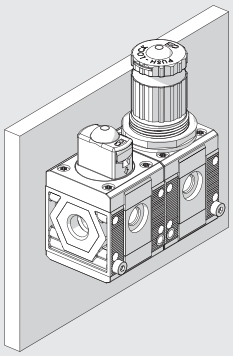
LASER MARKING



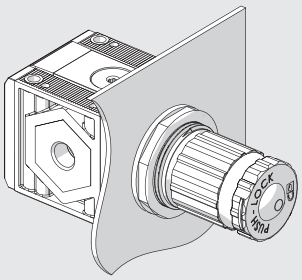
The following is marked indelibly on the body:
- Metal Work trademark
- Code
- Maximum pressure and temperature
- Degree of filtration or pressure range, where relevant
- Week and year of manufacture
- Atex category
- Made in Italy

MOUNTING OPTIONS

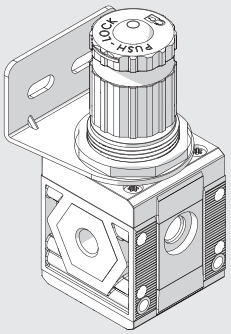
On the wall, using two screws



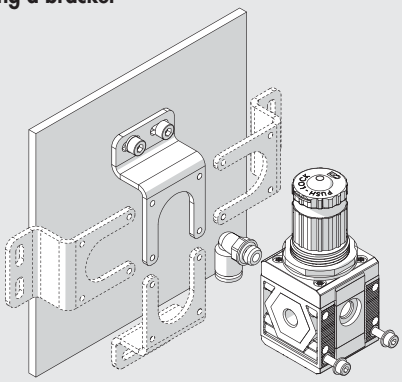
On a panel

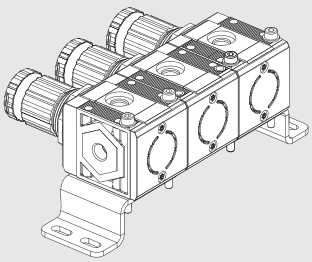


Using knob bracket



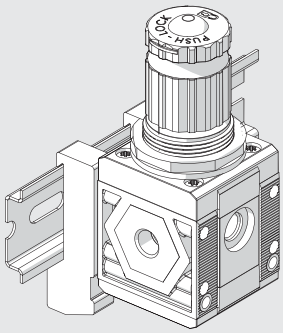
Using a bracket



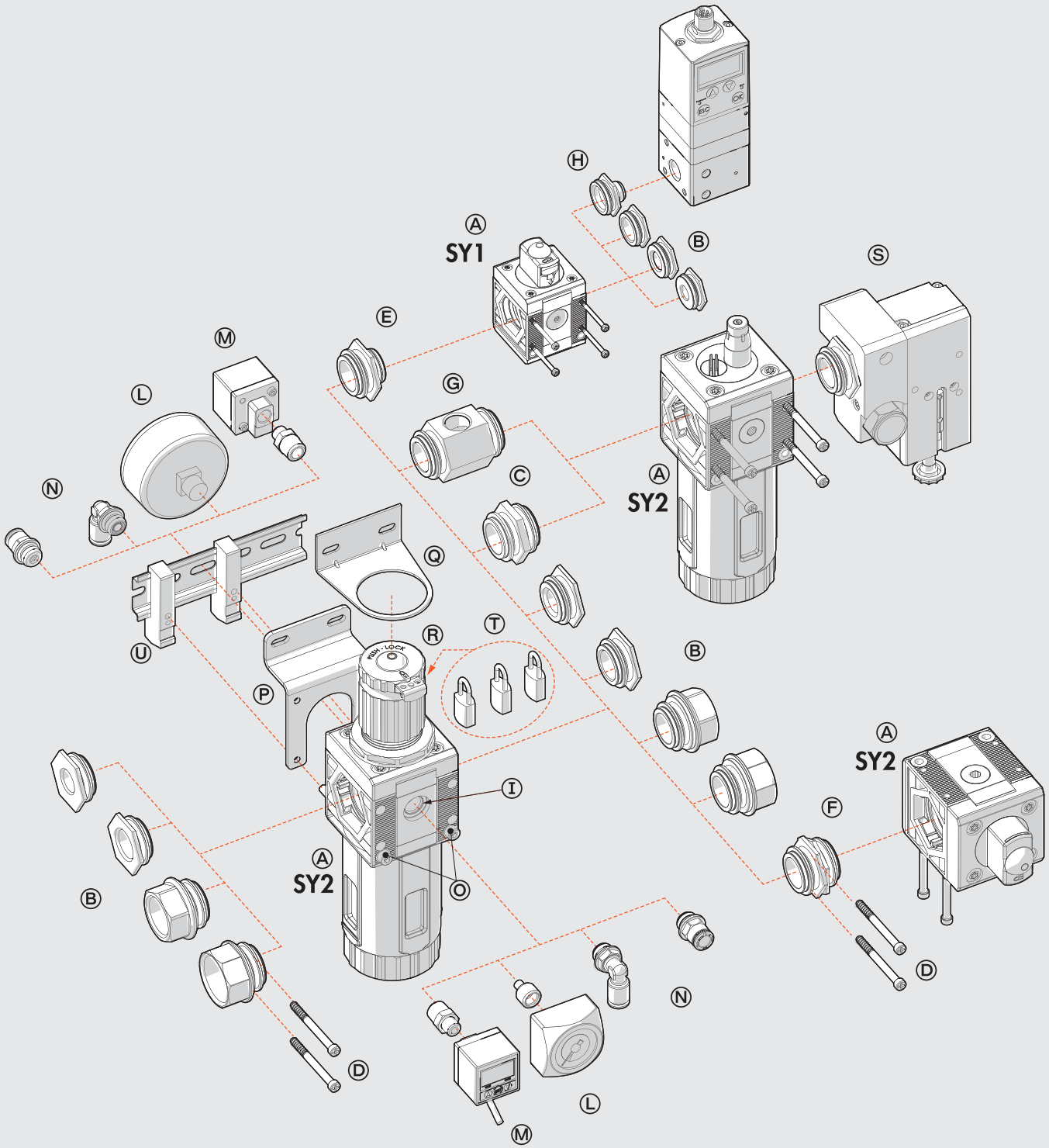


The bracket can be secured in any position, and the fittings can be mounted on the pressure gauge air intake at the back of the unit.

On a DIN EN50022 bar with the apposite adaptator



MODULARITY AND FLEXIBILITY



The various elements of Syntesi® Ⓐ can be connected to the air feed and delivery circuit using pneumatic nickel brass or passivated aluminium ports Ⓑ and can be fixed together using nipples Ⓒ.
The nipples and ports are easy to remove by unscrewing the two front screws Ⓓ. This solution has numerous advantages:
- Reduced overall dimensions.
- Free composition of multiple elements, without the need for brackets, stay bolts or yoke.
- The threads for the fittings are metallic, allowing high tightening torques, also for tapered threads.
- Maximum flexibility: a unit can be transformed at any time by adding an element or replacing a port with another one, e.g. 1/4" instead of 1/8".
- The air intake port can be the same or different from the outlet port, as desired.

Standard Syntesi® ports are: 1/8", 1/4", 3/8" for size 1; 3/8", 1/2", 3/4", 1" for size 2.
It may be necessary to use a vice to insert the bushes into size 2.
The nipples have different functions:
- Nipple Ⓒ joins two elements of the same size together.
- Size adaptor Ⓔ can be used to connect an element in the Syntesi® 2 series with one in the Syntesi® 1 series.
- The 90° adaptor Ⓕ can be used to connect two 90° angled elements. For example, it can help directing the regulator knob or the control knob of a sectioning valve towards the user.
- The two-way air intake Ⓖ is a simple and cost-effective system which, besides connecting two elements together, has 2 opposing threaded air intakes.
- The adaptor for Regtronic Ⓗ can be used to fix the Regtronic 1/4" proportional valve to a Syntesi® size 1 element.

Additional ports Ⓘ. On the front and back of ALL Syntesi® elements there is a port (1/8" for size 1, 1/4" for size 2) that can be used for pressure gauges Ⓛ, pressure switches Ⓜ or, given the high flow rate, as additional air take-off Ⓝ. These ports are downstream of the element, so, for example, a regulator port can supply air at a set pressure or a filter port can supply filtered air (not valid for activated carbon filter and depurator).
Wall fixing. Only two through screws Ⓞ are needed. No bulky brackets or additional flanges are required. The bracket Ⓟ can be used to separate the unit from the fixing wall, e.g. to mount a fitting to the rear port.
Fixing on a DIN EN50022 bar. Can be done using the bracket kit Ⓤ.
Regulator fixing bracket Ⓠ. Regulators and filter-regulators can also be fixed using a steel bracket Ⓠ that embraces the bell.
Padlockable knob Ⓡ. The knobs of regulators, filter-regulator and sectioning valves can all be padlocked. The steel plate is included in the supply. You can insert up to two 3 mm diameter padlocks Ⓣ on size 1 and three padlocks on size 2. As an alternative, the sectioning valve can have a steel plate suitable for a single 6 mm diameter padlock.
Safety valve Ⓢ. The unit can incorporate a series 70 SAFE AIR® safety valve.

SYNTESI® KEY TO CODES

KEY TO CODES SINGLE ELEMENT

56	1	1	F	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**TYPE**	**THREADED OUTPUT CONNECTION**
56 Syntesi **5X** Syntesi anti-corrosion	**1** Size 1	**0** Without bushing **1** 1/8″ port **2** 1/4″ port **3** 3/8″ port	**F** Filter **D** Depurator **C** Active carbon filter **R** Pressure regulator **B** Filter-regulator **L** Lubricator ● **V** Shut off valve ▲ **A** Progressive starter ▲ **S** Pressure switches **P** Air take-off	Varies from element to element	**0** Without bushing **1** 1/8″ port **2** 1/4″ port **3** 3/8″ port
	2 Size 2	**0** Without bushing **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port			**0** Without bushing **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port

● The anti-corrosion version of this element is only available with manual actuation.
▲ Not available in the anti-corrosion version.

KEY TO CODES UNIT COMPOSED OF TWO OR THREE ELEMENTS

56	1	1	V	10	B	24	L	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT 1**	**TYPE**	**ELEMENT 2**	**TYPE**	**ELEMENT 3**	**TYPE**	**THREADED OUTPUT CONNECTION**
56 Syntesi **5X** Syntesi anti-corrosion	**1** Size 1	**1** 1/8″ port **2** 1/4″ port **3** 3/8″ port	**F** Filter **D** Depurator **C** Active carbon filter **R** Pressure regulator **B** Filter-regulator **L** Lubricator ● **V** Shut off valve ▲ **A** Progressive starter ▲ **S** Pressure switches **P** Air Take-off	Varies from element to element	**F** Filter **D** Depurator **C** Active carbon filter **R** Pressure regulator **B** Filter-regulator **L** Lubricator ● **V** Shut off valve ▲ **A** Progressive starter ▲ **S** Pressure switches **P** Air Take-off	Varies from element to element	**F** Filter **D** Depurator **C** Active carbon filter **R** Pressure regulator **B** Filter-regulator **L** Lubricator ● **V** Shut off valve ▲ **A** Progressive starter ▲ **S** Pressure switches **P** Air Take-of	Varies from element to element	**1** 1/8″ port **2** 1/4″ port **3** 3/8″ port
	2 Size 2	**3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port							**3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port

● The anti-corrosion version of this element is only available with manual actuation.
▲ Not available in the anti-corrosion version.

SYNTESI® FILTER

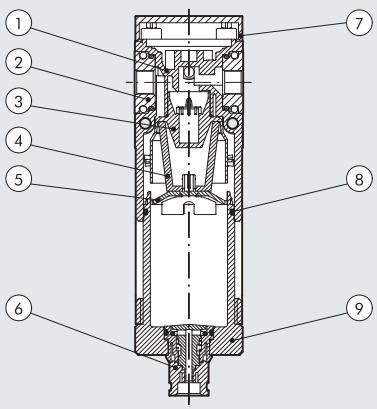
METAL WORK PNEUMATIC

The job of the filter is to retain liquid or solid impurities present in the compressed air. The incoming air is moved by the centrifuge unit, so that liquid particles, which are heavier, are projected against the walls of the container and force to adhere to it. As they accumulate, the create drops that deposit on the bottom by gravity.
The remaining solid particles are held back by the porous filtering element.
The condensate is maintained in a quiet state to prevent the deposited impurities from re-entering the circulation. The condensate drains out through the drain cock provided.
The RMSA drain discharges when the pressure in the filter drops to zero. Alternatively the condensate can be drained by hand by pressing the button.
The RA drain discharges condensate from the container automatically whenever necessary, regardless of the pressure level.
The SAC tap drains the condensate only as the result **of sudden changes in compressed air requests**.
On the front and back there is a port (1/8" for size 1 and 1/4" forsize 2) that can be used with pressure gauges, pressure switches or as an additional filtered air intake.

TECHNICAL DATA		FIL SY1			FIL SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Degree of filtration	µm	5 (yellow) - output air purity class ISO8573-1: 3.7.4						
		20 (white) - output air purity class ISO8573-1: 4.7.4						
		50 (blue) - output air purity class ISO8573-1: 5.7.4						
Max. input pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	900	1200	1300	3400	3800	3800	
	scfm	32	42	46	120	135	135	
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1300	1650	1750	4500	5200	5200	
	scfm	46	58	62	159	184	184	
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Weight	g	178	173	164	488	461	457	445
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure						
		RA: automatic drain with condensate discharge, independent of pressure and flow rate						
		SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**						
		Note: **the maximum input pressure for the RA version must not exceed 10 bar**						
Fluid		Compressed air or other inert gases						
Condensate bowl capacity	cm^3	30			70			
Mounting position		Vertical			Vertical			
Port for additional air take-off		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500			1500			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			53			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			

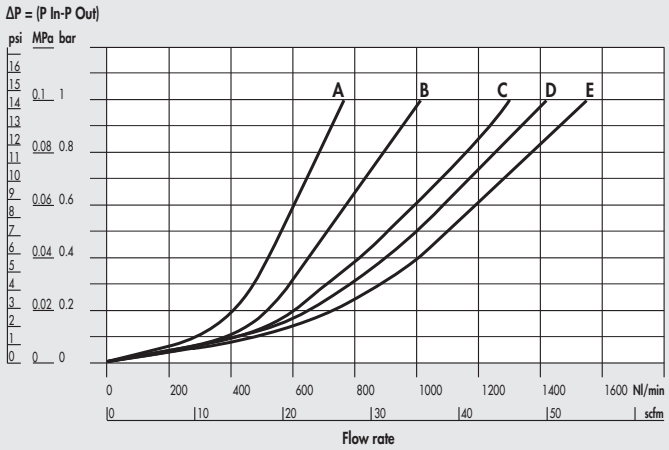
COMPONENTS

① Technopolymer filter body
② IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
③ Technopolymer centrifuge
④ Sintered HDPE filter cartridge
⑤ Technopolymer screen
⑥ Drain (RMSA)
⑦ Technolpolymer plate
⑧ NBR o-ring gaskets
⑨ Clear technopolymer bowl

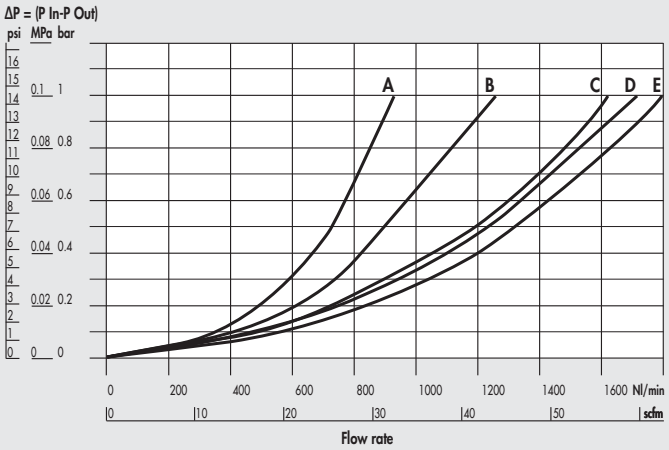


FLOW CHARTS

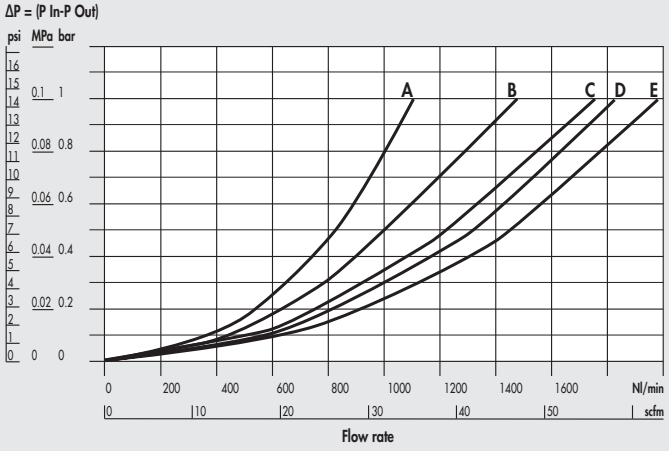
FIL Syntesi® **SY1** 1/8"



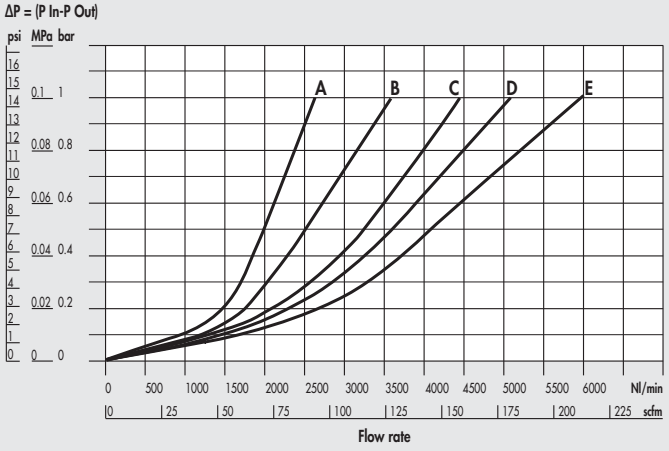
FIL Syntesi® **SY1** 1/4"



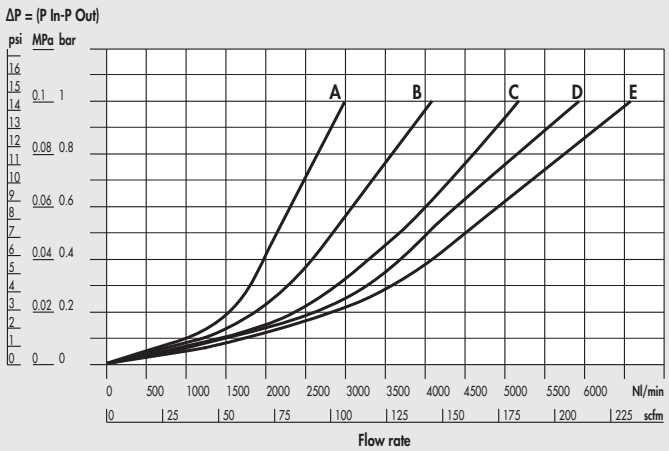
FIL Syntesi® **SY1** 3/8"



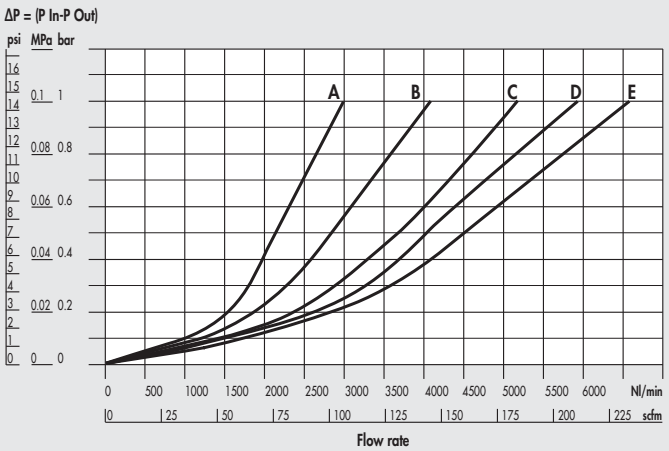
FIL Syntesi® **SY2** 3/8"



FIL Syntesi® **SY2** 1/2"



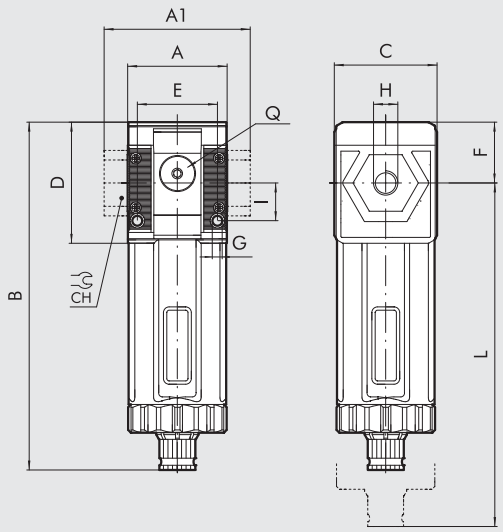
FIL Syntesi® **SY2** 3/4"-1"



A = 2.5 bar - 0.25 MPa - 36 psi
B = 4 bar - 0.4 MPa - 58 psi
C = 6.3 bar - 0.63 MPa - 91 psi
D = 8 bar - 0.8 MPa - 116 psi
E = 10 bar - 1 MPa - 145 psi

METAL WORK PNEUMATIC

DIMENSIONS



		SIZE 1			SIZE 2			
H (threaded port)		1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
A		42			61			
A1		-	-	44	-	-	95	95
B	RMSA	148			178			
	RA/SAC	152			182			
C		44			61			
CH		-			-	-	32	36
D		51.5			70.5			
E		33.5			47.5			
F		25.8			38.2			
G		Hole for M4 screws			Hole for M5 screws			
I		16			22.5			
L	RMSA	202			245			
	RA/SAC	206			249			
Q (no. 2 additional air takes-off)		1/8″			1/4″			

KEY TO CODES

56	1	1	F	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**DEGREE OF FILTRATION AND TYPE OF CONDENSATE DRAIN**	**THREADED OUTPUT CONNECTION**
56 Syntesi	**1** Size 1	**0** Without bushing	**F** Filter	**10** 5 µm, RMSA	**0** Without bushing
5X Syntesi anti-corrosion		**1** 1/8″ port		**20** 20 µm, RMSA	**1** 1/8″ port
		2 1/4″ port		**30** 50 µm, RMSA	**2** 1/4″ port
		3 3/8″ port		**40** 5 µm, RA	**3** 3/8″ port
	2 Size 2	**0** Without bushing		**50** 20 µm, RA	**0** Without bushing
		3 3/8″ port		**60** 50 µm, RA	**3** 3/8″ port
		4 1/2″ port		**11** 5 µm, SAC	**4** 1/2″ port
		5 3/4″ port		**21** 20 µm, SAC	**5** 3/4″ port
		6 1″ port		**31** 50 µm, SAC	**6** 1″ port

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.

RA: automatic drain with condensate discharge, independent of pressure and flow rate.

SAC: automatic drain with condensate discharge.

Operates by depression – requires variable air take-offs.

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
Syntesi® SY1 FILTER	
5610F100	FIL SY1 5 RMSA without bushings
5610F200	FIL SY1 20 RMSA without bushings
5610F400	FIL SY1 5 RA without bushings
5610F500	FIL SY1 20 RA without bushings
5611F101	FIL SY1 1/8 5 RMSA
5611F201	FIL SY1 1/8 20 RMSA
5611F401	FIL SY1 1/8 5 RA
5611F501	FIL SY1 1/8 20 RA
5612F102	FIL SY1 1/4 5 RMSA
5612F202	FIL SY1 1/4 20 RMSA
5612F402	FIL SY1 1/4 5 RA
5612F502	FIL SY1 1/4 20 RA
5613F103	FIL SY1 3/8 5 RMSA
5613F203	FIL SY1 3/8 20 RMSA
5613F403	FIL SY1 3/8 5 RA
5613F503	FIL SY1 3/8 20 RA

Code	Description
Syntesi® SY2 FILTER	
5620F100	FIL SY2 5 RMSA without bushings
5620F200	FIL SY2 20 RMSA without bushings
5620F400	FIL SY2 5 RA without bushings
5620F500	FIL SY2 20 RA without bushings
5623F103	FIL SY2 3/8 5 RMSA
5623F203	FIL SY2 3/8 20 RMSA
5623F403	FIL SY2 3/8 5 RA
5623F503	FIL SY2 3/8 20 RA
5624F104	FIL SY2 1/2 5 RMSA
5624F204	FIL SY2 1/2 20 RMSA
5624F404	FIL SY2 1/2 5 RA
5624F504	FIL SY2 1/2 20 RA
5625F105	FIL SY2 3/4 5 RMSA
5625F205	FIL SY2 3/4 20 RMSA
5625F405	FIL SY2 3/4 5 RA
5625F505	FIL SY2 3/4 20 RA

Code	Description
Syntesi® SY2 FILTER	
5626F106	FIL SY2 1 5 RMSA
5626F206	FIL SY2 1 20 RMSA
5626F406	FIL SY2 1 5 RA
5626F506	FIL SY2 1 20 RA

NOTE

Anti-corrosion version

5X_ _ _ _ _

Example

5X11F101 FIL SY1 1/8 5 RMSA anti-corrosion

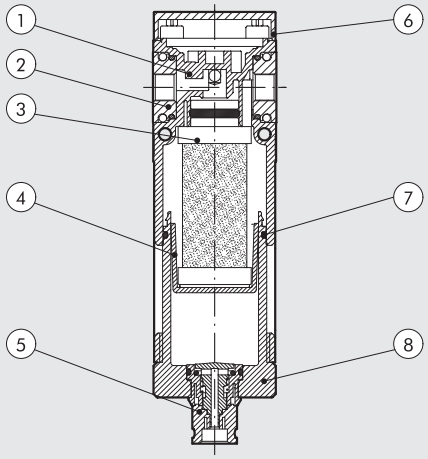
SYNTESI® DEPURATOR

The job of the filter purifier is to separate liquid and solid particles dispersed in the compressed air with a high degree of efficiency.
This separation is achieved by means of a special filtering element called a "coalescence cartridge".
It is particularly indicated for eliminating traces of oil present in the compressed air. The air flow rate must remain below the maximum values to achieve the desired degree of purification. Beyond this value, there may be a decline in the quality of air from the purifier.
On the front and back there is a port (1/8" for size 1 and 1/4" for size 2) that can be used with pressure gauges, pressure switches or as an additional air intake. **The air taken from here is not purified**.

TECHNICAL DATA		DEP SY1			DEP SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Degree of filtration	µm	0.01 - output air purity class ISO8573-1: 1.7.2						
Max. input pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Suggested flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	460			620			
	scfm	9			37			
Maximun suggested flow rate		See graph on the next page						
		N.B.: flow rates higher than the recommended value reduces purification efficiency						
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Weight	g	194	189	180	483	456	452	440
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure						
		SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs**.						
Fluid		Compressed air or other inert gases						
Bowl capacity	cm^3	15			40			
Mounting position		Vertical			Vertical			
Port for additional air take-off (not purified air)		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500			1500			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			53			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Notes on use		It is advisable to mount a 5 µm filter upstream of the purifier to retain solid particles						

COMPONENTS

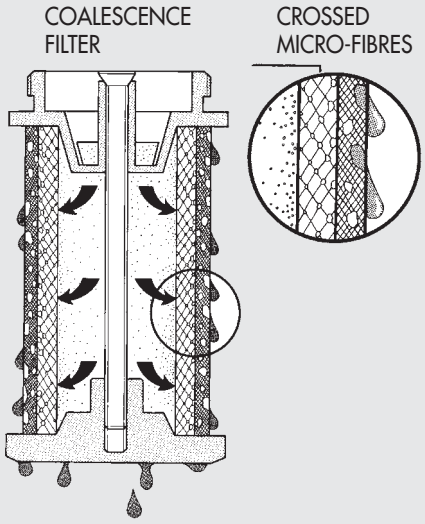
① Technopolymer depurator body
② IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
③ Coalescence cartridge
④ Technopolymer cartridge support
⑤ Drain (RMSA)
⑥ Technolpolymer plate
⑦ NBR o-ring gaskets
⑧ Clear technopolymer bowl



METAL WORK PNEUMATIC

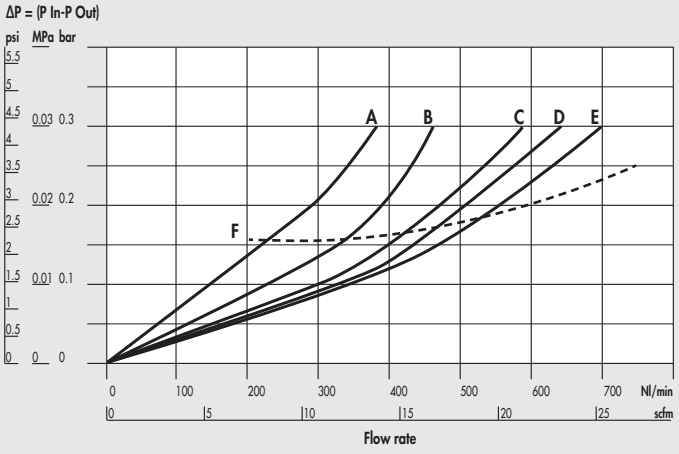
HOW THE COALESCENCE CARTRIDGE WORKS

Air from the mains – full of impurities – flows into the coalescence cartridge and then passes through the crossed micro-fibres that make up the cartridge. During this movement the liquid particles come into contact with the crossed micro-fibres and adhere to them. Due to the air pressure and gravity they join up with other micro-drops at each cross-over point and gradually increase in volume, leading to the physical phenomenon called coalescence. When they stop moving, the drops deposit on the outside of the cartridge, from which they detach and drop to the bottom. Since the volume of liquid leaving the cartridge is exactly the same as the drops arriving, the coalescence cartridge ought to work indefinitely. Solid particles are caught with the same efficiency but, unlike drops, they are not drained out and clog the cartridge. To get round this problem, it is necessary to mount a 5µm prefilter before the fine oil filter to separate the solid particles first.

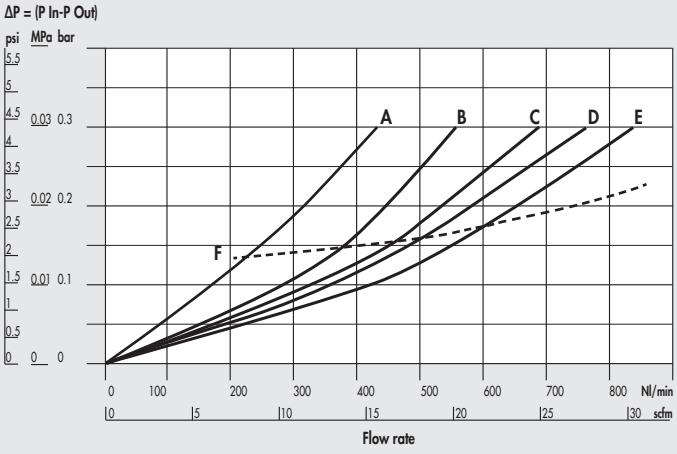


FLOW CHARTS

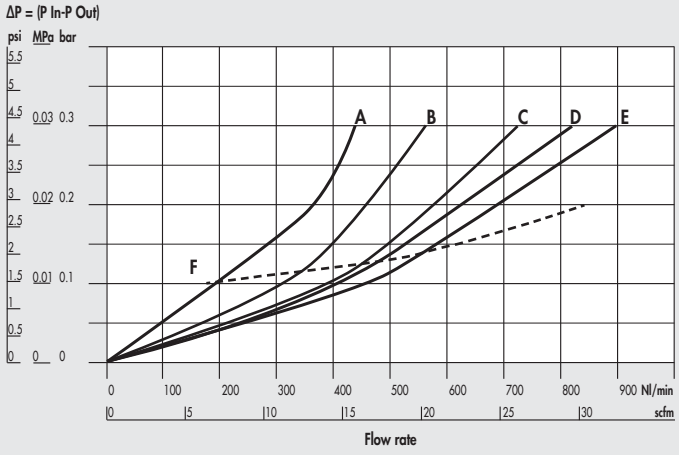
DEP Syntesi® **SY1** 1/8"



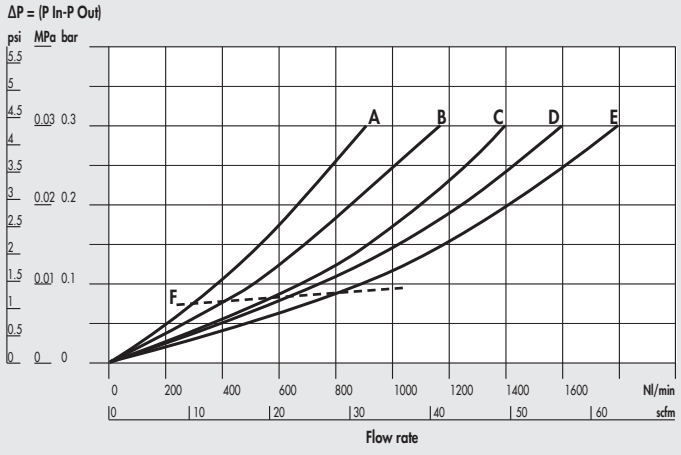
DEP Syntesi® **SY1** 1/4"



DEP Syntesi® **SY1** 3/8"

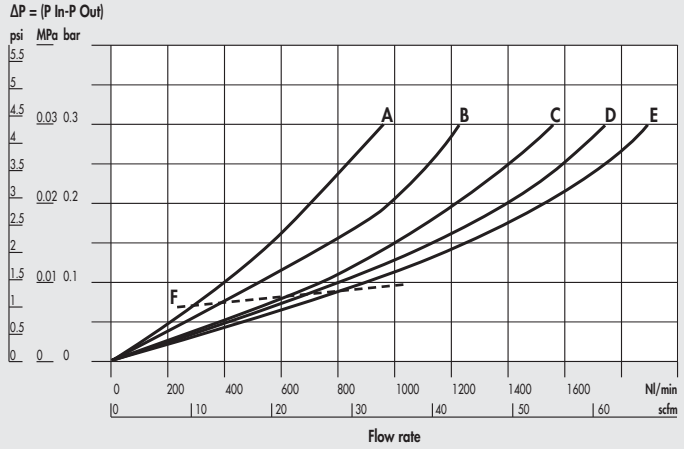


DEP Syntesi® **SY2** 3/8"

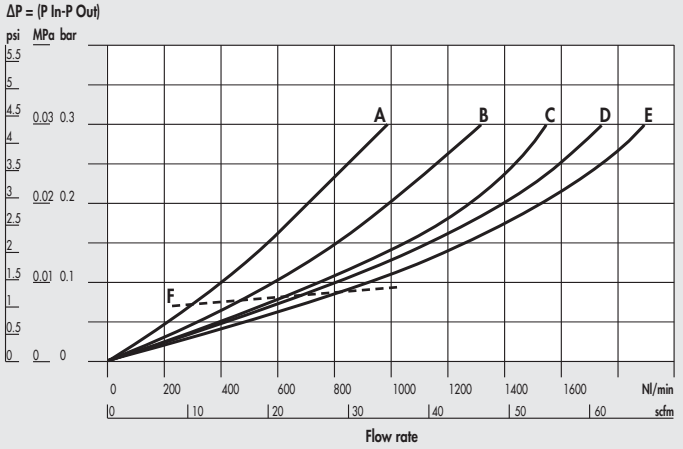


A = 2.5 bar - 0.25 MPa - 36 psi
B = 4 bar - 0.4 MPa - 58 psi
C = 6.3 bar - 0.63 MPa - 91 psi
D = 8 bar - 0.8 MPa - 116 psi
E = 10 bar - 1 MPa - 145 psi
F = max suggested flow

DEP Syntesi® **SY2** 1/2″

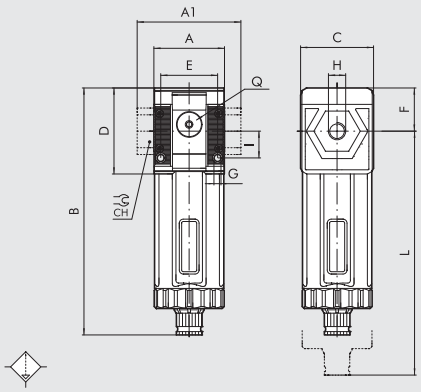


DEP Syntesi® **SY2** 3/4″ - 1″



A = 2.5 bar - 0.25 MPa - 36 psi
B = 4 bar - 0.4 MPa - 58 psi
C = 6.3 bar - 0.63 MPa - 91 psi
D = 8 bar - 0.8 MPa - 116 psi
E = 10 bar - 1 MPa - 145 psi
F = max suggested flow

DIMENSIONS



		SIZE 1			SIZE 2			
H (threaded port)		1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
A		42			61			
A1		-	-	44	-	-	95	95
B	**RMSA**	148			178			
	SAC	152			182			
C		44			61			
CH		-			-	-	32	36
D		51.5			70.5			
E		33.5			47.5			
F		25.8			38.2			
G		Hole for M4 screws			Hole for M5 screws			
I		16			22.5			
L	**RMSA**	202			245			
	SAC	206			249			
Q (no. 2 additional air takes-off)		1/8″			1/4″			

KEY TO CODES

56	1	1	D	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**TYPE**	**THREADED OUTPUT CONNECTION**
56 Syntesi	**1** Size 1	**0** Without bushing	**D** Depurator	**10** RMSA	**0** Without bushing
5X Syntesi anti-corrosion		**1** 1/8″ port		**11** SAC	**1** 1/8″ port
		2 1/4″ port			**2** 1/4″ port
		3 3/8″ port			**3** 3/8″ port
	2 Size 2	**0** Without bushing			**0** Without bushing
		3 3/8″ port			**3** 3/8″ port
		4 1/2″ port			**4** 1/2″ port
		5 3/4″ port			**5** 3/4″ port
		6 1″ port			**6** 1″ port

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.

SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
Syntesi® SY1 DEPURATOR	
5610D100	DEP SY1 RMSA without bushings
5611D101	DEP SY1 1/8 RMSA
5612D102	DEP SY1 1/4 RMSA
5613D103	DEP SY1 3/8 RMSA

Code	Description
Syntesi® SY2 DEPURATOR	
5620D100	DEP SY2 RMSA without bushings
5623D103	DEP SY2 3/8 RMSA
5624D104	DEP SY2 1/2 RMSA
5625D105	DEP SY2 3/4 RMSA
5626D106	DEP SY2 1 RMSA

NOTE	
Anti-corrosion version	
5X_ _ _ _ _	
Example	
5X11D101	DEP SY1 1/8 RMSA anti-corrosion

SYNTESI® ACTIVE CARBON FILTER

METAL WORK PNEUMATIC

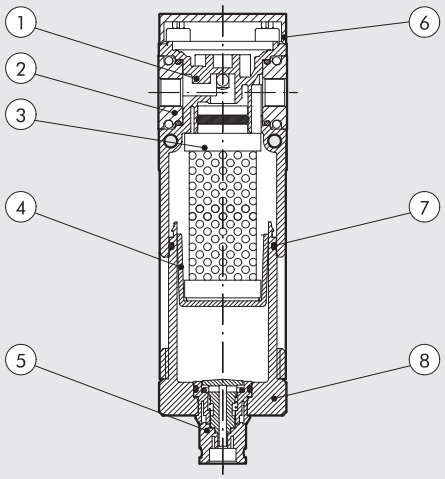
Activated-carbon filtering systems achieve the highest standard of purification possible in industrial applications. They eliminate all traces of oils, solvents and hydrocarbons, and remove unpleasant odours.
The operating principle uses activated carbon, which absorbs most of the polluting particles in the air thanks to minute holes in the granules of carbon.
On the front and back there is a port (1/8" for size 1 and 1/4" for size 2) that can be used with pressure gauges, pressure switches or as an additional air intake. **The air taken from here is not filtered by the activated-carbon cartridge**.
Cartridge life and efficiency can be increased by using pre-filtered (5µm) and purified (0.01µm) air.
The cartridge must be replaced at set intervals as there is no difference in load loss between an efficient cartridge and a saturated one.
N.B.: to ensure the performance and duration stated on the data sheet, the load loss (ΔP) must not exceed 75 mbar.

TECHNICAL DATA		FIL CA SY1			FIL CA SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Residual oil at 20°C *	mg/m³	0.003 - output air purity class ISO8573-1: 1.7.1						
Duration of cartridge *	hours	4000			4000			
Max. inlet pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Suggested flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	350			800			
	scfm	12			28			
		N.B.: flow rates higher than the recommended value reduces purification efficiency						
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Weight	g	195	190	181	483	456	452	440
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure						
Fluid		0.01 µm filtred and depurated air						
Mounting position		In any position			In any position			
Additional air take-off port (unfiltered air from cartridge CA)		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500			1500			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			53			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Notes on use		Upstream it's necessary to mount a coalescence filter depurator of 0.01µm.						

* if the load loss of 75 mbar is not exceeded

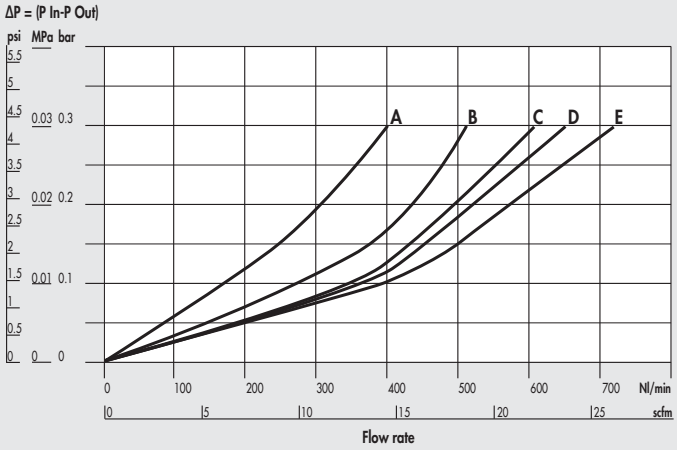
COMPONENTS

① Technopolymer depurator body
② IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
③ Active carbon cartridge
④ Technopolymer cartridge support
⑤ Drain (RMSA)
⑥ Technolpolymer plate
⑦ NBR o-ring gasket
⑧ Clear technopolymer bowl

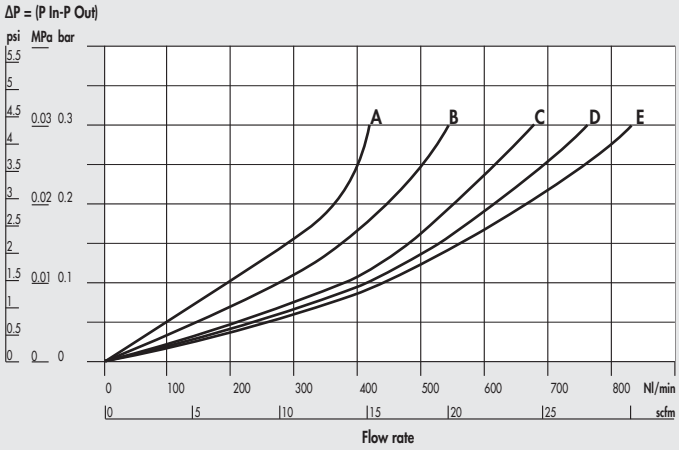


FLOW CHARTS

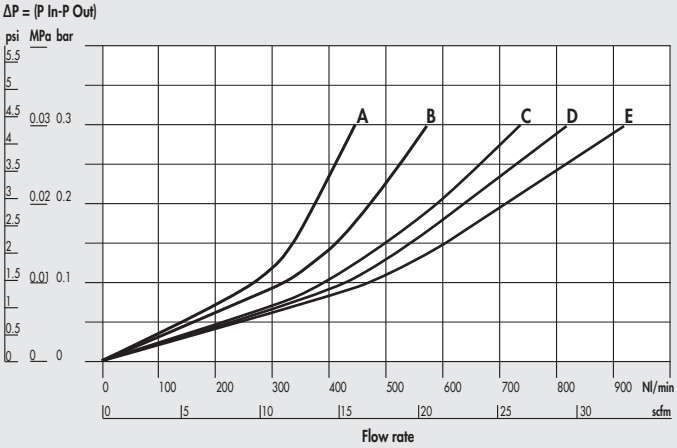
FIL CA Syntesi® **SY1** 1/8"



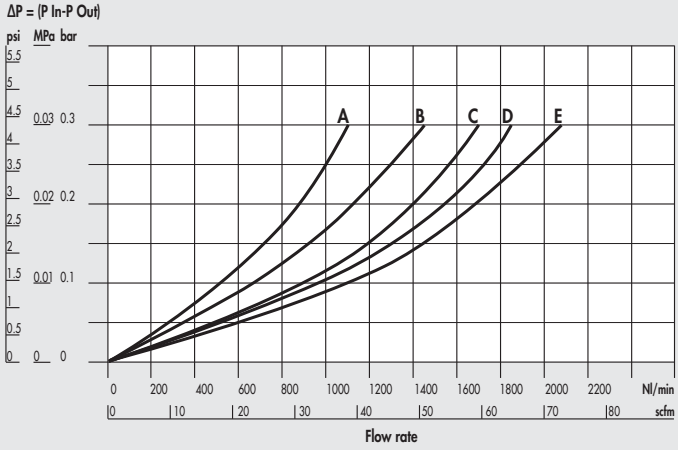
FIL CA Syntesi® **SY1** 1/4"



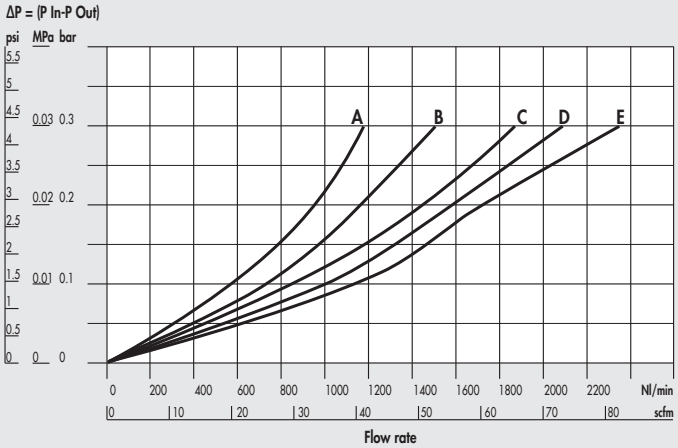
FIL CA Syntesi® **SY1** 3/8"



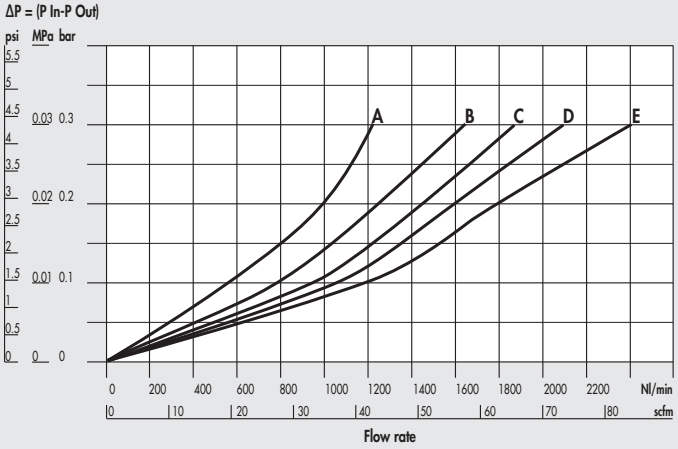
FIL CA Syntesi® **SY2** 3/8"



FIL CA Syntesi® **SY2** 1/2"



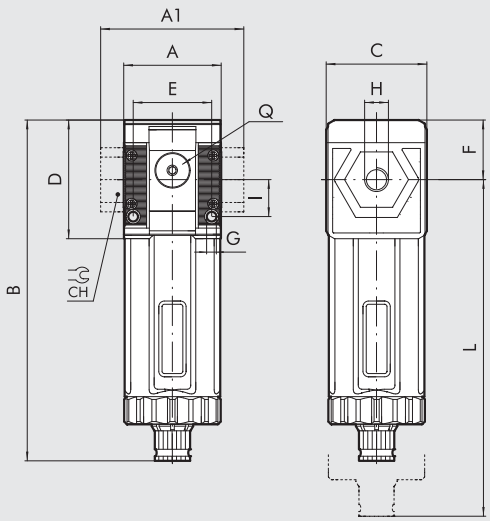
FIL CA Syntesi® **SY2** 3/4" - 1"



A = 2.5 bar - 0.25 MPa - 36 psi
B = 4 bar - 0.4 MPa - 58 psi
C = 6.3 bar - 0.63 MPa - 91 psi
D = 8 bar - 0.8 MPa - 116 psi
E = 10 bar - 1 MPa - 145 psi

METAL WORK PNEUMATIC

DIMENSIONS



		SIZE 1			SIZE 2			
H (threaded port)		1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
A		42			61			
A1		-	-	44	-	-	95	95
B	RMSA	148			178			
C		44			61			
CH		-			-	-	32	36
D		51.5			70.5			
E		33.5			47.5			
F		25.8			38.2			
G		Hole for M4 screws			Hole for M5 screws			
I		16			22.5			
L	RMSA	202			245			
Q (no. 2 additional air takes-off)		1/8″			1/4″			

KEY TO CODES

56	1	1	C	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**TYPE**	**THREADED OUTPUT CONNECTION**
56 Syntesi	**1** Size 1	**0** Without bushing	**C** Active carbon filter	**10** RMSA	**0** Without bushing
5X Syntesi anti-corrosion		**1** 1/8″ port			**1** 1/8″ port
		2 1/4″ port			**2** 1/4″ port
		3 3/8″ port			**3** 3/8″ port
	2 Size 2	**0** Without bushing			**0** Without bushing
		3 3/8″ port			**3** 3/8″ port
		4 1/2″ port			**4** 1/2″ port
		5 3/4″ port			**5** 3/4″ port
		6 1″ port			**6** 1″ port

RMSA: Drain with manual condensate discharge and automatic discharge at zero pressure.

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
FILTRO CARBONI ATTIVI Syntesi® SY1	
5610C100	AC SY1 RMSA without bushings
5611C101	AC SY1 1/8 RMSA
5612C102	AC SY1 1/4 RMSA
5613C103	AC SY1 3/8 RMSA

Code	Description
FILTRO CARBONI ATTIVI Syntesi® SY2	
5620C100	AC SY2 RMSA without bushings
5623C103	AC SY2 3/8 RMSA
5624C104	AC SY2 1/2 RMSA
5625C105	AC SY2 3/4 RMSA
5626C106	AC SY2 1 RMSA

NOTE	
Anti-corrosion version	
5X_ _ _ _ _	
Example	
5X11C101	AC SY1 1/8 RMSA anti-corrosion

SYNTESI® REGULATOR

Syntesi® pressure regulator is based on the rolling diaphragm principle, which offers numerous advantages compared to systems using a flat diaphragm:

- Increased stroke, allowing wider valve aperture and hence greater flow rate.
- Decreased dynamic and pick-up friction, and hence quicker response and enhanced sensitivity.
- Greater accuracy in maintaining the pressure setting, both with both variable flow rates and different supply pressures.

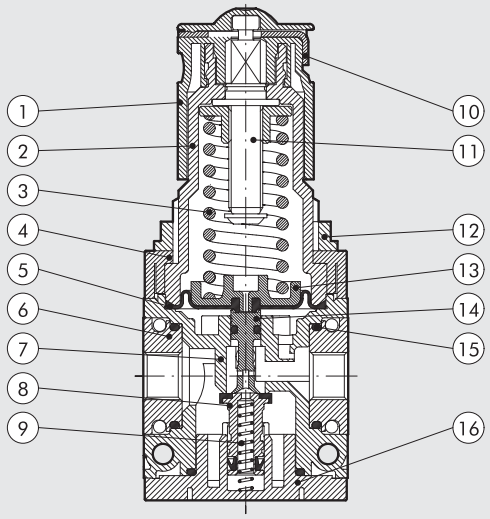
The regulator includes a compensation system that keeps the pressure setting virtually constant, even when the upstream pressure changes. This is achieved mainly by the design of the valve, which is pneumatically balanced.
If the downstream pressure rises above the threshold value, the air is discharged (relief valve) until it drops below the maximum value.
A special device relieves downstream pressure rapidly when the upstream pressure drops to zero. This means the regulator can be positioned between a valve and a cylinder because the air can flow in both directions, towards the cylinder with regulated pressure, or return towards the valve during relief.
The knob is the push-lock type – once the pressure has been set, press it and it locks in position. In this position you can pull out the plate and attach two padlocks on size 1 or three padlocks on size 2 in order to avoid possible tampering. On the front and back there is a port (1/8" for size 1 and 1/4" size 2) that can be used with pressure gauges, pressure switches or as an additional regulated air intake.

TECHNICAL DATA		REG SY1			REG SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Max. inlet pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	570	1600	2900	3000	4300	4700	
(inlet pressure 10 bar)	scfm	20	57	103	106	152	166	
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1200	2800	3350	5300	7400	7600	
(inlet pressure 10 bar)	scfm	42	99	119	188	261	267	
Relief valve flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	70			100			
	scfm	2.5			3.5			
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Full outflow with zero inlet pressure		Included						
Padlockable knob		Included						
Upstream pressure compensation		Included, via balanced valve						
Weight	g	193	188	179	546	519	515	503
Fluid		Compressed air or other inert gases						
Mounting position		In any position						
Additional air take-off, for pressure gauges or fittings		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500			1400			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			50			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Notes on use		The pressure must always be set upwards. For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value. On request version without overpressure exaust						

METAL WORK PNEUMATIC

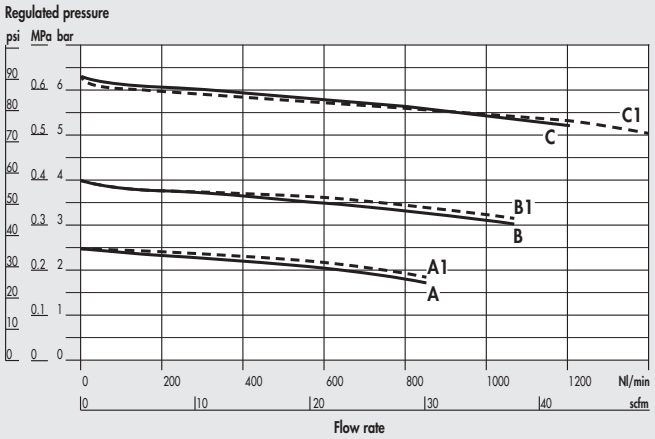
COMPONENTS

① Technopolymer adjusting knob
② Technopolymer bell
③ Steel adjusting spring (with Geomet® treatment for anti-corrosion version)
④ Technopolymer flange
⑤ Rolling diaphragm
⑥ IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
⑦ Technopolymer regulator body
⑧ OT58 brass valve, with NBR vulcanized gasket
⑨ Stainless steel valve spring
⑩ Galvanised steel plate for knob locking (stainless steel for anti-corrosion version)
⑪ OT58 brass adjusting screw
⑫ Technopolymer ring nut
⑬ Technopolymer plate
⑭ Technopolymer rod
⑮ NBR o-ring gasket
⑯ Technopolymer plug

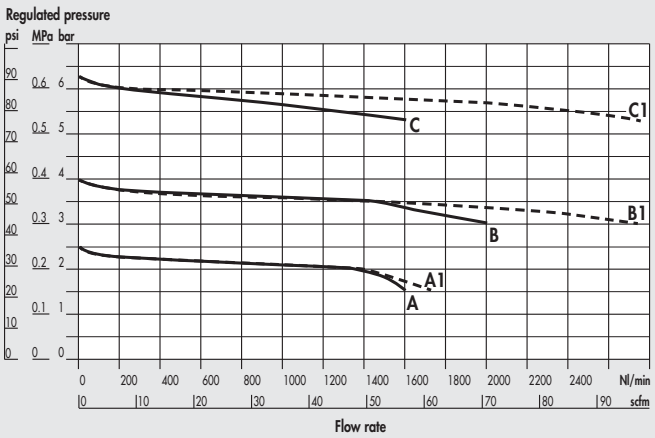


FLOW CHARTS

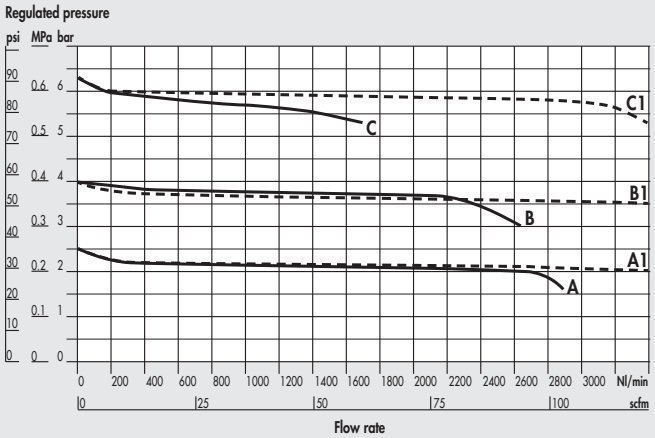
REG Syntesi® **SY1** 1/8"



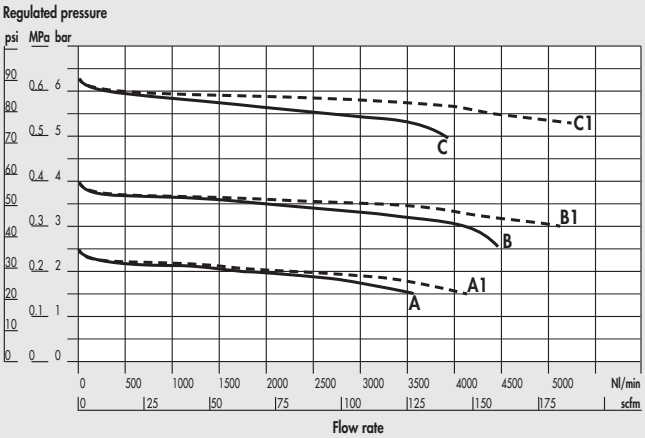
REG Syntesi® **SY1** 1/4"



REG Syntesi® **SY1** 3/8"

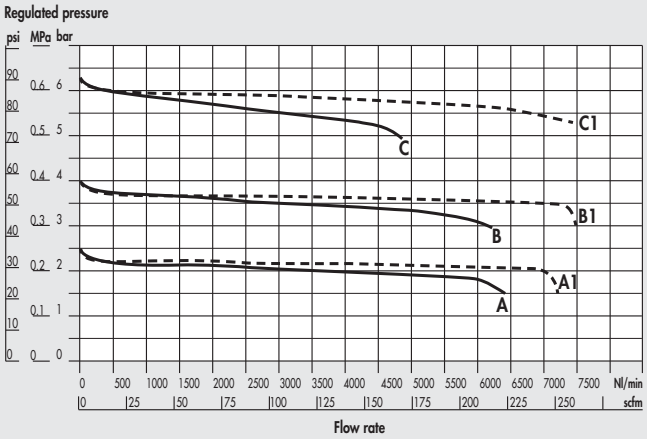


REG Syntesi® **SY2** 3/8"

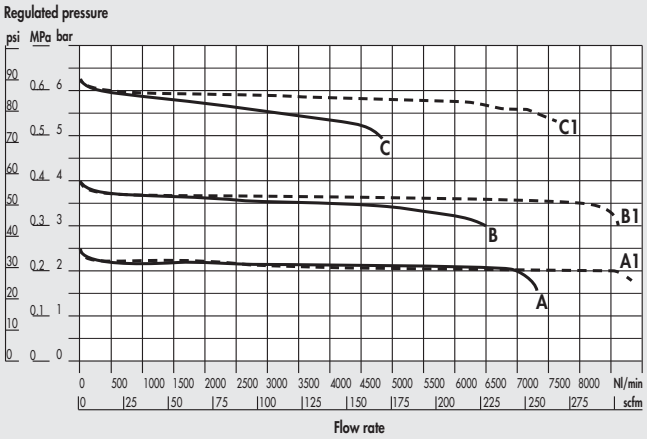


A = P In 7 bar - P Out 2.5 bar
B = P In 7 bar - P Out 4 bar
C = P In 7 bar - P Out 6.3 bar
A1 = P In 10 bar - P Out 2.5 bar
B1 = P In 10 bar - P Out 4 bar
C1 = P In 10 bar - P Out 6.3 bar

REG Syntesi® **SY2** 1/2"

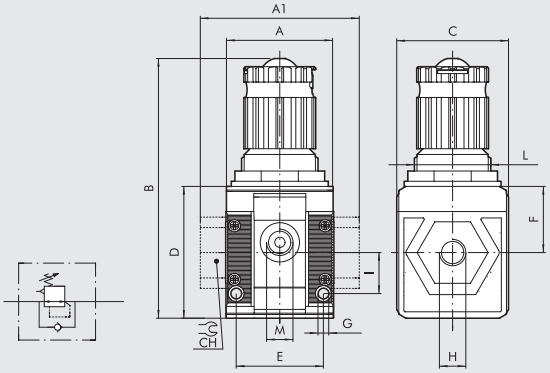


REG Syntesi® **SY2** 3/4" - 1"



A = P In 7 bar - P Out 2.5 bar
B = P In 7 bar - P Out 4 bar
C = P In 7 bar - P Out 6.3 bar
A1 = P In 10 bar - P Out 2.5 bar
B1 = P In 10 bar - P Out 4 bar
C1 = P In 10 bar - P Out 6.3 bar

DIMENSIONS



	SIZE 1			SIZE 2			
H (threaded port)	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
A	42			61			
A1	-	-	44	-	-	95	95
B	102			142			
C	44			61			
CH	-			-	-	32	36
D	51.5			70.5			
E	33.5			47.5			
F	25.8			38.2			
G	Hole for M4 screws			Hole for M5 screws			
I	16			22.5			
L	M30x1.5			M38x2			
M (pressure gauge port or air takes-off)	1/8"			1/4"			

KEY TO CODES

56	1	1	R	14	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**SETTING RANGE**	**THREADED OUTPUT CONNECTION**
56 Syntesi	**1** Size 1	**0** Without bushing	**R** Pressure regulator	● **10** 0 ÷ 2 bar	**0** Without bushing
5X Syntesi anti-corrosion		**1** 1/8" port		✚ **12** 0 ÷ 4 bar	**1** 1/8" port
		2 1/4" port		**14** 0 ÷ 8 bar	**2** 1/4" port
		3 3/8" port		**16** 0 ÷ 12 bar	**3** 3/8" port
	2 Size 2	**0** Without bushing			**0** Without bushing
		3 3/8" port			**3** 3/8" port
		4 1/2" port			**4** 1/2" port
		5 3/4" port			**5** 3/4" port
		6 1" port			**6** 1" port

● Not available in the anti-corrosion version. ✚ Anti-corrosion version available only in size 1.

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
Syntesi® SY1 REGULATOR	
5610R140	REG SY1 08 without bushings
5610R160	REG SY1 012 without bushings
5611R141	REG SY1 1/8 08
5611R161	REG SY1 1/8 012
5612R142	REG SY1 1/4 08
5612R162	REG SY1 1/4 012
5613R143	REG SY1 3/8 08
5613R163	REG SY1 3/8 012

Code	Description
Syntesi® SY2 REGULATOR	
5620R140	REG SY2 08 without bushings
5620R160	REG SY2 012 without bushings
5623R143	REG SY2 3/8 08
5623R163	REG SY2 3/8 012
5624R144	REG SY2 1/2 08
5624R164	REG SY2 1/2 012
5625R145	REG SY2 3/4 08
5625R165	REG SY2 3/4 012

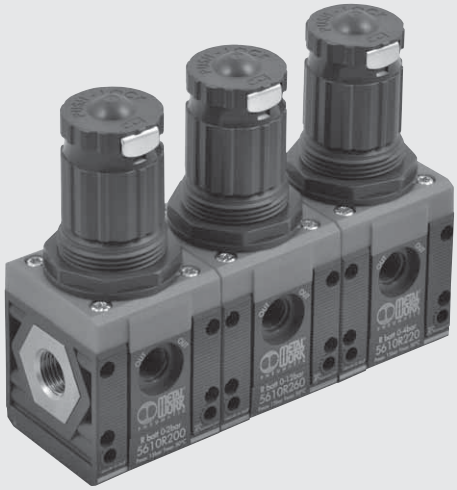
Code	Description
Syntesi® SY2 REGULATOR	
5626R146	REG SY2 1 08
5626R166	REG SY2 1 012

NOTE
Anti-corrosion version
5X_ _ _ _ _
Example
5X11R141 REG SY1 1/8 08 anti-corrosion

SYNTESI® IN-SERIES REGULATOR

METAL WORK PNEUMATIC

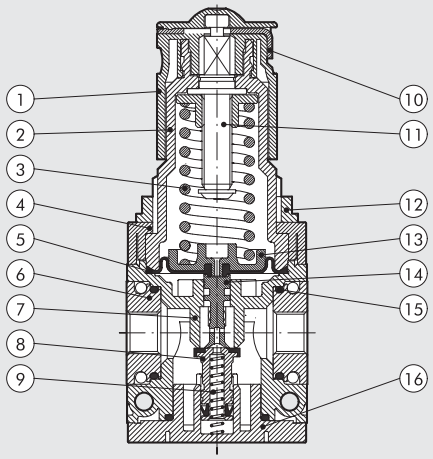
The in-series regulator is used to take air at a set pressure from the ports on the front and back of the body, while the pneumatic inlet and outlet ports are connected directly.
It is possible for instance to assemble several regulators side by side, all supplied at the same pressure, and obtain different regulated pressures, regardless of the pressure of the previous module.
The in-series regulator uses the same construction principles as the standard regulator, so the advantages are the same, such as compensation for upstream pressure changes, relief valve, rapid relief of the downstream pressure and a padlockable push-lock knob.



TECHNICAL DATA		IN-SERIES REGULATOR SY1			IN-SERIES REGULATOR SY2			
Threaded inlet port, through		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Utility threaded port		1/8"			1/4"			
Max. input pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	330			540			
	scfm	12			19			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	500			1000			
	scfm	18			35			
Relief valve flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	70			100			
	scfm	2.5			3.5			
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Full outflow with zero inlet pressure		Included						
Padlockable knob		Included						
Upstream pressure compensation		Included, via balanced valve						
Weight	g	193	188	179	546	519	515	503
Fluid		Compressed air or other inert gases						
Mounting position		In any position						
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Notes on use		The pressure must always be set upwards. For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value. On request version without overpressure exhaust						

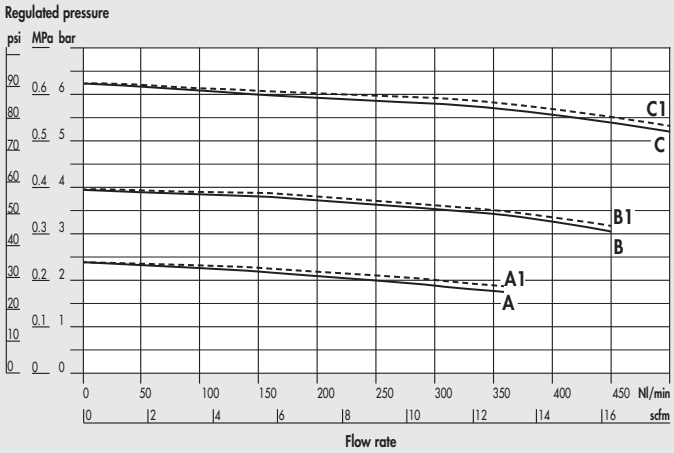
COMPONENTS

① Technopolymer adjusting knob
② Technopolymer bell
③ Steel adjusting spring (with Geomet® treatment for anti-corrosion version)
④ Technopolymer flange
⑤ Rolling diaphragm
⑥ IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
⑦ Technopolymer body
⑧ OT58 brass valve, with NBR vulcanized gasket
⑨ Stainless steel valve spring
⑩ Galvanised steel plate for knob locking (stainless steel for anti-corrosion version)
⑪ OT58 brass adjusting screw
⑫ Technopolymer ring nut
⑬ Technopolymer plate
⑭ Technopolymer rod
⑮ NBR o-ring gaskets
⑯ Technopolymer plug

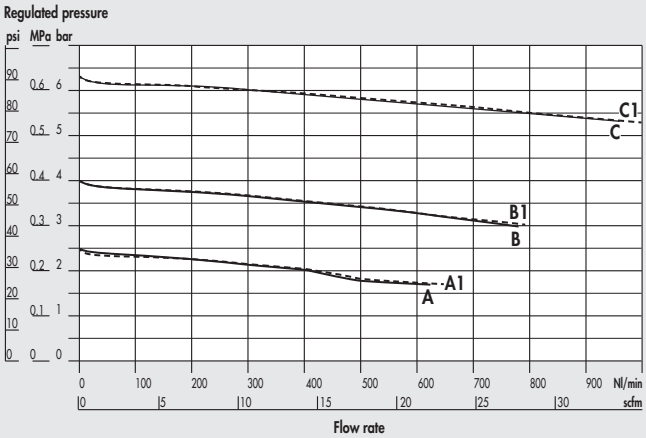


FLOW CHARTS

IN-SERIES REGULATOR Syntesi® **SY1** 1/4"-1/8"-3/8"



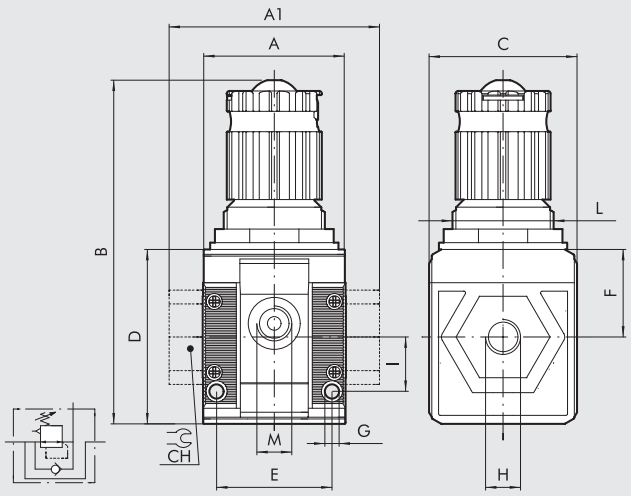
IN-SERIES REGULATOR Syntesi® **SY2** 3/8" - 1/2" - 3/4" - 1"



A = P In 7 bar - P Out 2.5 bar
B = P In 7 bar - P Out 4 bar
C = P In 7 bar - P Out 6.3 bar

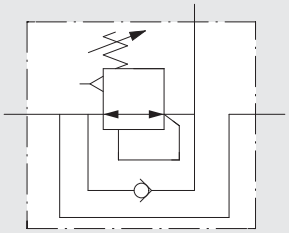
A1 = P In 10 bar - P Out 2.5 bar
B1 = P In 10 bar - P Out 4 bar
C1 = P In 10 bar - P Out 6.3 bar

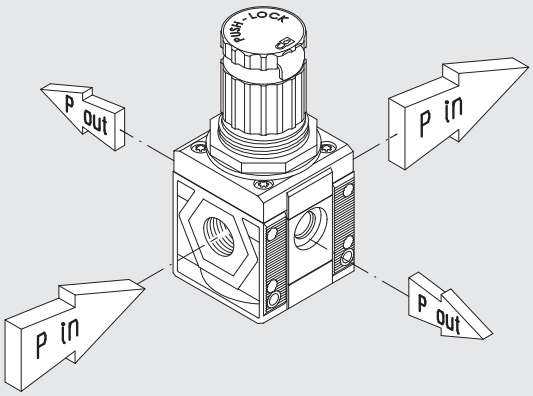
DIMENSIONS



	SIZE 1			SIZE 2			
H (threaded port)	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
A	42			61			
A1	-	-	44	-	-	95	95
B	102			142			
C	44			61			
CH	-			-	-	32	36
D	51.5			70.5			
E	33.5			47.5			
F	25.8			38.2			
G	Hole for M4 screws			Hole for M5 screws			
I	16			22.5			
L	M30x1.5			M38x2			
M (use)	1/8"			1/4"			

FUNCTION DIAGRAM





KEY TO CODES

56	1	1	R	24	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**IN-SERIES REGULATOR SETTING RANGE**	**THREADED OUTPUT CONNECTION**
56 Syntesi	**1** Size 1	**0** Without bushing	**R** Pressure regulator	● **20** 0 to 2 bar	**0** Without bushing
5X Syntesi anti-corrosion		**1** 1/8″ port		✚ **22** 0 to 4 bar	**1** 1/8″ port
		2 1/4″ port		**24** 0 to 8 bar	**2** 1/4″ port
		3 3/8″ port		**26** 0 to 12 bar	**3** 3/8″ port
	2 Size 2	**0** Without bushing			**0** Without bushing
		3 3/8″ port			**3** 3/8″ port
		4 1/2″ port			**4** 1/2″ port
		5 3/4″ port			**5** 3/4″ port
		6 1″ port			**6** 1″ port

● Not available in the anti-corrosion version. ✚ Anti-corrosion version available only in size 1.

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

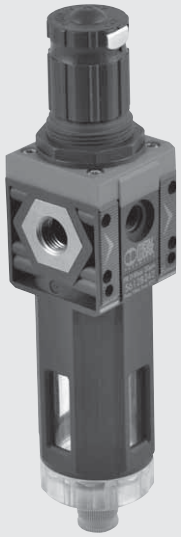
Code	Description	Code	Description	NOTE
Syntesi® SY1 IN-SERIES REGULATOR		**Syntesi® SY2 IN-SERIES REGULATOR**		**Anti-corrosion version**
5610R240	In-series REG SY1 08 without bushings	**5620R240**	In-series REG SY2 08 without bushings	**5X**_ _ _ _ _ _
5610R260	In-series REG SY1 012 without bushings	**5620R260**	In-series REG SY2 012 without bushings	**Example**
				5X11R241 In-series REG SY1 1/8 08 anti-corrosion
5611R241	In-series REG SY1 1/8 08	**5623R243**	In-series REG SY2 3/8 08	
5611R261	In-series REG SY1 1/8 012	**5623R263**	In-series REG SY2 3/8 012	
5612R242	In-series REG SY1 1/4 08	**5624R244**	In-series REG SY2 1/2 08	
5612R262	In-series REG SY1 1/4 012	**5624R264**	In-series REG SY2 1/2 012	
5613R243	In-series REG SY1 3/8 08	**5625R245**	In-series REG SY2 3/4 08	
5613R263	In-series REG SY1 3/8 012	**5625R265**	In-series REG SY2 3/4 012	
		5626R246	In-series REG SY2 1 08	
		5626R266	In-series REG SY2 1 012	

NOTES

SYNTESI® FILTER-REGULATOR

This device combines in a single unit the functions of filtration, condensate separation and pressure regulation.
It is made up of the same elements forming the filter and the regulator, so the performance and advantages are the same:

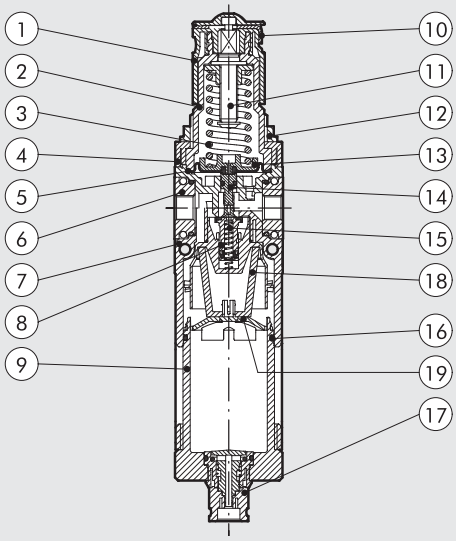
- Separation of condensate and larger liquid and solid particles by centrifugation.
- Three condensate drain options (RMSA, RA and SAC).
- 360° visually inspection of the condensate level, via transport spy-holes.
- Rolling diaphragm regulator, allowing maximum precision and flow rate, and minimal friction.
- Compensation for upstream pressure changes.
- Pressure relief valve.
- Quick downstream pressure relief.
- Padlockable push-lock knob.
- Front and rear ports for pressure gauges, pressure switches or, considering the high flow rate, for use as additional filtered and regulated air take-off.



TECHNICAL DATA		FR SY1			FR SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Degree of filtration	µm	5 (yellow) - output air purity class ISO8573-1: 3.7.4						
		20 (white) - output air purity class ISO8573-1: 4.7.4						
		50 (blue) - output air purity class ISO8573-1: 5.7.4						
Max. inlet pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	500	800	2200	3200	4300	5200	
(inlet pressure 10 bar)	scfm	18	28	78	113	152	184	
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1300	2000	3000	5800	7200	7400	
(inlet pressure 10 bar)	scfm	46	71	106	205	255	262	
Relief valve flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	70			100			
	scfm	2.5			3.5			
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Full outflow with zero inlet pressure		Included						
Padlockable knob		Included						
Upstream pressure compensation		Included, via balanced valve						
Weight	g	244	239	230	623	596	592	580
Fluid		Compressed air or other inert gases						
Mounting position		Vertical						
Additional air take-off, for pressure gauges or fittings		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500			1400			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			50			
Bowl capacity	cm^3	30			70			
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure						
		RA: automatic drain with condensate discharge, independent of pressure and flow rate						
		SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs**.						
		Nota d'uso: **the maximum input pressure for the RA version must not exceed 10 bar**						
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Notes on use		The pressure must always be set upwards. For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value.						
		On request version without overpressure exaust.						

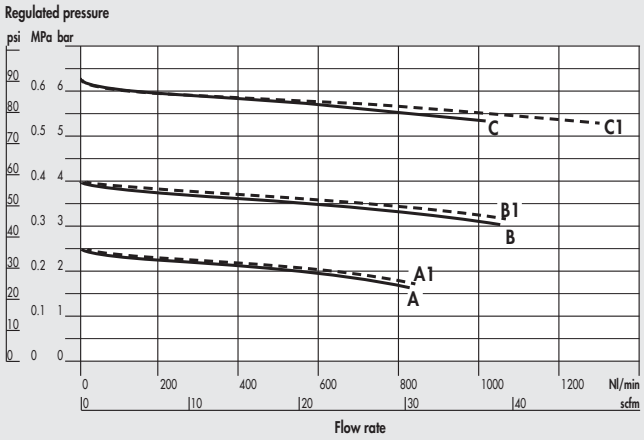
COMPONENTS

① Technopolymer adjusting knob
② Technopolymer bell
③ Steel adjusting spring (with Geomet® treatment for anti-corrosion version)
④ Technopolymer flange
⑤ Rolling diaphragm
⑥ IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
⑦ Technopolymer body
⑧ OT58 brass valve, with NBR vulcanized gasket
⑨ Clear technopolymer bowl
⑩ Galvanised steel plate for knob locking (stainless steel for anti-corrosion version)
⑪ OT58 brass adjusting screw
⑫ Technopolymer ring nut
⑬ Technopolymer plate
⑭ Technopolymer rod
⑮ Stainless steel valve spring
⑯ O-ring NBR gaskets
⑰ Drain (RMSA)
⑱ Sintered HDPE filter cartridge
⑲ Technopolymer screen

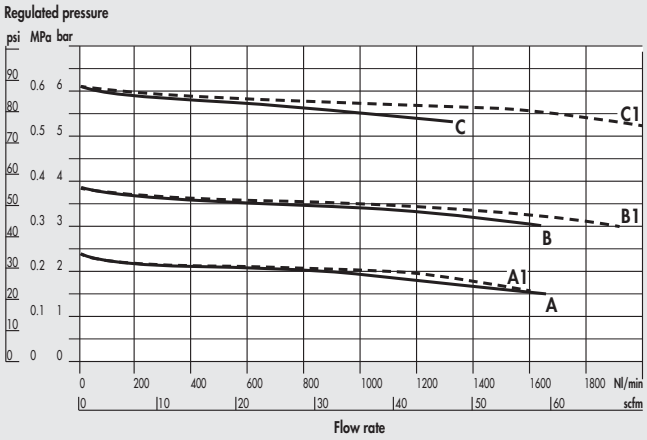


FLOW CHARTS

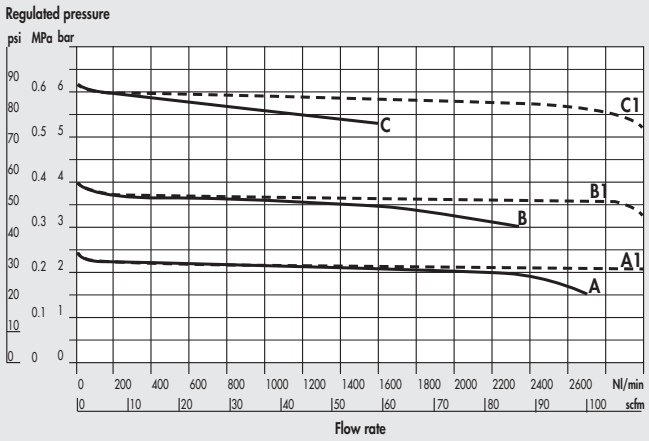
FR Syntesi® **SY1** 1/8"



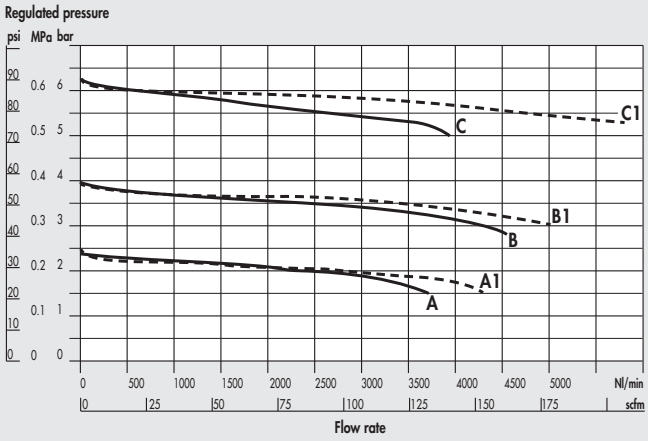
FR Syntesi® **SY1** 1/4"



FR Syntesi® **SY1** 3/8"

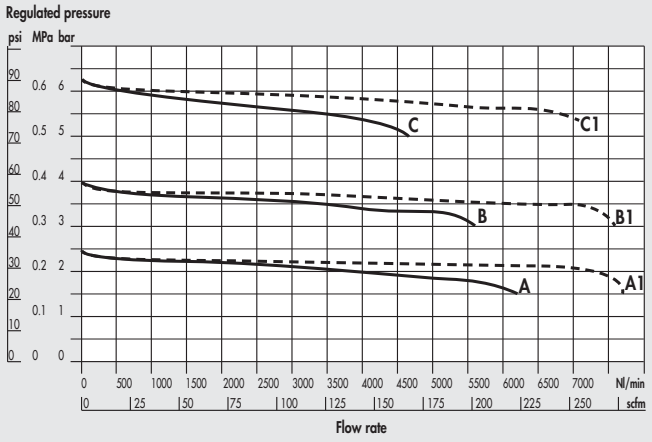


FR Syntesi® **SY2** 3/8"

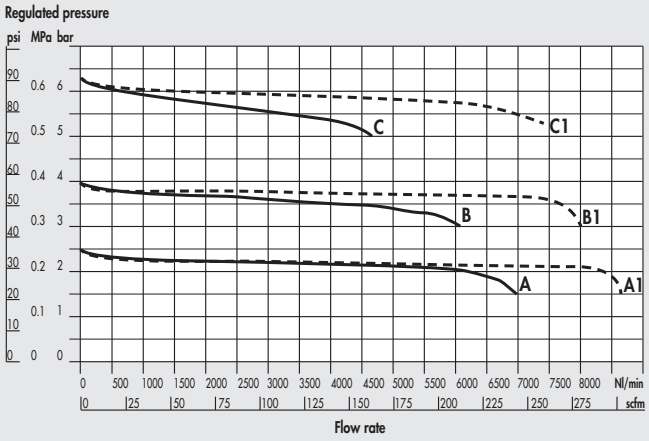


A = P In 7 bar - P Out 2.5 bar
B = P In 7 bar - P Out 4 bar
C = P In 7 bar - P Out 6.3 bar
A1 = P In 10 bar - P Out 2.5 bar
B1 = P In 10 bar - P Out 4 bar
C1 = P In 10 bar - P Out 6.3 bar

FR Syntesi® **SY2** 1/2"

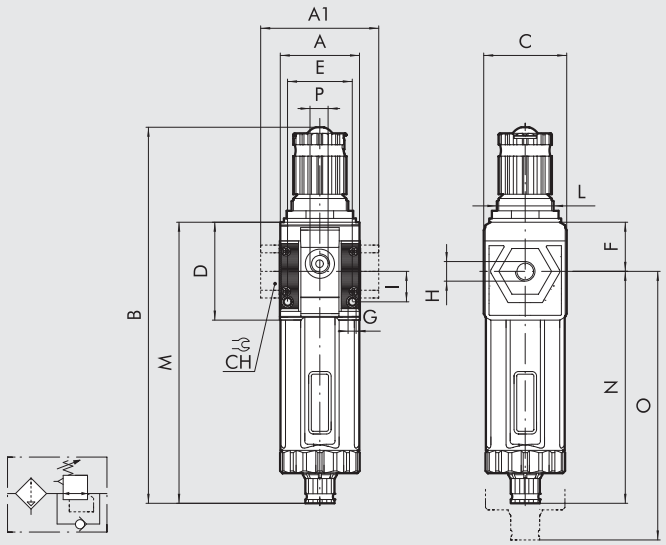


FR Syntesi® **SY2** 3/4" - 1"



A = P In 7 bar - P Out 2.5 bar
B = P In 7 bar - P Out 4 bar
C = P In 7 bar - P Out 6.3 bar
A1 = P In 10 bar - P Out 2.5 bar
B1 = P In 10 bar - P Out 4 bar
C1 = P In 10 bar - P Out 6.3 bar

DIMENSIONS



		SIZE 1			SIZE 2			
H (threaded port)		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
A		42			61			
A1		-	-	44	-	-	95	95
B	**RMSA**	198			246			
	RA/SAC	202			250			
C		44			61			
CH		-			-	-	32	36
D		51.5			70.5			
E		33.5			47.5			
F		25.8			38.2			
G		Hole for M4 screws			Hole for M5 screws			
I		16			22.5			
L		M30x1.5			M38x2			
M	**RMSA**	148			178			
	RA/SAC	152			182			
N	**RMSA**	122.2			139.8			
	RA/SAC	126.2			143.8			
O	**RMSA**	202			245			
	RA/SAC	206			249			
P (pressure gauge port or additional air takes-off)		1/8"			1/4"			

NOTES

METAL WORK PNEUMATIC

KEY TO CODES

56	1	1	B	24	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**DEGREE OF FILTRATION, TYPE OF CONDENSATE DRAIN AND SETTING RANGE**	**THREADED OUTPUT CONNECTION**
56 Syntesi **5X** Syntesi anti-corrosion	**1** Size 1 **2** Size 2	**0** Without bushing **1** 1/8" port **2** 1/4" port **3** 3/8" port **0** Without bushing **3** 3/8" port **4** 1/2" port **5** 3/4" port **6** 1" port	**B** Filter-regulator	● **10** 5 µm, RMSA, 0 to 2 bar ● **20** 20 µm, RMSA, 0 to 2 bar ● **30** 50 µm, RMSA, 0 to 2 bar ● **40** 5 µm, RA, 0 to 2 bar ● **50** 20 µm, RA, 0 to 2 bar ● **60** 50 µm, RA, 0 to 2 bar ● **11** 5 µm, SAC, 0 to 2 bar ● **21** 20 µm, SAC, 0 to 2 bar ● **31** 50 µm, SAC, 0 to 2 bar ✚ **12** 5 µm, RMSA, 0 to 4 bar ✚ **22** 20 µm, RMSA, 0 to 4 bar ✚ **32** 50 µm, RMSA, 0 to 4 bar ✚ **42** 5 µm, RA, 0 to 4 bar ✚ **52** 20 µm, RA, 0 to 4 bar ✚ **62** 50 µm, RA, 0 to 4 bar ✚ **13** 5 µm, SAC, 0 to 4 bar ✚ **23** 20 µm, SAC, 0 to 4 bar ✚ **33** 50 µm, SAC, 0 to 4 bar **14** 5 µm, RMSA, 0 to 8 bar **24** 20 µm, RMSA, 0 to 8 bar **34** 50 µm, RMSA, 0 to 8 bar **44** 5 µm, RA, 0 to 8 bar **54** 20 µm, RA, 0 to 8 bar **64** 50 µm, RA, 0 to 8 bar **15** 5 µm, SAC, 0 to 8 bar **25** 20 µm, SAC, 0 to 8 bar **35** 50 µm, SAC, 0 to 8 bar **16** 5 µm, RMSA, 0 to 12 bar **26** 20 µm, RMSA, 0 to 12 bar **36** 50 µm, RMSA, 0 to 12 bar **46** 5 µm, RA, 0 to 12 bar **56** 20 µm, RA, 0 to 12 bar **66** 50 µm, RA, 0 to 12 bar **17** 5 µm, SAC, 0 to 12 bar **27** 20 µm, SAC, 0 to 12 bar **37** 50 µm, SAC, 0 to 12 bar	**0** Without bushing **1** 1/8" port **2** 1/4" port **3** 3/8" port **0** Without bushing **3** 3/8" port **4** 1/2" port **5** 3/4" port **6** 1" port

● Not available in the anti-corrosion version.
✚ Anti-corrosion version available only in size 1.
RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**

NOTES

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description	Code	Description
FILTER-REGULATOR Syntesi® SY1		**FILTER-REGULATOR Syntesi® SY2**	
5610B140	FR SY1 5 08 RMSA without bushings	**5620B140**	FR SY2 5 08 RMSA without bushings
5610B240	FR SY1 20 08 RMSA without bushings	**5620B240**	FR SY2 20 08 RMSA without bushings
5610B440	FR SY1 5 08 RA without bushings	**5620B440**	FR SY2 5 08 RA without bushings
5610B540	FR SY1 20 08 RA without bushings	**5620B540**	FR SY2 20 08 RA without bushings
5610B160	FR SY1 5 012 RMSA without bushings	**5620B160**	FR SY2 5 012 RMSA without bushings
5610B260	FR SY1 20 012 RMSA without bushings	**5620B260**	FR SY2 20 012 RMSA without bushings
5610B460	FR SY1 5 012 RA without bushings	**5620B460**	FR SY2 5 012 RA without bushings
5610B560	FR SY1 20 012 RA without bushings	**5620B560**	FR SY2 20 012 RA without bushings
5611B141	FR SY1 1/8 5 08 RMSA	**5623B143**	FR SY2 3/8 5 08 RMSA
5611B241	FR SY1 1/8 20 08 RMSA	**5623B243**	FR SY2 3/8 20 08 RMSA
5611B441	FR SY1 1/8 5 08 RA	**5623B443**	FR SY2 3/8 5 08 RA
5611B541	FR SY1 1/8 20 08 RA	**5623B543**	FR SY2 3/8 20 08 RA
5611B161	FR SY1 1/8 5 012 RMSA	**5623B163**	FR SY2 3/8 5 012 RMSA
5611B261	FR SY1 1/8 20 012 RMSA	**5623B263**	FR SY2 3/8 20 012 RMSA
5611B461	FR SY1 1/8 5 012 RA	**5623B463**	FR SY2 3/8 5 012 RA
5611B561	FR SY1 1/8 20 012 RA	**5623B563**	FR SY2 3/8 20 012 RA
5612B142	FR SY1 1/4 5 08 RMSA	**5624B144**	FR SY2 1/2 5 08 RMSA
5612B242	FR SY1 1/4 20 08 RMSA	**5624B244**	FR SY2 1/2 20 08 RMSA
5612B442	FR SY1 1/4 5 08 RA	**5624B444**	FR SY2 1/2 5 08 RA
5612B542	FR SY1 1/4 20 08 RA	**5624B544**	FR SY2 1/2 20 08 RA
5612B162	FR SY1 1/4 5 012 RMSA	**5624B164**	FR SY2 1/2 5 012 RMSA
5612B262	FR SY1 1/4 20 012 RMSA	**5624B264**	FR SY2 1/2 20 012 RMSA
5612B462	FR SY1 1/4 5 012 RA	**5624B464**	FR SY2 1/2 5 012 RA
5612B562	FR SY1 1/4 20 012 RA	**5624B564**	FR SY2 1/2 20 012 RA
5613B143	FR SY1 3/8 5 08 RMSA	**5625B145**	FR SY2 3/4 5 08 RMSA
5613B243	FR SY1 3/8 20 08 RMSA	**5625B245**	FR SY2 3/4 20 08 RMSA
5613B443	FR SY1 3/8 5 08 RA	**5625B445**	FR SY2 3/4 5 08 RA
5613B543	FR SY1 3/8 20 08 RA	**5625B545**	FR SY2 3/4 20 08 RA
5613B163	FR SY1 3/8 5 012 RMSA	**5625B165**	FR SY2 3/4 5 012 RMSA
5613B263	FR SY1 3/8 20 012 RMSA	**5625B265**	FR SY2 3/4 20 012 RMSA
5613B463	FR SY1 3/8 5 012 RA	**5625B465**	FR SY2 3/4 5 012 RA
5613B563	FR SY1 3/8 20 012 RA	**5625B565**	FR SY2 3/4 20 012 RA
		5626B146	FR SY2 1 5 08 RMSA
		5626B246	FR SY2 1 20 08 RMSA
		5626B446	FR SY2 1 5 08 RA
		5626B546	FR SY2 1 20 08 RA
		5626B166	FR SY2 1 5 012 RMSA
		5626B266	FR SY2 1 20 012 RMSA
		5626B466	FR SY2 1 5 012 RA
		5626B566	FR SY2 1 20 012 RA

NOTE	
Anti-corrosion version	
5X_ _ _ _ _ _	
Example	
5X11B141	FR SY1 1/8 5 08 RMSA anti-corrosion

NOTES

SYNTESI® LUBRICATOR

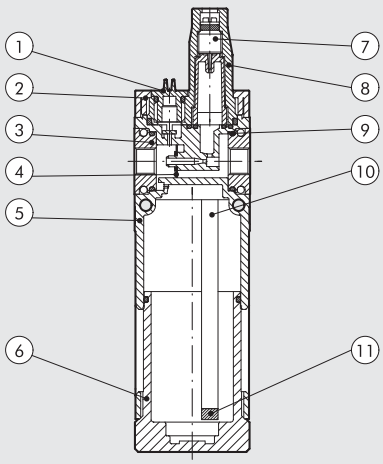
METAL WORK PNEUMATIC

The pneumatic lubricator is the simplest way of efficiently lubricating the actuators linked to a circuit. As compressed air flows towards the lubricator, it encounters a flexible diaphragm which partially blocks the way, creating a small pressure difference between the inlet and outlet air. Being at the higher pressure, the oil in the bowl is pumped through a tube with a filter towards the regulation pin. The quantity of oil can be metered accurately since the drops can be viewed through the transparent dome.
Filling with oil must take place in the absence of pressure, unscrewing the plug next to the dome. On the front and back there is a port (1/8" for size 1 and 1/4" for size 2) that can be used with pressure gauges, pressure switches or as an additional air intake.

TECHNICAL DATA		LUB SY1			LUB SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Type of lubrication		Oil mist						
Version		Manual filling from the top						
Max. input pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	1300	1700	2200	2300	3900	3900	
	scfm	46	60	78	81	138	138	
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1600	3000	3650	3650	6100	6100	
	scfm	57	106	129	129	216	216	
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Weight	g	185	180	171	480	453	449	437
Fluid		Compressed air or other inert gases						
Quantity of filled oil	cm^3	60			130			
Mounting position		Vertical			Vertical			
Port for additional air take-off		1/8", front and rear, lubricated air			1/4", front and rear, lubricated air			
Additional air take-off flow rate at 6.3 bar	Nl/min	450			800			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	16			53			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Recommended oils		ISO and UNI FD22 (Energol HPL; Spinesso; Mobil DTE; Tellus oil)						
Notes on use		Install the lubricator as close as possible to the point of use. Fill the lubricator bowl with oil before pressurizing the system. Do not use cleaning oils, brake fluid oils or solvents in general. For the best lubrication results, set the drip rate to one drop for 300-600 Nl.						

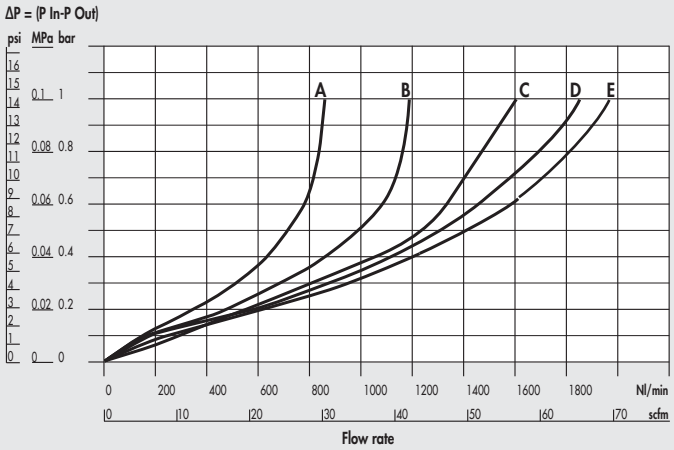
COMPONENTS

① Technopolymer oil filling plug
② Technopolymer flange
③ IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
④ Venturi NBR diaphragm
⑤ Technopolymer body
⑥ Clear technopolymer bowl
⑦ OT 58 brass oil flow regulation needle
⑧ Clear technopolymer cover
⑨ NBR o-ring gasket
⑩ Rilsan® oil suction pipe
⑪ Oil filter

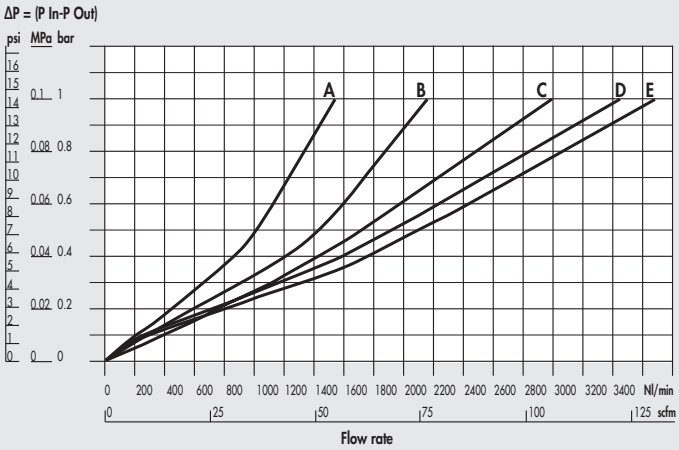


FLOW CHARTS

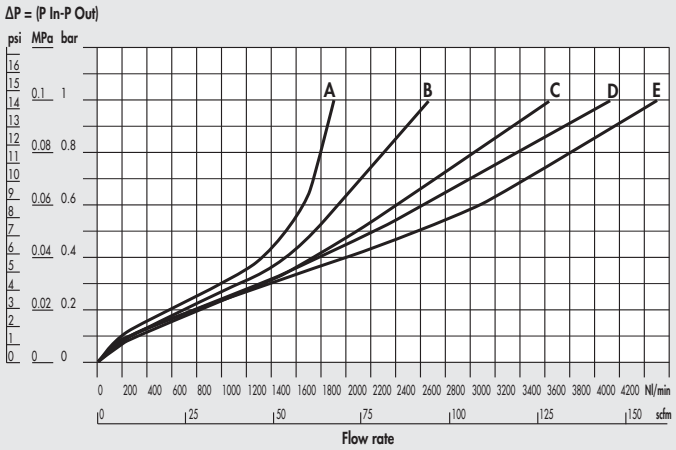
LUB Syntesi® **SY1** 1/8"



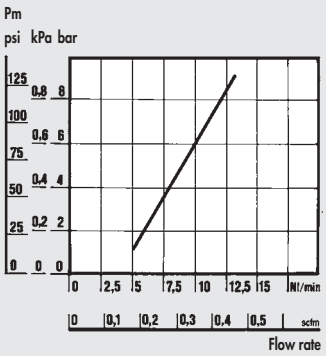
LUB Syntesi® **SY1** 1/4"



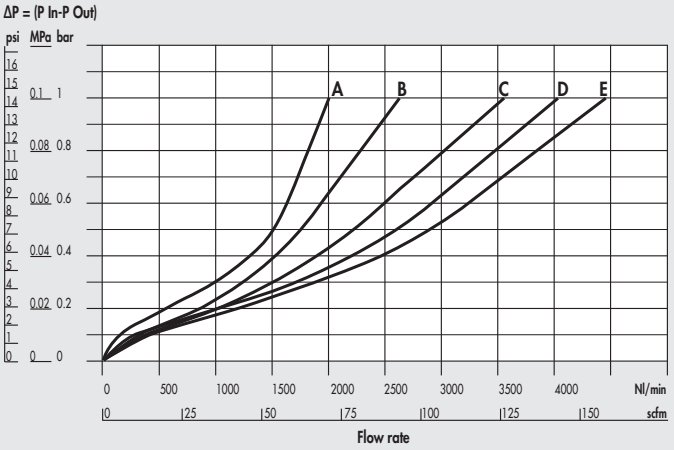
LUB Syntesi® **SY1** 3/8"



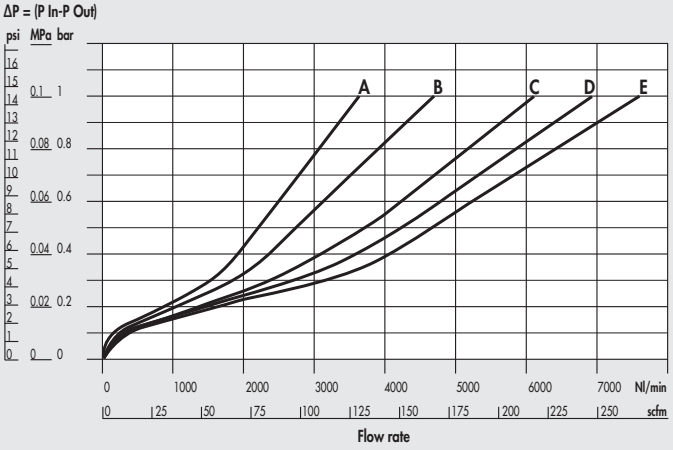
Minimum operating flow chart **SY1**



LUB Syntesi® **SY2** 3/8"



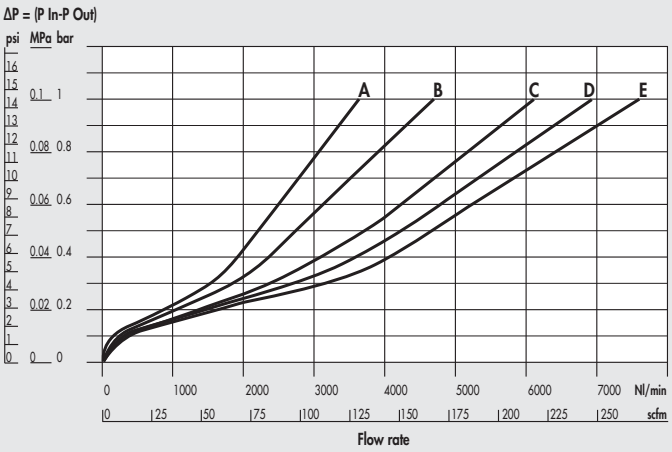
LUB Syntesi® **SY2** 1/2"



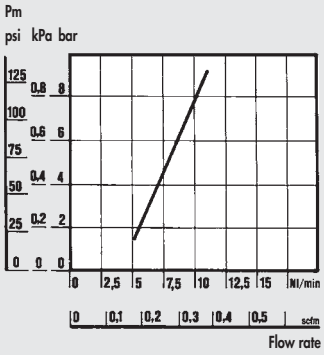
A = 2.5 bar - 0.25 MPa - 36 psi
B = 4 bar - 0.4 MPa - 58 psi
C = 6.3 bar - 0.63 MPa - 91 psi
D = 8 bar - 0.8 MPa - 116 psi
E = 10 bar - 1 MPa - 145 psi

METAL WORK PNEUMATIC

LUB Syntesi® **SY2** 3/4" - 1"

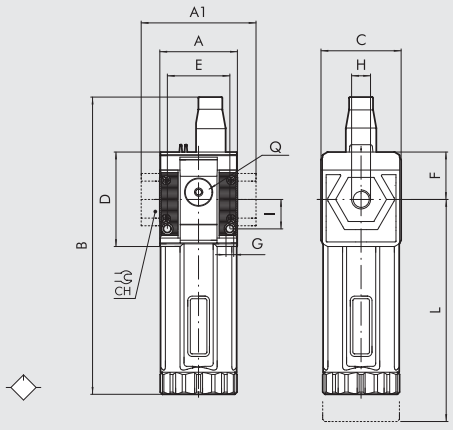


Minimum operating flow chart **SY2**



A = 2.5 bar - 0.25 MPa - 36 psi
B = 4 bar - 0.4 MPa - 58 psi
C = 6.3 bar - 0.63 MPa - 91 psi
D = 8 bar - 0.8 MPa - 116 psi
E = 10 bar - 1 MPa - 145 psi

DIMENSIONS



	SIZE 1			SIZE 2			
H (threaded port)	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
A	42			61			
A1	-	-	44	-	-	95	95
B	162			200.5			
C	44			61			
CH	-			-	-	32	36
D	51.5			70.5			
E	33.5			47.5			
F	25.8			38.2			
G	Hole for M4 screws			Hole for M5 screws			
I	16			22.5			
L	158			193			
Q (no. 2 additional air takes-off)	1/8"			1/4"			

KEY TO CODES

56	1	1	L	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**OIL FILLING**	**THREADED OUTPUT CONNECTION**
56 Syntesi	**1** Size 1	**0** Without bushing	**L** Lubricator	**10** Manual filling from the top	**0** Without bushing
5X Syntesi anti-corrosion		**1** 1/8" port			**1** 1/8" port
		2 1/4" port			**2** 1/4" port
		3 3/8" port			**3** 3/8" port
	2 Size 2	**0** Without bushing			**0** Without bushing
		3 3/8" port			**3** 3/8" port
		4 1/2" port			**4** 1/2" port
		5 3/4" port			**5** 3/4" port
		6 1" port			**6** 1" port

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
LUBRIFICATORE Syntesi® SY1	
5610L100	LUB SY1 without bushings
5611L101	LUB SY1 1/8
5612L102	LUB SY1 1/4
5613L103	LUB SY1 3/8

Code	Description
LUBRIFICATORE Syntesi® SY2	
5620L100	LUB SY2 without bushings
5623L103	LUB SY2 3/8
5624L104	LUB SY2 1/2
5625L105	LUB SY2 3/4
5626L106	LUB SY2 1

NOTE
Anti-corrosion version
5X_ _ _ _ _
Example
5X11L101 LUB SY1 1/8 anti-corrosion

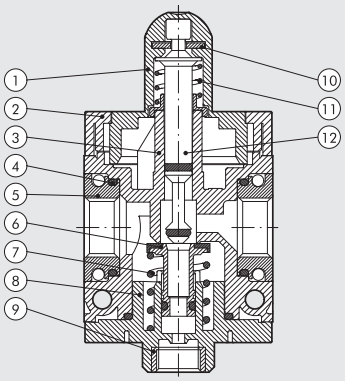
SYNTESI® SHUT-OFF VALVE

This device separates the compressed air circuit from the main air supply. It is a three-way valve that relieves the downstream system in the closed position. This makes it useful for maintenance operations or when the air supply to a machine or piece of equipment needs to be shut off.
Manual, pneumatic, electro-pneumatic and assisted electro-pneumatic control versions are available. The last version must be used if the inlet pressure is outside the electro-pneumatic valve operating range, so for particularly low or high pressures.
The version with manual control can be locked and you can enter up to two padlocks on size 1 and up to three on size 2 when the valve is in the closed position. As an alternative, a version with a single Ø7 hole is available for a single padlock. On the front and back there is a port (1/8" for size 1 and 1/4" size 2) that can be used with pressure gauges, pressure switches or as an additional air intake.

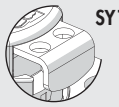
TECHNICAL DATA		V3V SY1			V3V SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Threaded discharge port		1/8"			1/4"			
Type of control		Manual - pneumatic - Elpn - Elpn pilot-assisted			Manual - Pneumatic - Cnomo elpn - Cnomo elpn pilot-assisted			
Max inlet pressure for pneumatic and solenoid pilot-assisted versions	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Inlet pressure for solenoid version	bar	3 - 10			3 - 10			
	MPa	0.3 - 1			0.3 - 1			
	psi	43 - 145			43 - 145			
Pilot pressure for pneumatic and solenoid pilot-assisted versions	bar	3 - 10			3 - 10			
	MPa	0.3 - 1			0.3 - 1			
	psi	43 - 145			43 - 145			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	800	1000	1100	2800	3000	3000	
	scfm	28	35	39	99	106	106	
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1100	1500	1600	3600	4000	4000	
	scfm	39	53	57	127	141.5	141.5	
Exhaust flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	500			2000			
	scfm	18			71			
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Padlockable knob					Included			
Weight	g	197	192	183	476	449	445	433
Fluid		Compressed air or other inert gases						
Mounting position		In any position						
Additional air take-off, for pressure gauges or fittings		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500			1500			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			53			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Bobbin capacity for electro-pneumatic version	W	12 VDC and 24 VDC = 2W			12 VDC and 24 VDC = 2W; 24 VAC, 110 VAC and 220 VAC = 3.5 VA			
		24 VAC, 110 VAC and 220 VAC = 3.5 VA			24 VDC = 4W; 24 VAC, 110 VAC, 220 VAC = 4 VA			
Manual control of electro-pneumatic versions		Bistable: horizontal = OFF, vertical = ON						

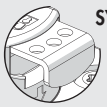
COMPONENTS

① Technopolymer knob
② Technopolymer hinge
③ Technopolymer body
④ NBR o-ring gasket
⑤ IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
⑥ OT58 brass valve with NBR vulcanized gasket
⑦ Stainless steel valve spring
⑧ Technopolymer plug
⑨ OT58 brass threaded insert
⑩ Galvanised steel plate for knob locking (stainless steel for anti-corrosion version)
⑪ Stainless steel spring stem recovery
⑫ OT58 brass stem

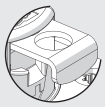


V10 - Steel plate with Ø3.5 holes for locking with 2 padlocks (SY1) or 3 padlocks (SY2).


SY1

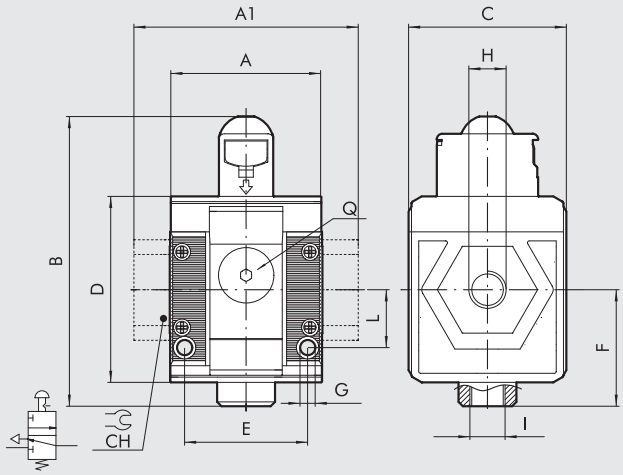

SY2

V11 - Steel plate with a single Ø7 hole for docking with a single padlock.

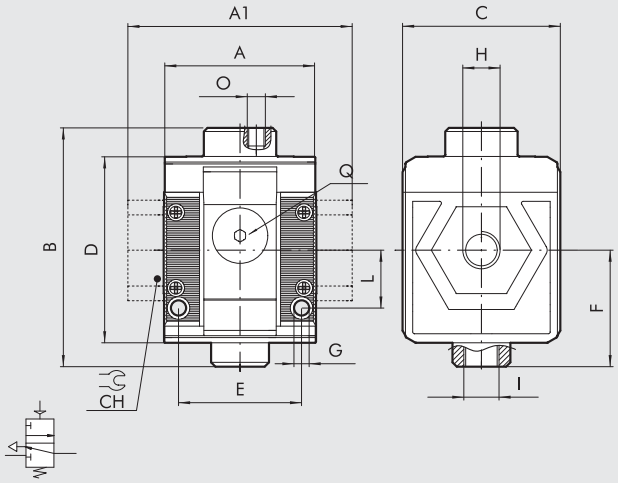


DIMENSIONS

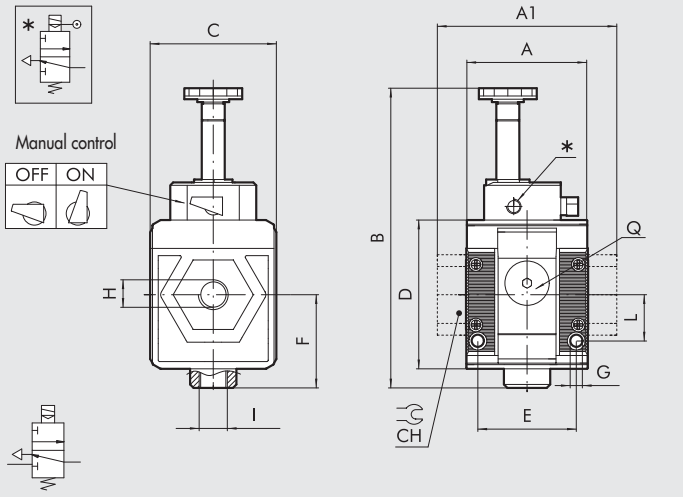
MANUAL **SY1-SY2**



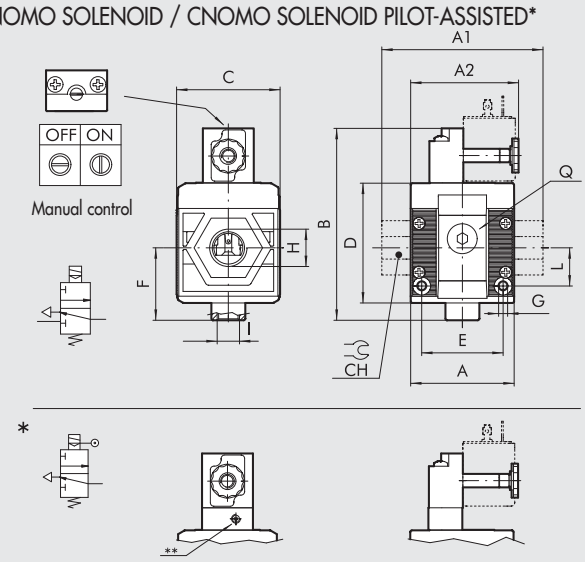
PNEUMATIC **SY1-SY2**



SOLENOID/SOLENOID PILOT-ASSISTED* **SY1**



CNOMO SOLENOID / CNOMO SOLENOID PILOT-ASSISTED* **SY2**



	MANUAL							PNEUMATIC							SOLENOID/SOLENOID PILOT-ASSISTED			CNOMO SOLENOID/CNOMO SOLENOID PILOT-ASSISTED			
	SIZE 1			SIZE 2				SIZE 1			SIZE 2				SIZE 1			SIZE 2			
H (threaded port)	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
A	42			61				42			61				42			61			
A1	-	-	44	-	-	95	95	-	-	44	-	-	95	95	-	-	44	-	-	95	95
A2	-			-				-			-				-			65			
B	80			109				66			94				104			-			
Cnomo	-			-				-			-				-			113			
Cnomo pilot ass.	-			-				-			-				-			126			
C	44			61				44			61				44			61			
CH	-			-	-	32	36	-			-	-	32	36	-			-	-	32	36
D	51.5			70.5				51.5			70.5				51.5			70.5			
E	33.5			47.5				33.5			47.5				33.5			47.5			
F	32.2			42.7				32.2			42.7				32.2			42.7			
G	Hole for M4 screws			Hole for M5 screws				Hole for M4 screws			Hole for M5 screws				Hole for M4 screws			Hole for M5 screws			
I (exhaust)	1/8"			1/4"				1/8"			1/4"				1/8"			1/4"			
L	16			22.5				16			22.5				16			22.5			
O (pilot)	-			-				M5			1/8"				-			-			
Q (no. 2 additional air takes-off)	1/8"			1/4"				1/8"			1/4"				1/8"			1/4"			
**** Pilot**	-							-			-				M5			M5			

KEY TO CODES

56	1	1	V	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**TYPE**	**THREADED OUTPUT CONNECTION**
56 Syntesi **5X** Syntesi anti-corrosion	**1** Size 1 **2** Size 2	**0** Without bushing **1** 1/8" port **2** 1/4" port **3** 3/8" port **0** Without bushing **3** 3/8" port **4** 1/2" port **5** 3/4" port **6** 1"port	**V** Shut-off valve	**10** Manual with Ø3.5 hole for padlocks **11** Manual with Ø7 hole for padlock ● **20** Pneumatic ● **30** Solenoid pilot-assisted ● **70** Solenoid	**0** Without bushing **1** 1/8" port **2** 1/4" port **3** 3/8" port **0** Without bushing **3** 3/8" port **4** 1/2" port **5** 3/4" port **6** 1" port

● Not available in the anti-corrosion version.

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
Syntesi® SY1 SHUT-OFF VALVE	
5610V100	V3V SY1 manual without bushings
5611V101	V3V SY1 1/8 manual
5612V102	V3V SY1 1/4 manual
5613V103	V3V SY1 3/8 manual
5610V200	V3V SY1 pneumatic without bushings
5611V201	V3V SY1 1/8 pneumatic
5612V202	V3V SY1 1/4 pneumatic
5613V203	V3V SY1 3/8 pneumatic
5610V300	V3V SY1 elpn pilot-assisted without bushings
5611V301	V3V SY1 1/8 elpn pilot-assisted
5612V302	V3V SY1 1/4 elpn pilot-assisted
5613V303	V3V SY1 3/8 elpn pilot-assisted
5610V700	V3V SY1 elpn without bushings
5611V701	V3V SY1 1/8 elpn
5612V702	V3V SY1 1/4 elpn
5613V703	V3V SY1 3/8 elpn

Code	Description
Syntesi® SY2 SHUT-OFF VALVE	
5620V100	V3V SY2 manual without bushings
5623V103	V3V SY2 3/8 manual
5624V104	V3V SY2 1/2 manual
5625V105	V3V SY2 3/4 manual
5626V106	V3V SY2 1 manual
5620V200	V3V SY2 pneumatic without bushings
5623V203	V3V SY2 3/8 pneumatic
5624V204	V3V SY2 1/2 pneumatic
5625V205	V3V SY2 3/4 pneumatic
5626V206	V3V SY2 1 pneumatic
5620V300	V3V SY2 elpn pilot-assisted Cnomo without bushings
5623V303	V3V SY2 3/8 elpn pilot-assisted Cnomo
5624V304	V3V SY2 1/2 elpn pilot-assisted Cnomo
5625V305	V3V SY2 3/4 elpn pilot-assisted Cnomo
5626V306	V3V SY2 1 elpn pilot-assisted Cnomo
5620V700	V3V SY2 elpn without bushings
5623V703	V3V SY2 3/8 elpn
5624V704	V3V SY2 1/2 elpn
5625V705	V3V SY2 3/4 elpn
5626V706	V3V SY2 1 elpn

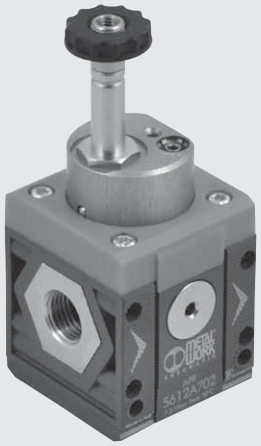
NOTE	
Anti-corrosion version	
5X_ _ _ _ _	
Example	
5X11V101	V3V SY1 1/8 anti-corrosion

NOTES

SYNTESI® PROGRESSIVE STARTER

METAL WORK PNEUMATIC

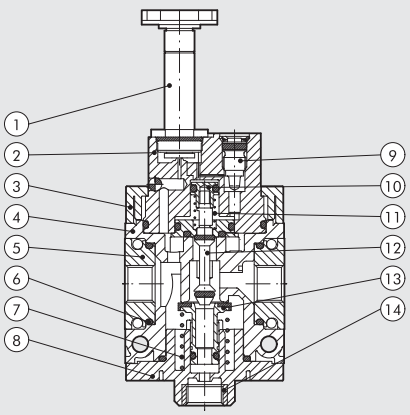
The progressive starter is a pneumatic component that allows air enter the circuit gradually, thereby avoiding excessive pressure bursts.
A sophisticated system of internal valves allows two separate stages of operation. During the first stage, a quantity of air that can be regulated via a pin flows from the APR. The second stage starts when the downstream pressure reached 40 to 60% of the upstream pressure, during which full-port flow is achieved. When the mechanism is deactivated, the air flow is cut off and the downstream circuit is relieved.
The progressive starter is particularly useful on machinery where it is important to prevent actuators from moving rapidly and out of control, or where, for safety reasons, the air in-feed needs to be gentle and gradual. It, however, there is a major leak in the downstream system, it may never be possible to achieve the pressure required to open the valve completely.



TECHNICAL DATA		APR SY1			APR SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Threaded discharge port		1/8"			1/4"			
Type of control		Solenoid			Solenoid - Cnomo solenoid			
Inlet pressure	bar	3 - 10			3 - 10			
	MPa	0.3 - 1			0.3 - 1			
	psi	43 - 145			43 - 145			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	900	1000	1100	2800	3600	3600	
	scfm	32	39	39	99	127	127	
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1250	1500	1600	4400	4800	4800	
	scfm	44	53	57	156	170	170	
Drain flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	500			2700			
	scfm	18			96			
Maximum flow rate start-up, at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	170			700			
with regulation pin completely unscrewed	scfm	6			25			
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Weight	g	203	198	189	503	476	472	460
Fluid		Compressed air or other inert gases						
Mounting position		In any position						
Additional air take-off, for pressure gauges or fittings		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500			1500			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			53			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Bobbin capacity for electro-pneumatic version	W	12 VDC and 24 VDC = 2W; 24 VAC, 110 VAC and 220 VAC = 3.5 VA						
		for Cnomo versions: 12 VDC and 24 VDC = 2W; 24 VAC, 110 VAC and 220 VAC = 3.5 VA						
Manual control		24 VDC = 4W; 24 VAC, 110 VAC, 220 VAC = 4 VA						
		Bistable: horizontal = OFF, vertical = ON						

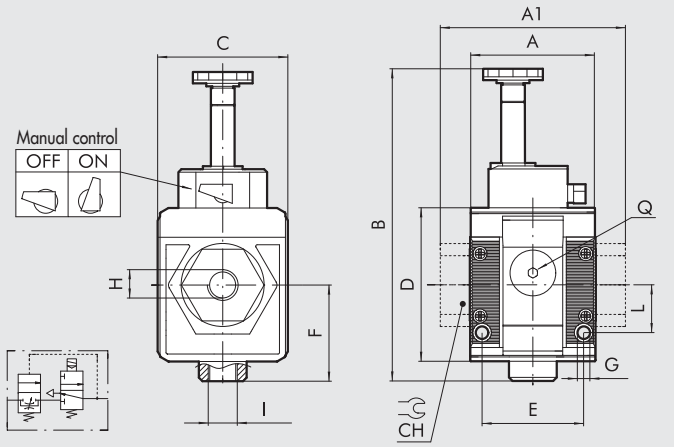
COMPONENTS

① Sleeve ø8
② Anodized aluminium upper block
③ Technopolymer flange
④ Technopolymer body
⑤ IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
⑥ O-ring NBR gasket
⑦ Stainless steel valve spring
⑧ Technopolymer bottom plug
⑨ OT58 brass progressive start regulation pin
⑩ OT58 brass internal valve
⑪ Stainless steel spring stem recoveryng
⑫ OT58 brass stem
⑬ OT58 brass main valve with vulcanized gasket
⑭ OT58 brass threaded insert

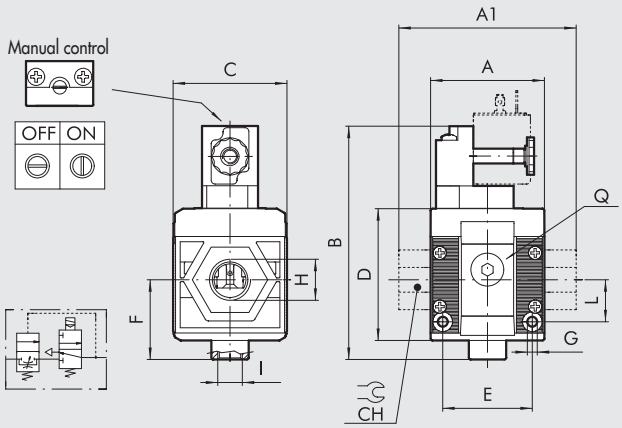


DIMENSIONS

SOLENOID **SY1-SY2**



CNOMO SOLENOID **SY2**



	SOLENOID SIZE 1			SOLENOID / CNOMO SOLENOID SIZE 2			
H (threaded port)	1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
A		42			61		
A1	-	-	44	-	-	95	95
B		105			131		
Cnomo		-			125		
C		44			61		
CH		-		-	-	32	36
D		51.5			70.5		
E		33.5			47.5		
F		32.2			42.7		
G		Hole for M4 screws			Hole for M5 screws		
I (exhaust)		1/8″			1/4″		
L		16			22.5		
Q (no. 2 additional air takes-off)		1/8″			1/4″		

KEY TO CODES

56	1	1	A	70	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**TYPE**	**THREADED OUTPUT CONNECTION**
56 Syntesi	**1** Size 1	**0** Without bushing **1** 1/8″ port **2** 1/4″ port **3** 3/8″ port	**A** Progressive starter APR	**70** Solenoid * **71** Cnomo solenoid	**0** Without bushing **1** 1/8″ port **2** 1/4″ port **3** 3/8″ port
	2 Size 2	**0** Without bushing **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port			**0** Without bushing **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port

* Only for size 2

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
Syntesi® SY1 PROGRESSIVE STARTER	
5610A700	APR SY1 elpn without bushings
5611A701	APR SY1 1/8 elpn
5612A702	APR SY1 1/4 elpn
5613A703	APR SY1 3/8 elpn

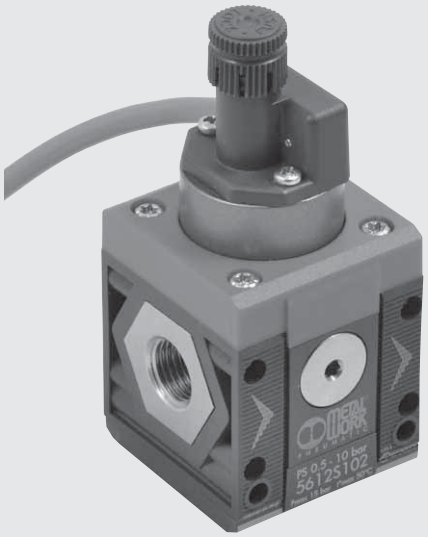
Code	Description
Syntesi® SY2 PROGRESSIVE STARTER	
5620A700	APR SY2 elpn without bushings
5623A703	APR SY2 3/8 elpn
5624A704	APR SY2 1/2 elpn
5625A705	APR SY2 3/4 elpn
5626A706	APR SY2 1 elpn

Code	Description
Syntesi® SY2 PROGRESSIVE STARTER	
5620A710	APR SY2 elpn Cnomo without bushings
5623A713	APR SY2 3/8 elpn Cnomo
5624A714	APR SY2 1/2 elpn Cnomo
5625A715	APR SY2 3/4 elpn Cnomo
5626A716	APR SY2 1 elpn Cnomo

SYNTESI® PRESSURE SWITCHES

METAL WORK PNEUMATIC

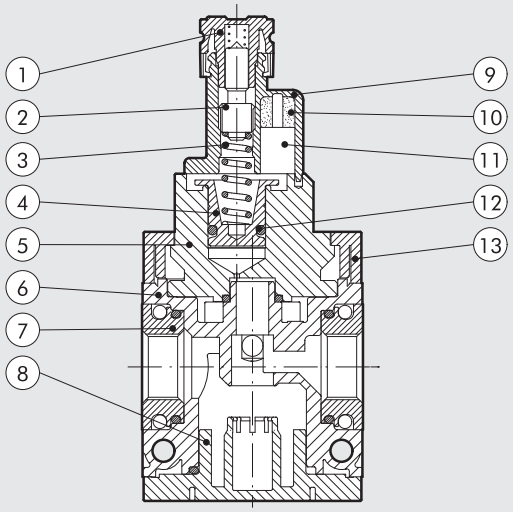
Syntesi® pressure switches feature a high degree of miniaturisation and a modern attractive design.
As they are extremely modular, the Syntesi® series can be installed facing up or down.
They come ready assembled with a 2-metre cable or an M8 connector with a 300-mm cable.
The contact is the switching type, which means it can be normally open or normally closed.
It can be regulated via a knurled push-lock handle.
On the front and back there is a port (1/8" for size 1 and 1/4" size 2) that can be used with pressure gauges or as an additional air intake.



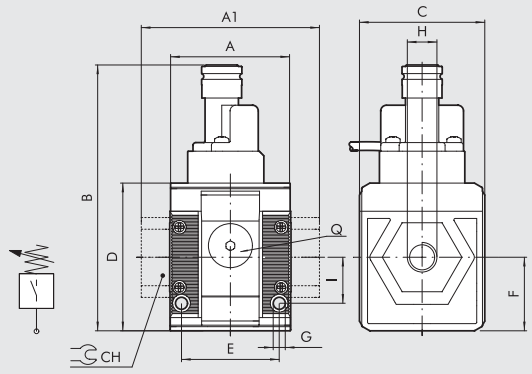
TECHNICAL DATA		SY1 PRESSURE SWITCHES			SY2 PRESSURE SWITCHES			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Adjustable pressure interval	bar	0.5 ÷ 10			0.5 ÷ 10			
Hysteresis (not adjustable)	bar	From 0.4 to 0.8 (See diagram)						
Maximum pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Min/Max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to 50			From -10 to 50			
Maximum current	A	2			2			
Maximum voltage	V	250			250			
Outside diameter of cable	mm	4.9			4.9			
Number of wires and cross section		3 x 0.5 mm^2			3 x 0.5 mm^2			
Contacts		Normally-Open (NO) and Normally-Closed (NC)						
Protection		IP65			IP65			
Number of switchings		5 x 10^6			5 x 10^6			
Fluid		Filtered lubricated or unlubricated compressed air. Lubrication, if used, must be continuous						
Mounting position		In any position						
Additional air take-off, for pressure gauges or fittings		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500			1500			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			53			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Weight	g	255	250	241	443	416	412	400

COMPONENTS

① Technopolymer adjusting "push lock" handle
② OT58 brass adjusting screw
③ Steel piston spring
④ OT58 brass piston
⑤ Aluminium top plug
⑥ Technopolymer body
⑦ IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
⑧ Technopolymer bottom plug
⑨ Technopolymer pressure switch body
⑩ Resin finish for IP65
⑪ Electrical contact
⑫ O-ring NBR gasket
⑬ Technopolymer flange

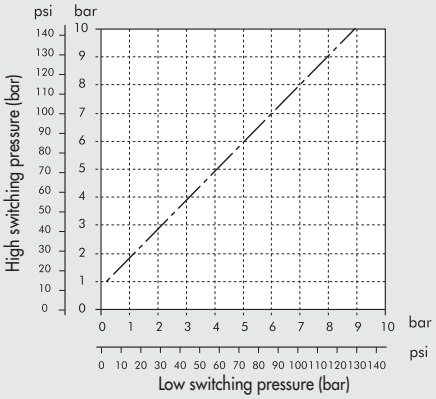


DIMENSIONS



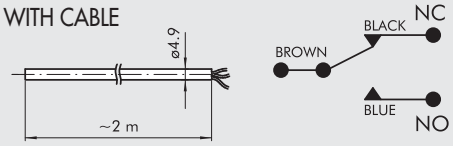
	SIZE 1			SIZE 2			
H (threaded port)	1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
A	42			61			
A1	-	-	44	-	-	95	95
B	93			101			
C	44			61			
CH	-			-	-	32	36
D	51.5			70.5			
E	33.5			47.5			
F	25.6			32.5			
G	Hole for M4 screws			Hole for M5 screws			
I	16			22.5			
Q (no. 2 additional air takes-off)	1/8″			1/4″			

HYSTERESIS GRAPH

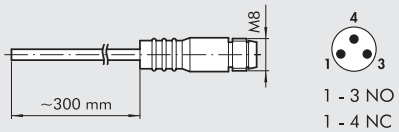


WIRING DIAGRAM

VERSION WITH CABLE



VERSION WITH M8 CONNECTOR



1 - 3 NO
1 - 4 NC

KEY TO CODES

56	1	1	S	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**TYPE**	**THREADED OUTPUT CONNECTION**
56 Syntesi	**1** Size 1	**0** Without bushing **1** 1/8″ port **2** 1/4″ port **3** 3/8″ port	**S** Pressure switches	**10** 2 m cable **20** 300 mm cable with M8 connector	**0** Without bushing **1** 1/8″ port **2** 1/4″ port **3** 3/8″ port
	2 Size 2	**0** Without bushing **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port			**0** Without bushing **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port

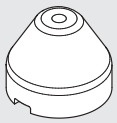
PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
Syntesi® SY1 PRESSURE SWITCHES	
5610S100	Pressure switch 2 m cable SY1 without bushings
5611S101	Pressure switch 2 m cable SY1 1/8
5612S102	Pressure switch 2 m cable SY1 1/4
5613S103	Pressure switch 2 m cable SY1 3/8
5610S200	Pressure switch M8 SY1 connector without bushings
5611S201	Pressure switch M8 connector SY1 1/8
5612S202	Pressure switch M8 connector SY1 1/4
5613S203	Pressure switch M8 connector SY1 3/8

Code	Description
Syntesi® SY2 PRESSURE SWITCHES	
5620S100	Pressure switch 2 m cable SY2 without bushings
5623S103	Pressure switch 2 m cable SY2 3/8
5624S104	Pressure switch 2 m cable SY2 1/2
5625S105	Pressure switch 2 m cable SY2 3/4
5626S106	Pressure switch 2 m cable SY2 1
5620S200	Pressure switch M8 SY2 connector without bushings
5623S203	Pressure switch M8 connector SY2 3/8
5624S204	Pressure switch M8 connector SY2 1/2
5625S205	Pressure switch M8 connector SY2 3/4
5626S206	Pressure switch M8 connector SY2 1

ACCESSOIRES: SECURITY KNOB



Code	Description
9200703	Security knob

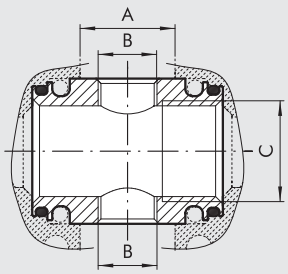
NOTE: Pull outwards to remove the knob from the pressure switch on the unit. Insert the security knob and regulate the pressure switch. Then press the handle firmly to lock it in position. If the pressure switch needs to be reset, remove the security knob by forcing it laterally with a screwdriver.

SYNTESI® AIR TAKE-OFF

The air take-off is a connecting element that is mounted between two Syntesi® modules. The 2-way version, made of metal and having restrained dimensions, has a threaded port upwards and one downwards. The 4-way version, in technopolymer, has a threaded port on each side. This gives or four additional air outlets for use as required. All Syntesi® modules come with two threaded ports, one on the front and one on the back, for use as air take-off.

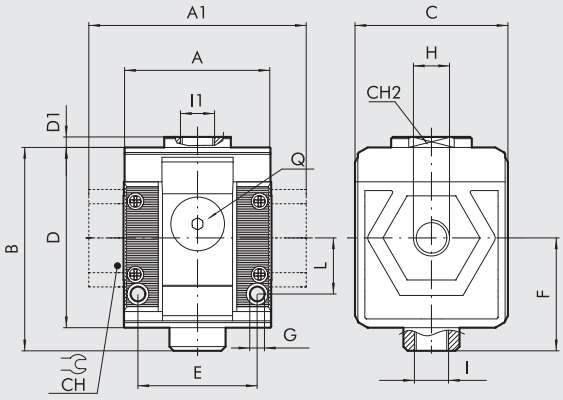
TECHNICAL DATA		AIR TAKE-OFF, SY1		AIR TAKE-OFF, SY2	
Version		PA 2-way	PA 4-way	PA 2-way	PA 4-way
Flow rate of the air take-off at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1550	500 - 2000	7000	1500 - 4500
	scfm	55	18 - 71	248	53 - 160
Maximum pressure	bar	15		13	
	MPa	1.5		1.3	
	psi	217		188	
Min/Max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to 50		From -10 to 50	
Weight	g	62	100	75	306
Fluid		Compressed air or other inert gases			

DIMENSIONS AND ORDERING CODES OF THE 2-WAY VERSION



Code	Description	A	B	C
5610P100	**PA SY1**	15.5	1/8"	3/8"
5620P100	**PA SY2**	27	3/8"	1/2"

DIMENSIONS 4 WAY-VERSION



	SIZE 1			SIZE 2			
H (threaded port)	1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
A	42			61			
A1	-	-	44	-	-	95	95
B	58			81			
C	44			61			
CH	-			-	-	32	36
CH2	19			-			
D	51.5			70.5			
D1	3			-			
E	33.5			47.5			
F	32.2			42.7			
G	Hole for M4 screws			Hole for M5 screws			
I	1/8″			1/4″			
I1	1/4″			3/8″			
L	16			22.5			
Q (no. 2 add. air takes-off)	1/8″			1/4″			

KEY TO CODE FOR 4-WAY VERSION

56	1	1	P	20	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**TYPE**	**THREADED OUTPUT CONNECTION**
56 Syntesi **5X** Syntesi anti-corrosion	**1** Size 1	**0** Without bushing **1** 1/8″ port **2** 1/4″ port **3** 3/8″ port	**P** Air take-off	**20** 4-way	**0** Without bushing **1** 1/8″ port **2** 1/4″ port **3** 3/8″ port
	2 Size 2	**0** Without bushing **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port			**0** Without bushing **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE CODES

Code	Description
AIR INTAKE, 2-way version	
5610P100	PA SY1
5620P100	PA SY2

Code	Description
AIR INTAKE, 4-way version	
5610P200	PA 4-way SY1 without bushing
5611P201	PA 4-way SY1 1/8
5612P202	PA 4-way SY1 1/4
5613P203	PA 4-way SY1 3/8
5620P200	PA 4-way SY2 without bushing
5623P203	PA 4-way SY2 3/8
5624P204	PA 4-way SY2 1/2
5625P205	PA 4-way SY2 3/4
5626P206	PA 4-way SY2 1

NOTE
Anti-corrosion version
5X_ _ _ _ _
Example
5X11P201 PA 4-way SY1 1/8 anti-corrosion

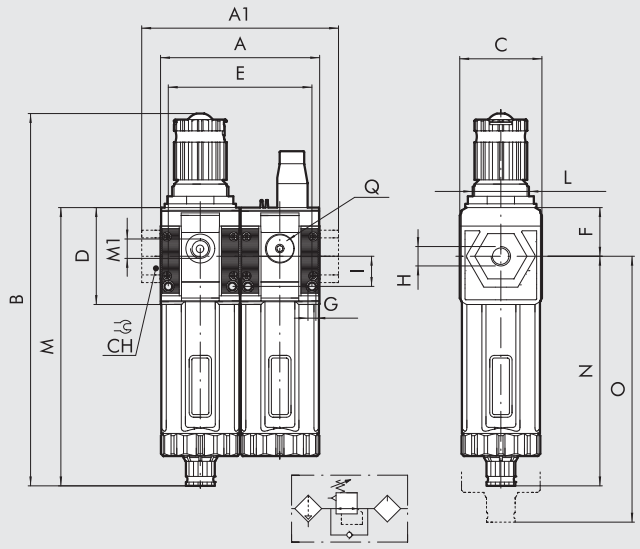
FR + LUB SYNTESi®

METAL WORK PNEUMATIC

For full details and list of components refer to the sections about filter-regulator and the lubricator.

TECHNICAL DATA		FR + LUB SY1			FR + LUB SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Degree of filtration	µm	5 (yellow) - output air purity class ISO8573-1: 3.7.-						
		20 (white) - output air purity class ISO8573-1: 4.7.-						
		50 (blue) - output air purity class ISO8573-1: 5.7.-						
Max. inlet pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	350			1200			
(P In=10 bar)	scfm	12			42.5			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1400			4000			
(P In=10 bar)	scfm	50			141.5			
Relief valve flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	70			100			
	scfm	2.5			3.5			
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Padlockable knob		Included						
Upstream pressure compensation		Included, via balanced valve						
Weight	g	414	409	400	1074	1047	1043	1031
Fluid		Compressed air or other inert gases						
Mounting position		Vertical			Vertical			
Additional air take-off, for pressure gauges or fittings		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500 (FR) - 450 (LUB)			1400 (FR) - 800 (LUB)			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18 (FR) - 16 (LUB)			49.5 (FR) - 28 (LUB)			
Filter bowl capacity (condensate)	cm^3	30			70			
Quantity of filled oil	cm^3	60			130			
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure						
		RA: automatic drain with condensate discharge, independent of pressure and flow rate						
		SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**						
		Note: **the maximum input pressure for the RA version must not exceed 10 bar**						
Recommended oils		ISO and UNI FD22						
		(Energol HPL; Spinesso; Mobil DTE; Tellus oil)						
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			

DIMENSIONS



		SIZE 1			SIZE 2			
H (threaded port)		1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
A		84			122			
A1		-	-	86	-	-	156	156
B	**RMSA**	198			246			
	RA/SAC	202			250			
C		44			61			
CH		-			-	-	32	36
D		51.5			70.5			
E		75.3			108			
F		25.8			38.2			
G		Hole for M4 screws			Hole for M5 screws			
I		16			22.5			
L		M30x1.5			M38x2			
M	**RMSA**	148			178			
	RA/SAC	152			182			
M1 (pressure gauge port)		1/8″			1/4″			
N	**RMSA**	122.2			139.8			
	RA/SAC	126.2			143.8			
O	**RMSA**	202			245			
	RA/SAC	206			249			
Q (no. 2 additional air takes-off)		1/8″			1/4″			

KEY TO CODES

56	1	1	B	24	L	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**DEGREE OF FILTRATION, TYPE OF CONDENSATE DRAIN AND SETTING RANGE**	**ELEMENT**	**OIL FILLING**	**THREADED OUTPUT CONNECTION**
56 Syntesi **5X** Syntesi anti-corrosion	**1** Size 1 **2** Size 2	**1** 1/8″ port **2** 1/4″ port **3** 3/8″ port **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port	**B** Filter-regulator	● **10** 5 µm, RMSA, 0 to 2 bar ● **20** 20 µm, RMSA, 0 to 2 bar ● **30** 50 µm, RMSA, 0 to 2 bar ● **40** 5 µm, RA, 0 to 2 bar ● **50** 20 µm, RA, 0 to 2 bar ● **60** 50 µm, RA, 0 to 2 bar ● **11** 5 µm, SAC, 0 to 2 bar ● **21** 20 µm, SAC, 0 to 2 bar ● **31** 50 µm, SAC, 0 to 2 bar ✚ **12** 5 µm, RMSA, 0 to 4 bar ✚ **22** 20 µm, RMSA, 0 to 4 bar ✚ **32** 50 µm, RMSA, 0 to 4 bar ✚ **42** 5 µm, RA, 0 to 4 bar ✚ **52** 20 µm, RA, 0 to 4 bar ✚ **62** 50 µm, RA, 0 to 4 bar ✚ **13** 5 µm, SAC, 0 to 4 bar ✚ **23** 20 µm, SAC, 0 to 4 bar ✚ **33** 50 µm, SAC, 0 to 4 bar **14** 5 µm, RMSA, 0 to 8 bar **24** 20 µm, RMSA, 0 to 8 bar **34** 50 µm, RMSA, 0 to 8 bar **44** 5 µm, RA, 0 to 8 bar **54** 20 µm, RA, 0 to 8 bar **64** 50 µm, RA, 0 to 8 bar **15** 5 µm, SAC, 0 to 8 bar **25** 20 µm, SAC, 0 to 8 bar **35** 50 µm, SAC, 0 to 8 bar **16** 5 µm, RMSA, 0 to 12 bar **26** 20 µm, RMSA, 0 to 12 bar **36** 50 µm, RMSA, 0 to 12 bar **46** 5 µm, RA, 0 to 12 bar **56** 20 µm, RA, 0 to 12 bar **66** 50 µm, RA, 0 to 12 bar **17** 5 µm, SAC, 0 to 12 bar **27** 20 µm, SAC, 0 to 12 bar **37** 50 µm, SAC, 0 to 12 bar	**L** Lubricator	**10** Manual filling from the top	**1** 1/8″ port **2** 1/4″ port **3** 3/8″ port **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port

● Not available in the anti-corrosion version.
✚ Anti-corrosion version available only in size 1.

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
FR + LUB Syntesi® SY1	
5611B24L101	FR+LUB SY1 1/8 20 08 RMSA
5611B54L101	FR+LUB SY1 1/8 20 08 RA
5612B24L102	FR+LUB SY1 1/4 20 08 RMSA
5612B54L102	FR+LUB SY1 1/4 20 08 RA
5613B24L103	FR+LUB SY1 3/8 20 08 RMSA
5613B54L103	FR+LUB SY1 3/8 20 08 RA

Code	Description
FR + LUB Syntesi® SY2	
5623B24L103	FR+LUB SY2 3/8 20 08 RMSA
5623B54L103	FR+LUB SY2 3/8 20 08 RA
5624B24L104	FR+LUB SY2 1/2 20 08 RMSA
5624B54L104	FR+LUB SY2 1/2 20 08 RA
5625B24L105	FR+LUB SY2 3/4 20 08 RMSA
5625B54L105	FR+LUB SY2 3/4 20 08 RA
5626B24L106	FR+LUB SY2 1 20 08 RMSA
5626B54L106	FR+LUB SY2 1 20 08 RA

NOTE
Anti-corrosion version
5X_ _ _ _ _ _
Example
5X11B54L101 FR+LUB SY1 1/8 20 08 RA anti-corrosion

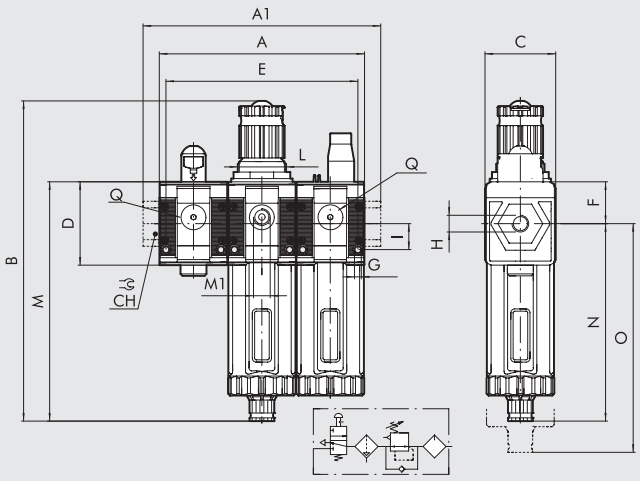
NOTES

V3V + FR + LUB SYNTESI®

For full details and list of components refer to the sections about shut-off valve, filter-regulator and lubricator.

TECHNICAL DATA		V3V + FR + LUB SY1			V3V + FR + LUB SY2			
Threaded port		1/8'	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Degree of filtration	µm	5 (yellow) - output air purity class ISO8573-1: 3.7.-						
		20 (white) - output air purity class ISO8573-1: 4.7.-						
		50 (blue) - output air purity class ISO8573-1: 5.7.-						
Max. inlet pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	250			1200			
(P In=10 bar)	scfm	9			42.5			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1050			4000			
(P In=10 bar)	scfm	37			141.5			
Relief valve flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	70			100			
	scfm	2.5			3.5			
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Full outflow with zero inlet pressure		Included			Included			
Drain flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	500			2000			
	scfm	18			71			
Padlockable knob		Included with both V3V and regulator						
Upstream pressure compensation		Included, via balanced valve						
Weight	g	598	593	584	1479	1452	1448	1436
Fluid		Compressed air or other inert gases						
Mounting position		Vertical			Vertical			
Additional air take-off, for pressure gauges or fittings		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500 (V3V) - 500 (FR) - 450 (LUB)			1500 (V3V) - 1400 (FR) - 800 (LUB)			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18 (V3V) - 18 (FR) - 16 (LUB)			53 (V3V) - 49.5 (FR) - 28 (LUB)			
Filter bowl capacity	cm^3	30			70			
Quantity of filled oil	cm^3	60			130			
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure						
		RA: automatic drain with condensate discharge, independent of pressure and flow rate						
		SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**						
		Note: **the maximum input pressure for the RA version must not exceed 10 bar**						
Recommended oils		ISO and UNI FD22						
		(Energol HPL; Spinesso; Mobil DTE; Tellus oil)						
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			

OVERALL DIMENSIONS



		SIZE 1			SIZE 2			
H (threaded port)		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
A		126			183			
A1		-	-	128	-	-	217	217
B	RMSA	198			246			
	RA/SAC	202			250			
C		44			61			
CH		-			-	-	32	36
D		51.5			70.5			
E		117.1			168.5			
F		25.8			38.2			
G		Hole for M4 screws			Hole for M5 screws			
I		16			22.5			
L		M30x1.5			M38x2			
M	RMSA	148			178			
	RA/SAC	152			182			
M1 (pressure gauge port)		1/8"			1/4"			
N	RMSA	122.2			139.8			
	RA/SAC	126.2			143.8			
O	RMSA	202			245			
	RA/SAC	206			249			
Q (no. 2 additional air takes-off)		1/8"			1/4"			

KEY TO CODES

56	1	1	V	10	B	24	L	10	1
SYNTESI	SIZE	THREADED INPUT CONNECTION	ELEMENT	TYPE	ELEMENT	DEGREE OF FILTRATION, TYPE OF CONDENSATE DRAIN AND SETTING RANGE	ELEMENT	OIL FILLING	THREADED OUTPUT CONNECTION
56 Syntesi **5X** Syntesi anti-corrosion	**1** Size 1 **2** Size 2	**1** 1/8" port **2** 1/4" port **3** 3/8" port **3** 3/8" port **4** 1/2" port **5** 3/4" port **6** 1" port	**V** V3V	**10** Manual with Ø3.5 hole for padlocks **11** Manual with Ø7 hole for padlock	**B** Filter-regulator	● **10** 5 µm, RMSA, 0 to 2 bar ● **20** 20 µm, RMSA, 0 to 2 bar ● **30** 50 µm, RMSA, 0 to 2 bar ● **40** 5 µm, RA, 0 to 2 bar ● **50** 20 µm, RA, 0 to 2 bar ● **60** 50 µm, RA, 0 to 2 bar ● **11** 5 µm, SAC, 0 to 2 bar ● **21** 20 µm, SAC, 0 to 2 bar ● **31** 50 µm, SAC, 0 to 2 bar ✚ **12** 5 µm, RMSA, 0 to 4 bar ✚ **22** 20 µm, RMSA, 0 to 4 bar ✚ **32** 50 µm, RMSA, 0 to 4 bar ✚ **42** 5 µm, RA, 0 to 4 bar ✚ **52** 20 µm, RA, 0 to 4 bar ✚ **62** 50 µm, RA, 0 to 4 bar ✚ **13** 5 µm, SAC, 0 to 4 bar ✚ **23** 20 µm, SAC, 0 to 4 bar ✚ **33** 50 µm, SAC, 0 to 4 bar **14** 5 µm, RMSA, 0 to 8 bar **24** 20 µm, RMSA, 0 to 8 bar **34** 50 µm, RMSA, 0 to 8 bar **44** 5 µm, RA, 0 to 8 bar **54** 20 µm, RA, 0 to 8 bar **64** 50 µm, RA, 0 to 8 bar **15** 5 µm, SAC, 0 to 8 bar **25** 20 µm, SAC, 0 to 8 bar **35** 50 µm, SAC, 0 to 8 bar **16** 5 µm, RMSA, 0 to 12 bar **26** 20 µm, RMSA, 0 to 12 bar **36** 50 µm, RMSA, 0 to 12 bar **46** 5 µm, RA, 0 to 12 bar **56** 20 µm, RA, 0 to 12 bar **66** 50 µm, RA, 0 to 12 bar **17** 5 µm, SAC, 0 to 12 bar **27** 20 µm, SAC, 0 to 12 bar **37** 50 µm, SAC, 0 to 12 bar	**L** Lubricator	**10** Manual filling from the top	**1** 1/8" port **2** 1/4" port **3** 3/8" port **3** 3/8" port **4** 1/2" port **5** 3/4" port **6** 1" port

● Not available in the anti-corrosion version.
✚ Anti-corrosion version available only in size 1.
RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs**.

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description
V3V + FR + LUB Syntesi® SY1	
5611V10B24L101	V3V+FR+LUB SY1 1/8 20 08 RMSA
5611V10B54L101	V3V+FR+LUB SY1 1/8 20 08 RA
5612V10B24L102	V3V+FR+LUB SY1 1/4 20 08 RMSA
5612V10B54L102	V3V+FR+LUB SY1 1/4 20 08 RA
5613V10B24L103	V3V+FR+LUB SY1 3/8 20 08 RMSA
5613V10B54L103	V3V+FR+LUB SY1 3/8 20 08 RA

Code	Description
V3V + FR + LUB Syntesi® SY2	
5623V10B24L103	V3V+FR+LUB SY2 3/8 20 08 RMSA
5623V10B54L103	V3V+FR+LUB SY2 3/8 20 08 RA
5624V10B24L104	V3V+FR+LUB SY2 1/2 20 08 RMSA
5624V10B54L104	V3V+FR+LUB SY2 1/2 20 08 RA
5625V10B24L105	V3V+FR+LUB SY2 3/4 20 08 RMSA
5625V10B54L105	V3V+FR+LUB SY2 3/4 20 08 RA
5626V10B24L106	V3V+FR+LUB SY2 1 20 08 RMSA
5626V10B54L106	V3V+FR+LUB SY2 1 20 08 RA

NOTE
Anti-corrosion version
5X_ _ _ _ _ _
Example
5X11V10B54L101 V3V+FR+LUB SY1 1/8 20 08 RA anti-corrosion

NOTES

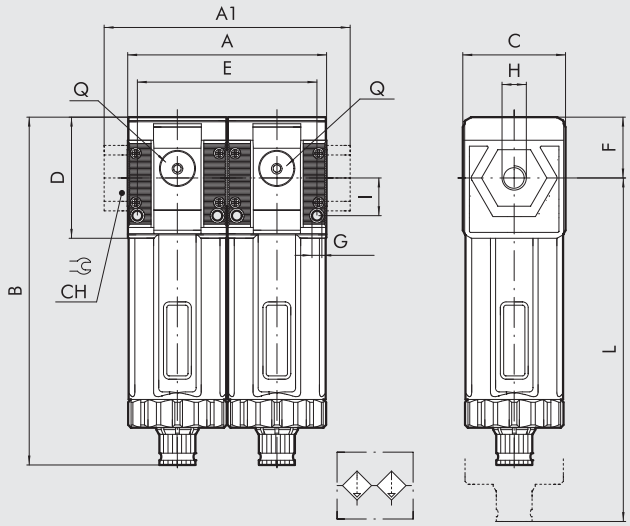
FIL + DEP SYNTESI®

METAL WORK PNEUMATIC

For full details and list of components refer to the sections about filter and depurator.

TECHNICAL DATA		FIL + DEP SY1			FIL + DEP SY2			
Threaded port		1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
Purifier degree of filtration	µm	0.01 - output air purity class ISO8573-1: 1.7.2						
Filter degree of filtration	µm	5 (yellow)						
Max. inlet pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Suggested flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min	550			1050			
	scfm	9			37			
Maximun suggested flow rate		Look a the chart on the depurator page **C1**.12			Look a the chart on the depurator page **C1**.12 / **C1**.13			
		N.B.: flow rates higher than the recommended value reduces purification efficiency						
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Weight	g	358	353	344	942	915	911	899
Purifier condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure						
Filter condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure						
		RA: automatic drain with condensate discharge, independent of pressure and flow rate						
		SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**						
		Note: **the maximum input pressure for the RA version must not exceed 10 bar**						
Fluid		Compressed air or other inert gases						
Bowl capacity filter/depurator	cm^3	30/15			70/40			
Mounting position		Vertical			Vertical			
Port for additional air take-off		1/8″, front and rear			1/4″, front and rear			
Additional air take-off flow rate (not purified air)	Nl/min	500			1500			
at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			53			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			

DIMENSIONS



		SIZE 1			SIZE 2			
H (threaded port)		1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
A		84			122			
A1		-	-	86	-	-	217	217
B	RMSA	148			178			
	RA/SAC	152			182			
C		44			61			
CH		-			-	-	32	36
D		51.5			70.5			
E		75.3			108			
F		25.8			38.2			
G		Hole for M4 screws			Hole for M5 screws			
I		16			22.5			
L	RMSA	202			245			
	RA/SAC	206			249			
Q (no. 2 additional air takes-off)		1/8″			1/4″			

KEY TO CODES

56	1	1	F	10	D	10	1
SYNTESI	SIZE	THREADED INPUT CONNECTION	ELEMENT	DEGREE OF FILTRATION AND TYPE OF CONDENSATE DRAIN	ELEMENT	TYPE	THREADED OUTPUT CONNECTION
56 Syntesi **5X** Syntesi anti-corrosion	**1** Size 1 **2** Size 2	**1** 1/8″ port **2** 1/4″ port **3** 3/8″ port **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port	**F** Filter	**10** 5 µm, RMSA **40** 5 µm, RA **11** 5 µm, SAC	**D** Depurator	**10** RMSA **11** SAC	**1** 1/8″ port **2** 1/4″ port **3** 3/8″ port **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description	Code	Description
FIL + DEP Syntesi® SY1		**FIL + DEP Syntesi® SY2**	
5611F10D101	FIL+DEP SY1 1/8 05 RMSA	**5623F10D103**	FIL+DEP SY2 3/8 05 RMSA
5611F40D101	FIL+DEP SY1 1/8 05 RA	**5623F40D103**	FIL+DEP SY2 3/8 05 RA
5612F10D102	FIL+DEP SY1 1/4 05 RMSA	**5624F10D104**	FIL+DEP SY2 1/2 05 RMSA
5612F40D102	FIL+DEP SY1 1/4 05 RA	**5624F40D104**	FIL+DEP SY2 1/2 05 RA
5613F10D103	FIL+DEP SY1 3/8 05 RMSA	**5625F10D105**	FIL+DEP SY2 3/4 05 RMSA
5613F40D103	FIL+DEP SY1 3/8 05 RA	**5625F40D105**	FIL+DEP SY2 3/4 05 RA
		5626F10D106	FIL+DEP SY2 1 05 RMSA
		5626F40D106	FIL+DEP SY2 1 05 RA

NOTE
Anti-corrosion version
5X_ _ _ _ _
Example
5X11F40D101 FIL+DEP SY1 1/8 05 RA anti-corrosion

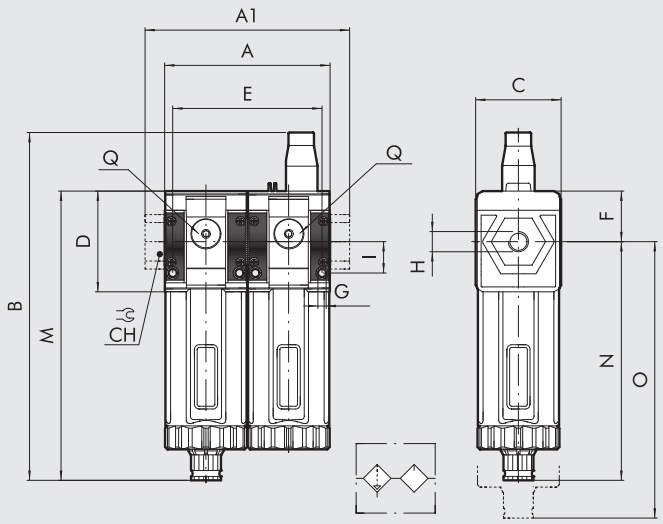
FIL + LUB SYNTESI®

METAL WORK PNEUMATIC

For full details and list of components refer to the sections about filter and lubricator.

TECHNICAL DATA		FIL + LUB SY1			FIL + LUB SY2			
Threaded port		1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Degree of filtration	µm	5 (yellow) - output air purity class ISO8573-1: 3.7.-						
		20 (white) - output air purity class ISO8573-1: 4.7.-						
		50 (blue) - output air purity class ISO8573-1: 5.7.-						
Max. inlet pressure	bar	15			13			
	MPa	1.5			1.3			
	psi	217			188			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min	860			2900			
	scfm	30			102.5			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min	1450			4400			
	scfm	51			156			
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Weight	g	349	344	355	840	813	809	797
Fluid		Compressed air or other inert gases						
Mounting position		Vertical			Vertical			
Additional air take-off, for pressure gauges or fittings		1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	Nl/min	500 - 450			1500 - 800			
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18 - 16			53 - 28			
Filter bowl capacity (condensate)	cm^3	30			70			
Quantity of filled oil	cm^3	60			130			
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure						
		RA: automatic drain with condensate discharge, independent of pressure and flow rate						
		SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**						
		Note: **the maximum input pressure for the RA version must not exceed 10 bar**						
Recommended oils		ISO and UNI FD22						
		(Energol HPL; Spinesso; Mobil DTE; Tellus oil)						
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			

DIMENSIONS



		SIZE 1			SIZE 2			
H (threaded port)		1/8″	1/4″	3/8″	3/8″	1/2″	3/4″	1″
A		84			122			
A1		-	-	86	-	-	156	156
B	**RMSA**	117.5			208			
	RA/SAC	121.5			212			
C		44			61			
CH		-			-	-	32	36
D		51.5			70.5			
E		75.3			108			
F		25.8			38.2			
G		Hole for M4 screws			Hole for M5 screws			
I		16			22.5			
M	**RMSA**	148			178			
	RA/SAC	152			182			
N	**RMSA**	122.2			139.8			
	RA/SAC	126.2			143.8			
O	**RMSA**	202			245			
	RA/SAC	206			249			
Q (no. 2 additional air takes-off)		1/8″			1/4″			

KEY TO CODES

56	1	1	F	10	L	10	1
SYNTESI	**SIZE**	**THREADED INPUT CONNECTION**	**ELEMENT**	**DEGREE OF FILTRATION AND TYPE OF CONDENSATE DRAIN**	**ELEMENT**	**OIL FILLING**	**THREADED OUTPUT CONNECTION**
56 Syntesi **5X** Syntesi anti-corrosion	**1** Size 1 **2** Size 2	**1** 1/8″ port **2** 1/4″ port **3** 3/8″ port **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port	**F** Filter	**10** 5 µm, RMSA **20** 20 µm, RMSA **30** 50 µm, RMSA **40** 5 µm, RA **50** 20 µm, RA **60** 50 µm, RA **11** 5 µm, SAC **21** 20 µm, SAC **31** 50 µm, SAC	**L** Lubricator	**10** Manual filling from the top	**1** 1/8″ port **2** 1/4″ port **3** 3/8″ port **3** 3/8″ port **4** 1/2″ port **5** 3/4″ port **6** 1″ port

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**

PURCHASE ORDER CODES HAVING A MORE FREQUENT USE

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

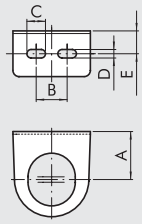
Code	Description	Code	Description
FIL + LUB Syntesi® SY1		**FIL + LUB Syntesi® SY2**	
5611F20L101	FIL+LUB SY1 1/8 20 RMSA	**5623F20L103**	FIL+LUB SY2 3/8 20 RMSA
5611F50L101	FIL+LUB SY1 1/8 20 RA	**5623F50L103**	FIL+LUB SY2 3/8 20 RA
5612F20L102	FIL+LUB SY1 1/4 20 RMSA	**5624F20L104**	FIL+LUB SY2 1/2 20 RMSA
5612F50L102	FIL+LUB SY1 1/4 20 RA	**5624F50L104**	FIL+LUB SY2 1/2 20 RA
5613F20L103	FIL+LUB SY1 3/8 20 RMSA	**5625F20L105**	FIL+LUB SY2 3/4 20 RMSA
5613F50L103	FIL+LUB SY1 3/8 20 RA	**5625F50L105**	FIL+LUB SY2 3/4 20 RA
		5626F20L106	FIL+LUB SY2 1 20 RMSA
		5626F50L106	FIL+LUB SY2 1 20 RA

NOTE
Anti-corrosion version
5X_ _ _ _ _
Example
5X11F50L101 FIL+LUB SY1 1/8 20 RA anti-corrosion

SYNTESI® ACCESSORIES

METAL WORK PNEUMATIC

MOUNTING BRACKET FOR REG. AND FR KNOB

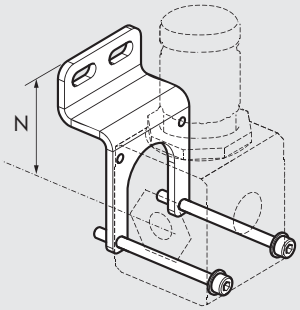


Code	Description
9200701	SF100 - BIT-ND 1/4 - SY1
9400701	SF200 - ND-3/8 1/2 - SY2

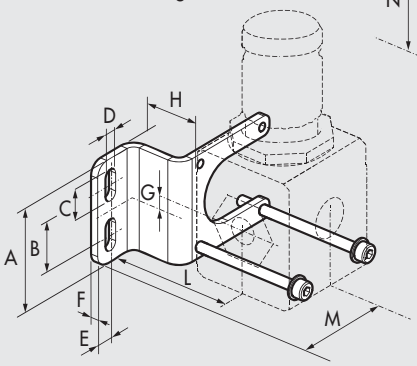
Code	A	B	C	D	E
9200701	32	20	12	5.5	14.2
9400701	42	40	12	5.5	15

MOUNTING BRACKET

Vertical mounting



Horizontal mounting

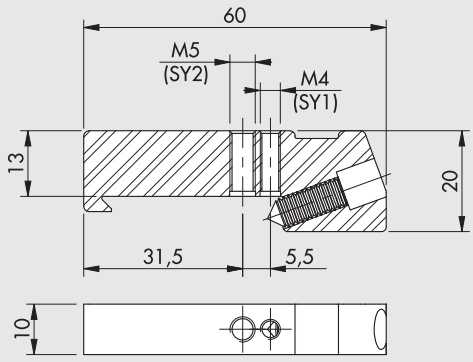


Code	Description
9200716X	Mounting bracket SY1
9200717X	Mounting bracket SY2

Note: Supplie complete with screws and washers.
Max torque 0.8 Nm for SY1 - Max torque 2.0 Nm for SY2
Codes to be used for units in the standard and the anti-corrosion version

Code	A	B	C	D	E	F	G	H	L	M	N
9200716X	41.5	20	12.7	5.5	7	3	0.8	25	43.8	46.5	47
9200717X	60	40	12.7	5.5	8	3	1.3	30	57.5	58.3	59.5

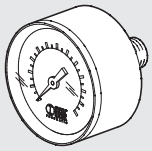
CONNECTION BRACKETS ON THE BAR (DIN EN50022)

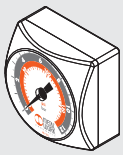


Code	Description
9200718X	Connection brackets on DIN bar, SY1 - SY2

Note: 2 pieces per pack complete with screws and washers.
Max torque 0.8 Nm for SY1 - Max torque 2.0 Nm for SY2
Codes to be used for units in the standard and the anti-corrosion version

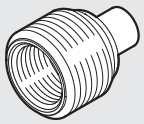
PRESSURE GAUGES





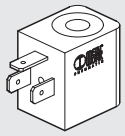
Code	Description
9700101	M 40 1/8 012
9700102	M 40 1/8 04
9800101	M 50 1/8 012
9800102	M 50 1/8 04
9900101	M 63 1/4 012
9700109	M 40x40 1/8 04
9700110	M 40x40 1/8 012

ADAPTERS FOR PRESSURE GAUGES (SY2)



Code	Description
9210005	1/4 adapter for 1/8 pressure gauge

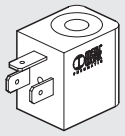
COIL 22 mm FOR APR AND V3V ELPN



Code	Description
W0215000151	Coil 22 Ø 8 BA 2W-12VDC
W0215000101	Coil 22 Ø 8 BA 2W-24VDC
W0215000111	Coil 22 Ø 8 BA 3.5VA-24VAC
W0215000121	Coil 22 Ø 8 BA 3.5VA-110VAC
W0215000131	Coil 22 Ø 8 BA 3.5VA-220VAC

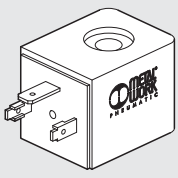
"UL" AND "CSA" COILS 22 mm

c UL us



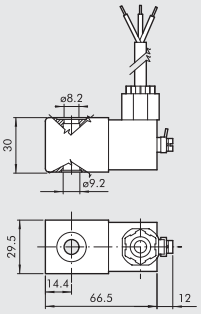
Code	Description
W0215000251	Coil 22 Ø 8 BA 2W-12VDC UR
W0215000201	Coil 22 Ø 8 BA 2W-24VDC UR
W0215000211	Coil 22 Ø 8 BA 3.5VA-24VAC UR
W0215000221	Coil 22 Ø 8 BA 3.5VA-110VAC UR
W0215000231	Coil 22 Ø 8 BA 3.5VA-220VAC UR

COIL 30 mm FOR APR AND V3V ELPN



Code	Description
W0210010100	Coil 30 Ø 8 2W-24VDC
W0210011100	Coil 30 Ø 8 3.5VA-24VAC 50/60 HZ
W0210012100	Coil 30 Ø 8 3.5VA-110VAC 50/60 HZ
W0210013100	Coil 30 Ø 8 3.5VA-220VAC 50/60 HZ

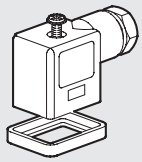
KIT FOR COIL EEXM



Code	Description
0227606913	Kit for coil 30 24 VDC EEXMT5 cable 3m
0227606915	Kit for coil 30 24 VDC EEXMT5 cable 5m
0227608013	Kit for coil 30 24 VAC EEXMT5 cable 3m
0227608015	Kit for coil 30 24 VAC EEXMT5 cable 5m
0227608023	Kit for coil 30 110 VAC EEXMT5 cable 3m
0227608025	Kit for coil 30 110 VAC EEXMT5 cable 5m
0227608033	Kit for coil 30 230 VAC EEXMT5 cable 3m
0227608035	Kit for coil 30 230 VAC EEXMT5 cable 5m

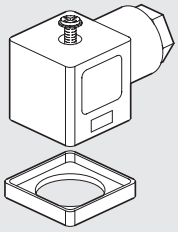
According to Atex 94/9 CE rule,
Ex II 2G Ex mb IIC T4/T5 Gb
Ex II 2D Ex tb IIIC T130/T95 °C IP66 Db

ELECTRIC CONNECTOR 22 mm FOR APR AND V3V ELPN



Code	Description
W0970510011	Connector standard
W0970510012	Connector 22 LED 24V
W0970510013	Connector 22 LED 110V
W0970510014	Connector 22 LED 220V
W0970510015	Connector 22 LED VDR 24V
W0970510016	Connector 22 LED VDR 110V
W0970510017	Connector 22 LED VDR 220V
W0970510070	Connector 22 II 2 GD ATEX

ELECTRIC CONNECTOR 30 mm FOR APR AND V3V ELPN



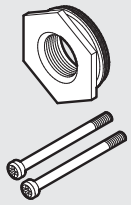
Code	Description
W0970520033	Connector 30 STD
W0970520034	Connector 30 LED 24V
W0970520035	Connector 30 LED 110V
W0970520036	Connector 30 LED 220V
W0970520037	Connector 30 LED VDR 24V
W0970520038	Connector 30 LED VDR 110V
W0970520039	Connector 30 LED VDR 220V

KIT COIL SIDE 22 IP65

Code	Description
0222100100	Kit for coils 22 - IP65

Improved IP65 protection, even after prolonged exposure to atmospheric agents.

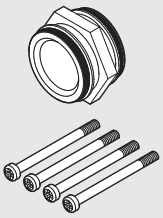
THREADED PORT



Code	Description
9210001	Kit IN OUT 1/8 SY1
9210002	Kit IN OUT 1/4 SY1
9210003	Kit IN OUT 3/8 SY1
9210011	Kit IN OUT 3/8 SY2
9210012	Kit IN OUT 1/2 SY2
9210013	Kit IN OUT 3/4 SY2
9210014	Kit IN OUT 1 SY2
9210001X	Kit IN OUT 1/8 SY1 anti-corrosion
9210002X	Kit IN OUT 1/4 SY1 anti-corrosion
9210003X	Kit IN OUT 3/8 SY1 anti-corrosion
9210011X	Kit IN OUT 3/8 SY2 anti-corrosion
9210012X	Kit IN OUT 1/2 SY2 anti-corrosion
9210013X	Kit IN OUT 3/4 SY2 anti-corrosion
9210014X	Kit IN OUT 1 SY2 anti-corrosion

Max torque 0.4 Nm for SY1
Max torque 2.5 Nm for SY2

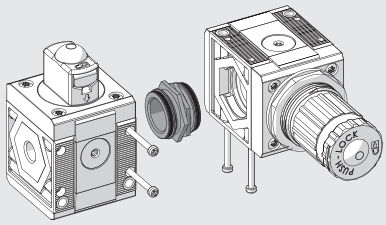
CONNECTING NIPPLE KIT



Code	Description
9210000	Connecting nipple kit SY1
9210010	Connecting nipple kit SY2
9210000X	Connecting nipple kit SY1 anti-corrosion
9210010X	Connecting nipple kit SY2 anti-corrosion

Max torque 0.4 Nm for SY1
Max torque 2.5 Nm for SY2

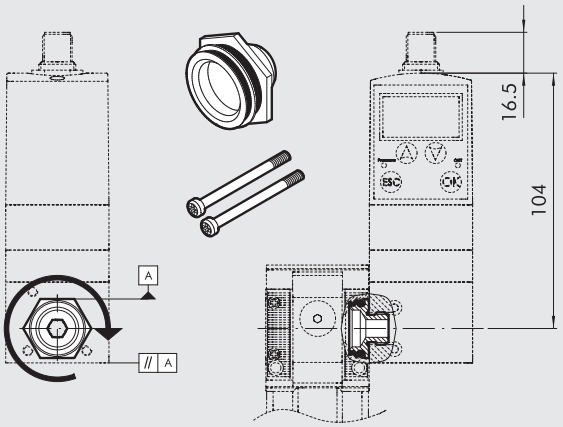
90° CONNECTING ELEMENT KIT



Code	Description
9210009	90° SY1 connection element kit
9210019	90° SY2 connection element kit
9210009X	90° anti-corrosion SY1 connection element kit
9210019X	90° anti-corrosion SY2 connection element kit

Max torque 0.4 Nm for SY1
Max torque 2.5 Nm for SY2

KIT CONNECTING REGTRONIC 1/4 (PAGE C6.10) AND GS REGULATOR (PAGE C6.2)



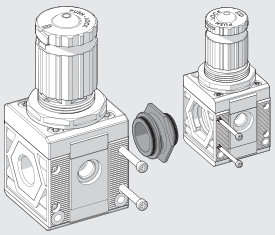
Code	Description
9210004	Adattatore per regtronic 1/4 SY1

Max torque for screw, 0.4 Nm

Instructions:

1) Screw the connecting bushing onto the REGTRONIC 1/4 as far as it will go. Use sealant on the G1/4 thread to provide a further seal.
2) Unscrew the bushing slightly until two surfaces of the hexagon are parallel to the body of REGTRONIC 1/4 (see diagram).
3) Insert the bushing into the Syntesi® unit.
4) Tighten the two self-tapping screws in the Syntesi® unit to a torque of 0.4 Nm max.

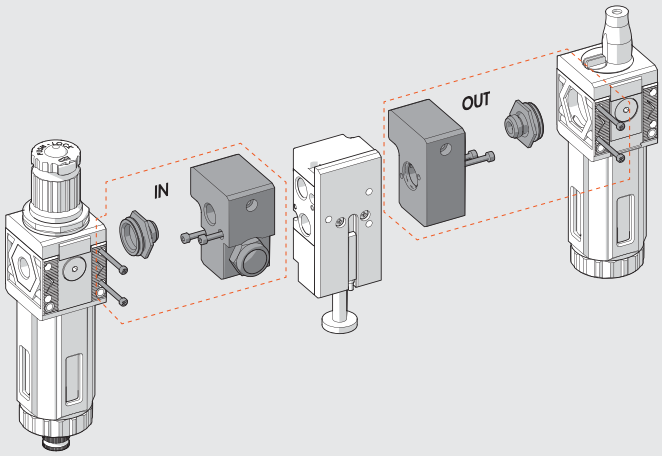
SY1 - SY2 SIZE ADAPTER



Code	Description
9210006	SY1 - SY2 size adapter
9210006X	SY1 - SY2 size adapter anti-corrosion

Max torque for screw, 0.4 Nm for SY1
Max torque for screw, 2.5 Nm for SY2

SY1 - SY2 KIT FOR CONNECTION TO SERIE 70 SAFE AIR® VALVES

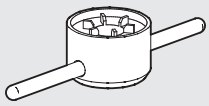


Code	Description
9210015	IN 1/4 SY1 block accessory
9210016	OUT 1/4 SY1 block accessory
9210017	IN 3/8 SY2 block accessory
9210018	OUT 3/8 SY2 block accessory

Max torque for screw, 0.4 Nm for SY1
Max torque for screw, 2.5 Nm for SY2

See page **B1**.141 for the assembly diagram.

BOWL DISASSEMBLY SPANNER



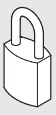
Code	Description
9170601	CS TF - TL BIT/SY1
9210050	CS TF - TL SY2

WALL-FIXING SCREW

Code	Description
9210030	M4 x 55 fixing screw SY1
9210031	M5 x 75 fixing screw SY2

Max torque 0.8 Nm for SY1
Max torque 2.0 Nm for SY2

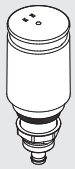
PADLOCK



Code	Description
9062401	Padlock

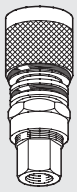
SYNTESI® SPARE PARTS

AUTOMATIC DRAIN (RA)



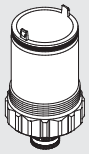
Code	Description
9000802	RA automatic drain spare part

AUTOMATIC DRAIN (SAC)



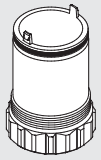
Code	Description
9000803	Spares SAC automatic drain

BOWL RMSA/RA/SAC



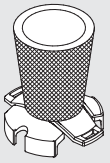
Code	Description
9210100	Bowl FIL FR DEP RMSA SY1
9210101	Bowl FIL FR RA SY1
9210102	Bowl FIL FR DEP SAC SY1
9210105	Bowl FIL FR DEP RMSA SY2
9210106	Bowl FIL FR RA SY2
9210107	Bowl FIL FR DEP SAC SY2

LUBRICATOR BOWL



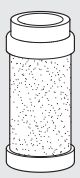
Code	Description
9210110	Bowl LUB SY1
9210115	Bowl LUB SY2

FILTERING ELEMENT



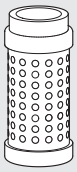
Code	Description
9210150	Filtering element 5µm (yellow) SY1
9210151	Filtering element 20µm (white) SY1
9210152	Filtering element 50µm (blue) SY1
9210155	Filtering element 5µm (yellow) SY2
9210156	Filtering element 20µm (white) SY2
9210157	Filtering element 50µm (blue) SY2

PURIFIER FILTERING ELEMENT



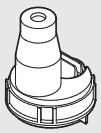
Code	Description
9210160	Cartridge DEP SY1
9210165	Cartridge DEP SY2

AC FILTERING ELEMENT (ACTIVE CARBON)



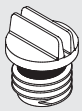
Code	Description
9210161	Cartridge AC SY1
9210166	Cartridge AC SY2

TRANSPARENT LUBRICATOR COVER



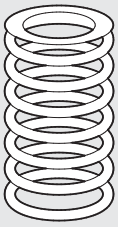
Code	Description
9210180	Transparent cover LUB SY1
9210185	Transparent cover LUB SY2

LUBRICATOR OIL-FILLING CAP



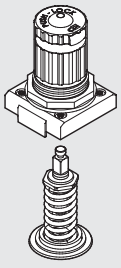
Code	Description
9210181	Oil-filling cap LUB SY1
9210186	Oil-filling cap LUB SY2

SPRINGS FOR REGULATORS AND FR



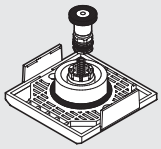
Code	Description
9210190	Spares MO 02 SY1
9210191	Spares MO 04 SY1/SY1 anti-corrosion
9210192	Spares MO 08 SY1
9210193	Spares MO 012 SY1
9210195	Spares MO 02 SY2
9210196	Spares MO 04 SY2
9210197	Spares MO 08 SY2
9210198	Spares MO 012 SY2
9210192X	Spares 08 SY1 anti-corrosion
9210193X	Spares 012 SY1 anti-corrosion
9210197X	Spares 08 SY2 anti-corrosion
9210198X	Spares 012 SY2 anti-corrosion

BELL FOR REG AND FR



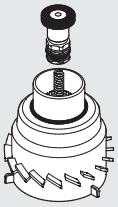
Code	Description
9210200	Bell 02 SY1
9210201	Bell 04 SY1
9210202	Bell 08 SY1
9210203	Bell 012 SY1
9210220	Bell 02 SY2
9210221	Bell 04 SY2
9210222	Bell 08 SY2
9210223	Bell 012 SY2
9210202X	Bell 08 SY1 anti-corrosion
9210203X	Bell 012 SY1 anti-corrosion
9210222X	Bell 08 SY2 anti-corrosion
9210223X	Bell 012 SY2 anti-corrosion

POPPET FOR REG



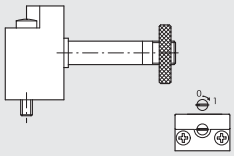
Code	Description
9210210	Poppet REG SY1
9210230	Poppet REG SY2
9210210X	Poppet REG SY1 anti-corrosion
9210230X	Poppet REG SY2 anti-corrosion

POPPET FOR FR



Code	Description
9210211	Poppet FR 5µm SY1
9210212	Poppet FR 20µm SY1
9210213	Poppet FR 50µm SY1
9210231	Poppet FR 5µm SY2
9210232	Poppet FR 20µm SY2
9210233	Poppet FR 50µm SY2

CNOMO CONTROL FOR V3V AND APR SY2



Code	Description
9453922	Elpn Cnomo control kit, manual bistable

NOTES

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SUMMARY bit

bit STANDARD

	GENERAL TECHNICAL DATA bit	C2.2
	bit FILTER	C2.4
	bit DEPURATOR	C2.6
	bit MICRO-REGULATOR	C2.8
	bit PADLOCKABLE MICROREGULATOR	C2.10
	bit FILTER-REGULATOR	C2.11
	bit LUBRICATOR	C2.13
	bit TAKE-OFF	C2.16
	FIL + REG + LUB bit	C2.17
	FR + LUB bit	C2.19
	FIL + DEP bit	C2.21
	FIL + LUB bit	C2.22

bit SERIES F FOR WATER

	GENERAL TECHNICAL DATA bit SERIES F FOR WATER	C2.23
	bit SERIES F FILTER FOR WATER	C2.24
	bit SERIES F REGULATOR FOR WATER	C2.26
	bit SERIES F FILTER-REGULATOR FOR WATER	C2.29

ACCESSORIES AND SPARE PARTS

	bit ACCESSORIES	C2.32
	bit SPARE PARTS	C2.33

GENERAL TECHNICAL DATA **bit**

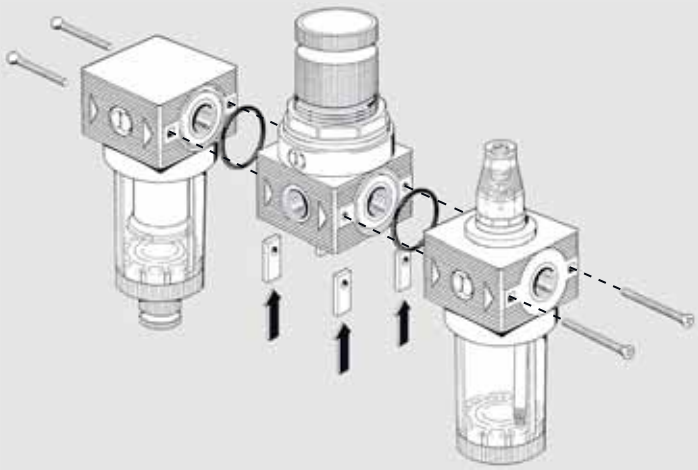
The units in the **bit** range feature:
- reduced dimensions
- negligible load loss
- long life
- excellent quality-to-price ratio

Thanks to its technical features the **bit** air treatment range is particularly suitable for de-centralized use near the final actuators.

TECHNICAL DATA		BIT 1/8"	BIT 1/4"
Threaded port		1/8"	1/4"
Degree of filtration	µm	5 (yellow) 20 (white) 50 (blue)	
Degree of purification		99.97% a 0.01 µm	
Setting range	bar	0 to 2 - 0 to 4 - 0 to 8 - 0 to 12	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	350	
	scfm	12	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	– 10° to + 50°	
	°F	14° to 122°	
Elements		Filter – Regulator – Lubricator – Filter-regulator – Depurator	
		Units: FRL, FR + L, F + L, F + D	
Mounting		By means of the bracket provided	
Fluid		Compressed air	
Compatibility with oils		See **chapter Z1**	

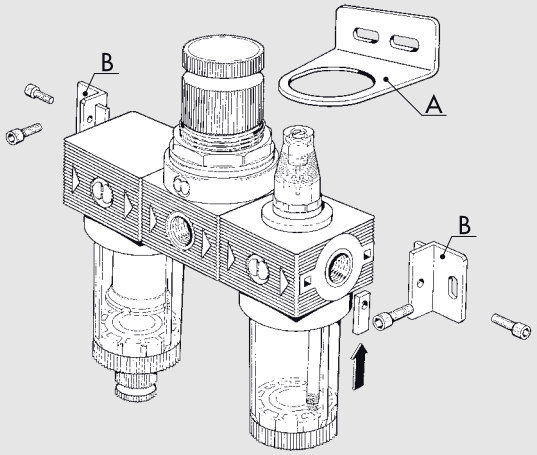
ASSEMBLY

Use ASSEMBLY PLATES (code 9170201) to assemble the **bit** elements correctly.
Assembly procedure:
- Fit the plates right into the slots under the body of the **bit** element
- Check that there O-rings round the threaded outlet
- Assemble the elements, making sure that the flow run in the direction of the arrows marked on the body.

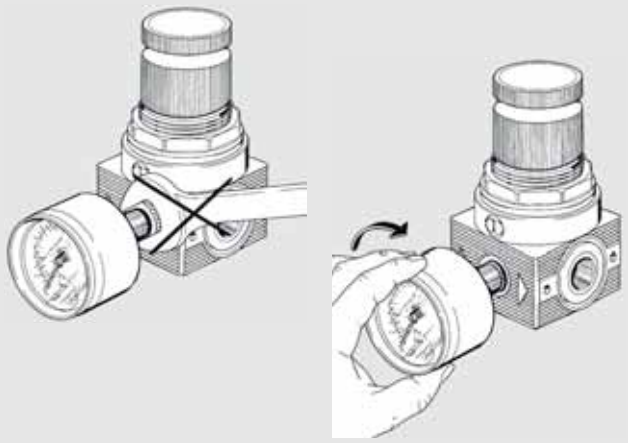


WALL MOUNTING

The wall fixing of a **bit** unit can be made through:
- Fixing bracket R/FR code 9200701 (A)
- Wall fixing plates code 9170301 (B)

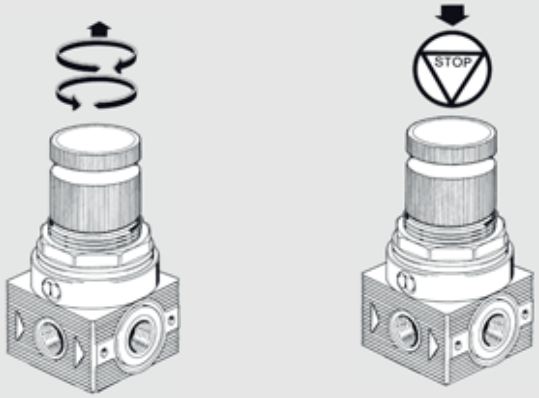


GENERAL RULES - USE AND MAINTENANCE



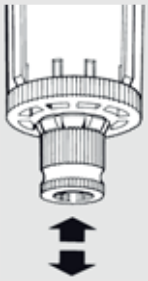
MOUNTING THE GAUGE

The gauge must be mounted by hand without using a spanner.
Use fluid sealants to provide a good seal.
N.B. Do not use Teflon.



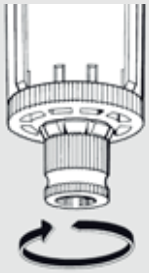
SETTING THE PRESSURE

The air pressure must always be set upwards. The knob can be locked so that the set pressure cannot be altered.



With the knob in the centre position, the drain is semi-automatic.
The drain operates when the bowl is not pressurized and closes when it is.

Press the button to drain condensate when the bowl is pressurized.



Turn the knob anticlockwise to close the valve with bowl pressurized or not pressurized.

To clean or replace the filter element unscrew the screen of the centrifuge assembly.
Use a no. 3 compass spanner to unscrew the bowl.

bit FILTER

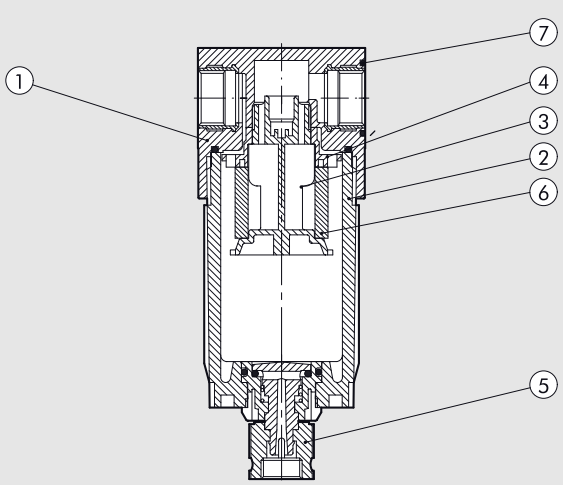
The units in the **bit** range feature:
- reduced dimensions
- negligible load loss
- long life
- excellent quality-to-price ratio

Thanks to its technical features the **bit** air treatment range is particularly suitable for de-centralized use near the final actuators.

TECHNICAL DATA		BIT 1/8"	BIT 1/4"
Threaded port		1/8"	1/4"
Degree of filtration	µm	5 (yellow) 20 (white) 50 (blue)	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.6 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	860	
	scfm	30.5	
Flow rate at 6.3 bar (0.6 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	1200	
	scfm	42.5	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	g	40	
Wall fixing screws		M4 by means of the bracket provided	
Bowl capacity	cm^3	16	
Mounting position		Vertical	
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure	
		SAC: automatic drain with condensate discharge .	
		Operates by depression – requires variable air take-offs.	
Fluid		Compressed air	

COMPONENTS

① Technopolymer body with OT58 threaded element
② Clear technopolymer bowl
③ Technopolymer baffle plug
④ Technopolymer centrifuge
⑤ Condensate drain (RMSA)
⑥ HDPE sintered filter cartridge
⑦ NBR gaskets



FLOW CHARTS

FIL

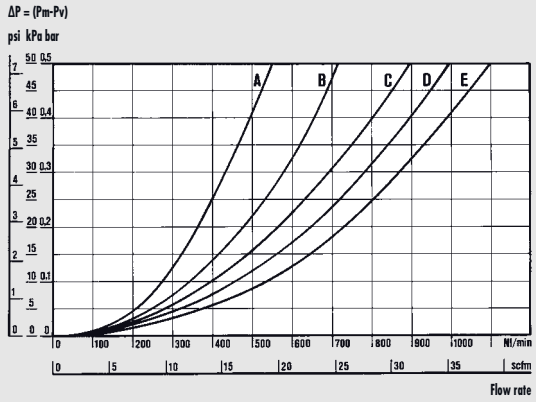


Chart referring to a filter with 1/4 ports

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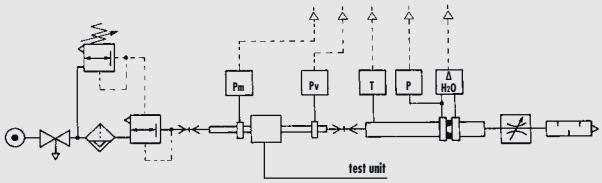
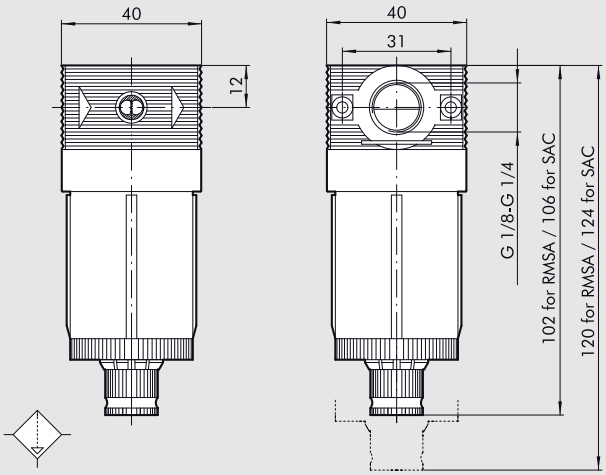
Turin Polytechnic



• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

DIMENSIONS



ORDERING CODES

Code	Description
5101001	FIL BIT 1/8 5 RMSA
5101004	FIL BIT 1/8 5 SAC
5101002	FIL BIT 1/8 20 RMSA
5101005	FIL BIT 1/8 20 SAC
5101003	FIL BIT 1/8 50 RMSA
5101006	FIL BIT 1/8 50 SAC
5201001	FIL BIT 1/4 5 RMSA
5201004	FIL BIT 1/4 5 SAC
5201002	FIL BIT 1/4 20 RMSA
5201005	FIL BIT 1/4 20 SAC
5201003	FIL BIT 1/4 50 RMSA
5201006	FIL BIT 1/4 50 SAC

SYNOPTIC, SIZES AND VERSIONS

FIL	BIT	1/8	5	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	CONDENSATE DRAIN
FIL	BIT	1/8 1/4	5 = 5 µm 20 = 20 µm 50 = 50 µm	RMSA SAC

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

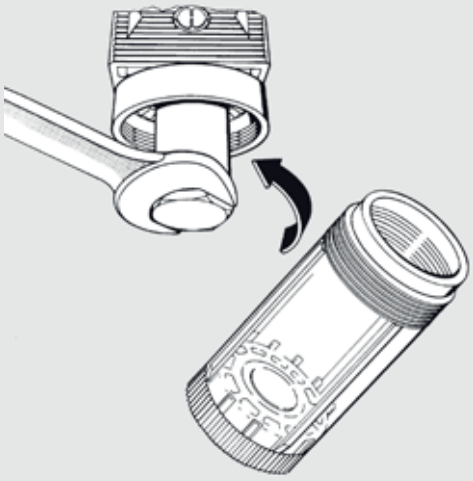
bit DEPURATOR

Coalescing mini-depurator
- Space saving
- Minimum load loss as the flow rate varies
- All-round condensate level viewing

TECHNICAL DATA		DEP BIT 1/8"	DEP BIT 1/4"
Threaded port		1/8"	1/4"
Degree of purification		99.97% 0.01 µm	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Suggested flow at 6 bar	Nl/min	200	
	scfm	7	
Maximum suggested flow rate		See next page	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	g	65	
Wall fixing screws		M4 by means of the bracket provided	
Bowl capacity	cm^3	16	
Mounting position		Vertical	
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.	
Fluid		Filtered 5 µm compressed air	
Notes		A It is advisable to mount a 5 m filter upstream the depurator acting as a rough filter.	

USE AND MAINTENANCE

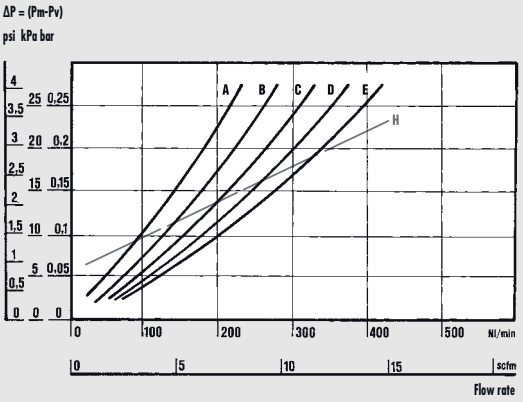
When replacing the coalescing cartridge, unscrew the bowl and then unscrew the screen of the cartridge assembly.
Then replace the cartridge. Use a no. 3 compass spanner to unscrew the bowl.



METAL WORK PNEUMATIC

FLOW CHARTS

DEP



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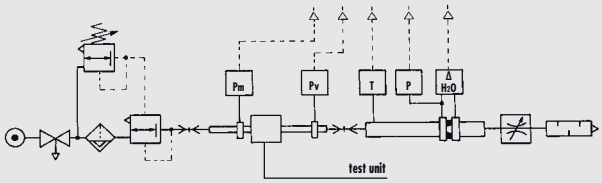
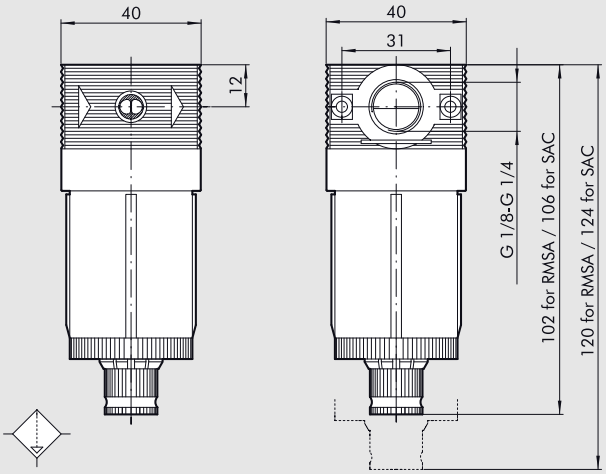


• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi
(H) = maximum flow rate recommended for optimal operation

DIMENSIONS



ORDERING CODES

Code	Description
5112001	DEP BIT 1/8 RMSA
5212001	DEP BIT 1/4 RMSA

SYNOPTIC, SIZES AND VERSIONS

DEP	BIT	1/8	RMSA
ELEMENT	SIZE	THREADED PORT	CONDENSATE DRAIN
DEP	BIT	1/8 1/4	RMSA

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.

bit MICRO-REGULATOR

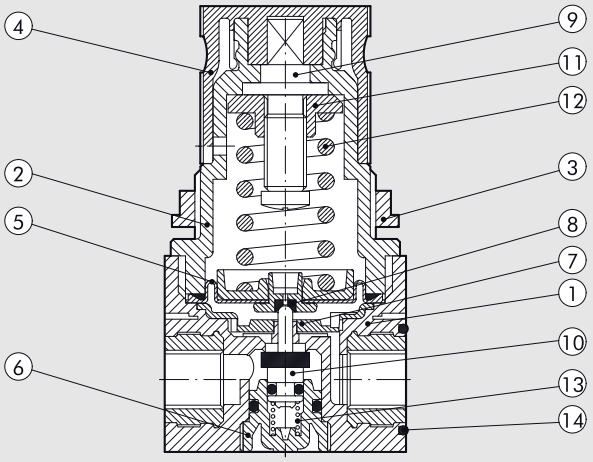
Micro-regulator with rolling diaphragm.
- Preset pressure stability as the upstream pressure varies.
- High flow rates with reduced pressure drops
- Quick overpressure exhaust

Versions available
bit FC: controlled relief to allow greater accuracy in regulation by means of slight continuous air relief.
bit for water: used to regulate the pressure in water circuits; without blowoff valve
bit SR: for use when the downstream circuit needs to be relieved quickly as the upstream pressure drops. Mount the SR regulator between the power supply valve and the point of use.

TECHNICAL DATA		MR BIT 1/8"	MR BIT 1/4"
Threaded port		1/8"	1/4"
Setting range		0 to 2 - 0 to 4 - 0 to 8 - 0 to 12	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	340	
	scfm	12	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	600	
	scfm	21	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	g	80	
Wall fixing screws		M4 by means of the bracket provided	
Gauge port		G 1/8"	
Mounting position		In any position	
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.	
Notes		The regulator pressure must always be set upwards.	
		For increased sensitivity, use a pressure regulator with a rated pressure	
		as close as possible to the required value.	

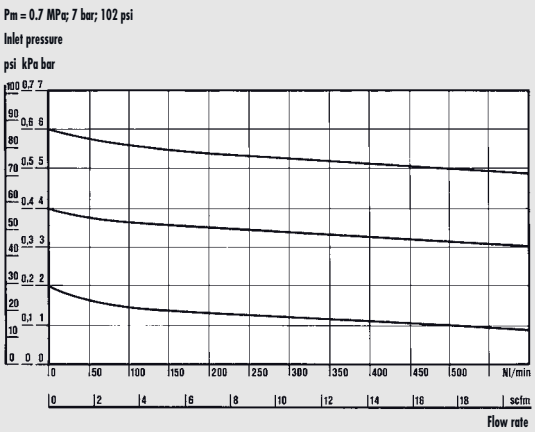
COMPONENTS

① Technopolymer body with OT58 threaded element
② Technopolymer bell
③ Technopolymer fixing ring nut
④ Technopolymer knob
⑤ Rolling diaphragm
⑥ Technopolymer plug
⑦ Technopolymer anti-vibration screen
⑧ NBR relieving gasket
⑨ OT58 brass adjusting screws
⑩ OT58 valve with NBR vulcanized gasket
⑪ OT58 brass nut
⑫ Steel adjusting spring
⑬ Stainless steel valve compression spring
⑭ NBR gaskets



FLOW CHARTS

MR



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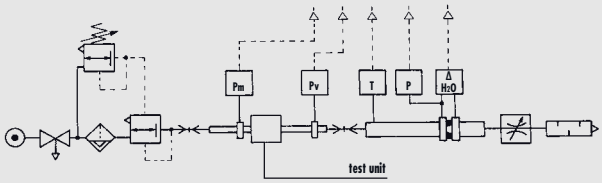
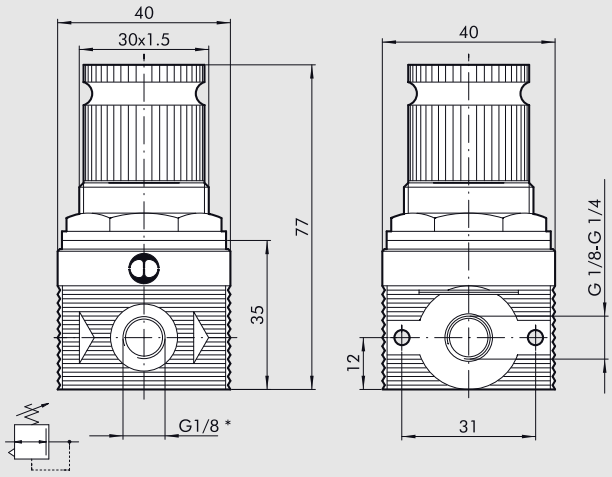


• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

DIMENSIONS



* Pressure gauge port

SYNOPTIC, SIZES AND VERSIONS

MR	BIT	FC	1/8	02
ELEMENT	SIZE	VERSION	THREADED PORT	CONDENSATE DRAIN
MR	BIT	FC = Controlled relief	1/8"	02 = 0 to 2 bar
	BIT	SR = Quickly relieved	1/4"	04 = 0 to 4 bar
	BIT	= Standard		08 = 0 to 8 bar
MRA	BIT	Without relief (for WATER)		012 = 0 to 12 bar

ORDERING CODES

Code	Description
MICROREGULATOR (MR)	
5107004	MR BIT 1/8 012
5107001	MR BIT 1/8 02
5107002	MR BIT 1/8 04
5107003	MR BIT 1/8 08
5207004	MR BIT 1/4 012
5207001	MR BIT 1/4 02
5207002	MR BIT 1/4 04
5207003	MR BIT 1/4 08
MICROREGULATOR WITH CONTROLLED RELIEF	
5111001	MR BIT FC 1/8 02
5111002	MR BIT FC 1/8 04
5211001	MR BIT FC 1/4 02
5211002	MR BIT FC 1/4 04
MICROREGULATOR WITH QUICK RELIEF	
5102001	MR BIT SR 1/8 02
5102002	MR BIT SR 1/8 04
5102003	MR BIT SR 1/8 08
5102004	MR BIT SR 1/8 012
5202001	MR BIT SR 1/4 02
5202002	MR BIT SR 1/4 04
5202003	MR BIT SR 1/4 08
5202004	MR BIT SR 1/4 012
WATER MICROREGULATOR	
5108001	MRA BIT 1/8 02
5108002	MRA BIT 1/8 04
5108003	MRA BIT 1/8 08
5108004	MRA BIT 1/8 012
5208001	MRA BIT 1/4 02
5208002	MRA BIT 1/4 04
5208003	MRA BIT 1/4 08
5208004	MRA BIT 1/4 012

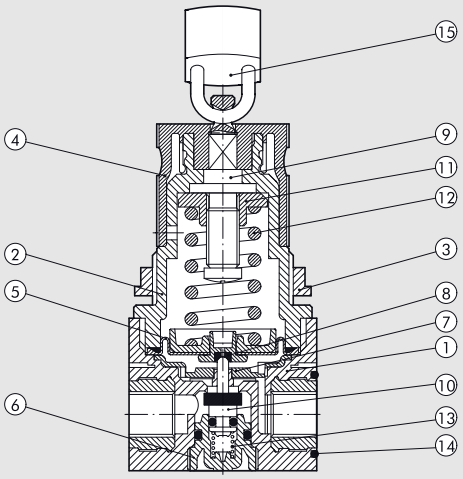
bit PADLOCKABLE MICROREGULATOR

The padlockable microregulator has a pin with a hole in it that projects from the top of the knob. When the knob is in the push-lock position, the padlock can be inserted in the hole, preventing the knob from being operated. A padlock and two keys are supplied with the regulator.

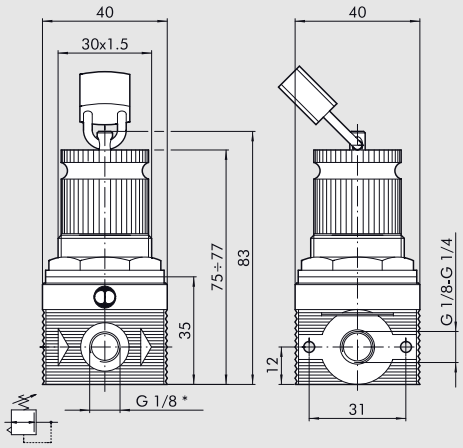
Refer to the bit microregulator for technical data and flow curves.

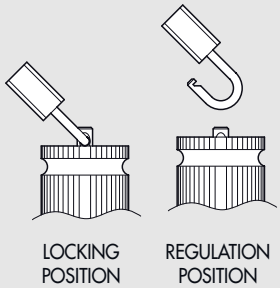
COMPONENTS

① Technopolymer body with OT58 threaded element
② Technopolymer bell
③ Technopolymer fixing ring nut
④ Technopolymer knob
⑤ Rolling diaphragm
⑥ Technopolymer plug
⑦ Technopolymer anti-vibration screen
⑧ NBR relieving gasket
⑨ Nickel-plated brass OT58 adjusting screws
⑩ OT58 valve with NBR vulcanized gasket
⑪ OT58 brass nut
⑫ Steel adjusting spring
⑬ Stainless steel valve compression spring
⑭ NBR gaskets
⑮ Padlock



DIMENSIONS





* Pressure gauge port

ORDERING CODES

Code	Description
5110001	MR BIT KEY 1/8 02
5110002	MR BIT KEY 1/8 04
5110003	MR BIT KEY 1/8 08
5110004	MR BIT KEY 1/8 012
5210001	MR BIT KEY 1/4 02
5210002	MR BIT KEY 1/4 04
5210003	MR BIT KEY 1/4 08
5210004	MR BIT KEY 1/4 012

SYNOPTIC, SIZES AND VERSIONS

MR	BIT	KEY	1/8	02
ELEMENT	SIZE	TYPE	THREADED PORT	SETTING RANGE
MR	BIT	Padlockable	1/8 1/4	02 = 0 to 2 bar 04 = 0 to 4 bar 08 = 0 to 8 bar 012 = 0 to 12 bar

bit FILTER-REGULATOR

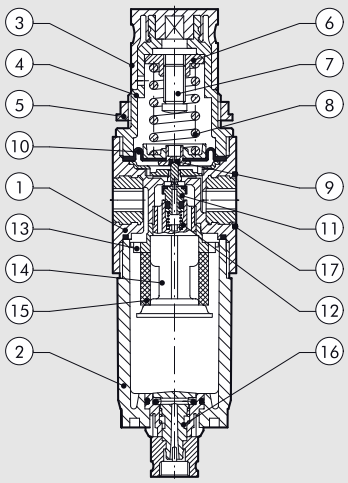
Filter regulator with rolling diaphragm.
- High flow rate with reduced pressure drop
- Excellent degree of condensate separation
- Semi-automatic or automatic drain
- All-round condensate level viewing

The degree of filtration is shown by the colour of the cartridge:
yellow = 5 µm, white = 20 µm, blue = 50 µm.

TECHNICAL DATA		FR BIT 1/8"	FR BIT 1/4"
Threaded port		1/8"	1/4"
Setting range		0 to 2 - 0 to 4 - 0 to 8 - 0 to 12	
Degree of filtration	µm	5 (yellow) - 20 (white) - 50 (blue)	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	290	
	scfm	10	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	600	
	scfm	21	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	g	110	
Wall fixing screws		M4 by means of the bracket provided	
Bowl capacity	cm^3	16	
Mounting position		Vertical	
Gauge port		G 1/8"	
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure SAC: automatic drain with condensate discharge .	
		Operates by depression – requires variable air take-offs.	
Fluid		Compressed air	
Notes		The regulator pressure must always be set upwards. For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value.	

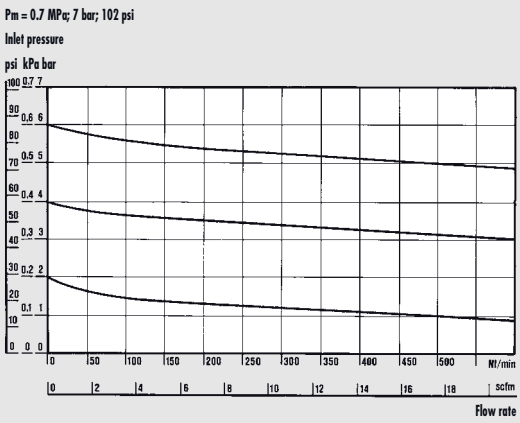
COMPONENTS

① Technopolymer body with OT58 threaded element
② Clear technopolymer bowl
③ Technopolymer knob
④ Technopolymer bell
⑤ Technopolymer fixing ring nut
⑥ OT58 brass nut
⑦ OT58 brass adjusting screw
⑧ Steel adjusting spring
⑨ NBR relieving gasket
⑩ Rolling diaphragm
⑪ OT58 valve with NBR vulcanized gasket
⑫ Stainless steel valve compression spring
⑬ Technopolymer centrifuge
⑭ Technopolymer baffle plug
⑮ HDPE sintered filter cartridge
⑯ Condensate drain (RMSA)
⑰ NBR gaskets



FLOW CHARTS

FR



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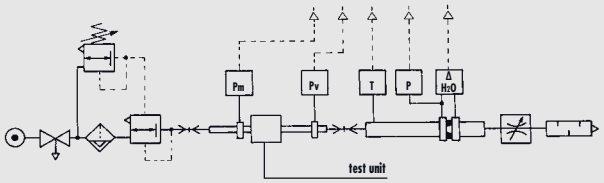
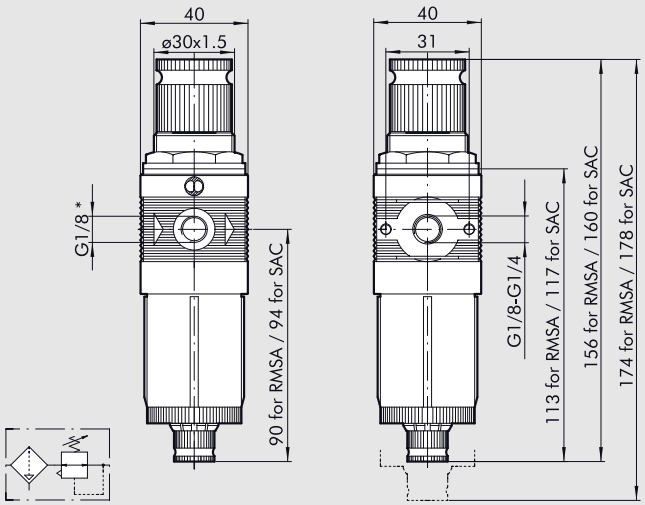
Turin Polytechnic



• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

DIMENSIONS



* Pressure gauge port

SYNOPTIC, SIZES AND VERSIONS

FR	BIT	1/8	5	02	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	CONDENSATE DRAIN
FR	BIT	1/8 1/4	5 = 5 µm 20 = 20 µm 50 = 50 µm	02 = 0 to 2 bar 04 = 0 to 4 bar 08 = 0 to 8 bar 012 = 0 to 12 bar	RMSA SAC

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure
SAC: automatic drain with condensate discharge .
Operates by depression – requires variable air take-offs.

ORDERING CODES

Code	Description
5105001	FR BIT 1/8 5 02 RMSA
5105013	FR BIT 1/8 5 02 SAC
5105002	FR BIT 1/8 20 02 RMSA
5105014	FR BIT 1/8 20 02 SAC
5105003	FR BIT 1/8 50 02 RMSA
5105015	FR BIT 1/8 50 02 SAC
5105004	FR BIT 1/8 5 04 RMSA
5105016	FR BIT 1/8 5 04 SAC
5105005	FR BIT 1/8 20 04 RMSA
5105017	FR BIT 1/8 20 04 SAC
5105006	FR BIT 1/8 50 04 RMSA
5105018	FR BIT 1/8 50 04 SAC
5105007	FR BIT 1/8 5 08 RMSA
5105019	FR BIT 1/8 5 08 SAC
5105008	FR BIT 1/8 20 08 RMSA
5105020	FR BIT 1/8 20 08 SAC
5105009	FR BIT 1/8 50 08 RMSA
5105021	FR BIT 1/8 50 08 SAC
5105010	FR BIT 1/8 5 012 RMSA
5105022	FR BIT 1/8 5 012 SAC
5105011	FR BIT 1/8 20 012 RMSA
5105023	FR BIT 1/8 20 012 SAC
5105012	FR BIT 1/8 50 012 RMSA
5105024	FR BIT 1/8 50 012 SAC
5205001	FR BIT 1/4 5 02 RMSA
5205013	FR BIT 1/4 5 02 SAC
5205002	FR BIT 1/4 20 02 RMSA
5205014	FR BIT 1/4 20 02 SAC
5205003	FR BIT 1/4 50 02 RMSA
5205015	FR BIT 1/4 50 02 SAC
5205004	FR BIT 1/4 5 04 RMSA
5205016	FR BIT 1/4 5 04 SAC
5205005	FR BIT 1/4 20 04 RMSA
5205017	FR BIT 1/4 20 04 SAC
5205006	FR BIT 1/4 50 04 RMSA
5205018	FR BIT 1/4 50 04 SAC
5205007	FR BIT 1/4 5 08 RMSA
5205019	FR BIT 1/4 5 08 SAC
5205008	FR BIT 1/4 20 08 RMSA
5205020	FR BIT 1/4 20 08 SAC
5205009	FR BIT 1/4 50 08 RMSA
5205021	FR BIT 1/4 50 08 SAC
5205010	FR BIT 1/4 5 012 RMSA
5205022	FR BIT 1/4 5 012 SAC
5205011	FR BIT 1/4 20 012 RMSA
5205023	FR BIT 1/4 20 012 SAC
5205012	FR BIT 1/4 50 012 RMSA
5205024	FR BIT 1/4 50 012 SAC

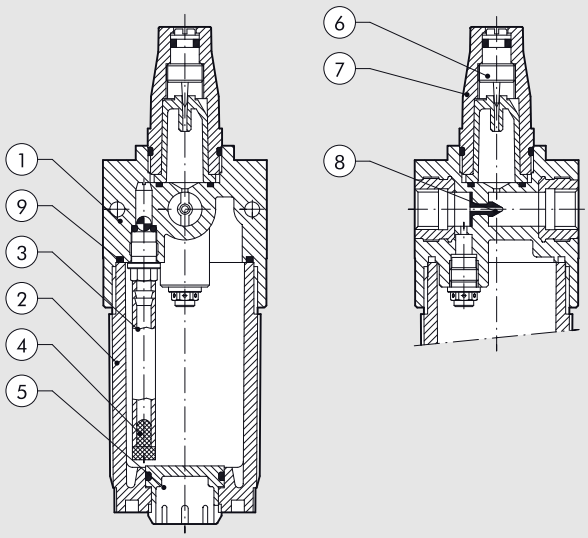
bit LUBRICATOR

Mini-lubricator with high lubrication stability.
- Quantity of lubricant proportioned to air flow
- Activates at low flow rates
- Micrometric regulation of lubricant flow
- All-round oil level viewing

TECHNICAL DATA		LUB BIT 1/8"	LUB BIT 1/4"
Threaded port		1/8"	1/4"
Type of lubrication		Oil mist	
Bowl capacity	cm^3	26.5	
Lubricator version		Manual filling with the bowl disassembled	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	400	
	scfm	14	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	710	
	scfm	25	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	g	40	
Wall fixing screws		M4 by means of the bracket provided	
Mounting position		Vertical	
Fluid		Filtered compressed air	

COMPONENTS

① Technopolymer body with OT58 threaded elements
② Clear technopolymer bowl
③ Rilsan oil suction pipe
④ Filter
⑤ Technopolymer plug
⑥ Oil flow adjustment regulation needle made of OT58 brass
⑦ Clear technopolymer cover
⑧ NBR Venturi diaphragm
⑨ NBR gaskets

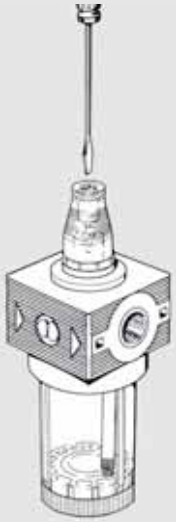


GENERAL RULES - USE AND MAINTENANCE

Use a no. 3 compass spanner to unscrew the bowl.

- Fit the lubricator as close as possible to the point of use
- Fill the bowl with oil before pressurizing the system
- Do not use cleaning oil, brake fluid or solvents in general
- For correct lubrication, set the drip rate to approximately 1 drop every 300-600 Nl via the adjusting screw.
- Recommended lubricants:
  ISO and UNI FD22
  E.g. Energol HLP 22 (BP) – Spinesso 22 (Esso) - Mobil DTE 22 (Mobil) – Tellus Oil 22 (Shell).

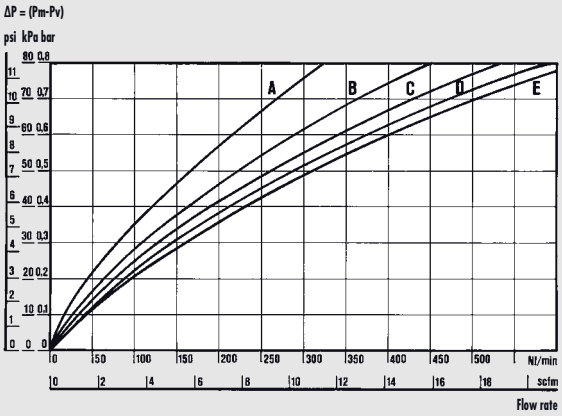
REGULATING LUBRICATION



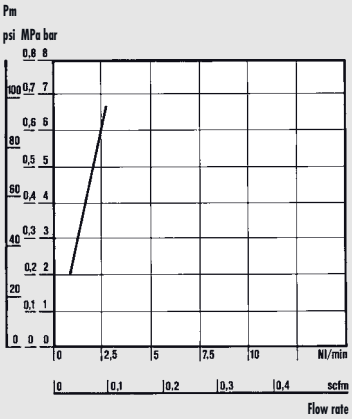
FILLING THE BOWL WITH OIL

FLOW CHARTS

LUB



LUB 1/8-1/4



MINIMUM OPERATION FLOW CHARTS
Minimum flow tests were performed in compliance with ISO/DP 6301/2.

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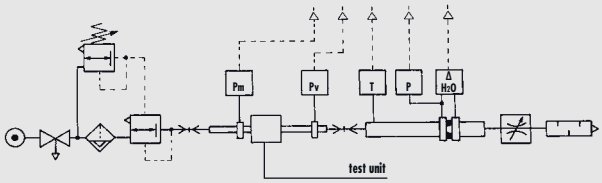
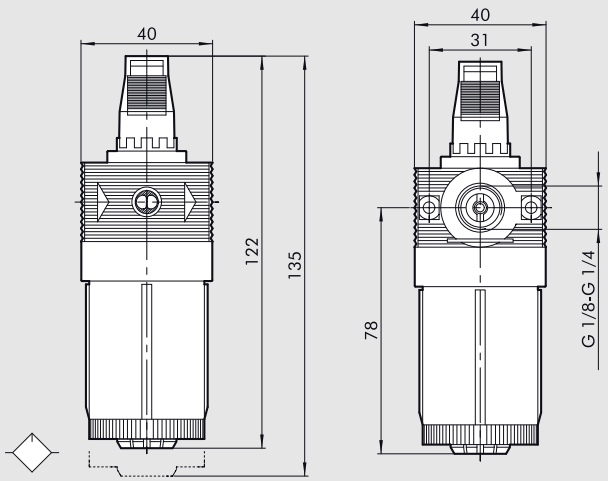


- Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

DIMENSIONS



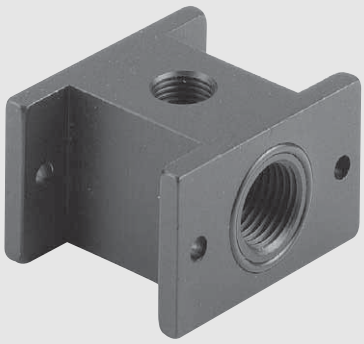
ORDERING CODES

Code	Description
5103001	LUB BIT 1/8
5203001	LUB BIT 1/4

NOTES

bit TAKE-OFF

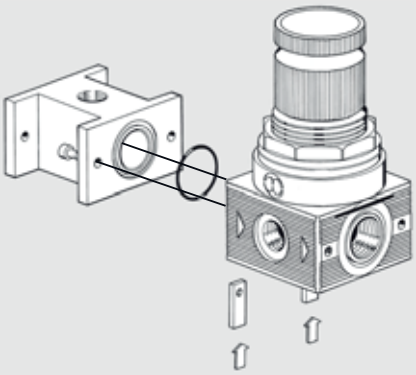
- The air take-off takes air from the FRL unit irrespective of the assembly position.
- It is necessary when air needs to be taken from the FRL unit at any stage of the treatment (normal, filtered, regulated, lubricated, etc.).



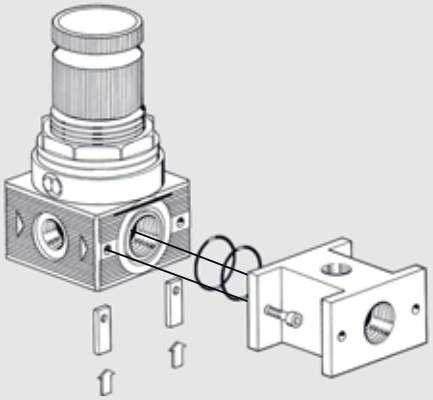
TECHNICAL DATA		PA
Maximum operating pressure	MPa	1.3
	bar	13
	psi	188
Maximum working temperature at 1 MPa; 10 bar; 145 psi	°C	50
	°F	

CONNECTION DIAGRAMS AND APPLICATION

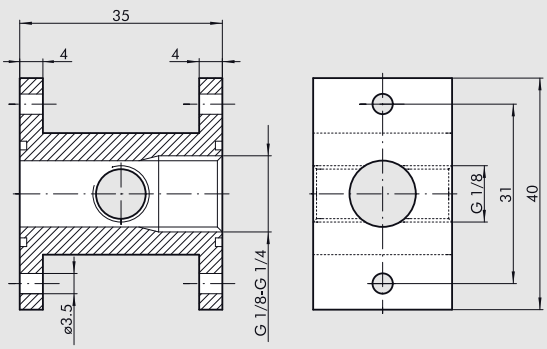
Mounting the air take-off at the inlet: only use two screws and the O-rings supplied in the PA kit.



Mounting the air take-off at the outlet: only use two screws and the O-rings supplied in the PA kit. Seal is provided by the contact between O-rings.



DIMENSIONS



ORDERING CODES

Code	Description
9100401	PAB 1/8 - 1/4 BIT

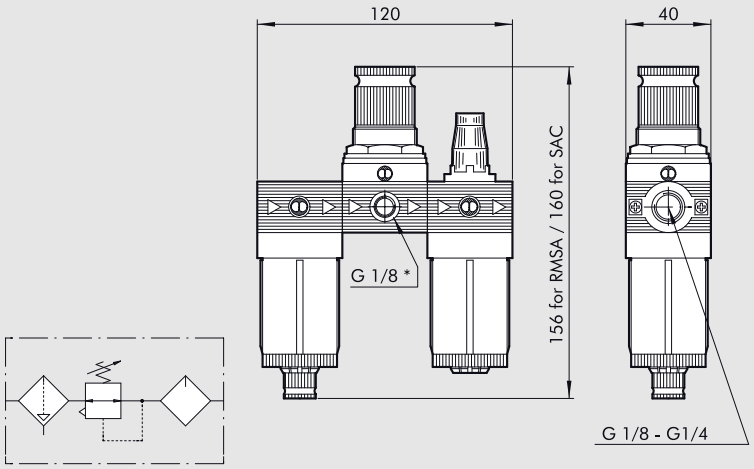
FIL + REG + LUB bit

METAL WORK PNEUMATIC

Complete mini-FRL unit with rolling diaphragm.
- High flow rates with reduced pressure drop
- Excellent degree of condensate separation
- Quantity of lubricant proportioned to air flow
- Activates at low flow rates

TECHNICAL DATA		F + R + L BIT 1/8"	F + R + L BIT 1/4"
Threaded port		1/8"	1/4"
Setting range		0 to 2 - 0 to 4 - 0 to 8 - 0 to 12	
Degree of filtration	µm	5 (yellow) 20 (white) 50 (blue)	
Type of lubrication		Oil mist	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	150	
	scfm	5.3	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	280	
	scfm	10	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	g	160	
Wall fixing screws		M4 by means of the bracket provided	
Gauge port		G1/8"	
Mounting position		Vertical	
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure	
		SAC: automatic drain with condensate discharge.	
		Operates by depression – requires variable air take-offs.	
Fluid		Compressed air	
Notes		See chapters regarding individual elements.	

DIMENSIONS



* Pressure gauge port

SYNOPTIC, SIZES AND VERSIONS

FRL	BIT	1/8	5	02	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	CONDENSATE DRAIN
FRL	BIT	1/8 1/4	5 = 5 µm 20 = 20 µm 50 = 50 µm	02 = 0 to 2 bar 04 = 0 to 4 bar 08 = 0 to 8 bar 012 = 0 to 12 bar	RMSA SAC

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

ORDERING CODES

Code	Description
5104008	FRL BIT 1/8 20 08 RMSA
5104011	FRL BIT 1/8 20 012 RMSA
5204008	FRL BIT 1/4 20 08 RMSA
5204011	FRL BIT 1/4 20 012 RMSA

The following versions are available on request:
- with 5 µm or 50 µm degree of filtration
- with 0-2 bar or 0-4 bar setting range
- with SAC condensate discharge

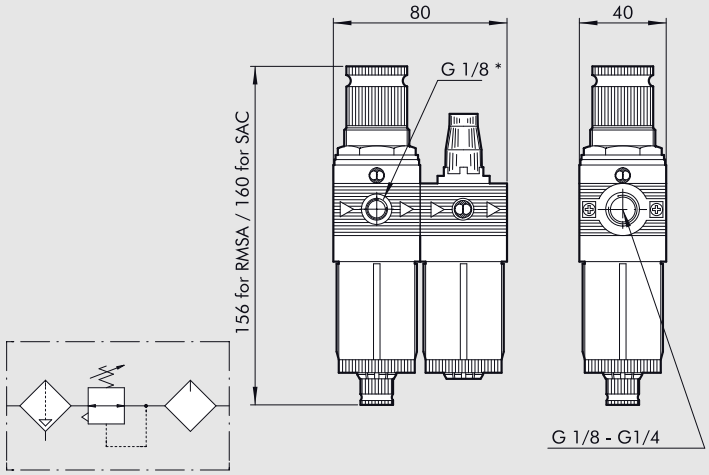
NOTES

FR + LUB bit

Compact FR + L unit with rolling diaphragm.
- High flow rates with reduced pressure drop
- Excellent degree of condensate separation
- Quantity of lubricant proportioned to air flow
- Activates at low flow rates

TECHNICAL DATA		FR + L BIT 1/8"	FR + L BIT 1/4"
Threaded port		1/8"	1/4"
Setting range		0 to 2 - 0 to 4 - 0 to 8 - 0 to 12	
Degree of filtration	µm	5 (yellow) 20 (white) 50 (blue)	
Type of lubrication		Oil mist	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	140	
	scfm	5	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	260	
	scfm	9.2	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	g	170	
Wall fixing screws		M4 by means of the bracket provided	
Gauge port		G1/8"	
Mounting position		Vertical	
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure	
		SAC: automatic drain with condensate discharge.	
		Operates by depression – requires variable air take-offs.	
Fluid		Compressed air	
Notes		See chapters regarding individual elements.	

DIMENSIONS



* Pressure gauge port

SYNOPTIC, SIZES AND VERSIONS

FR+L	BIT	1/8	5	02	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	CONDENSATE DRAIN
FR+L	BIT	1/8 1/4	5 = 5 µm 20 = 20 µm 50 = 50 µm	02 = 0 to 2 bar 04 = 0 to 4 bar 08 = 0 to 8 bar 012 = 0 to 12 bar	RMSA SAC

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

ORDERING CODES

Code	Description
5106008	FR+L BIT 1/8 20 08 RMSA
5106011	FR+L BIT 1/8 20 012 RMSA
5206008	FR+L BIT 1/4 20 08 RMSA
5206011	FR+L BIT 1/4 20 012 RMSA

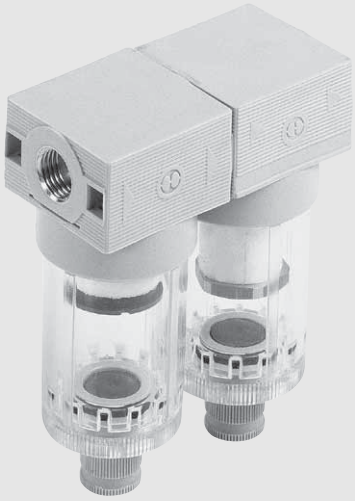
The following versions are available on request:
- with 5 µm or 50 µm degree of filtration
- with 0-2 bar or 0-4 bar setting range
- with SAC condensate discharge

NOTES

FIL + DEP bit

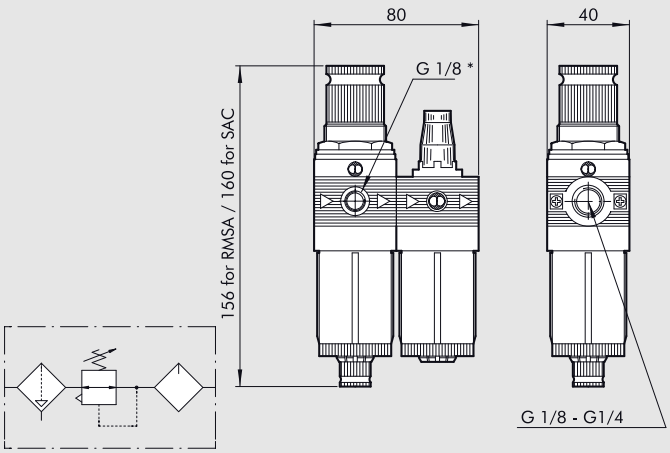
Compact filter + depurator unit for fine filtering followed by purification by coalescence.

- All-round condensate level viewing
- Condensate drainage - manual/semi-auto (RMSA) or automatic (SAC) on the filter
- 5 µm filter element.



TECHNICAL DATA		F + D BIT 1/8"	F + D BIT 1/4"
Threaded port		1/8"	1/4"
Degree of purification		5 µm filter – 99.97% depurator at 0.01 µm	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Maximum suggested flow rate		Please look at the flow rate curves at page **C2**.7	
Fluid		Compressed air	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	g	110	
Wall fixing screws		M4 by means of the bracket provided	
Mounting position		Vertical	
Condensate drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure	
		SAC: automatic drain with condensate discharge.	
		Operates by depression – requires variable air take-offs.	
Notes		See chapters regarding individual elements	

DIMENSIONS



SYNOPTIC, SIZES AND VERSIONS

F+D	BIT	1/4	5	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	CONDENSATE DRAIN
F+D	BIT	1/8 1/4	5 µm	RMSA SAC

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure

SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

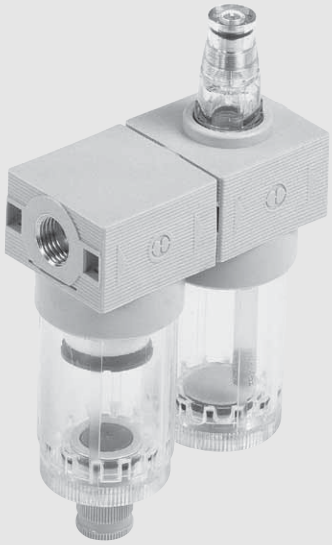
ORDERING CODES

Code	Description
5114001	F+D BIT 1/8 5 RMSA - RMSA
5114002	F+D BIT 1/8 5 SAC - RMSA
5214001	F+D BIT 1/4 5 RMSA - RMSA
5214002	F+D BIT 1/4 5 SAC - RMSA

FIL + LUB bit

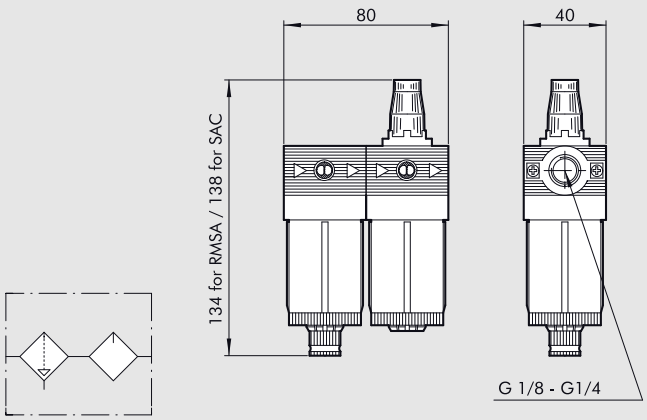
Compact filter + lubricator unit with different degrees of filtration and high lubrication stability.

- Excellent degree of condensate separation
- Semi-automatic and automatic condensate drainage
- Lubrication activates at low flow rates
- All-round oil and condensate level viewing



TECHNICAL DATA		F + L BIT 1/8"	F + L BIT 1/4"
Threaded port		1/8"	1/4"
Degree of filtration	µm	5 (yellow) - 20 (white) - 50 (blue)	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6 bar (0.6 MPa to 87 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	300	
	scfm	10.6	
Flow rate at 6 bar (0.6 MPa to 87 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	600	
	scfm	21.2	
Fluid		Compressed air	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	g	90	
Wall fixing screws		M4 by means of the bracket provided	
Mounting position		Vertical	
Condensed drain		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**	
Notes		See chapters regarding individual elements	

DIMENSIONS



SYNOPTIC, SIZES AND VERSIONS

F+L	BIT	1/4	5	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	CONDENSATE DRAIN
F+L	BIT	1/8 1/4	5 = 5 µm 20 = 20 µm 50 = 50 µm	RMSA SAC

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure

SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

ORDERING CODES

Code	Description
5113002	F+L BIT 1/8 20 RMSA
5213002	F+L BIT 1/4 20 RMSA

The following versions are available on request:
- with 5 µm or 50 µm degree of filtration
- with SAC condensate discharge

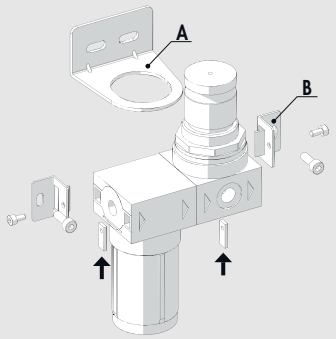
GENERAL TECHNICAL DATA
bit SERIES F FOR WATER

Filtering and/or water pressure regulation units, characterized by the use of materials certified to specific standards on products for use in contact with foodstuff or drinking water.
Declarations of conformity and release test reports are available on request for those who need them to certify our product incorporated in their own systems.
The white colour surface finish of the body was chosen to enhance the highly hygienic properties of the product.
If the pressure regulator works with incompressible fluids (water) and there is a valve leak, the downstream pressure could rise up to reach the inlet pressure and then it re-stabilizes with water consumption.
If necessary, consider the possibility of installing a safety valve that relieves any excess pressure.

TECHNICAL DATA		BIT F 1/8"	BIT F 1/4"
Threaded port		1/8"	1/4"
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Max temperature at 10 bar (1 MPa; 145 psi)	°C	50	
	°F	122	
Elements		Filter - Regulator - Filter regulator	
Mounting		Fixed to a wall, using fixing plate code 9170301 and M4 screws, or fixing bracket code 9200701 for the threaded regulator and filter-regulator bell.	
		Panel-mounted using the threaded bell of the regulator or filter-regulator (Ø hole 30-32 mm).	
Fluid		Water, air and fluids compatible with the materials used	

WALL MOUNTING

The wall fixing of a bit unit can be made through:
- Fixing bracket R/FR code 9200701 (A)
- Wall fixing plates code 9170301 (B)



MATERIALS

COMPONENTS IN CONTACT WITH THE FLUID

Designation	Material	Certifications
Body	Hostaform® C13031	European Regulation (EU) 10/2011, KTW, W270, WRAS, ACS, NSF61
Threaded body inserts	CW510L low-lead brass	Approved for compliance with the UBA List, NSF/ANSI 372
Transparent bowl	TR90 Grilamid®	European Regulation (EU) 10/2011, KTW, W270, WRAS, NSF61
Rolling diaphragm	0477 NBR 70 telato	DM174/04, KTW, W270, WRAS, ACS, NSF61
Valve	AISI 303 stainless steel	Approved for compliance with the UBA List
	with vulcanized gasket 0477 NBR 70	DM174/04, KTW, W270, WRAS, ACS, NSF61
Valve spring	AISI 302 stainless steel	Approved for compliance with the UBA List
Gaskets	0477 NBR 70	DM174/04, KTW, W270, WRAS, ACS, NSF61
Filter cartridge	GUR X192	European Regulation (EU) 10/2011,
Centrifuge	Hostaform® C13031	European Regulation (EU) 10/2011, KTW, W270, WRAS, ACS, NSF61
Baffle plug	Hostaform® C13031	European Regulation (EU) 10/2011, KTW, W270, WRAS, ACS, NSF61

COMPONENTS NOT IN CONTACT WITH THE FLUID

Designation	Material
Bell	Technopolymer
Fixing ring nut	Technopolymer
Nut	OT58 brass
Adjusting screw	OT58 brass
Adjusting spring	Steel

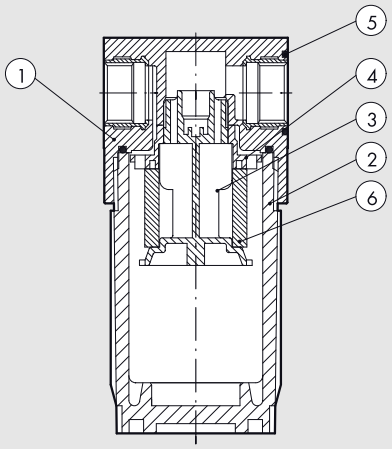
bit SERIES F FILTER FOR WATER

Water filter characterized by the use of materials certified to specific standards on products for use in contact with foodstuff or drinking water.
Declarations of conformity and release test reports are available on request for those who need them to certify our product incorporated in their own systems.
The white colour surface finish of the body was chosen to enhance the highly hygienic properties of the product.
The transparent bowl was designed to make it possible to check the state of the filter cartridge.
Unlike compressed air filters, the bowl has no drain holes.
The cartridge filtration degree is 20 µm.

TECHNICAL DATA		FIL BIT F 1/8"	FIL BIT F 1/4"
Threaded port		1/8"	1/4"
Degree of filtration	µm	20 (white)	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa ÷ 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	l/min	13	14.5
	cfm	0.46	0.51
Max temperature at 10 bar (1 MPa; 145 psi)	°C	50	
	°F	122	
Weight	g	40	
Internal volume	cm^3	40	
Mounting position		In any position	
Fluid		Water, air and fluids compatible with the materials used	

COMPONENTS

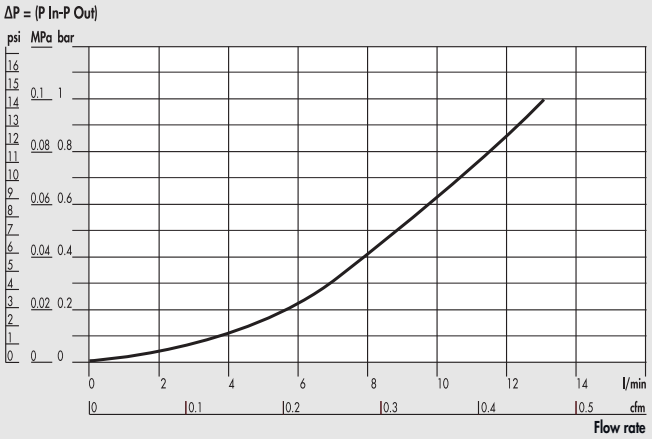
① Body with threaded inserts
② Transparent bowl
③ Baffle plug
④ Centrifuge
⑤ Gaskets
⑥ Filter cartridge



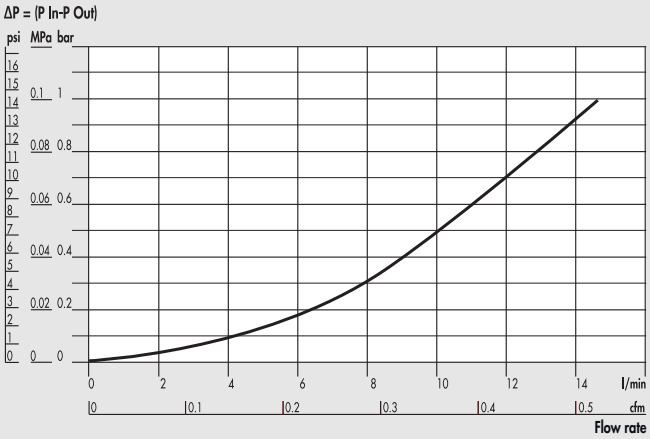
N.B.: For details on the materials used, please refer to the section "general technical data".

FLOW CHARTS

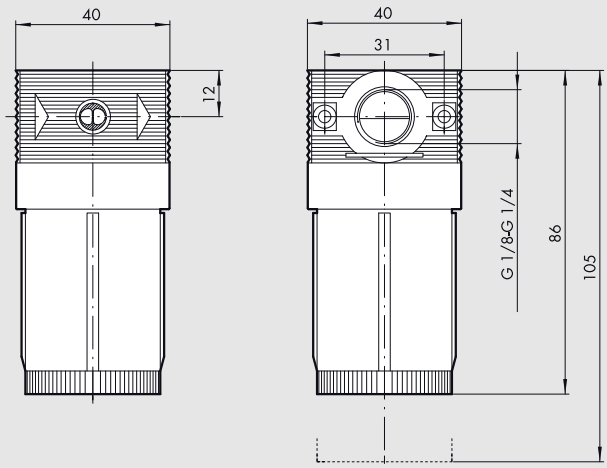
FIL BIT F 1/8"



FIL BIT F 1/4"



DIMENSIONS



ORDERING CODES

Code	Description
5101002F	FIL BIT F 1/8 20
5201002F	FIL BIT F 1/4 20

NOTES

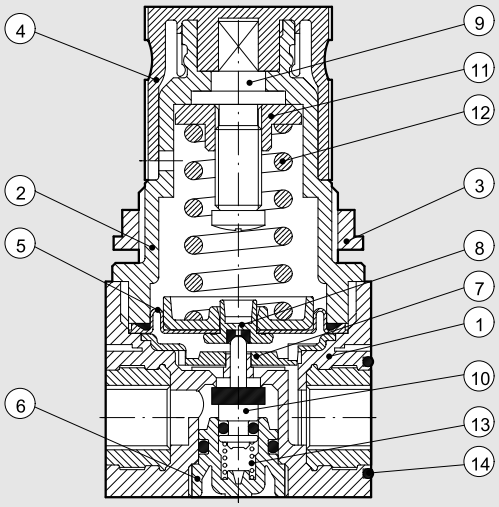
bit SERIES F REGULATOR FOR WATER

Water regulator characterized by the use of materials certified to specific standards on products for use in contact with foodstuff or drinking water. Declarations of conformity and release test reports are available on request for those who need them to certify our product incorporated in their own systems.
The white colour surface finish of the body was chosen to enhance the highly hygienic properties of the product.
Versions with brass threaded inlet and outlet ports and side sockets for pressure gauges and other uses with engineering plastic thread are available. There is also a version with inlet and outlet ports incorporated directly in the engineering plastic body, without requiring further threaded ports for pressure gauges.
If the pressure regulator works with incompressible fluids (water) and there is a valve leak, the downstream pressure could rise up to reach the inlet pressure and then it re-stabilizes with water consumption.
If necessary, consider the possibility of installing a safety valve that relieves any excess pressure.

TECHNICAL DATA		REG BIT F 1/8"	REG BIT F 1/4"
Threaded port		1/8"	1/4"
Setting range	bar	0 to 2; 0 to 4; 0 to 8; 0 to 12	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa ÷ 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	l/min	6.5	7
	scfm	0.23	0.25
Max temperature at 10 bar (1 MPa; 145 psi)	°C	50°	
	°F	122°	
Weight	g	80	
Versions		With 1/8" or 1/4" brass threaded ports and 1/8" pressure gauge port.	
		With 1/4" engineering plastic threaded ports, without pressure gauge ports	
Mounting position		In any position	
Fluid		Water, air and fluids compatible with the materials used	
Notes		The pressure must always be set upwards.	
		For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value.	

COMPONENTS

① Body with incorporated threads or threaded inserts
② Bell
③ Fixing ring nut
④ Knob
⑤ Rolling diaphragm
⑥ Plug
⑦ Anti-vibration screen
⑧ Plate with gasket
⑨ Adjusting screws
⑩ Valve gasket
⑪ Nut
⑫ Adjusting spring
⑬ Valve spring
⑭ Gaskets



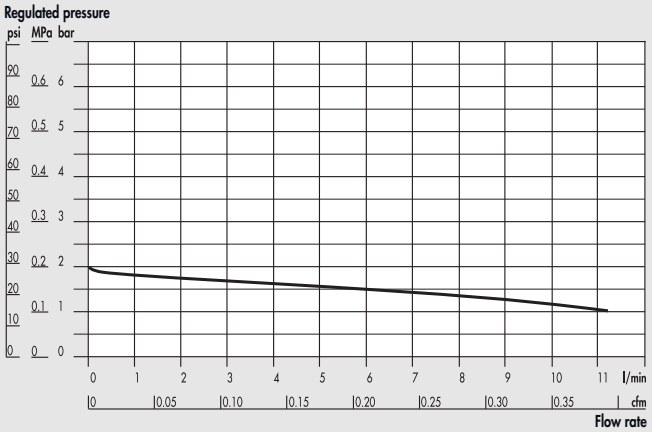
N.B.: For details on the materials used, please refer to the section "general technical data".

METAL WORK PNEUMATIC

FLOW CHARTS

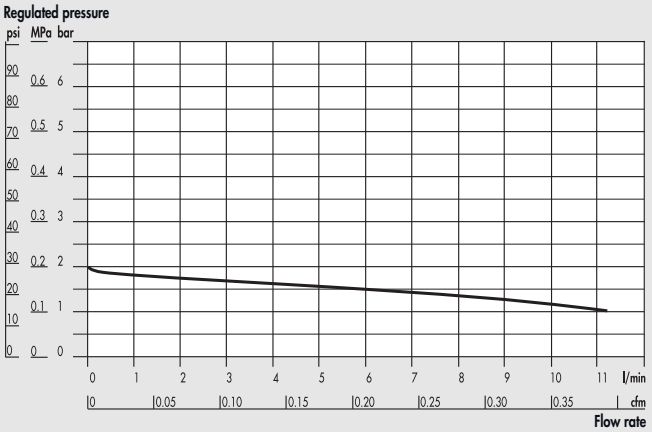
REG BIT F 1/8" 0-2

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



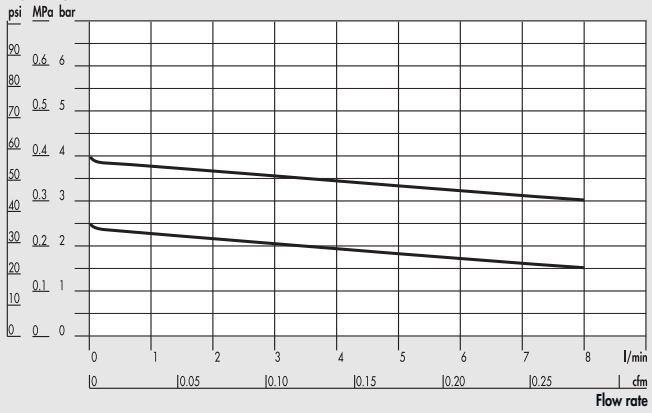
REG BIT F 1/4" 0-2

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



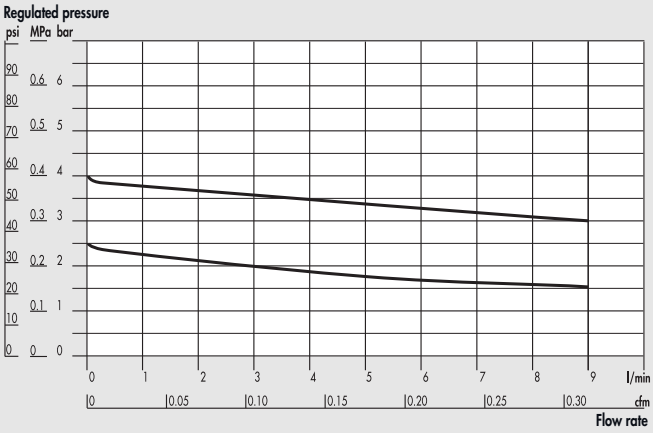
REG BIT F 1/8" 0-4

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



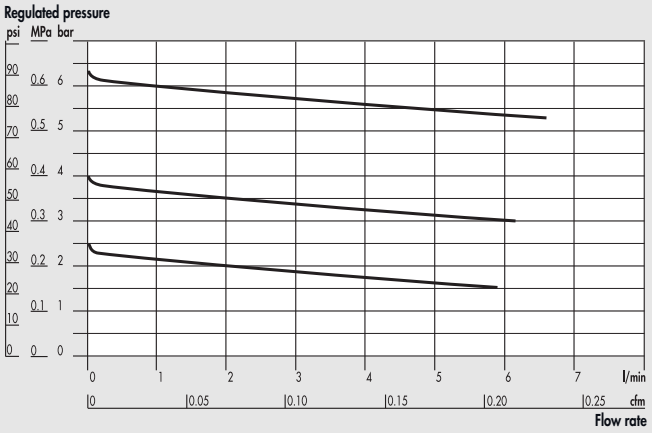
REG BIT F 1/4" 0-4

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



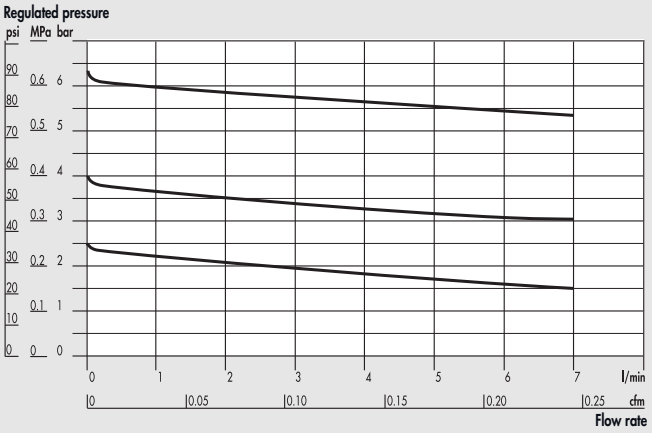
REG BIT F 1/8" 0-8; 0-12

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure

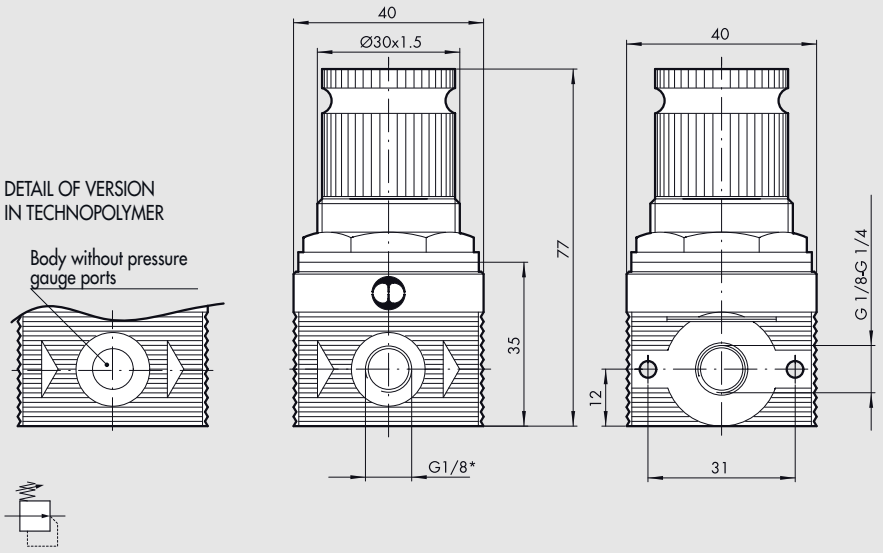


REG BIT F 1/4" 0-8; 0-12

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



DIMENSIONS



* Pressure gauge port (not supplied in the technopolymer version)

ORDERING CODES

Code	Description
REGULATOR WITH BRASS PORTS	
5108001F	REG BIT F 1/8 02
5108002F	REG BIT F 1/8 04
5108003F	REG BIT F 1/8 08
5108004F	REG BIT F 1/8 012
5208001F	REG BIT F 1/4 02
5208002F	REG BIT F 1/4 04
5208003F	REG BIT F 1/4 08
5208004F	REG BIT F 1/4 012
REGULATOR WITH TECHNOPOLYMER PORTS **	
5228001F	REG BIT F 1/4 TP 02
5228002F	REG BIT F 1/4 TP 04
5228003F	REG BIT F 1/4 TP 08
5228004F	REG BIT F 1/4 TP 012

** Without pressure gauge ports

NOTES

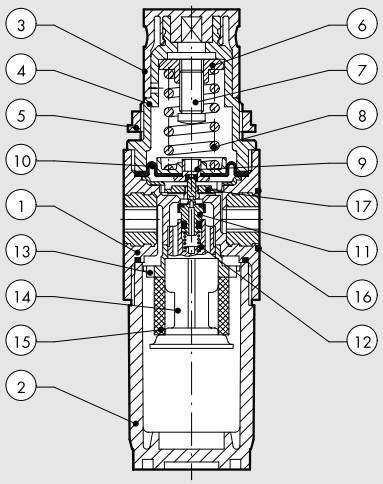
bit SERIES F FILTER-REGULATOR FOR WATER

Filter-regulator characterized by the use of materials certified to specific standards on products for use in contact with foodstuff or drinking water. Declarations of conformity and release test reports are available on request for those who need them to certify our product incorporated in their own systems. The white colour surface finish of the body was chosen to enhance the highly hygienic properties of the product.
The transparent bowl was designed to make it possible to check the state of the filter cartridge. The transparent bowl was designed to make it possible to check the state of the filter cartridge.
Unlike compressed air filters, the bowl has no drain holes.
The cartridge filtration degree is 20 µm.
If the pressure regulator works with incompressible fluids (water) and there is a valve leak, the downstream pressure could rise up to reach the inlet pressure and then it re-stabilizes with water consumption. If necessary, consider the possibility of installing a safety valve that relieves any excess pressure.

TECHNICAL DATA		FR BIT F 1/8"	FR BIT F 1/4"
Threaded port		1/8"	1/4"
Setting range	bar	0 to 2; 0 to 4; 0 to 8; 0 to 12	
Degree of filtration	µm	20 (white)	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa ÷ 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	l/min	6	6
	cfm	0.21	0.21
Max temperature at 10 bar (1 MPa; 145 psi)	°C	50	
	°F	122	
Weight	g	110	
Mounting position		In any position	
Fluid		Water, air and fluids compatible with the materials used	
Notes		The pressure must always be set upwards. For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value.	

COMPONENTS

① Body with threaded inserts
② Bowl
③ Knob
④ Bell
⑤ Fixing ring nut
⑥ Nut
⑦ Adjusting screws
⑧ Adjusting spring
⑨ Plate with gasket
⑩ Rolling diaphragm
⑪ Valve
⑫ Valve spring
⑬ Centrifuge
⑭ Baffle plug
⑮ Filter cartridge
⑯ Gaskets
⑰ Anti-vibration screen

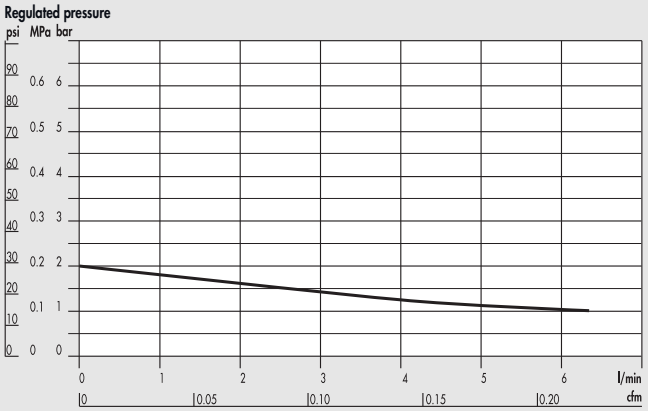


N.B.: For details on the materials used, please refer to the section "general technical data".

FLOW CHARTS

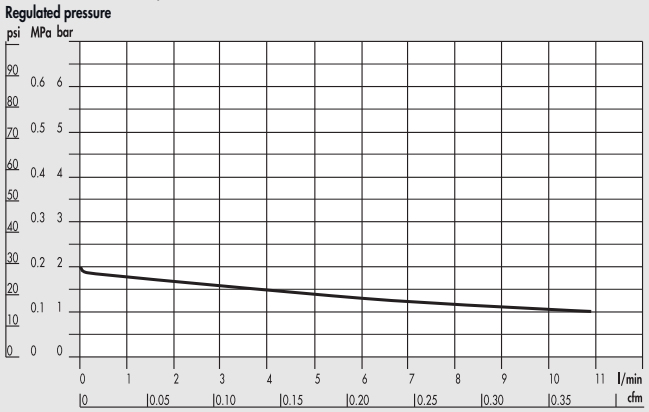
FR BIT F 1/8" 0-2

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



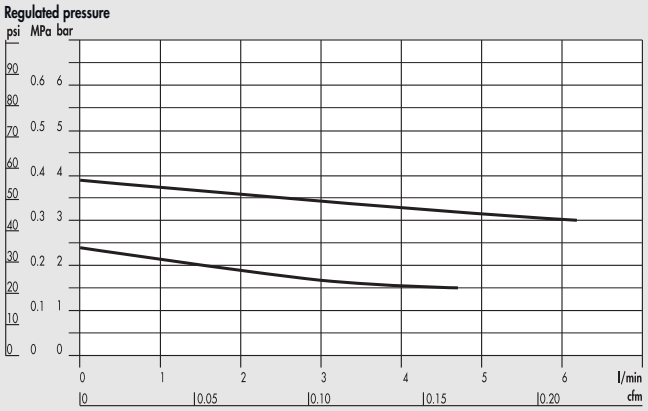
FR BIT F 1/4" 0-2

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



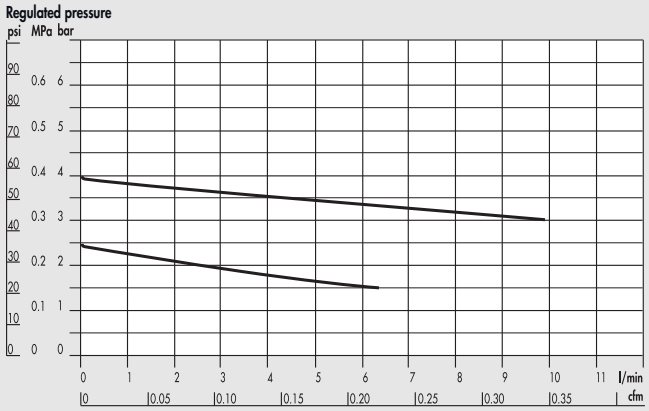
FR BIT F 1/8" 0-4

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



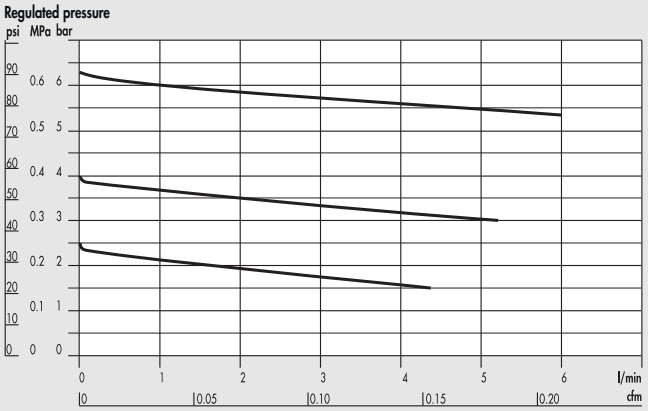
FR BIT F 1/4" 0-4

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



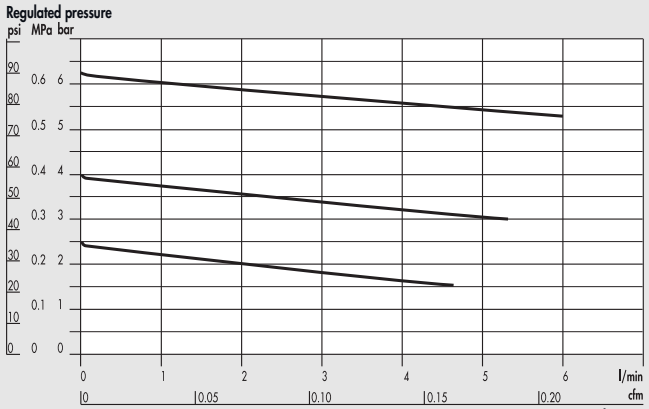
FR BIT F 1/8" 0-8; 0-12

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure

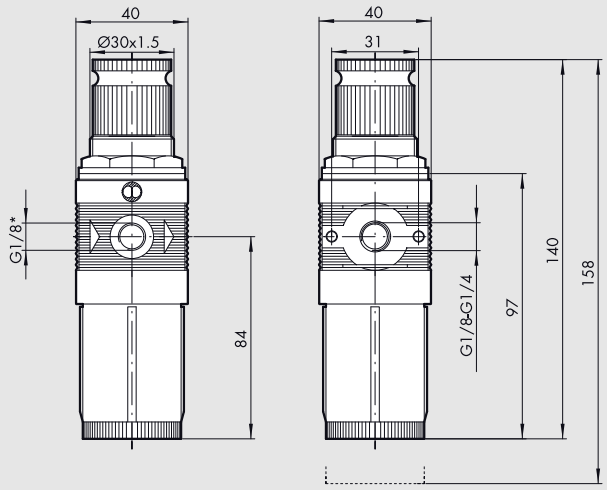


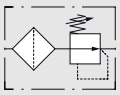
FR BIT F 1/4" 0-8; 0-12

Pm = 0.9 MPa; 9 bar; 130 psi
Regulated pressure



DIMENSIONS





* Pressure gauge port

ORDERING CODES

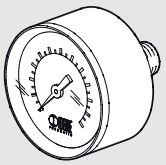
Code	Description
5105102F	FR BIT F 1/8 20 02
5105105F	FR BIT F 1/8 20 04
5105108F	FR BIT F 1/8 20 08
5105111F	FR BIT F 1/8 20 012
5205102F	FR BIT F 1/4 20 02
5205105F	FR BIT F 1/4 20 04
5205108F	FR BIT F 1/4 20 08
5205111F	FR BIT F 1/4 20 012

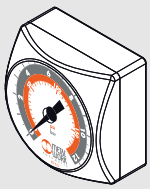
NOTES

bit ACCESSORIES

ACCESSORIES FOR STANDARD bit AND SERIES F bit FOR WATER

PRESSURE GAUGE

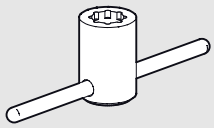




Code	Description
9700102 *	M 40 1/8 04
9700101 *	M 40 1/8 012
9700109 *	M 40x40 1/8 04
9700110 *	M 40x40 1/8 012

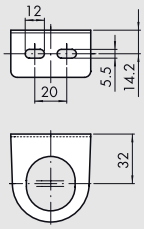
* Cannot be used with water

DOME DISASSEMBLY SPANNER



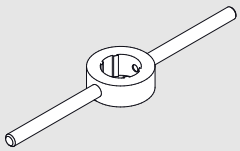
Code	Description
9220701	Cover LUB spanner

R/FR FIXING BRACKET



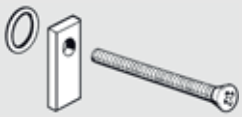
Code	Description
9200701	SF100 - BIT - ND 1/4 - SY1

COVER DISASSEMBLY SPANNER



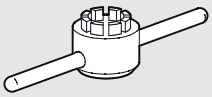
Code	Description
9170401	CS CS BIT

ASSEMBLY PLATE (PAIR)



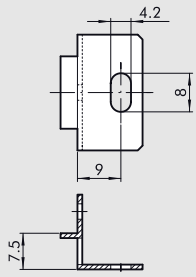
Code	Description
9170201	PAB 1/8 - 1/4 BIT

REDUCER PLUG DISASSEMBLY SPANNER



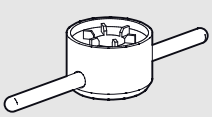
Code	Description
9170501	CS OTR BIT

WALL MOUNTING BRACKET (PAIR)



Code	Description
9170301	SFB 1/8 - 1/4 BIT

BOWL DISASSEMBLY SPANNER

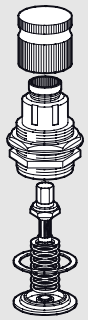


Code	Description
9170601	CS TF - TL BIT - SY1

bit SPARE PARTS

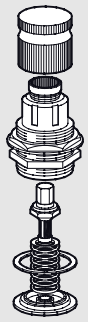
SPARE PARTS FOR STANDARD bit

UPPER COVER FOR MR



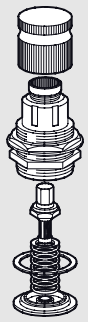
Code	Description
9250805	Spares CS 1/8 1/4 BIT 02
9250806	Spares CS 1/8 1/4 BIT 04
9250807	Spares CS 1/8 1/4 BIT 08
9250808	Spares CS 1/8 1/4 BIT 012

UPPER COVER FOR MR FC



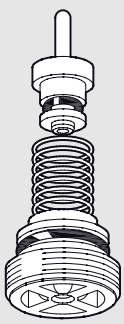
Code	Description
9250817	Spares CS FC 1/8 1/4 BIT 02
9250818	Spares CS FC 1/8 1/4 BIT 04

UPPER COVER FOR MRA



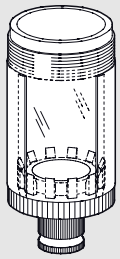
Code	Description
9250809	Spares CSA 1/8 - 1/4 BIT 02
9250814	Spares CSA 1/8 - 1/4 BIT 04
9250815	Spares CSA 1/8 - 1/4 BIT 08
9250816	Spares CSA 1/8 - 1/4 BIT 012

COMPLETE POPPET FOR MR AND MRA



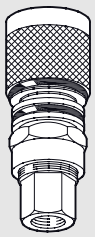
Code	Description
9250705	Spares poppet for MR
9250706	Spares poppet for MR-SR (rapid drain)
9250708	Spares poppet for MRA

FILTER AND FILTER-REGULATOR BOWL



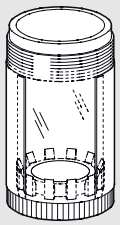
Code	Description
9255001	Spares TF 1/8 1/4 BIT RMSA
9255101	Spares TF 1/8 1/4 BIT SAC

AUTOMATIC DRAIN (SAC)



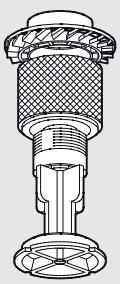
Code	Description
9000803	Spares SAC automatic drain

LUBRICATOR BOWL



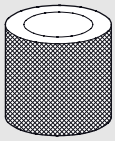
Code	Description
9251402	Spares TL 1/8 1/4 BIT

FILTER ELEMENT



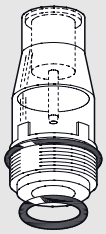
Code	Description
9251708	Spares FP 1/8-1/4 BIT 5 (yellow)
9251709	Spares FP 1/8-1/4 BIT 20 (white)
9251710	Spares FP 1/8-1/4 BIT 50 (blue)

FILTER CARTRIDGE



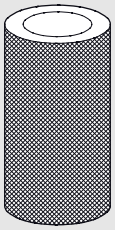
Code	Description
9251808	Spares filter cartridge BIT 5 (yellow)
9251809	Spares filter cartridge BIT 20 (white)
9251810	Spares filter cartridge BIT 50 (blue)

TRANSPARENT LUBRICATOR COVER



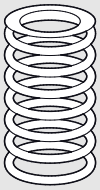
Code	Description
9251302	Spares CVL 100-200-300-400 BIT

DEPURATOR FILTER ELEMENT



Code	Description
9251712	Spares FP DEP. 1/8 1/4 BIT

SPRING FOR MR, FR



Code	Description
9250610	Spares MO 02 BIT
9250611	Spares MO 04 BIT
9250612	Spares MO 08 BIT
9250613	Spares MO 012 BIT

COMPLETE POPPET FOR FR

Code	Description
9250905	Spares OTFR 1/8 1/4 BIT 5 (yellow)
9250906	Spares OTFR 1/8 1/4 BIT 20 (white)
9250907	Spares OTFR 1/8 1/4 BIT 50 (blue)

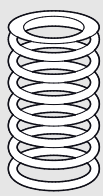
NOTES

SPARE PARTS FOR SERIES F bit FOR WATER

FILTER ELEMENT

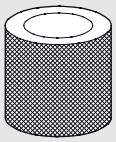
Code	Description
9251709	Spares FP 1/8-1/4 BIT 20 (white)

SPRING FOR REG F, FR F



Code	Description
9250610	Spares MO 02 BIT
9250611	Spares MO 04 BIT
9250612	Spares MO 08 BIT
9250613	Spares MO 012 BIT

FILTER CARTRIDGE



Code	Description
9251809	Spares filter cartridge BIT 20 (white)

NOTES

NOTES

SUMMARY Skillair®

	● GENERAL TECHNICAL DATA Skillair®	C3.4
	● Skillair® FILTER	C3.7
	● Skillair® DEPURATOR	C3.11
	● Skillair® ACTIVE CARBON FILTER	C3.14
	● DIAPHRAGM DRIER SERIES DRY 100 Skillair®	C3.17
	● Skillair® REGULATOR	C3.20
	● Skillair® 100 IN-SERIES REGULATOR	C3.24
	● Skillair® PADLOCKABLE REGULATOR	C3.25
	● Skillair® PILOT REGULATOR	C3.27
	● Skillair® PILOT PADLOCKABLE REGULATOR	C3.29
	● Skillair® 300 PILOT OPERATED REGULATOR	C3.30
	● Skillair® FILTER REGULATOR	C3.31
	● Skillair® LUBRICATOR	C3.34

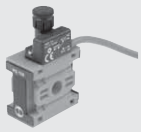
METAL WORK PNEUMATIC

- **Skillair® SHUT-OFF VALVE** C3.38

- **Skillair® PROGRESSIVE START VALVE** C3.43

- **Skillair® PROGRESSIVE STARTER** C3.45

- **Skillair® AIR TAKE-OFF** C3.49



- **Skillair® PRESSURE SWITCHES** C3.50

- **Skillair® SUB-BASE AND ADAPTER BASE** C3.52

- **FIL + REG + LUB Skillair®** C3.54

- **FR + LUB Skillair®** C3.56

- **V3V + FR + LUB Skillair®** C3.58

- **FIL + LUB Skillair®** C3.60

- **FIL + DEP Skillair®** C3.62

- **Skillair® ACCESSORIES** C3.64
- **Skillair® SPARES PARTS** C3.65

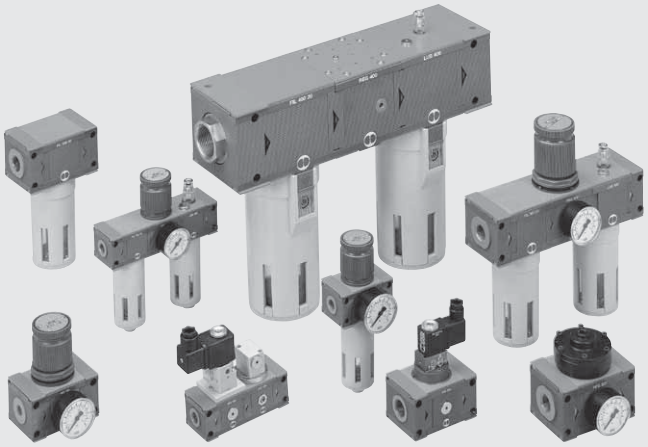
GENERAL TECHNICAL DATA Skillair®

The superior technology of Skillair® FRL units is the expression of Metal Work innovation. The FRL system is the brainchild of a joint study by Metal Work engineers and researchers from the Department of Mechanics in Turin. The integration of metal alloys and super-resistant techno-polymers is the result of co-operation between CESAP (European Centre for the Development of Plastic Applications) and leading international companies such as Du Pont, EMS Chemie and Hoechst. The installation of advanced processing and quality control systems guarantees the reliability of Skillair® FRLs.

Technical features

The Skillair® units incorporate very interesting technological features:

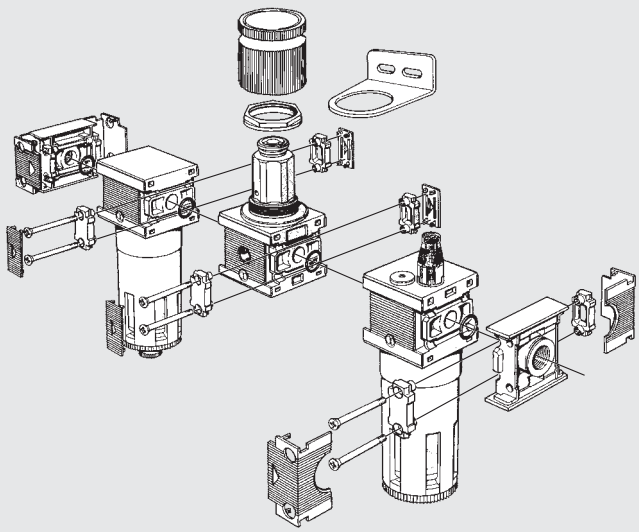
- Compactness: with the same flow capacity our unit is one of the smallest on the market.
- Modularity: various elements such as filters, reducers, lubricators, 3-way valves, progressive actuators and air take-offs can be combined at will. With the modular system the FRL units can be removed without disturbing the pipes.
- Easy maintenance: Any of the elements or the entire unit can be removed without disturbing the remaining part or pipes.



TECHNICAL DATA		SK 100		SK 200			SK 300			SK 400			
Threaded port		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
Degree of filtration	µm	5 - 20 - 50											
Degree of purification	µm	99.97% a 0.01											
Setting range	bar	0 to 2 0 to 4 0 to 8 0 to 12											
Max. input pressure	MPa	1.5		1.3			1.3			1.3			
	bar	15		13			13			13			
	psi	217		188			188			188			
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	From 1100 to 20000											
ΔP 0.5 bar (0.05 MPa to 7 psi)													
Fluid		Lubricated or unlubricated compressed air											
Temperature range at 1 MPa; 10 bar; 145 psi	°C	−10 to +50											
	°F	14 to 122											
Elements comprising the range		Filter, Depurator, Regulator, Pilot operated regulator, In-series Regulator, Filter-regulator, Lubricator with various lubricant filling systems, Circuit Shut-off Valve, Progressive Actuator.											
Compatibility with oils		See **chapter Z1**											

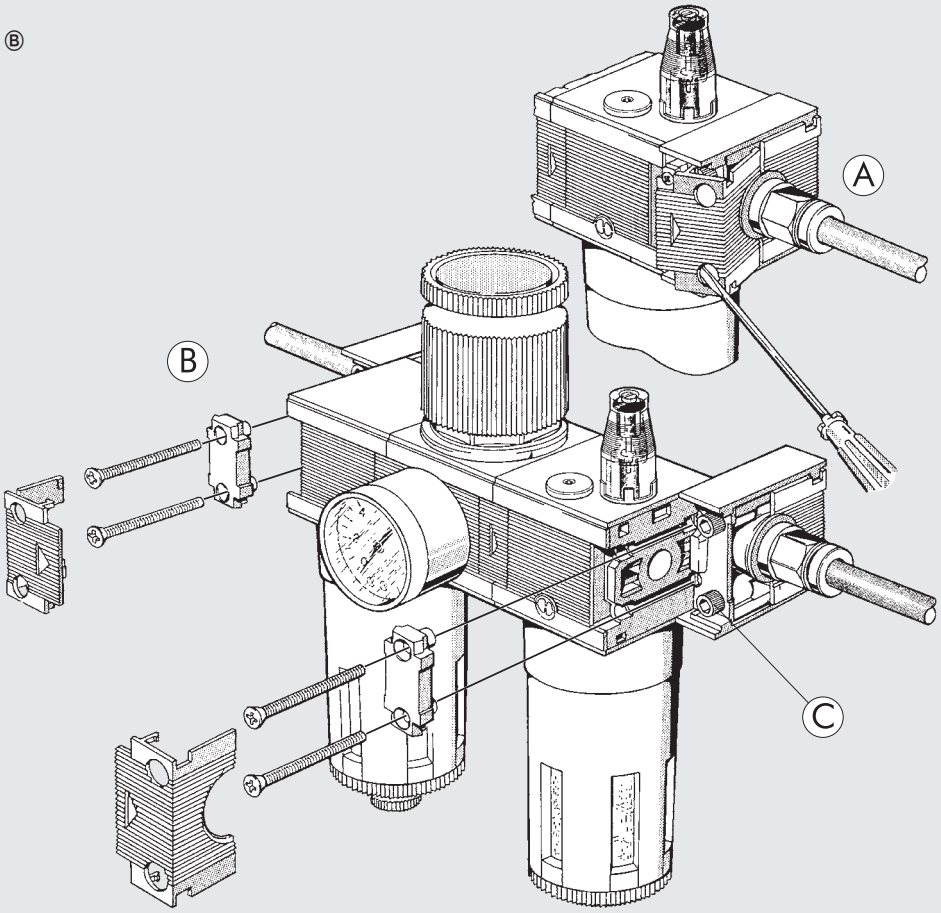
Skillair® MODULARITY

The FRL units can be removed from the system without disturbing the pipes. This can be done with a single element or with the entire system. Assemble the unit so that the air flows in the direction marked by the arrows.



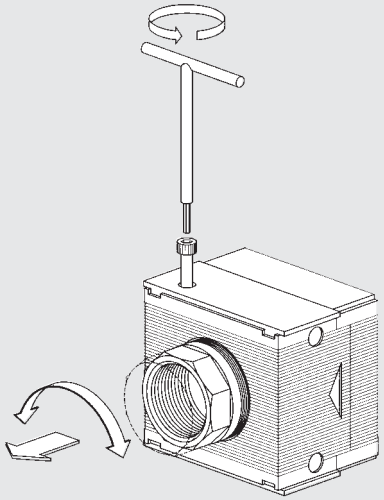
DISASSEMBLING THE UNIT – WALL FIXING

How to disassemble Skillair® end plates:
- Remove the plate Ⓐ.
- Unscrew the screws and remove the cams Ⓑ to disassemble the unit.
- Screws to fix the end plates to the wall Ⓒ:
  Series 100: M4x50
  Series 200: M5x60
  Series 300: M5x70
  Series 400: M6x110



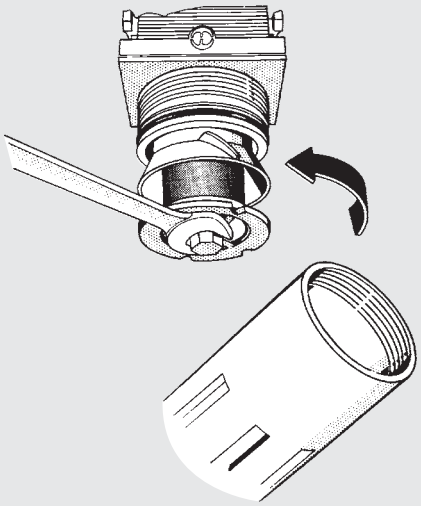
Skillair® 400 - ROTARY SLIDING JOINT

The series 400 comes with a patented system with a rotary sliding end joint to allow the unit to be adapted to the pipe cutting distance. For correct assembly and disassembly, loosen the screw in the end plate before screwing in or unscrewing the bush.



CLEANING AND/OR REPLACING THE FILTER ELEMENTS

Before unscrewing the bowl to replace the filter elements, check that the line is no longer pressurized.
Replace as shown in the diagram.

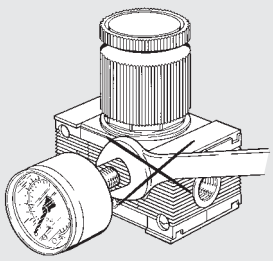


GENERAL RULES FOR USE AND MAINTENANCE

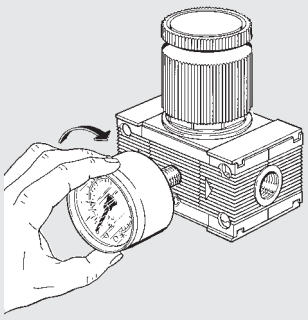
MOUNTING THE PRESSURE GAUGE

① Do not use a spanner.
② The gauge must be mounted by hand.
Use liquid sealants only.
Do not use Teflon.

①



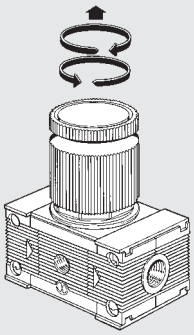
②



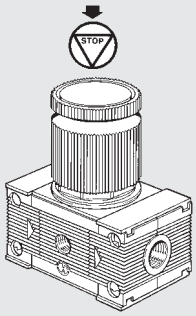
SETTING THE PRESSURE

③ **N.B.: the pressure in standard regulators must always be set upwards.**
Before setting the pressure, check that the knob is raised.
④ When the required pressure has been reached, press the knob downwards.

③



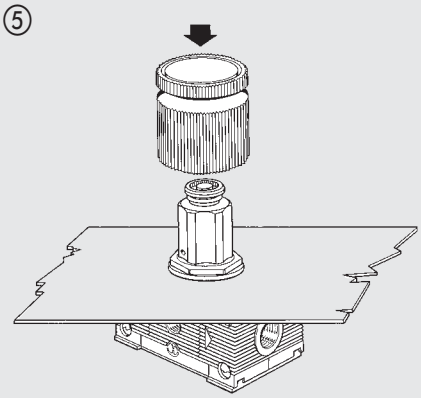
④



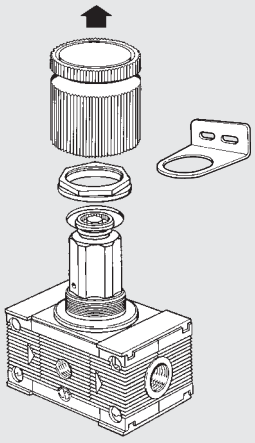
MOUNTING THE REGULATOR AND FILTER-REGULATOR

⑤ Panel mounting: remove the knob and lock the regulator with the ring nut.
⑥ Wall mounting: use a suitable bracket (see Skillair® accessories).

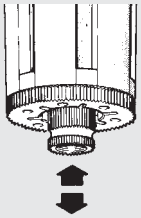
⑤



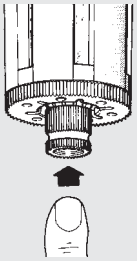
⑥



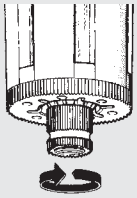
SEMI-AUTO CONDENSATE DRAIN FOR FILTER, FILTER-REGULATOR AND DEPURATOR



The semi-auto condensate drain is the normally open type. When there is pressure in the bowl, the drain closes. When there is no pressure in the bowl, it opens and the condensate drains out.



If necessary, it is possible to drain the condensate whilst the bowl is pressurised. The simple manual operation of "pushing up the valve" will allow the condensate to drain.



When rotating the button clockwise, the valve becomes in locked position, and can only work when the button is returned to the central position.

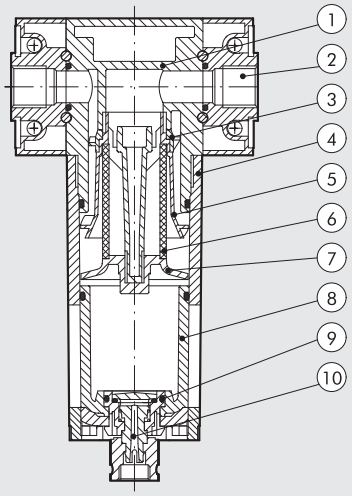
Skillair® FILTER

The Job of the filter is to remove any solid or liquid impurities from the air generated by the compressor.
Incoming air is rotated by the centrifuge unit. The heaviest liquid and solid particles are projected against the walls of the container and forced to adhere to it. As they accumulate they form drops that deposit on the bottom by gravity.
The remaining solid particles are held back by the porous element depending on the filtering threshold.
The accumulated condensate is drained out through the drain - automatically when there is no pressure in the filter, or by hand pressing the button.
An automatic drain is available. It automatically eliminates condensate from the container whenever necessary, whatever the pressure.
The transparent windows allow to view the level of condensation at 360°.

TECHNICAL DATA		FIL 100	FIL 200	FIL 300	FIL 400	
Threaded port		1/4" | 3/8"	1/4" | 3/8" | 1/2"	1/2" | 3/4" | 1"	1" | 1 1/4" | 1 1/2"	2"
Degree of filtration	µm	5 - 20 - 50	5 - 20 - 50	5 - 20 - 50	5 - 20 - 50	
Max. input pressure	MPa	1.5	1.3	1.3	1.3	1.3
	bar	15	13	13	13	13
	psi	217	188	188	188	188
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	1400	2400	3800	16500	20000
ΔP 0.5 bar (0.05 MPa to 7 psi)	scfm	50	85	135	590	710
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	2000	3100	5300	-	-
ΔP 1 bar (0.1 MPa to 14 psi)	scfm	71	110	188	-	-
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	50	50	50	50
	°F	122	122	122	122	122
Weight	kg	0.4	0.7	1.4	5.2	6
Wall fixing screws		M4 x 50	M5 x 60	M5 x 70	M6 x 110	M6 x 110
Bowl capacity	cm^3	22	45	75	270	270
Mounting position		Vertical	Vertical	Vertical	Vertical	Vertical
Drain		RMSA - SAC	RMSA - SAC - RA	RMSA - RA	RMSA - RA	RMSA - RA
		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure				
		RA: automatic drain with condensate discharge, independent of pressure and flow rate				
		SAC: automatic drain with condensate discharge .**Operates by depression – requires variable air take-offs.**				
Fluid		Compressed air.				
Notes on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**				

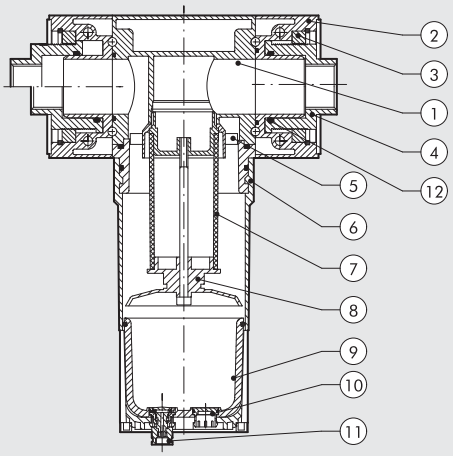
COMPONENTS FIL 100 - 200 - 300

① Technopolymer body
② Zamak end plate
③ Technopolymer centrifuge
④ Bowl: technopolymer for FIL 100 and FIL 200, metal for FIL 300
⑤ Technopolymer baffle
⑥ Sintered HDPE filter cartridge
⑦ Technopolymer screen
⑧ Clear technopolymer glass
⑨ NBR gaskets
⑩ Drain (RMSA)



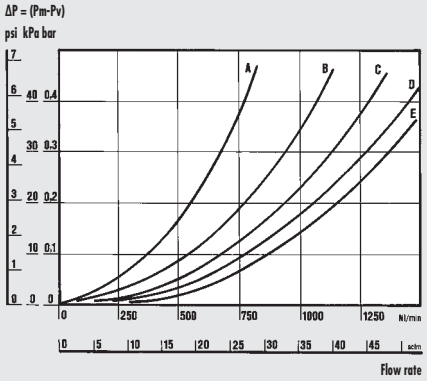
COMPONENTS FIL 400

① Aluminium body
② Aluminium end plate
③ OT58 brass retaining ring
④ OT58 threaded bush, axial adjustment
⑤ Technopolymer centrifuge
⑥ Aluminium bowl
⑦ Sintered bronze filter cartridge
⑧ Aluminium screen
⑨ Clear technopolymer glass
⑩ Technopolymer plug
⑪ Drain (RMSA)
⑫ NBR gaskets

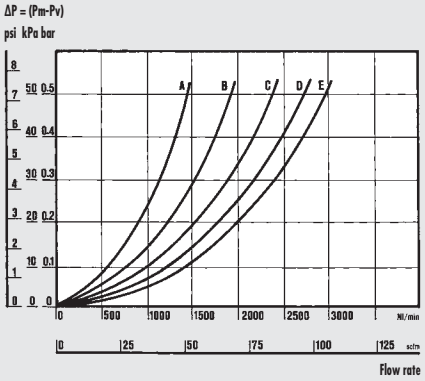


FLOW CHARTS

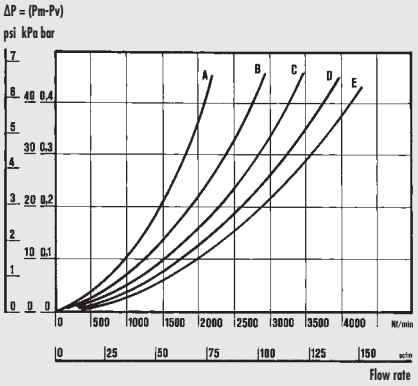
FIL 100 1/4 - 3/8



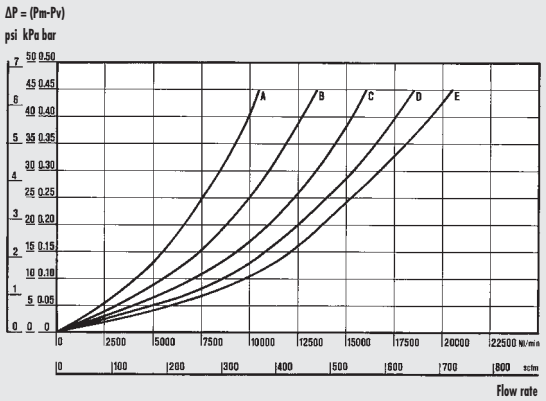
FIL 200 1/4 - 3/8 - 1/2



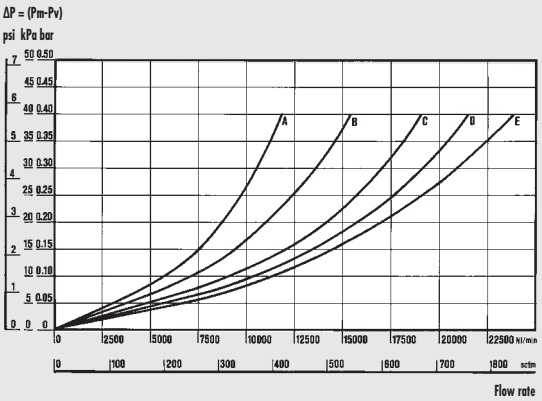
FIL 300 1/2 - 3/4 - 1



FIL 400 1″



FIL 400 2″



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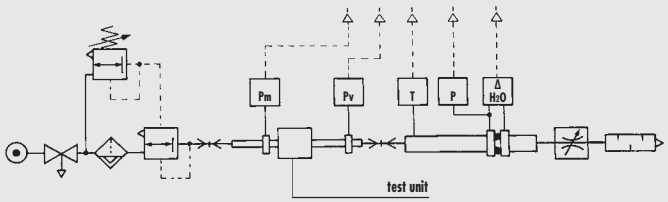
Turin Polytechnic

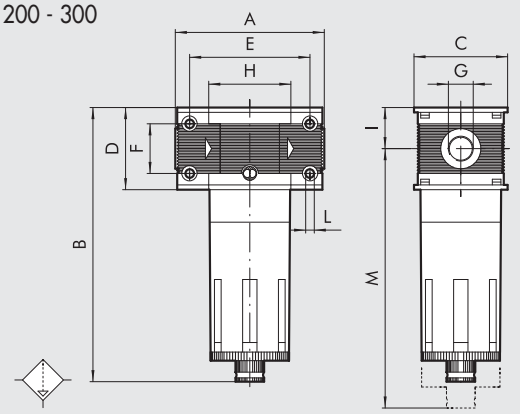


• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

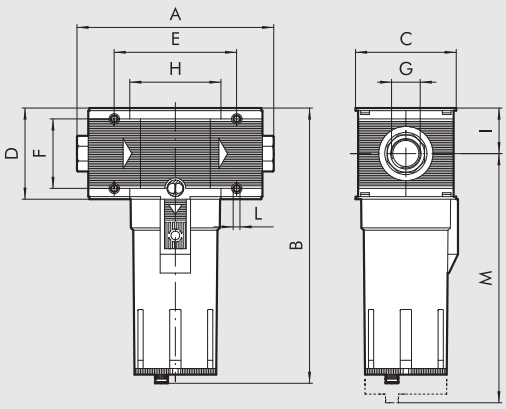
(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

DIMENSIONS

100 - 200 - 300



400



		FIL 100		FIL 200			FIL 300			FIL 400			
Threaded port G		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A		78		93.5			110		112	225 to 255			283 to 313
B	**RMSA**	144		175			195			320			
	RA	-		179			199			324			
	SAC	148		179			-			-			
C		50		63			72			116			
D		43		55			65			105			
E		63		78.5			92			141.4			
F		26		36			42			80			
H		43		55.5			65			105.4			
I		21.5		27.5			32.5			52.5			
L		M4 hole		M5 hole			M5 hole			M6 hole			
M	**RMSA**	137		196			215			378			
	RA	-		200			219			382			
	SAC	141		200			-			-			

NOTES

SYNOPTIC, SIZES AND VERSIONS

FIL ELEMENT	100 SIZE	1/4 THREADED PORT	20 DEGREE OF FILTRATION	RMSA TYPE OF DRAIN
FIL.	100	1/4 3/8	5 = 5 µm 20 = 20 µm 50 = 50 µm	RMSA SAC
	200	1/4 3/8 1/2		RMSA SAC RA*
	300	1/2 3/4 1		RMSA RA
	400	1 1 1/4 1 1/2 2		

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure

RA: automatic drain with condensate discharge, independent of pressure and flow rate. (for size 300 and 400)

SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.
(for size 100 and 200)

* For Skillair® 200 with RA, please contact our sales assistance department.

ORDERING CODES

Code	Description
Skillair® 100 FILTER	
3280001A	FIL 100 5 RMSA without end plates
3280007A	FIL 100 5 SAC without end plates
3280002A	FIL 100 20 RMSA without end plates
3280008A	FIL 100 20 SAC without end plates
3280003A	FIL 100 50 RMSA without end plates
3280009A	FIL 100 50 SAC without end plates
3280001	FIL 100 1/4 5 RMSA
3280007	FIL 100 1/4 5 SAC
3280002	FIL 100 1/4 20 RMSA
3280008	FIL 100 1/4 20 SAC
3280003	FIL 100 1/4 50 RMSA
3280009	FIL 100 1/4 50 SAC
3380001	FIL 100 3/8 5 RMSA
3380007	FIL 100 3/8 5 SAC
3380002	FIL 100 3/8 20 RMSA
3380008	FIL 100 3/8 20 SAC
3380003	FIL 100 3/8 50 RMSA
3380009	FIL 100 3/8 50 SAC
Skillair® 200 FILTER	
3480001A	FIL 200 5 RMSA without end plates
3480007A	FIL 200 5 SAC without end plates
3480002A	FIL 200 20 RMSA without end plates
3480008A	FIL 200 20 SAC without end plates
3480003A	FIL 200 50 RMSA without end plates
3480009A	FIL 200 50 SAC without end plates
3480001	FIL 200 1/4 5 RMSA
3480007	FIL 200 1/4 5 SAC
3480002	FIL 200 1/4 20 RMSA
3480008	FIL 200 1/4 20 SAC
3480003	FIL 200 1/4 50 RMSA
3480009	FIL 200 1/4 50 SAC
3580001	FIL 200 3/8 5 RMSA
3580007	FIL 200 3/8 5 SAC
3580002	FIL 200 3/8 20 RMSA
3580008	FIL 200 3/8 20 SAC
3580003	FIL 200 3/8 50 RMSA
3580009	FIL 200 3/8 50 SAC
3680001	FIL 200 1/2 5 RMSA
3680007	FIL 200 1/2 5 SAC
3680002	FIL 200 1/2 20 RMSA
3680008	FIL 200 1/2 20 SAC
3680003	FIL 200 1/2 50 RMSA
3680009	FIL 200 1/2 50 SAC

Code	Description
Skillair® 300 FILTER	
4480001A	FIL 300 5 RMSA without end plates
4480002A	FIL 300 20 RMSA without end plates
4480003A	FIL 300 50 RMSA without end plates
4480004A	FIL 300 5 RA without end plates
4480005A	FIL 300 20 RA without end plates
4480006A	FIL 300 50 RA without end plates
4480001	FIL 300 1/2 5 RMSA
4480002	FIL 300 1/2 20 RMSA
4480003	FIL 300 1/2 50 RMSA
4480004	FIL 300 1/2 5 RA
4480005	FIL 300 1/2 20 RA
4480006	FIL 300 1/2 50 RA
4580001	FIL 300 3/4 5 RMSA
4580002	FIL 300 3/4 20 RMSA
4580003	FIL 300 3/4 50 RMSA
4580004	FIL 300 3/4 5 RA
4580005	FIL 300 3/4 20 RA
4580006	FIL 300 3/4 50 RA
4680001	FIL 300 1 5 RMSA
4680002	FIL 300 1 20 RMSA
4680003	FIL 300 1 50 RMSA
4680004	FIL 300 1 5 RA
4680005	FIL 300 1 20 RA
4680006	FIL 300 1 50 RA

Code	Description
Skillair® 400 FILTER	
6180001A	FIL 400 5 RMSA without end plates
6180002A	FIL 400 20 RMSA without end plates
6180003A	FIL 400 50 RMSA without end plates
6180004A	FIL 400 5 RA without end plates
6180005A	FIL 400 20 RA without end plates
6180006A	FIL 400 50 RA without end plates
6180001	FIL 400 1 5 RMSA
6180002	FIL 400 1 20 RMSA
6180003	FIL 400 1 50 RMSA
6180004	FIL 400 1 5 RA
6180005	FIL 400 1 20 RA
6180006	FIL 400 1 50 RA
6280001	FIL 400 1 1/4 5 RMSA
6280002	FIL 400 1 1/4 20 RMSA
6280003	FIL 400 1 1/4 50 RMSA
6280004	FIL 400 1 1/4 5 RA
6280005	FIL 400 1 1/4 20 RA
6280006	FIL 400 1 1/4 50 RA
6380001	FIL 400 1 1/2 5 RMSA
6380002	FIL 400 1 1/2 20 RMSA
6380003	FIL 400 1 1/2 50 RMSA
6380004	FIL 400 1 1/2 5 RA
6380005	FIL 400 1 1/2 20 RA
6380006	FIL 400 1 1/2 50 RA
6480001	FIL 400 2 5 RMSA
6480002	FIL 400 2 20 RMSA
6480003	FIL 400 2 50 RMSA
6480004	FIL 400 2 5 RA
6480005	FIL 400 2 20 RA
6480006	FIL 400 2 50 RA

Skillair® DEPURATOR

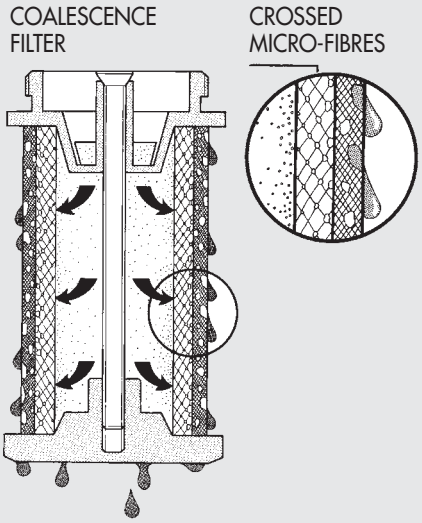
METAL WORK PNEUMATIC

The role of the depurator is to separate the liquid and solid particles contained in the compressed air with a high degree of efficiency. This separation is carried out using a special filtering element called a "coalescence cartridge".

TECHNICAL DATA		DEP 100	DEP 200	DEP 300	DEP 400
Threaded port		1/4" | 3/8"	1/4" | 3/8" | 1/2"	1/2" | 3/4" | 1"	1" | 1 1/4" | 1 1/2" | 2"
Degree of purification		99.97% at 0.01 µm	99.97% at 0.01 µm	99.97% at 0.01 µm	99.97% at 0.01 µm
Max. inlet pressure	MPa	1.5	1.3	1.3	1.3 | 1.3
	bar	15	13	13	13 | 13
	psi	217	188	188	188 | 188
Suggested flow at 6 bar	Nl/min	230	360	500	2300 | 2250
Maximun suggested flow rate		See next page			
Max temperature at: 1 MPa; 10 bar; 145 psi	°C	50	50	50	50 | 50
	°F	122	122	122	122 | 122
Weight	kg	0.4	0.9	1.4	4.2 | 5
Wall fixing screws		M4 x 50	M5 x 60	M5 x 70	M6 x 110 | M6 x 110
Bowl capacity	cm^3	22	45	75	270 | 270
Mounting position		Vertical	Vertical	Vertical	Vertical | Vertical
Drain		RMSA	RMSA	RMSA - RA	RMSA - RA | RMSA - RA
		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure RA: automatic drain with condensate discharge, independent of pressure and flow rate			
Fluid		5 µm filtered air			
Notes on use		It is advisable to mount a 5 µm pre-filter in order to separate the solid particles first. **The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**			

HOW THE COALESCENCE CARTRIDGE WORKS

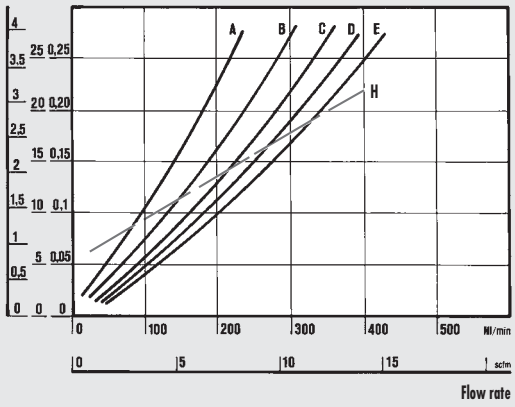
Air from the mains – full of impurities – flows into the coalescence cartridge and then passes through the crossed micro-fibres that make up the cartridge. During this movement the liquid particles come into contact with the crossed micro-fibres and adhere to them. Due to the air pressure and gravity they join up with other micro-drops at each cross-over point and gradually increase in volume, leading to the physical phenomenon called coalescence. When they stop moving, the drops deposit on the outside of the cartridge, from which they detach and drop to the bottom.
Since the volume of liquid leaving the cartridge is exactly the same as the drops arriving, the coalescence cartridge ought to work indefinitely.
Solid particles are caught with the same efficiency but, unlike drops, they are not drained out and clog the cartridge.
To get round this problem, it is necessary to mount a 5 µm pre-filter before the fine oil filter to separate the solid particles first.



FLOW CHARTS

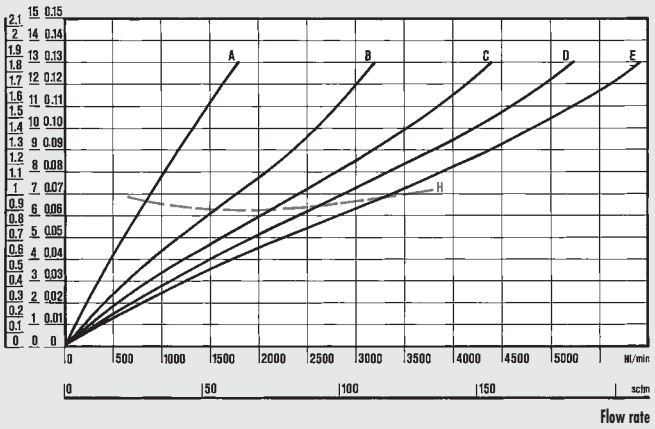
DEP 100 1/4 - 3/8

ΔP = (Pm-Pv)
psi kPa bar



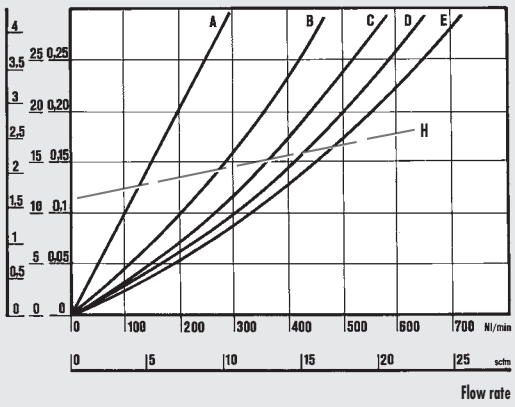
DEP 400 1″

ΔP = (Pm-Pv)
psi kPa bar



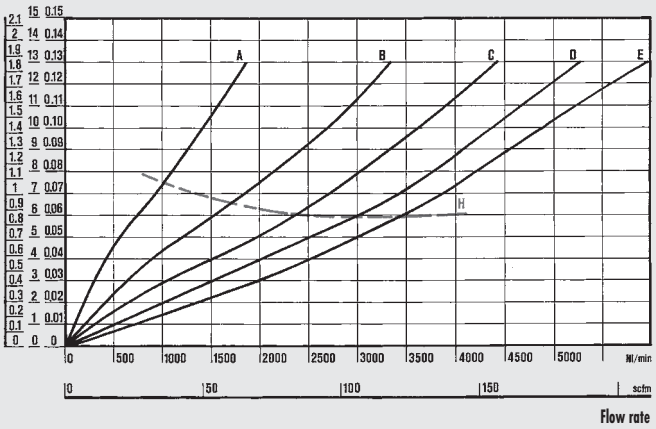
DEP 200 1/4 - 3/8 - 1/2

ΔP = (Pm-Pv)
psi kPa bar



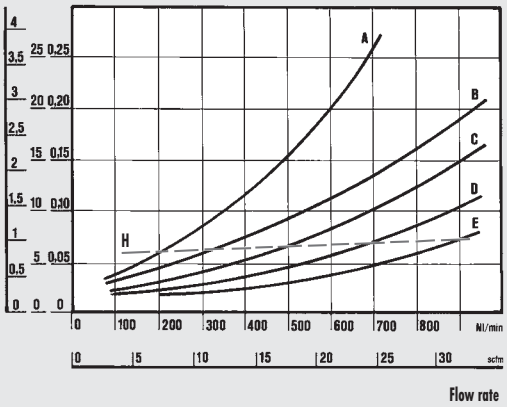
DEP 400 2″

ΔP = (Pm-Pv)
psi kPa bar



DEP 300 1/2 - 3/4 - 1

ΔP = (Pm-Pv)
psi kPa bar



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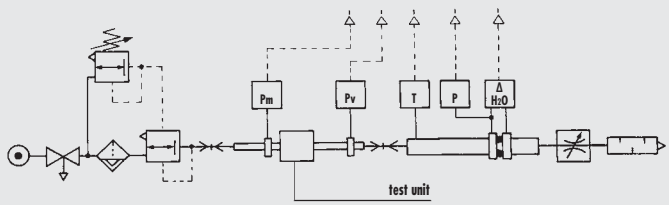


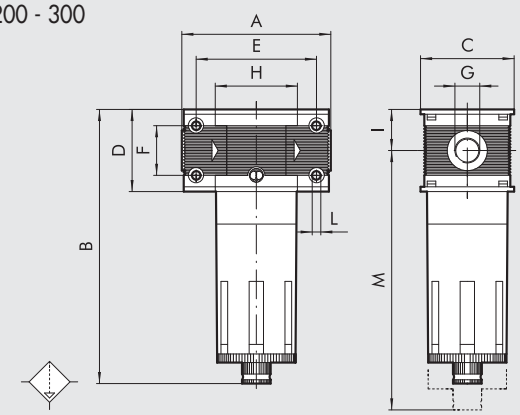
• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi
(H) = maximum flow rate recommended for optimal operation

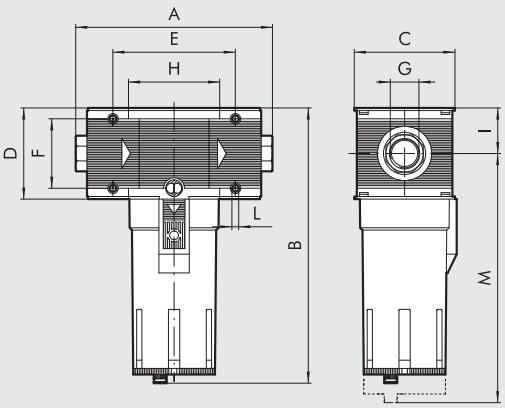
METAL WORK PNEUMATIC

DIMENSIONS

100 - 200 - 300



400



		DEP 100		DEP 200			DEP 300			DEP 400			
Threaded port G		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A		78		93.5			110		112	225 to 255			283 to 313
B	**RMSA**	144		175			195			320			
	RA	-		-			199			324			
C		50		63			72			116			
D		43		55			65			105			
E		63		78.5			92			141.4			
F		26		36			42			80			
H		43		55.5			65			105.4			
I		21.5		27.5			32.5			52.5			
L		M4 hole		M5 hole			M5 hole			M6 hole			
M	**RMSA**	137		196			215			378			
	RA	-		-			219			382			

SYNOPTIC, SIZES AND VERSIONS

DEP	**100**	**1/4**	**RMSA**
ELEMENT	**SIZE**	**THREADED PORT**	**TYPE OF DRAIN**
DEP	100	1/4 3/8	RMSA
	200	1/4 3/8 1/2	
	300	1/2 3/4 1	RMSA RA
	400	1 1 1/4 1 1/2 2	

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure

RA: automatic drain with condensate discharge, independent of pressure and flow rate. (for size 300 and 400)

ORDERING CODES

Code	Description
Skillair® 100 DEPURATOR	
3288001A	D 100 RMSA without end plates
3288001	D 100 1/4 RMSA
3388001	D 100 3/8 RMSA
Skillair® 200 DEPURATOR	
3488001A	D 200 RMSA without end plates
3488001	D 200 1/4 RMSA
3588001	D 200 3/8 RMSA
3688001	D 200 1/2 RMSA

Code	Description
Skillair® 300 DEPURATOR	
4488001A	D 300 RMSA without end plates
4488002A	D 300 RA without end plates
4488001	D 300 1/2 RMSA
4488002	D 300 1/2 RA
4588001	D 300 3/4 RMSA
4588002	D 300 3/4 RA
4688001	D 300 1 RMSA
4688002	D 300 1 RA

Code	Description
Skillair® 400 DEPURATOR	
6188001A	D 400 RMSA without end plates
6188002A	D 400 RA without end plates
6188001	D 400 1 RMSA
6188002	D 400 1 RA
6288001	D 400 1 1/4 RMSA
6288002	D 400 1 1/4 RA
6388001	D 400 1 1/2 RMSA
6388002	D 400 1 1/2 RA
6488001	D 400 2 RMSA
6488002	D 400 2 RA

Skillair® ACTIVE CARBON FILTER

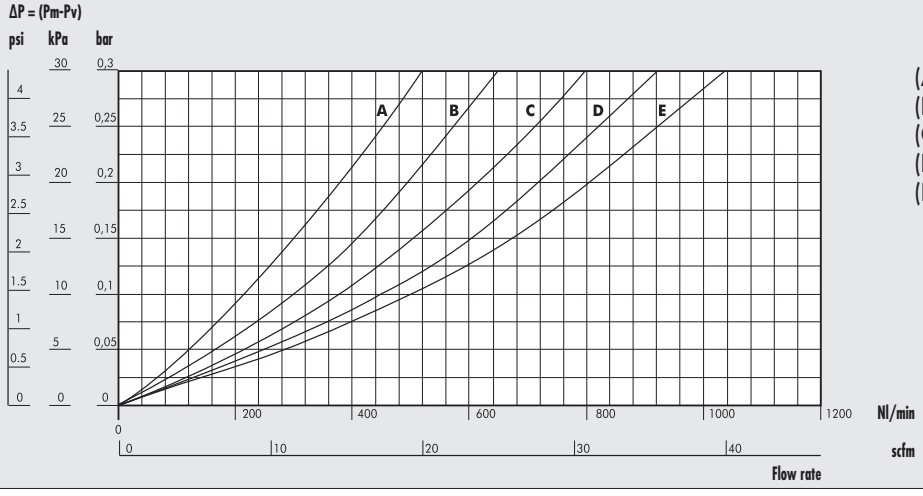
Active carbon filtering systems are the most efficient in the industry as they eliminate all traces of oils, solvents and hydrocarbons, and remove unpleasant odours from the air.
The operating principle is based on active carbon's ability to absorb the majority of the polluting particles in the air thanks to the presence of tiny passages inside the carbon granules.
The incoming air must be filtered (5 μm) and purified (0.01 μm) to increase the duration and efficiency of the cartridge.
The cartridge must be replaced at set intervals since there is no difference in load loss between an efficient cartridge and a saturated one.
N.B. To maintain the same performance and duration specified on the data sheet, the load loss (ΔP) must not exceed 75 mbar.

TECHNICAL DATA		AC 100		AC 200			AC 300			AC 400			
Threaded port		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
Residual oil at 20°C *	mg/m³	0.003		0.003			0.003			0.003			
Duration of cartridge *	hours	4000		4000			4000			1000			
Max. inlet pressure	MPa	1.5		1.3			1.3			1.3			
	bar	15		13			13			13			
	psi	217		188			188			188			
Max temperature at: 1 MPa; 10 bar; 145 psi	°C	50		50			50			50			
	°F	122		122			122			122			
Weight	kg	0.4		0.9			1.4			4.2			5
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70			M6 x 110			
Mounting position		In any position.											
Fluid		0.01 μm filtred and depurated air.											
Notes on use		Upstream it's necessary to mount a coalescence filter depurator of 0.01 μm.											

* if the load loss of 75 mbar is not exceeded

FLOW CHARTS

AC 100 1/4 - 3/8

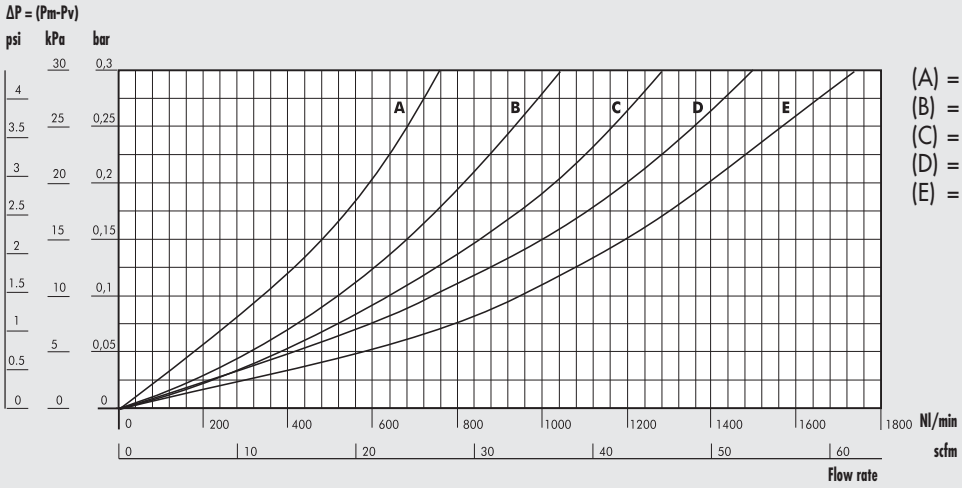


(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

METAL WORK PNEUMATIC

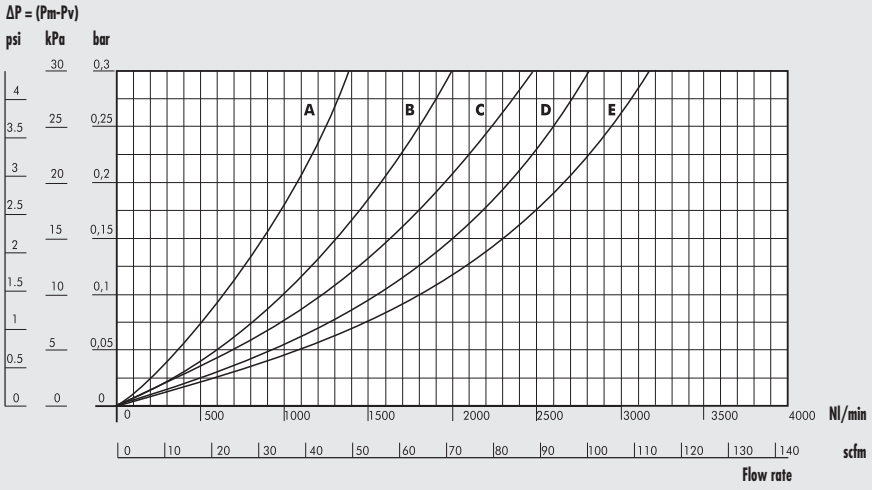
FLOW CHARTS

AC 200 1/4 - 3/8 - 1/2



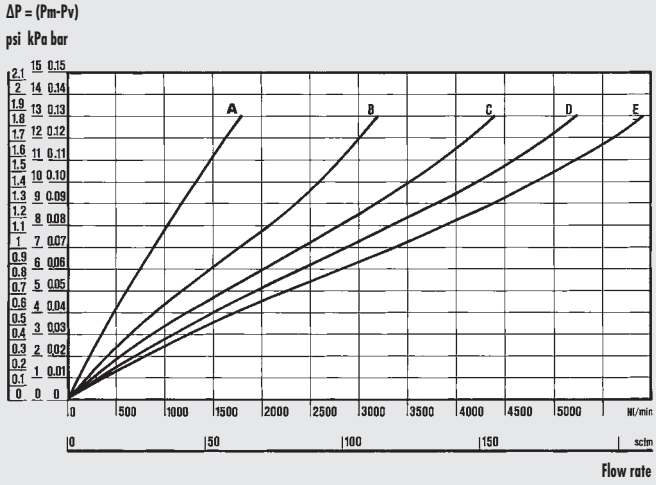
(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

AC 300 1/2 - 3/4 - 1



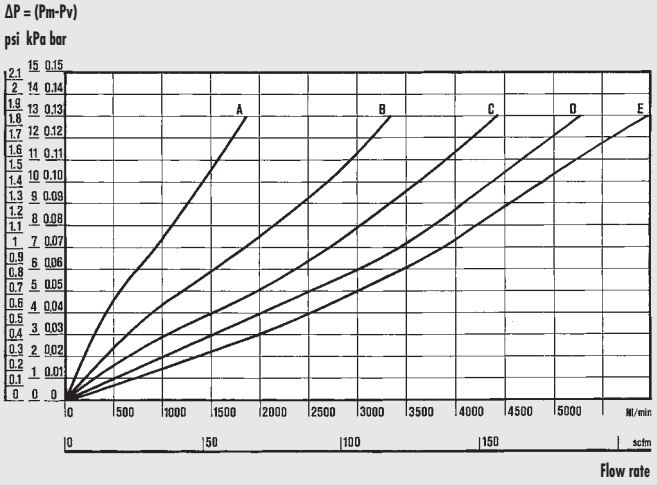
(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

AC 400 1



(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

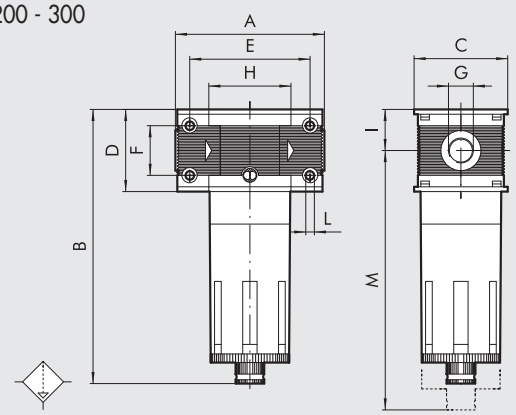
AC 400 2



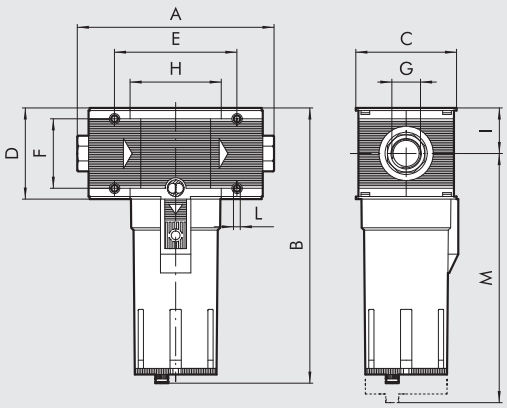
(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

DIMENSIONS

100 - 200 - 300



400



	AC 100		AC 200			AC 300			AC 400			
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A	78		93.5			110		112	225 to 255			283 to 313
B	144		175			195			320			
C	50		63			72			116			
D	43		55			65			105			
E	63		78.5			92			141.4			
F	26		36			42			80			
H	43		55.5			65			105.4			
I	21.5		27.5			32.5			52.5			
L	M4 hole		M5 hole			M5 hole			M6 hole			
M	137		196			215			378			

SYNOPTIC, SIZES AND VERSIONS

AC	**100**	**1/4**	**RMSA**
ELEMENT	**SIZE**	**THREADED PORT**	**TYPE**
AC = Active carbon	100	1/4 3/8	RMSA
	200	1/4 3/8 1/2	
	300	1/2 3/4 1	
	400	1 1 1/4 1 1/2 2	

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.

ORDERING CODES

Code	Description
Skillair® 100 ACTIVE CARBON FILTER	
3288003A	FIL AC 100 RMSA without end plates
3288003	FIL AC 100 1/4 RMSA
3388003	FIL AC 100 3/8 RMSA
Skillair® 200 ACTIVE CARBON FILTER	
3488003A	FIL AC 200 RMSA without end plates
3488003	FIL AC 200 1/4 RMSA
3588003	FIL AC 200 3/8 RMSA
3688003	FIL AC 200 1/2 RMSA

Code	Description
Skillair® 300 ACTIVE CARBON FILTER	
4488003A	FIL AC 300 RMSA without end plates
4488003	FIL AC 300 1/2 RMSA
4588003	FIL AC 300 3/4 RMSA
4688003	FIL AC 300 1 RMSA

Code	Description
Skillair® 400 ACTIVE CARBON FILTER	
6188003A	FIL AC 400 RMSA without end plates
6188003	FIL AC 400 1 RMSA
6288003	FIL AC 400 1 1/4 RMSA
6388003	FIL AC 400 1 1/2 RMSA
6488003	FIL AC 400 2 RMSA

DIAPHRAGM DRIER SERIES DRY 100 Skillair®

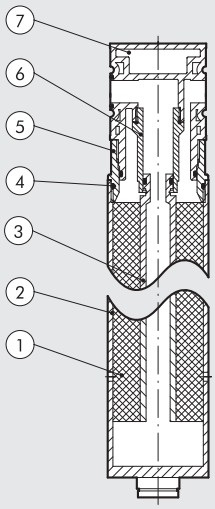
METAL WORK PNEUMATIC

Skillair® diaphragm driers are used to reduce the air's moisture content by lowering the dew point, i.e. the temperature at which condensate starts to form. They use diaphragms with a new cross-fibre system that guarantees a lower consumption of regenerated air and hence power.
This is an all-in-one unit complete with a filter, purifier, air intake and drier. The air intake uses air that has been filtered and purified, but not dried, and sends it to utilities not requiring dry air. This is a much more efficient system as only the required quantity of compressed air is dried.
An alternative proposal is the drier by itself. As the Skillair® system is modular, it can be inserted in any type of assembly. It is important, however, to remember that only properly filtered and purified air must be supplied to the drier. It's advisable that the drier should be used at the highestpressure as possible.

TECHNICAL DATA		DRY 100	FIL + DEP + PA + DRY 100
Threaded port		1/4" - 3/8"	
Max. inlet pressure		1.3 MPa / 13 bar /188 psi	
Suggested flow rate at 6.3 bar (0.63 MPa, 91 psi)	Nl/min	230	
	scfm	8	
Consumption of compressed air for regeneration at 6.3 bar	Nl/min	20	
	scfm	0.7	
Minimum temperature		2°C / 35°F	
Maximum temperature at 1MPa; 10 bar; 145 psi		50°C / 122°F	
Noise level	dB(A)	< 45	
Weight	kg	0.84	1.24
Wall fixing screws		M4 x 50	
Mounting position		In any position	Vertical
Drain		-	RMSA: drain with manual condensate discharge and automatic discharge at zero pressure
		-	SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**
Filter bowl and purification bowl capacity	cm^3	-	22
Fluid		Compressed air without condensate max solid particle size:1 µm max oil residue: 0.01mg/m^3	Compressed air
Important note		The drier must always be preceded by a 5 µm filter and a purifier	

COMPONENTS

① Body: painted anodized aluminium
② Diaphragm: poliester sulfone resin
③ Inner tube: salt-water resistant aluminium
④ O-Ring seals: NBR
⑤ Adapter: anodized aluminium
⑥ Flanges: brass
⑦ Skillair® body: technopolymer

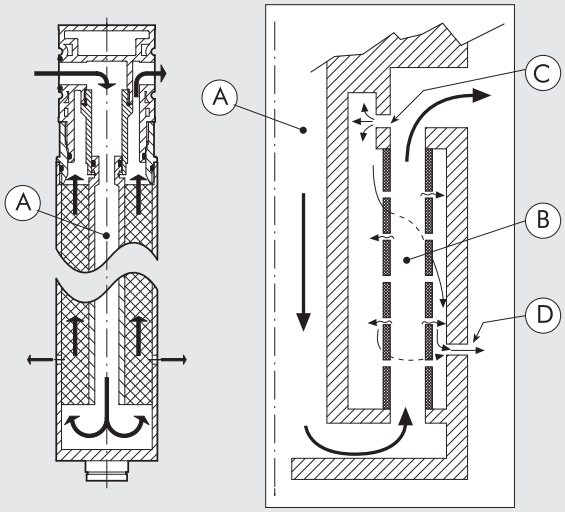


OPERATING PRINCIPLE

The drying element is comprised of cross-fibre diaphragms arranged around an inner tube. The compressed air passes through the tube (A) and flows back through the hollow diaphragms (B). At the same time, the regeneration air required for drying is tapped from the outlet port, expands as it passes through a nozzle (C), which reduces the relative humidity, and flows back along the outer side of the fibres. This allows moist compressed air to flow through the diaphragms and the dry regeneration air outside.
The difference in moisture content causes the water to pass from the compressed air to the regeneration air, which is drained through holes (D) at the bottom of the drier.

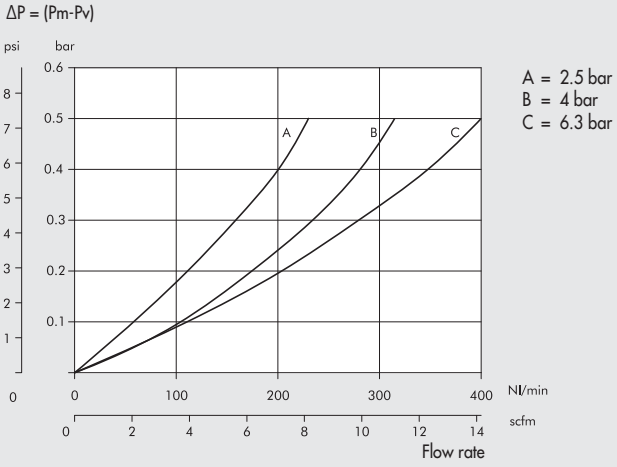
ADVANTAGES

- Drying is guaranteed as all the moisture is removed
- Minimum consumption of regeneration air
- Reduce drier maintenance as none of the components are subject to wear
- Environmentally friendly drying process.

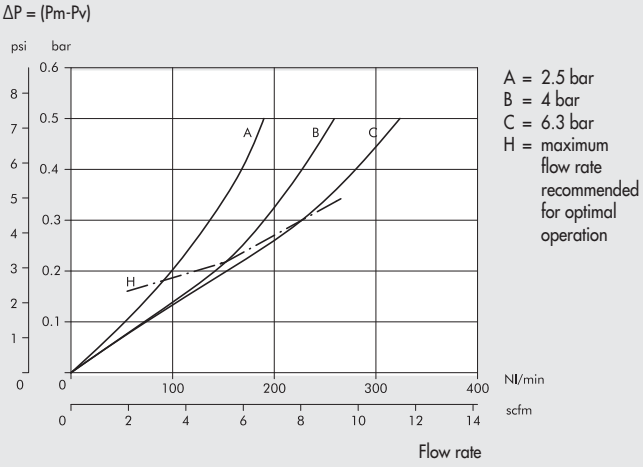


FLOW CHARTS

DRY 100



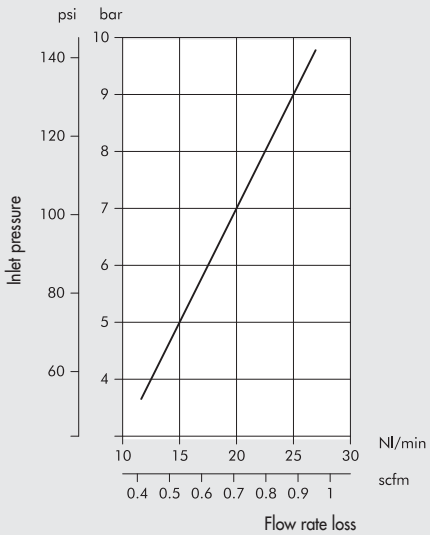
FIL (5 µm) + DEP + PA + DRY 100



REGENERATION AIR

Thanks to the cross-fiber system, the flow rate loss is much lesser than in traditional linear-fibre systems.
In the diagram on the right is indicated the drop-in air flow according to the operating pressure.

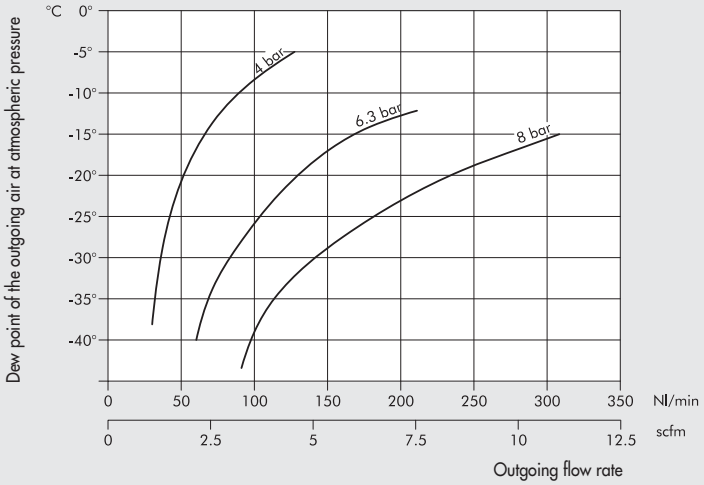
N.B.: for the best drying efficiency the higest pressure possible is required, though this implies an increase of the regeneration air.



METAL WORK PNEUMATIC

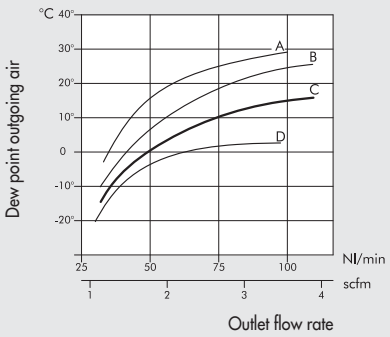
DRYING

Dew point of the outgoing air in nominal reference conditions:
- Dew point referred to atmospheric pressure
- Incoming air with dew point at 25°C (i.e. saturated at 25°C)

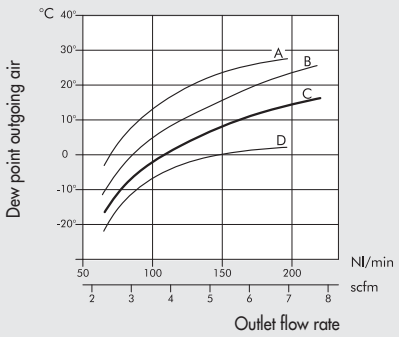


In the diagram below is indicated the dew point of the outgoing compressed air for various input air dew points, depending on the rate of flow of compressed air.

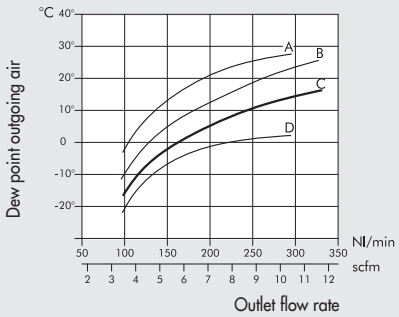
INLET PRESSURE: 4 bar



INLET PRESSURE: 6.3 bar

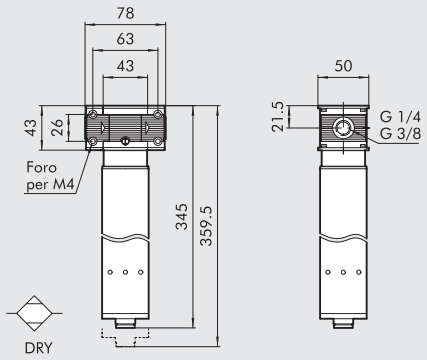


INLET PRESSURE: 8 bar



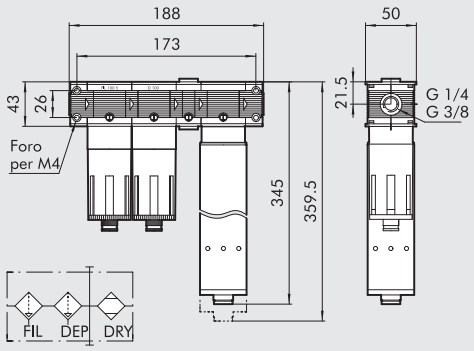
A: Incoming air with dew point at 45°C
B: Incoming air with dew point at 35°C
C: Incoming air with dew point at 25°C
D: Incoming air with dew point at 15°C

DRY 100 DIMENSIONS



Code	Description
3290001A	DRY 100 without end plates
3290001	DRY 100 1/4"
3390001	DRY 100 3/8"

FIL + DEP + PA + DRY 100 DIMENSIONS



Code	Description
3291001	F+D+PA+DRY 100 1/4" RMSA-RMSA
3291005	F+D+PA+DRY 100 1/4" SAC-RMSA
3291006	F+D+PA+DRY 100 1/4" SAC-SAC
3391001	F+D+PA+DRY 100 3/8" RMSA-RMSA
3391005	F+D+PA+DRY 100 3/8" SAC-RMSA
3391006	F+D+PA+DRY 100 3/8" SAC-SAC

Skillair® REGULATOR

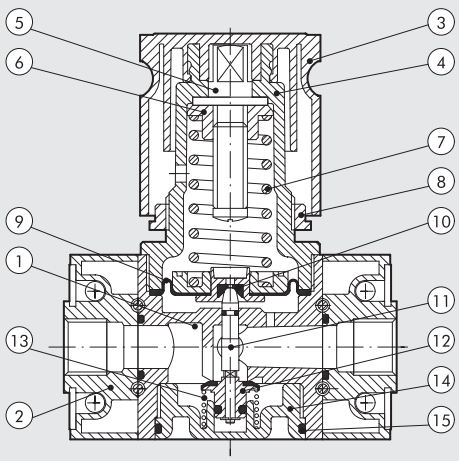
Each system served by the air supply mains (e.g. actuators and general appliances) requires its own constant operating pressure. It is necessary to use a regulator to regulate the pressure within a set range by means of regulating springs, with the pressure never exceeding the mains pressure.
The new Skillair® regulator uses a rolling diaphragm which gives a much better performance than the flat version.
Advantages of this system:

- Increased stroke, increased valve opening and hence higher flow rate.
- Decreased dynamic and inrush friction; prompter, more sensitive operation.
- Reduced working stress and hence longer life allowing the use of thinner diaphragms (0.45 mm versus 1.5 mm for a flat one) which increases regulator sensitivity and prompt action.
- Increased accuracy in maintaining the set pressure with both variable flow rates and different feed pressures.
- Downstream overpressures relieved quickly.

TECHNICAL DATA		REG 100		REG 200			REG 300			REG 400 PILOT OPERATOR*			
Threaded port		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
Setting range	bar	0 to 2 - 0 to 4 - 0 to 8 - 0 to 12								Depending on the pilot operated regulator			
Max. input pressure	MPa	1.5		1.5			1.3			1.3			1.3
	bar	15		15			13			13			13
	psi	217		217			188			188			188
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	1100		2500			3500			18000			20000
ΔP 0.5 bar (0.05 MPa to 7 psi)	scfm	39		88			124			363			707
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	1600		3500			7000			-			-
ΔP 1 bar (0.1 MPa to 14 psi)	scfm	57		124			247			-			-
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50		50			50			50			50
	°F	122		122			122			122			122
Weight	kg	0.4		0.7			1.4			4.8			5.6
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70			M6 x 110			M6 x 110
Pressure gauge port		1/8″		1/8″			1/8″			1/4″			1/4″
Mounting position		In any position											
Fluid		Filtered lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.											
Notes on use		The regulator pressure must always be set upwards.											
		For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value.											
		Do not take air from pressure gauge ports.											
		***Supplied without a pilot regulator.**											

COMPONENTS REG 100 - 200 - 300

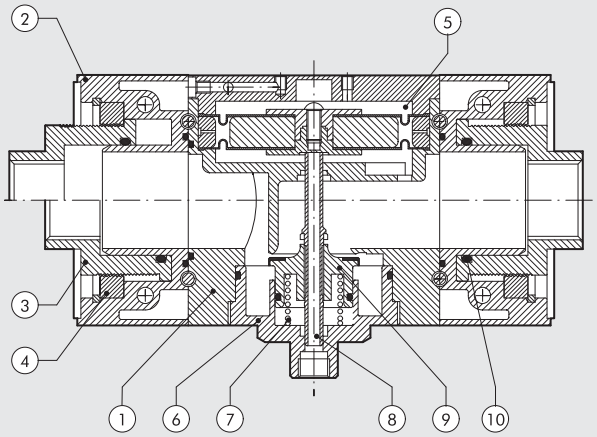
① Technopolymer body
② Zamak end plate
③ Technopolymer knob
④ Technopolymer bell
⑤ OT58 brass adjusting screw
⑥ OT58 brass scroll
⑦ Steel adjusting spring
⑧ Technopolymer ring nut
⑨ Rolling diaphragm
⑩ NBR relieving gaskets
⑪ OT58 brass stem
⑫ Valve with NBR vulcanized gasket
⑬ Stainless steel valve spring
⑭ Technopolymer plug
⑮ NBR gaskets



METAL WORK PNEUMATIC

COMPONENTS REG 400 PILOT OPERATED

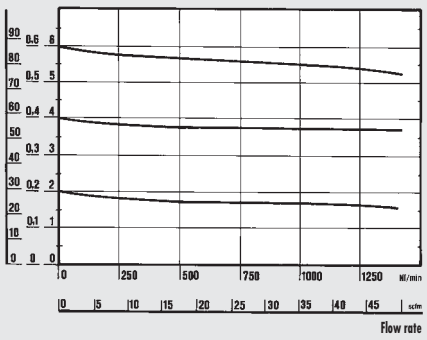
① Aluminium body
② Aluminium end plate
③ OT58 brass threaded bush, axial adjustment
④ OT58 brass retaining ring
⑤ Rolling diaphragm
⑥ OT58 brass plug
⑦ Stainless steel valve spring
⑧ OT58 brass stem with air relief hole
⑨ Valve with NBR vulcanized gasket
⑩ NBR gaskets



FLOW CHARTS

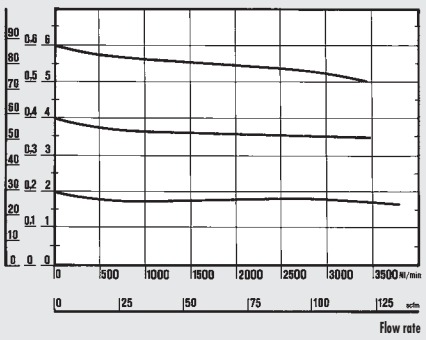
REG 100 1/4 - 3/8

Preset pressure
Pm = 7 bar - 0.7 MPa - 100 psi



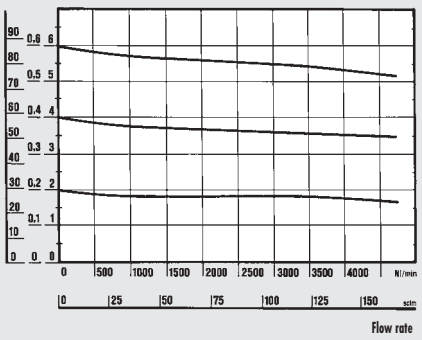
REG 200 1/4 - 3/8 - 1/2

Preset pressure
Pm = 7 bar - 0.7 MPa - 100 psi



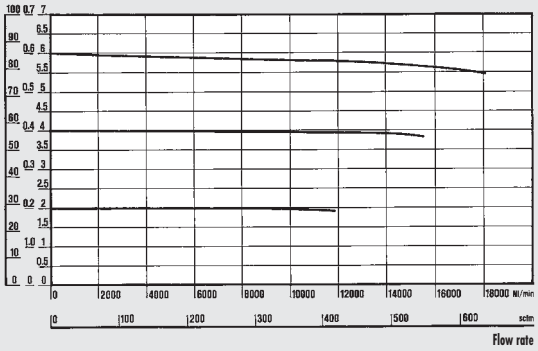
REG 300 1/2 - 3/4 - 1

Preset pressure
Pm = 7 bar - 0.7 MPa - 100 psi



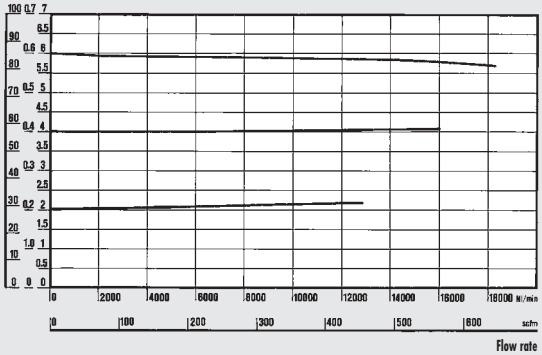
REG 400 1″

Preset pressure
Pm = 7 bar - 0.7 MPa - 100 psi

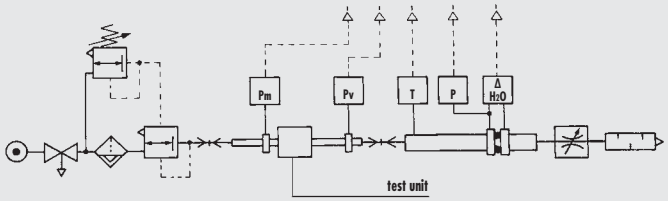


REG 400 2″

Preset pressure
Pm = 7 bar - 0.7 MPa - 100 psi



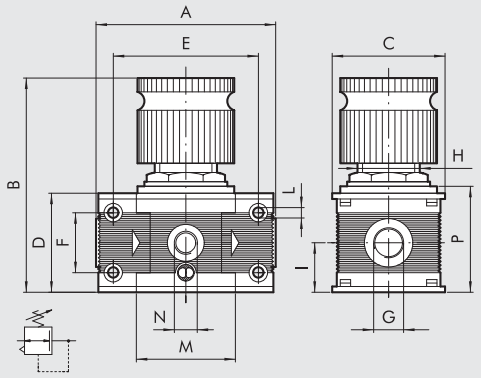
Department of Mechanics
Turin Polytechnic



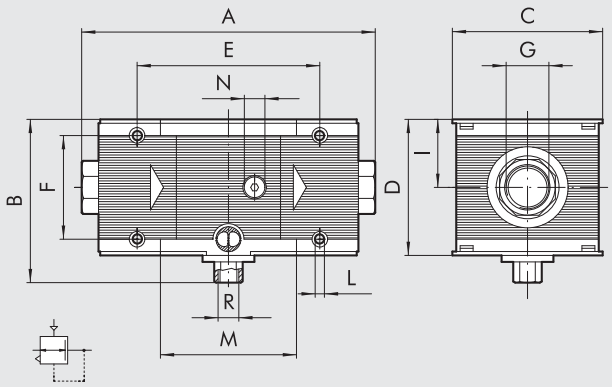
• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

DIMENSIONS

100 - 200 - 300



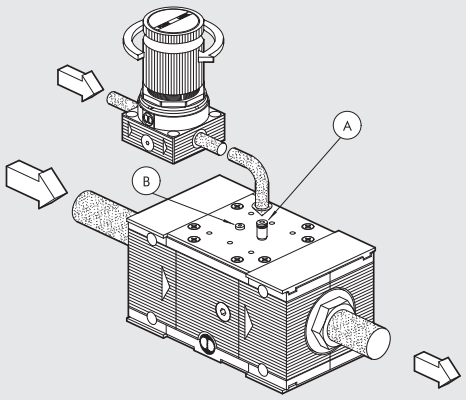
400



	REG 100		REG 200			REG 300			REG 400			
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A	78		93.5			110		112	225 to 255			283 to 313
B	98		125			148			127			
C	50		63			72			116			
D	43		55			65			105			
E	63		78.5			92			141.4			
F	26		36			42			80			
H	30 x 1.5		40 x 1.5			48 x 1.5			-			
I	21.5		27.5			32.5			52.5			
L	M4 hole		M5 hole			M5 hole			M6 hole			
M	43		55.5			65			105.4			
N (pressure gauge port)	1/8″		1/8″			1/8″			1/4″			
P	46		58			69			-			
R (relief)	-		-			-			1/4″			

INSTRUCTIONS FOR USE REG 400

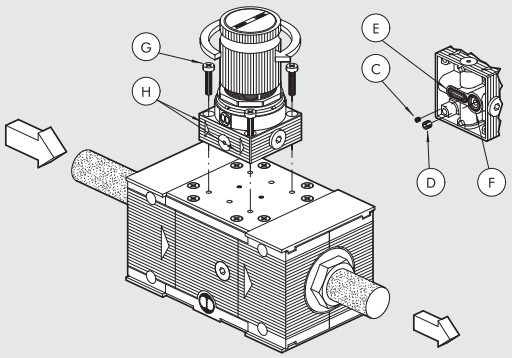
①



REMOTE PILOT

- Fit the A7 M5 plug into the threaded hole Ⓑ (close to the entrance).
- Fit the M5 fitting into the threaded hole Ⓐ as close to the entrance as possible.
- Connect the downstream circuit of the selected pilot operated regulator to the input Ⓐ (R1 fitting).
- Set the required pressure on the pilot operated regulator.

②



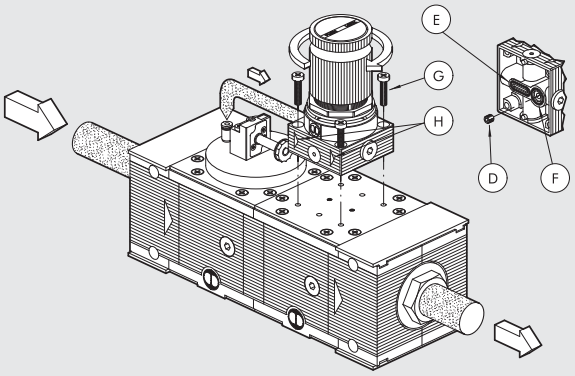
DIRECT PILOT WITH Skillair® PILOT OPERATED REGULATOR

- Remove the pins Ⓒ and Ⓓ under the pilot operated regulator.
- Check that the two gaskets Ⓔ and Ⓕ under the pilot are in place.
- Fix the pilot operated regulator to the base of the regulator using the self-threading screws Ⓖ. Make sure the arrows Ⓗ point in the same direction as the arrows in relief under the base of the regulator.

METAL WORK PNEUMATIC

INSTRUCTIONS FOR USE REG 400

③



PILOT REGULATOR FOLLOW-UP LINK

This is used when the regulator is mounted downstream of a V3V valve or an APR.
The air can be bled from the V3V or APR valves instead of from the regulator relieving system.

- Remove only the stud pin marked with a letter Ⓓ under the pilot regulator.
- Check the two gaskets under the pilot marked Ⓔ and Ⓕ.
- Secure the pilot regulator to the regulator base with the self-tapping screws marked with a letter Ⓖ. Making sure the arrows marked Ⓗ point in the same direction as the arrows in relief under the regulator base.
- Remove the A7 M5 plug from the V3V or APR plate and remount the fitting.
- Connect the pilot regulator supply to the fitting.

SYNOPTIC, SIZES AND VERSIONS

REG	100	1/4	02
ELEMENT	SIZE	THREADED PORT	SETTING RANGE
REG	100	1/4 3/8	02 = 0 to 2 bar 04 = 0 to 4 bar 08 = 0 to 8 bar 012 = 0 to 12 bar
	200	1/4 3/8 1/2	
	300	1/2 3/4 1	
	400	1 1 1/4 1 1/2 2	Depending on the pilot used

The pilot operated regulator is necessary for size 400. See page **C3**.27

ORDERING CODES

Code	Description
Skillair® 100 REGULATOR	
3202001A	REG 100 02 without end plates
3202002A	REG 100 04 without end plates
3202003A	REG 100 08 without end plates
3202004A	REG 100 012 without end plates
3202001	REG 100 1/4 02
3202002	REG 100 1/4 04
3202003	REG 100 1/4 08
3202004	REG 100 1/4 012
3302001	REG 100 3/8 02
3302002	REG 100 3/8 04
3302003	REG 100 3/8 08
3302004	REG 100 3/8 012

Code	Description
Skillair® 200 REGULATOR	
3402001A	REG 200 02 without end plates
3402002A	REG 200 04 without end plates
3402003A	REG 200 08 without end plates
3402004A	REG 200 012 without end plates
3402001	REG 200 1/4 02
3402002	REG 200 1/4 04
3402003	REG 200 1/4 08
3402004	REG 200 1/4 012
3502001	REG 200 3/8 02
3502002	REG 200 3/8 04
3502003	REG 200 3/8 08
3502004	REG 200 3/8 012
3602001	REG 200 1/2 02
3602002	REG 200 1/2 04
3602003	REG 200 1/2 08
3602004	REG 200 1/2 012

Code	Description
Skillair® 300 REGULATOR	
4402000A	REG 300 02 without end plates
4402001A	REG 300 04 without end plates
4402002A	REG 300 08 without end plates
4402003A	REG 300 012 without end plates
4402000	REG 300 1/2 02
4402001	REG 300 1/2 04
4402002	REG 300 1/2 08
4402003	REG 300 1/2 012
4502000	REG 300 3/4 02
4502001	REG 300 3/4 04
4502002	REG 300 3/4 08
4502003	REG 300 3/4 012
4602000	REG 300 1 02
4602001	REG 300 1 04
4602002	REG 300 1 08
4602003	REG 300 1 012
Skillair® 400 REGULATOR	
6102001A	REG 400 without end plates
6102001	REG 400 1
6202001	REG 400 1 1/4
6302001	REG 400 1 1/2
6402001	REG 400 2

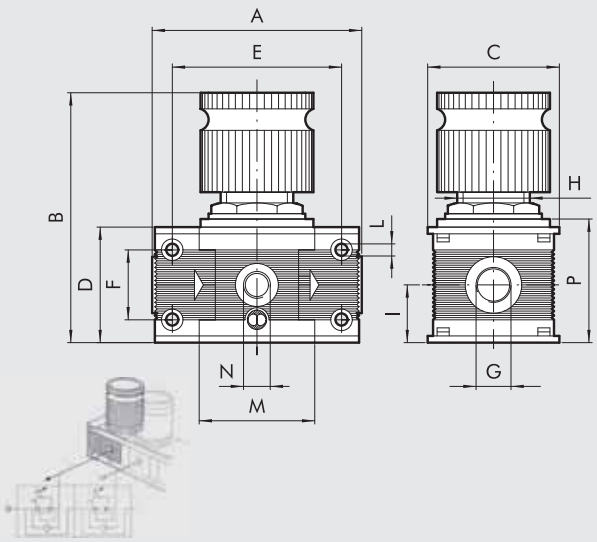
Skillair® 100 IN-SERIES REGULATOR

TECHNICAL DATA

Threaded inlet port		1/4″ - 3/8″
Threaded user port		G 1/8″
Degree of purification	bar	0 to 2 - 0 to 4 - 0 to 8 - 0 to 12
Max. input pressure		1.5 MPa - 15 bar - 217 psi
Flow rate at 6.3 bar (0.63 MPa to 91 psi)		500 Nl/min
ΔP 0.5 bar (0.05 MPa to 7 psi)		18 scfm
Flow rate at 6.3 bar (0.63 MPa to 91 psi)		950 Nl/min
ΔP 1 bar (0.1 MPa to 14 psi)		34 scfm
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous
Max temperature	°C	50
at 1 MPa; 10 bar; 145 psi	°F	122
Weight	kg	0.4
Wall fixing screws		M4x50
Mounting position		In any position
Pressure gauge port		G 1/8″
Notes on use		The regulator pressure must always be set upwards. For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value.

DIMENSIONS

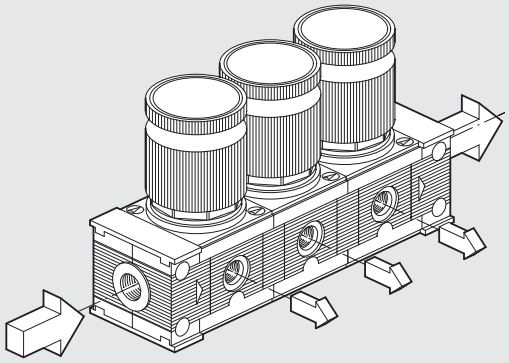
	REG 100	REG 100
Threaded port	1/4″	3/8″
A	78	
B	98	
C	50	
D	43	
E	63	
F	26	
G	1/4″	3/8″
H	30 x 1.5	
I	21.5	
L	M4 hole	
M	43	
N (use)	1/8″	
P	46	



ORDERING CODES

Code	Description
100 IN-SERIES REGULATOR	
3202101A	100 IN-SERIES REG. 0-2 without end plates
3202102A	100 IN-SERIES REG. 0-4 without end plates
3202103A	100 IN-SERIES REG. 0-8 without end plates
3202104A	100 IN-SERIES REG. 0-12 without end plates
3202101	100 IN-SERIES REG. 1/4 0-2
3202102	100 IN-SERIES REG. 1/4 0-4
3202103	100 IN-SERIES REG. 1/4 0-8
3202104	100 IN-SERIES REG. 1/4 0-12
3302101	100 IN-SERIES REG. 3/8 0-2
3302102	100 IN-SERIES REG. 3/8 0-4
3302103	100 IN-SERIES REG. 3/8 0-8
3302104	100 IN-SERIES REG. 3/8 0-12

Several of these Skillair® regulators can be mounted in series, all fed by the same pressure. They can give different set pressures, each independent of the previous regulator.
Operating compressed air can be taken from the pressure gauge ports (G 1/8″).



Skillair® PADLOCKABLE REGULATOR

METAL WORK PNEUMATIC

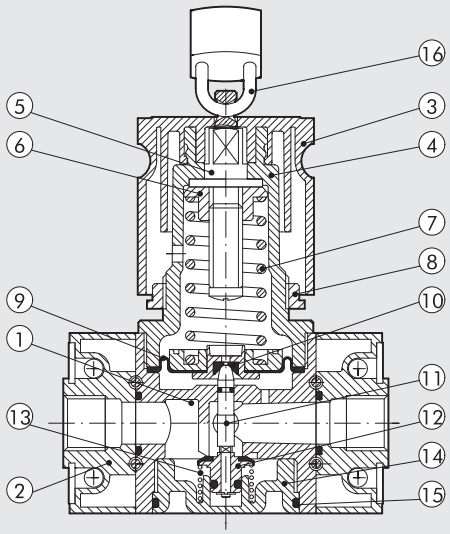
The padlockable regulator has a pin with a hole in it that projects from the top of the knob. When the knob is in the push-lock position, the padlock can be inserted in the hole, preventing the knob from being operated. A padlock and two keys are supplied with the regulator.
The new Skillair® regulator uses a rolling diaphragm which gives a much better performance than the flat version.
Advantages of this system:

- Increased stroke, increased valve opening and hence higher flow rate.
- Decreased dynamic and inrush friction; prompter, more sensitive operation.
- Reduced working stress and hence longer life allowing the use of thinner diaphragms (0.45 mm versus 1.5 mm for a flat one) which increases regulator sensitivity and prompt action.
- Increased accuracy in maintaining the set pressure with both variable flow rates and different feed pressures.
- Downstream overpressures relieved quickly.

Refer to the regulator for technical data and flow curves.

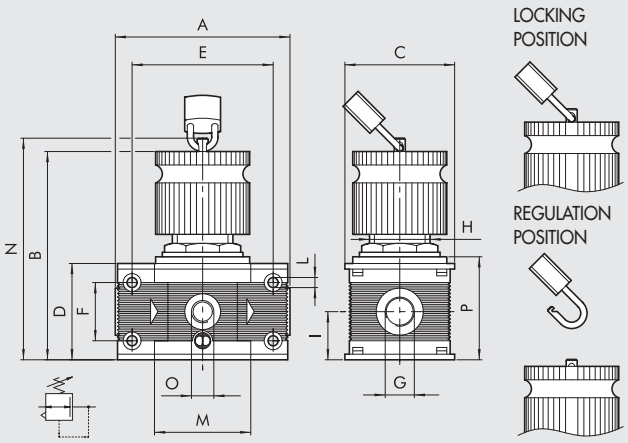
COMPONENTS

① Technopolymer body
② Zamak end plate
③ Technopolymer knob
④ Technopolymer bell
⑤ Nickel-plated OT58 brass adjusting screw
⑥ OT58 brass scroll
⑦ Steel adjusting spring
⑧ Technopolymer ring nut
⑨ Rolling diaphragm
⑩ NBR relieving gaskets
⑪ OT58 brass stem
⑫ Valve with NBR vulcanized gasket
⑬ Stainless steel valve spring
⑭ Technopolymer plug
⑮ NBR gaskets
⑯ Padlock



DIMENSIONS

	REG 100 KEY		REG 200 KEY			REG 300 KEY		
Threaded port G	1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"
A	78		93.5			110		112
B	95 to 98		123 to 125			145 to 148		
C	50		63			72		
D	43		55			65		
E	63		78.5			92		
F	26		36			42		
H	30 x 1.5		40 x 1.5			48 x 1.5		
I	21.5		27.5			32.5		
L	M4 hole		M5 hole			M5 hole		
M	43		55.5			65		
N	101		127			151		
O (pressure gauge port)	1/8"		1/8"			1/8"		
P	46		58			69		



SYNOPTIC, SIZES AND VERSIONS

REG	100	KEY	1/4	02
ELEMENT	SIZE	TYPE	THREADED PORT	SETTING RANGE
REG = Regulator	100	KEY = Padlockable	1/4	02 = 0 to 2 bar
	200		3/8	04 = 0 to 4 bar
	300		1/4	08 = 0 to 8 bar
			3/8	012 = 0 to 12 bar
			1/2	
			1/2	
			3/4	
			1	

ORDERING CODES

Code	Description
Skillair® 100 PADLOCKABLE REGULATOR	
3210001A	REG 100 KEY 02 without end plates
3210002A	REG 100 KEY 04 without end plates
3210003A	REG 100 KEY 08 without end plates
3210004A	REG 100 KEY 012 without end plates
3210001	REG 100 KEY 1/4 02
3210002	REG 100 KEY 1/4 04
3210003	REG 100 KEY 1/4 08
3210004	REG 100 KEY 1/4 012
3310001	REG 100 KEY 3/8 02
3310002	REG 100 KEY 3/8 04
3310003	REG 100 KEY 3/8 08
3310004	REG 100 KEY 3/8 012

Code	Description
Skillair® 200 PADLOCKABLE REGULATOR	
3410001A	REG 200 KEY 02 without end plates
3410002A	REG 200 KEY 04 without end plates
3410003A	REG 200 KEY 08 without end plates
3410004A	REG 200 KEY 012 without end plates
3410001	REG 200 KEY 1/4 02
3410002	REG 200 KEY 1/4 04
3410003	REG 200 KEY 1/4 08
3410004	REG 200 KEY 1/4 012
3510001	REG 200 KEY 3/8 02
3510002	REG 200 KEY 3/8 04
3510003	REG 200 KEY 3/8 08
3510004	REG 200 KEY 3/8 012
3610001	REG 200 KEY 1/2 02
3610002	REG 200 KEY 1/2 04
3610003	REG 200 KEY 1/2 08
3610004	REG 200 KEY 1/2 012

Code	Description
Skillair® 300 PADLOCKABLE REGULATOR	
4410000A	REG 300 KEY 02 without end plates
4410001A	REG 300 KEY 04 without end plates
4410002A	REG 300 KEY 08 without end plates
4410003A	REG 300 KEY 012 without end plates
4410000	REG 300 KEY 1/2 02
4410001	REG 300 KEY 1/2 04
4410002	REG 300 KEY 1/2 08
4410003	REG 300 KEY 1/2 012
4510000	REG 300 KEY 3/4 02
4510001	REG 300 KEY 3/4 04
4510002	REG 300 KEY 3/4 08
4510003	REG 300 KEY 3/4 012
4610000	REG 300 KEY 1 02
4610001	REG 300 KEY 1 04
4610002	REG 300 KEY 1 08
4610003	REG 300 KEY 1 012

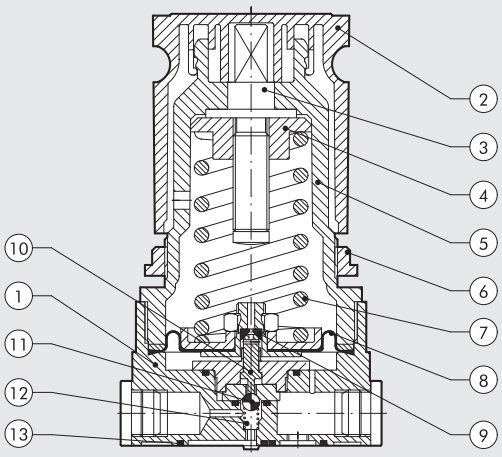
Skillair® PILOT REGULATOR

The pilot regulator is used when great accuracy is required in maintaining the set pressure under changing operating conditions.
It is ideal for use as:
• a precision regulator for flow rates < 100 Nl/min.
• a pilot in general - typically for large size regulators (see REG 400).
The system's high operating accuracy and low hysteresis are determined by the virtually total lack of friction.
The presence of a slight air leak is necessary for the regulator to operate properly - it is not a malfunction. It is advisable to use filtered air.

TECHNICAL DATA		PILOT REGULATOR
Threaded port		1/4"
Setting range	bar	0 to 2 - 0 to 4 - 0 to 8 - 0 to 12
Max. input pressure	MPa	1.3
	bar	13
	psi	188
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)		120 Nl/min - 4.3 scfm
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)		140 Nl/min - 5 scfm
Fluid		Filtered, lubricated or unlubricated compressed air.
		Lubrication, if used, must be continuous.
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50
	°F	122
Weight	kg	0.6
Mounting position		In any position
Pressure gauge port		G 1/8"
Notes on use		The regulator pressure must always be set upwards.
		For increased sensitivity, use a pressure regulator with a rated pressure
		as close as possible to the required value.
		Do not take air from the pressure gauge ports. Mount directly on REG 400.

COMPONENTS

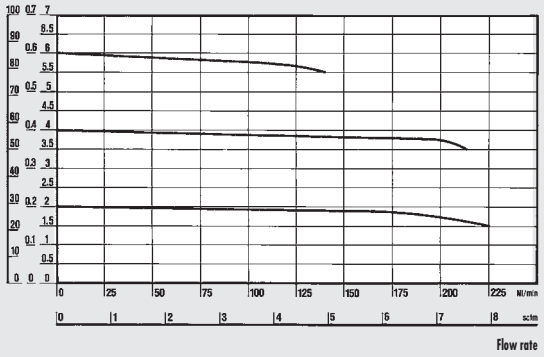
① Aluminium body
② Technopolymer knob
③ OT58 brass adjusting screw
④ OT58 brass scroll
⑤ Technopolymer bell
⑥ Technopolymer ring nut
⑦ Steel adjusting spring
⑧ Rolling diaphragm
⑨ NBR relieving gaskets
⑩ OT58 brass stem
⑪ Stainless steel ball valve
⑫ Stainless steel valve spring
⑬ NBR gaskets



FLOW CHARTS

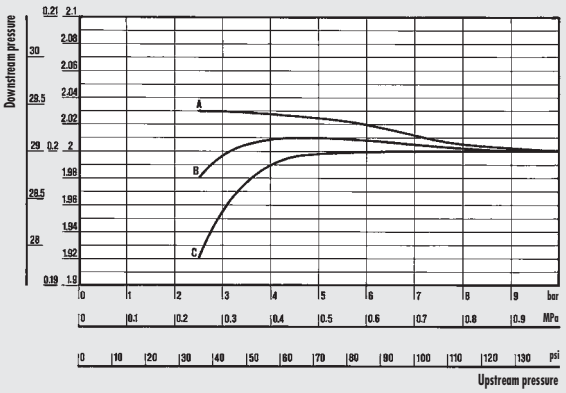
FLOW FEATURES REG. P 1/4"

Preset pressure
Pm = 7 bar - 0.7 MPa - 100 psi



REGULATION FEATURES REG. P 1/4" *

Flow rate: A = 0 Nl/min = 0 scfm -
B = 25 Nl/min = 0.88 scfm - C = 50 Nl/min = 1.76 scfm



REGULATION FEATURES REG. P 1/4" *

Flow rate: A = 0 Nl/min = 0 scfm
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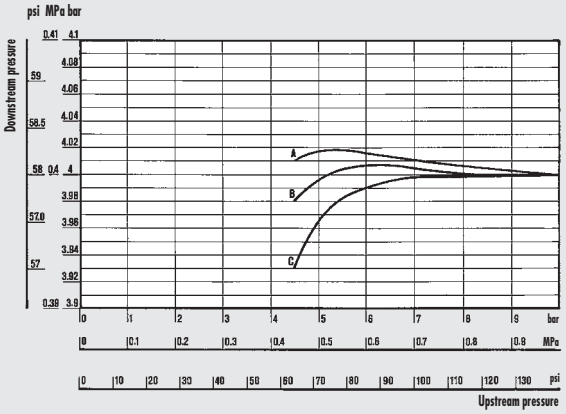
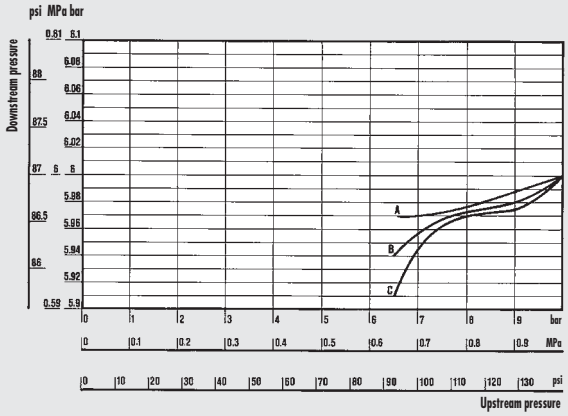
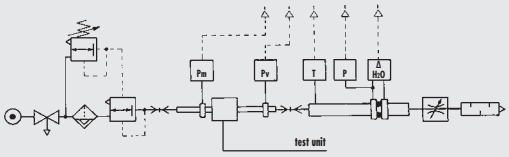


REGULATION FEATURES REG. P 1/4" *

Flow rate: A = 0 Nl/min = 0 scfm
B = 25 Nl/min = 0.88 scfm - C = 50 Nl/min = 1.76 scfm



Department of Mechanics
Turin Polytechnic

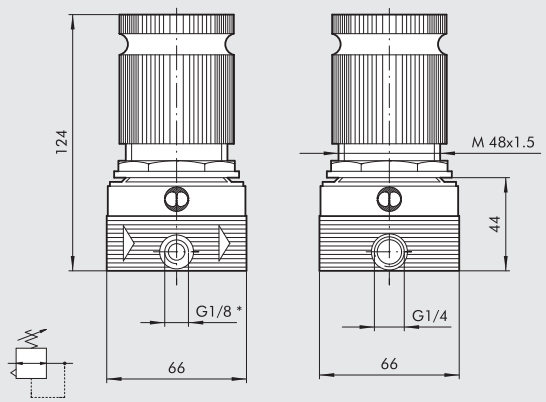


• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

* Pressure stability adjusted according to changes in upstream pressure.

DIMENSIONS

Code	Description
3206001	REG. P 1/4" 02
3206002	REG. P 1/4" 04
3206003	REG. P 1/4" 08
3206004	REG. P 1/4" 012



*Pressure gauge port

Skillair®
PILOT PADLOCKABLE REGULATOR

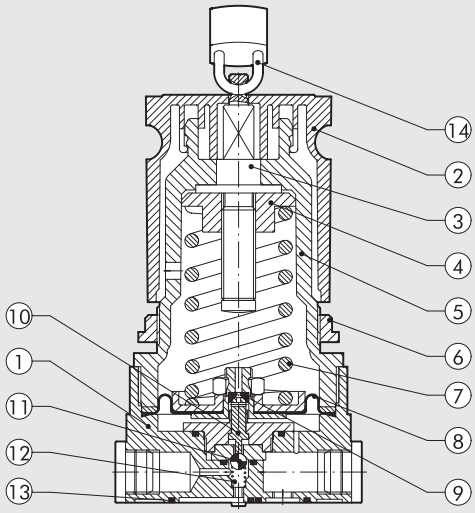
METAL WORK PNEUMATIC

The pilot regulator is used when great accuracy is required in maintaining the set pressure under changing operating conditions.
It is ideal for use as:
• a precision regulator for flow rates < 100 Nl/min.
• a pilot in general - typically for large size regulators (see REG 400).
The system's high operating accuracy and low hysteresis are determined by the virtually total lack of friction. The presence of a slight air leak is necessary for the regulator to operate properly - it is not a malfunction.
It is advisable to use filtered air.
The pilot padlockable regulator has a pin with a hole in it that projects from the top of the knob. When the knob is in the push-lock position, the padlock can be inserted in the hole, preventing the knob from being operated.
A padlock and two keys are supplied with the regulator.

Refer to the pilot regulator for technical data and flow curves.

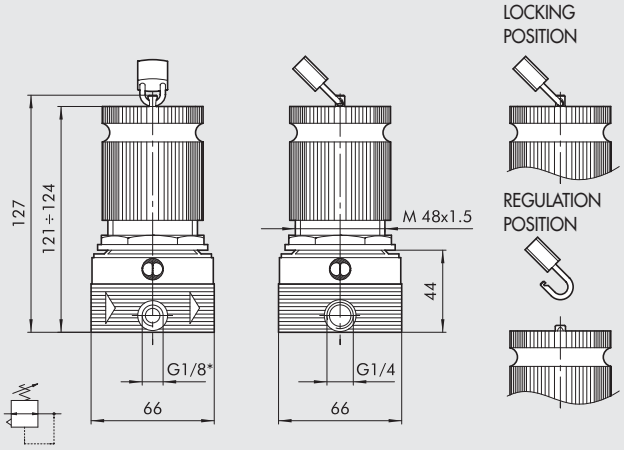
COMPONENTS

① Aluminium body
② Technopolymer knob
③ Nickel-plated brass OT58 adjusting screw
④ OT58 brass scroll
⑤ Technopolymer bell
⑥ Technopolymer ring nut
⑦ Steel adjusting spring
⑧ Rolling diaphragm
⑨ NBR relieving gaskets
⑩ OT58 brass stem
⑪ Stainless steel ball valve
⑫ Stainless steel valve spring
⑬ NBR gaskets
⑭ Padlock



DIMENSIONS

Code	Description
3208001	REG. P KEY 1/4" 02
3208002	REG. P KEY 1/4" 04
3208003	REG. P KEY 1/4" 08
3208004	REG. P KEY 1/4" 012



*Pressure gauge port

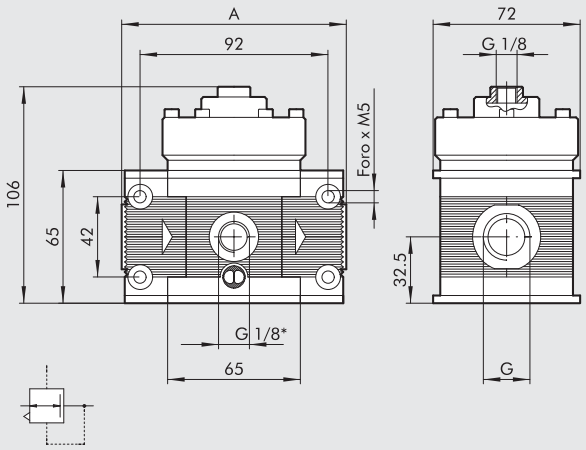
Skillair® 300 PILOT OPERATED REGULATOR

- Pilot-operated or servo-piloted regulator.
- Twin rolling diaphragm to ensure improved opening and hence greater flow rate.
- Low load losses
- Excellent precision in pressure setting.
- Excellent sensitivity during relieving.

TECHNICAL DATA		300 PILOT OPERATED REG		
Threaded port		1/2″	3/4″	1″
Setting range		Depending on the pilot regulator		
Max. input pressure	MPa	1.3		
	bar	13		
	psi	188		
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	4500		
	scfm	160		
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	7000		
	scfm	247		
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.		
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50		
	°F	122		
Weight	kg	1.3		
Wall fixing screws		M5 x 70		
Mounting position		In any position		
Pressure gauge port		1/8″		
Notes on use		The regulator pressure must always be set upwards. **Do not take air from the pressure gauge ports.**		

DIMENSIONS

	REG 300		
Threaded port G	1/2″	3/4″	1″
A	110	110	112



*Pressure gauge port

ORDERING CODES

Code	Description
4403003A	300 PILOT OPERATED REG without end plates
4403003	300 1/2" PILOT OPERATED REG
4503003	300 3/4" PILOT OPERATED REG
4603003	300 1" PILOT OPERATED REG

Skillair® FILTER REGULATOR

METAL WORK PNEUMATIC

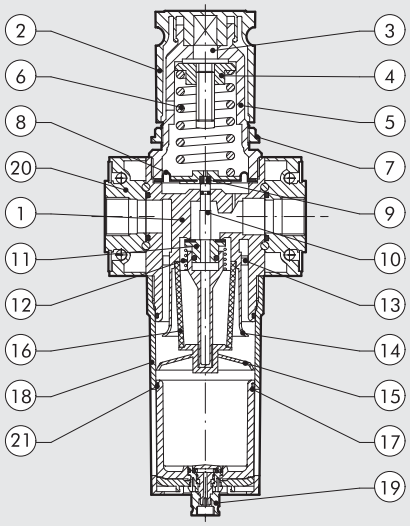
This device combines a filter and a pressure regulator in a single unit.
It has the dual function of filtering and regulating air from the compressor.
As the filter regulator is made up of the same elements as the regulator and the filter, the performance is the same.

- High flow rates with low load loss.
- Special rolling diaphragm - higher flow rate, greater stability, improved sensitivity.
- Rapid relief of downstream overpressures.
- Stability of the regulated pressure as the mains pressure fluctuates.
- Maximum degree of condensate separation.
- 360° condensate level display.
- Condensate drain with manual/semi-automatic or automatic function.

TECHNICAL DATA		FR 100		FR 200			FR 300		
Threaded port		1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"
Setting range	bar	0 to 2 - 0 to 4 - 0 to 8 - 0 to 12		0 to 2 - 0 to 4 - 0 to 8 - 0 to 12			0 to 2 - 0 to 4 - 0 to 8 - 0 to 12		
Degree of filtration	µm	5 - 20 - 50		5 - 20 - 50			5 - 20 - 50		
Max. input pressure		1.5 MPa - 15 bar - 217 psi		1.3 MPa - 13 bar - 188 psi			1.3 MPa - 13 bar - 188 psi		
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	1100		1600			3500		
ΔP 0.5 bar (0.05 MPa to 7psi)	scfm	39		57			125		
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	1600		3000			5600		
ΔP 1 bar (0.1 MPa to 14 psi)	scfm	57		71			200		
Max temperature	°C	50		50			50		
at: 1 MPa; 10 bar; 145 psi	°F	122		122			122		
Weight	kg	0.5		1			1.8		
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70		
Mounting position		Vertical		Vertical			Vertical		
Pressure gauge port		1/8"		1/8"			1/8"		
Bowl capacity	cm^3	22		45			75		
Drain		RMSA - SAC		RMSA - SAC - RA			RMSA - RA		
		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure							
		RA: automatic drain with condensate discharge, independent of pressure and flow rate							
		SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**							
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.							
Notes on use		The regulator pressure must always be set upwards. For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value. **Do not take air from pressure gauge ports.**							
		The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.							

COMPONENTS

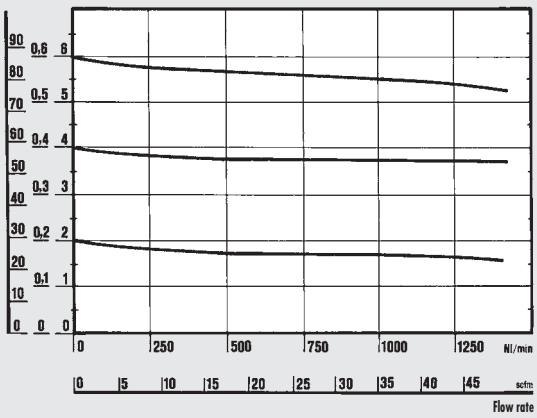
① Technopolymer body
② Technopolymer knob
③ OT58 brass adjusting screw
④ OT58 brass scroll
⑤ Technopolymer bell
⑥ Steel adjusting spring
⑦ Technopolymer ring nut
⑧ Rolling diaphragm
⑨ NBR relieving gaskets
⑩ OT58 brass stem
⑪ Valve with NBR vulcanized gasket
⑫ Stainless steel valve spring
⑬ Technopolymer centrifuge
⑭ Technopolymer baffle plug
⑮ Technopolymer screen
⑯ Sintered HDPE filter cartridge
⑰ Clear technopolymer glass
⑱ Bowl: technopolymer for FR100 and FR200, metal for FR 300
⑲ Drain (RMSA)
⑳ Zamak end plate
㉑ NBR gaskets



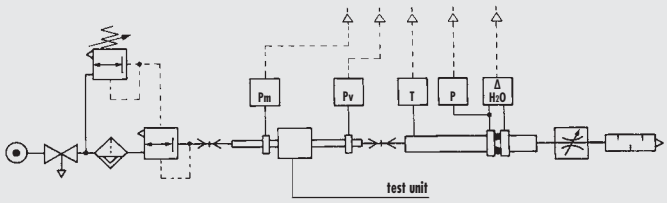
FLOW CHARTS

FR 100 1/4 - 3/8

Preset pressure
Pm = 7 bar - 0.7 MPa - 100 psi



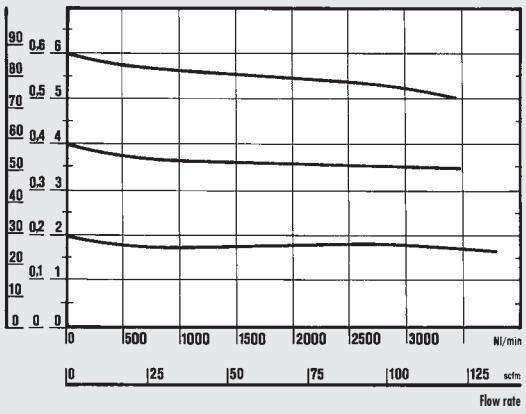
Department of Mechanics
Turin Polytechnic



• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

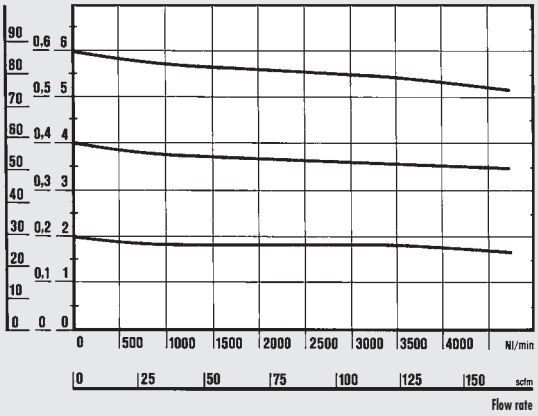
FR 200 1/4 - 3/8 - 1/2

Preset pressure
Pm = 7 bar - 0.7 MPa - 100 psi

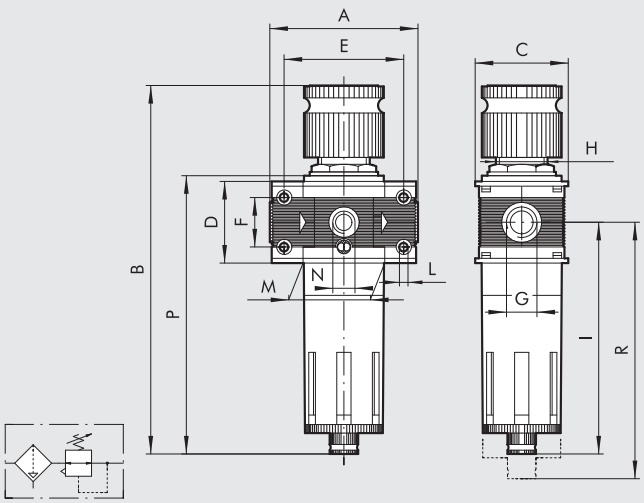


FR 300 1/2 - 3/4 - 1

Preset pressure
Pm = 7 bar - 0.7 MPa - 100 psi



DIMENSIONS



		FR 100		FR 200			FR 300		
Threaded port G		1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"
A		78		93.5			110		112
B	RMSA	199		245			278		
	RA	-		249			282		
	SAC	203		249			282		
C		50		63			72		
D		43		55			65		
E		63		78.5			92		
F		26		36			42		
H		30 x 1.5		40x1.5			48 x 1.5		
I		122.5		147.5			162.5		
L		M4 hole		M5 hole			M5 hole		
M		43		55.5			65		
N (pressure gauge port)		1/8"		1/8"			1/8"		
P	RMSA	147		178			200		
	RA	-		182			204		
	SAC	151		182			204		
R	RMSA	137		196			215		
	RA	-		200			219		
	SAC	141		200			219		

METAL WORK PNEUMATIC

SYNOPTIC, SIZES AND VERSIONS

FR	100	1/4	5	02	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	TYPE OF DRAIN
FR	100	1/4	5 = 5 µm	02 = 0 to 2 bar	RMSA
		3/8	20 = 20 µm	04 = 0 to 4 bar	SAC
	200	1/4	50 = 50 µm	08 = 0 to 8 bar	RMSA
		3/8		012 = 0 to 12 bar	SAC
		1/2			RA*
	300	1/2			RMSA
		3/4			RA
		1			

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.

RA: automatic drain with condensate discharge, independent of pressure and flow rate. (for size 300 and 400)

SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.
(for size 100 and 200)

* For Skillair® 200 with RA, please contact our sales assistance department.

ORDERING CODES

Code	Description
Skillair® 100 FILTER REGULATOR	
3283007A	FR 100 5 08 RMSA without end plates
3283008A	FR 100 20 08 RMSA without end plates
3283009A	FR 100 50 08 RMSA without end plates
3283010A	FR 100 5 012 RMSA without end plates
3283011A	FR 100 20 012 RMSA without end plates
3283012A	FR 100 50 012 RMSA without end plates
3283031A	FR 100 5 08 SAC without end plates
3283032A	FR 100 20 08 SAC without end plates
3283033A	FR 100 50 08 SAC without end plates
3283034A	FR 100 5 012 SAC without end plates
3283035A	FR 100 20 012 SAC without end plates
3283036A	FR 100 50 012 SAC without end plates
3283007	FR 100 1/4 5 08 RMSA
3283008	FR 100 1/4 20 08 RMSA
3283009	FR 100 1/4 50 08 RMSA
3283010	FR 100 1/4 5 012 RMSA
3283011	FR 100 1/4 20 012 RMSA
3283012	FR 100 1/4 50 012 RMSA
3283031	FR 100 1/4 5 08 SAC
3283032	FR 100 1/4 20 08 SAC
3283033	FR 100 1/4 50 08 SAC
3283034	FR 100 1/4 5 012 SAC
3283035	FR 100 1/4 20 012 SAC
3283036	FR 100 1/4 50 012 SAC
3383007	FR 100 3/8 5 08 RMSA
3383008	FR 100 3/8 20 08 RMSA
3383009	FR 100 3/8 50 08 RMSA
3383010	FR 100 3/8 5 012 RMSA
3383011	FR 100 3/8 20 012 RMSA
3383012	FR 100 3/8 50 012 RMSA
3383031	FR 100 3/8 5 08 SAC
3383032	FR 100 3/8 20 08 SAC
3383033	FR 100 3/8 50 08 SAC
3383034	FR 100 3/8 5 012 SAC
3383035	FR 100 3/8 20 012 SAC
3383036	FR 100 3/8 50 012 SAC

Code	Description
Skillair® 200 FILTER REGULATOR	
3483007A	FR 200 5 08 RMSA without end plates
3483008A	FR 200 20 08 RMSA without end plates
3483009A	FR 200 50 08 RMSA without end plates
3483010A	FR 200 5 012 RMSA without end plates
3483011A	FR 200 20 012 RMSA without end plates
3483012A	FR 200 50 012 RMSA without end plates
3483031A	FR 200 5 08 SAC without end plates
3483032A	FR 200 20 08 SAC without end plates
3483033A	FR 200 50 08 SAC without end plates
3483034A	FR 200 5 012 SAC without end plates
3483035A	FR 200 20 012 SAC without end plates
3483036A	FR 200 50 012 SAC without end plates
3483007	FR 200 1/4 5 08 RMSA
3483008	FR 200 1/4 20 08 RMSA
3483009	FR 200 1/4 50 08 RMSA
3483010	FR 200 1/4 5 012 RMSA
3483011	FR 200 1/4 20 012 RMSA
3483012	FR 200 1/4 50 012 RMSA
3483031	FR 200 1/4 5 08 SAC
3483032	FR 200 1/4 20 08 SAC
3483033	FR 200 1/4 50 08 SAC
3483034	FR 200 1/4 5 012 SAC
3483035	FR 200 1/4 20 012 SAC
3483036	FR 200 1/4 50 012 SAC
3583007	FR 200 3/8 5 08 RMSA
3583008	FR 200 3/8 20 08 RMSA
3583009	FR 200 3/8 50 08 RMSA
3583010	FR 200 3/8 5 012 RMSA
3583011	FR 200 3/8 20 012 RMSA
3583012	FR 200 3/8 50 012 RMSA
3583031	FR 200 3/8 5 08 SAC
3583032	FR 200 3/8 20 08 SAC
3583033	FR 200 3/8 50 08 SAC
3583034	FR 200 3/8 5 012 SAC
3583035	FR 200 3/8 20 012 SAC
3583036	FR 200 3/8 50 012 SAC
3683007	FR 200 1/2 5 08 RMSA
3683008	FR 200 1/2 20 08 RMSA
3683009	FR 200 1/2 50 08 RMSA
3683010	FR 200 1/2 5 012 RMSA
3683011	FR 200 1/2 20 012 RMSA
3683012	FR 200 1/2 50 012 RMSA
3683031	FR 200 1/2 5 08 SAC
3683032	FR 200 1/2 20 08 SAC
3683033	FR 200 1/2 50 08 SAC
3683034	FR 200 1/2 5 012 SAC
3683035	FR 200 1/2 20 012 SAC
3683036	FR 200 1/2 50 012 SAC

Code	Description
Skillair® 300 FILTER REGULATOR	
4483004A	FR 300 5 08 RMSA without end plates
4483005A	FR 300 20 08 RMSA without end plates
4483006A	FR 300 50 08 RMSA without end plates
4483007A	FR 300 5 012 RMSA without end plates
4483008A	FR 300 20 012 RMSA without end plates
4483009A	FR 300 50 012 RMSA without end plates
4483013A	FR 300 5 08 RA without end plates
4483014A	FR 300 20 08 RA without end plates
4483015A	FR 300 50 08 RA without end plates
4483016A	FR 300 5 012 RA without end plates
4483017A	FR 300 20 012 RA without end plates
4483018A	FR 300 50 012 RA without end plates
4483004	FR 300 1/2 5 08 RMSA
4483005	FR 300 1/2 20 08 RMSA
4483006	FR 300 1/2 50 08 RMSA
4483007	FR 300 1/2 5 012 RMSA
4483008	FR 300 1/2 20 012 RMSA
4483009	FR 300 1/2 50 012 RMSA
4483013	FR 300 1/2 5 08 RA
4483014	FR 300 1/2 20 08 RA
4483015	FR 300 1/2 50 08 RA
4483016	FR 300 1/2 5 012 RA
4483017	FR 300 1/2 20 012 RA
4483018	FR 300 1/2 50 012 RA
4583004	FR 300 3/4 5 08 RMSA
4583005	FR 300 3/4 20 08 RMSA
4583006	FR 300 3/4 50 08 RMSA
4583007	FR 300 3/4 5 012 RMSA
4583008	FR 300 3/4 20 012 RMSA
4583009	FR 300 3/4 50 012 RMSA
4583013	FR 300 3/4 5 08 RA
4583014	FR 300 3/4 20 08 RA
4583015	FR 300 3/4 50 08 RA
4583016	FR 300 3/4 5 012 RA
4583017	FR 300 3/4 20 012 RA
4583018	FR 300 3/4 50 012 RA
4683004	FR 300 1 5 08 RMSA
4683005	FR 300 1 20 08 RMSA
4683006	FR 300 1 50 08 RMSA
4683007	FR 300 1 5 012 RMSA
4683008	FR 300 1 20 012 RMSA
4683009	FR 300 1 50 012 RMSA
4683013	FR 300 1 5 08 RA
4683014	FR 300 1 20 08 RA
4683015	FR 300 1 50 08 RA
4683016	FR 300 1 5 012 RA
4683017	FR 300 1 20 012 RA
4683018	FR 300 1 50 012 RA

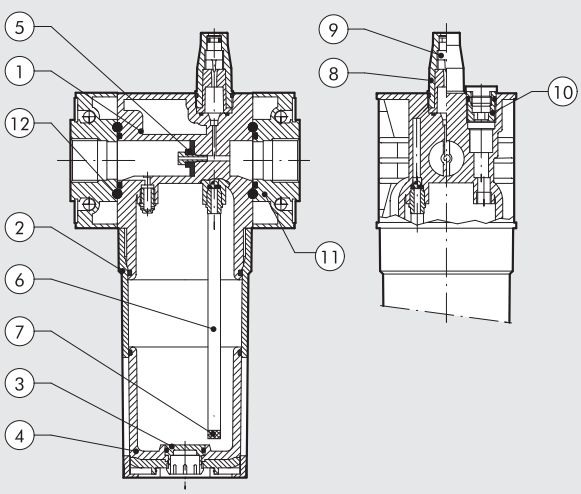
Skillair® LUBRICATOR

The pneumatic lubricator is the simplest way of properly lubricating actuators connected to a circuit.
As air flows from the mains through the lubricator, it encounters the diaphragm which obstruct the flow and the air is forced through the Venturi tube.
The inside of the Venturi tube is connected to the inspection dome, which connects with the bowl via a tube with a regulating needle in between.
The drop in pressure caused by the Venturi tube sucks up air through the dome, the tube and lastly into the bowl containing oil.
The quantity of oil controlled by the regulating needle then flows back from the bowl to the circuit.

TECHNICAL DATA		LUB 100		LUB 200			LUB 300			LUB 400			
Threaded port		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
Type of lubrication		Mist		Mist			Mist			Mist			
Bowl capacity	cm^3	50		95			160			800			
Versions		Standard - CD		Standard - CD			Standard - CD - ML CD			Standard - CD - ML CD			
Max. inlet pressure	Mpa	1.5		1.3			1.3			1.3			1.3
	bar	15		13			13			13			13
	psi	217		188			188			188			188
Flow rate at 6.3 bar (0.63 MPa to 91psi)	Nl/min	1100		2200			3500			18000			21000
ΔP 0.5 bar (0.05 MPa to 7 psi)	scfm	39		71			125			640			750
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	1500		3700			5500			-			-
ΔP 1 bar (0.1 MPa to 14 psi)	scfm	53		131			196			-			-
Max temperature at: 1 MPa; 10 bar; 145 psi	°C	50		50			50			50			50
	°F	122		122			122			122			122
Weight	Kg	0.4		0.7			1.4			4.9			5.7
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70			M6 x 110			M6 x 110
Mounting position		Vertical											
Fluid		Filtered compressed air											
Recommended oils		ISO and UNI FD22 (Energol HPL to Spinesso to Mobil DTE to Tellus Oil).											
Notes on use		Install the lubricator as close as possible to the point of use. Fill the lubricator bowl with oil before pressurizing the system.											
		Do not use cleaning oils, brake fluid oils or solvents in general.											
		For the best lubrication results, set the drip rate to one drop per 300-600 Nl.											

COMPONENTS LUB 100 - LUB 200 - LUB 300

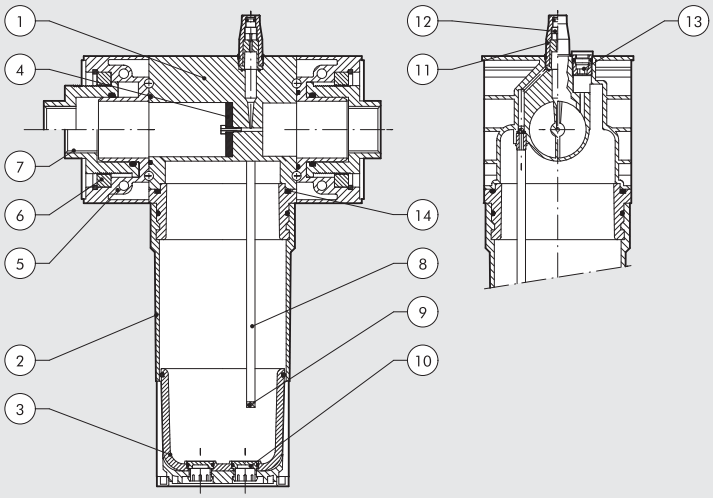
① Technopolymer body
② Bowl: technopolymer for LUB 100 and 200, metal for LUB 300
③ Technopolymer plug
④ Clear technopolymer glass
⑤ NBR Venturi tube diaphragm
⑥ Rilsan® oil suction tube
⑦ Filter
⑧ Clear technopolymer inspection dome
⑨ OT58 brass oil flow regulating needle
⑩ OT58 brass oil filling plug
⑪ Zamak end plate
⑫ NBR gaskets

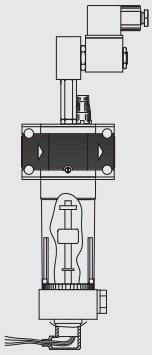


METAL WORK PNEUMATIC

COMPONENTS LUB 400

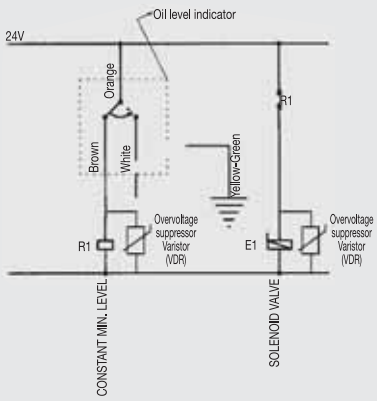
① Aluminium body
② Aluminium bowl
③ Clear technopolymer glass
④ NBR Venturi tube diaphragm
⑤ Aluminium end plate
⑥ OT58 brass retaining ring
⑦ OT48 brass threaded bush with axial adjustment
⑧ Rilsan® oil suction pipe
⑨ Filter
⑩ Technopolymer plug
⑪ Clear technopolymer inspection dome
⑫ OT58 brass oil flow regulating needle
⑬ OT58 brass oil filling plug
⑭ NBR gaskets



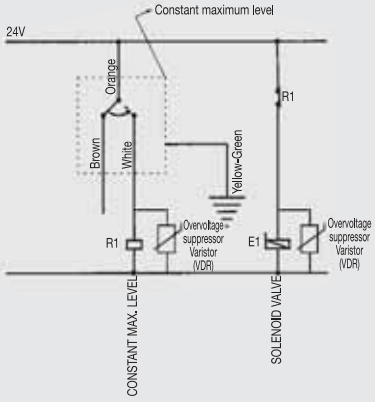


DEPRESSION FILLING WITH MINIMUM LEVEL (ML CD AUTOMATIC)
Available in sizes 300 and 400, this lubricator is controlled by a solenoid valve (2/2 NC minimum bore 3) situated on the lubricator body.
It reduces pressure inside the bowl allow it to be filled with oil taken from a tank at ambient pressure, which can be located in a lower position than the lubricator (max. difference in height 2 m).
The electric indicator inside the bowl sends an electric signal used
to activate the valve. When the oil reaches the maximum level, another signal disactivates the valve. In this case, the lubricator system operates with the oil level between minimum and maximum. If it is necessary
to keep the oil level in the bowl constant, only one of the two signals
can be used. Pressure range 3-10 bar. Connect the oil tank to the G1/4 fitting on the bowl.

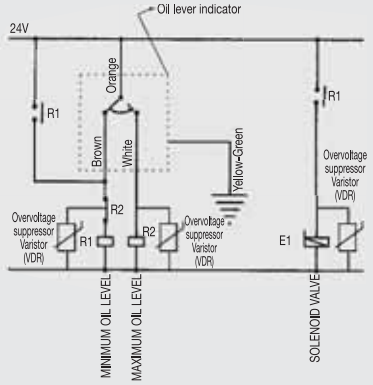
Constant minimum level

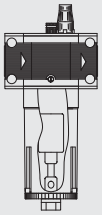


Constant maximum level



Oil level between maximum and minimum





FILLING BY DEPRESSION (CD MANUAL)
Available in all sizes. It is operated by means of a button on the lubricator body. The pressure inside the bowl drops to allow it to be filled with oil taken from a tank at ambient pressure, which can be located in a lower position than the lubricator (max. difference in height 2 m). Oil filling stops when the level of oil raises the float and shuts off a specific valve.
Important – The SK4 lubricator is filled with oil by hand. Filling must stop when the oil level is visible through the spy-hole in the bowl release lever. Pressure range 3-10 bar. Lubrication is discontinued during filling.
Connect the oil tank to the G1/4 fitting below the bowl.

FLOW CHARTS

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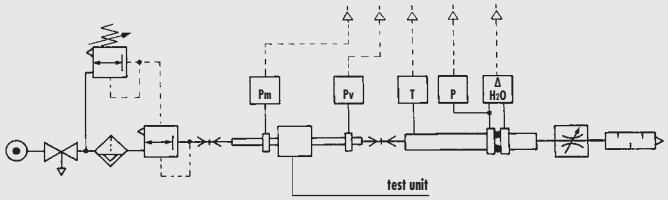
Turin Polytechnic

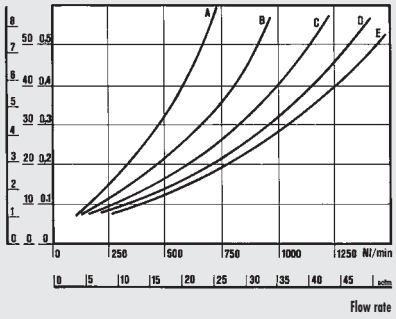


• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

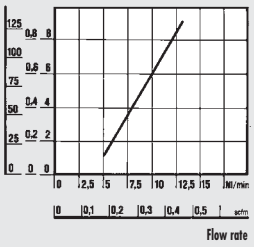
LUB 100 1/4 - 3/8

ΔP = (Pm-Pv)
psi kPa bar



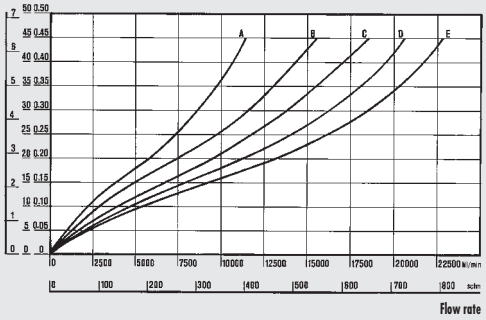
MINIMUM OPERATING FLOW CHART

Pm
psi kPa bar



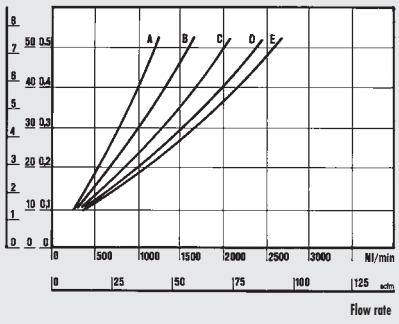
LUB 400 1"

ΔP = (Pm-Pv)
psi kPa bar



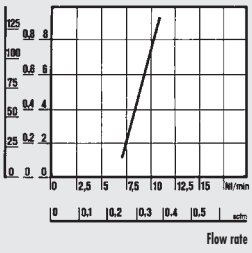
LUB 200 1/4 - 3/8 - 1/2

ΔP = (Pm-Pv)
psi kPa bar



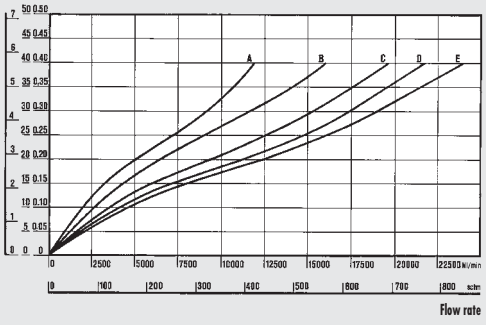
MINIMUM OPERATING FLOW CHART

Pm
psi kPa bar



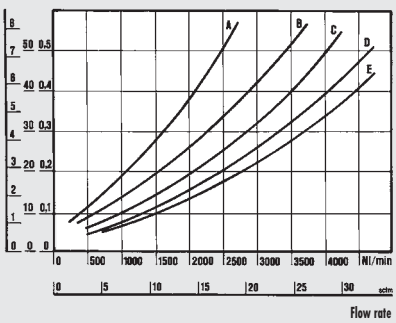
LUB 400 2"

ΔP = (Pm-Pv)
psi kPa bar



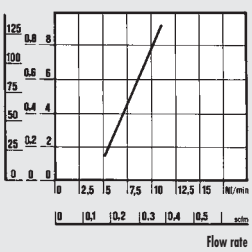
LUB 300 1/2 - 3/4 - 1

ΔP = (Pm-Pv)
psi kPa bar



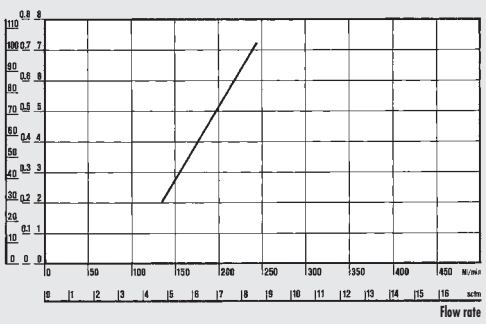
MINIMUM OPERATING FLOW CHART

Pm
psi kPa bar



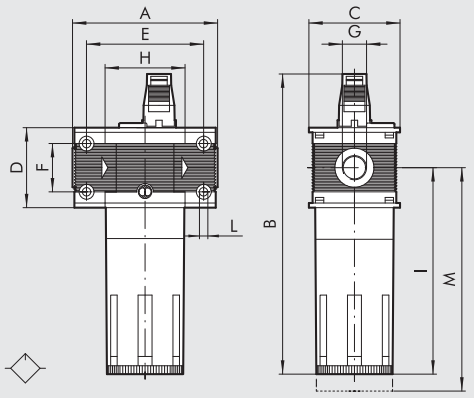
MINIMUM OPERATING FLOW CHART LUB 400 1" AND 2"

PRESSURE
psi kPa bar

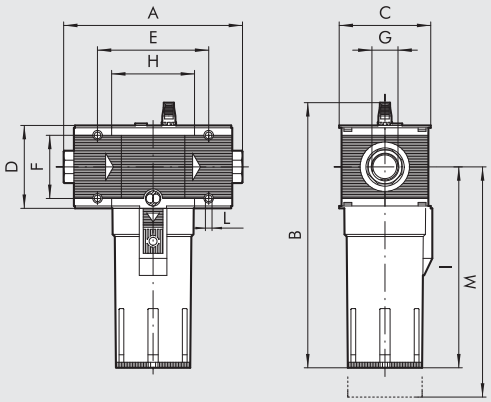


DIMENSIONS

100 - 200 - 300



400



	LUB 100		LUB 200			LUB 300			LUB 400			
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A	78		93.5			110		112	225 to 255			283 to 313
B	162		193			214			338			
C	50		63			72			116			
D	43		55			65			105			
E	63		78.5			92			141.4			
F	26		36			42			80			
H	43		55.5			65			105.4			
I	112		137.5			153			256			
L	M4 hole		M5 hole			M5 hole			M6 hole			
M	130		150			160			285			

SYNOPTIC, SIZES AND VERSIONS

LUB ELEMENT	100 SIZE	1/4 THREADED PORT	- TYPE OF OIL FILLING
LUB	100	1/4 3/8	- = STD ML-CD = AUTOMATIC CD = MANUAL
	200	1/4 3/8 1/2	
	300	1/2 3/4 1	
	400	1 1 1/4 1 1/2 2	

STD: Standard version filled with oil by removing the bowl or through the top cap. Requires circuit relieving.
ML CD: Depression filling with minimum level and valve
CD MANUAL: Filling by depression.

ORDERING CODES

Code	Description
Skillair® 100 LUBRICATOR	
3281001A	LUB 100 without end plates
3281005A	LUB 100 CD manual without end plates
3281001	LUB 100 1/4
3281005	LUB 100 1/4 CD manual
3381001	LUB 100 3/8
3381005	LUB 100 3/8 CD manual
Skillair® 200 LUBRICATOR	
3481001A	LUB 200 without end plates
3481005A	LUB 200 CD manual without end plates
3481001	LUB 200 1/4
3481005	LUB 200 1/4 CD manual
3581001	LUB 200 3/8
3581005	LUB 200 3/8 CD manual
3681001	LUB 200 1/2
3681005	LUB 200 1/2 CD manual

Code	Description
Skillair® 300 LUBRICATOR	
4481001A	LUB 300 without end plates
4481005A	LUB 300 CD manual without end plates
4481006A	LUB 300 ML-CD automatic without end plates
4481001	LUB 300 1/2
4481005	LUB 300 1/2 CD manual
4481006	LUB 300 1/2 ML-CD automatic
4581001	LUB 300 3/4
4581005	LUB 300 3/4 CD manual
4581006	LUB 300 3/4 ML-CD automatic
4681001	LUB 300 1
4681005	LUB 300 1 CD manual
4681006	LUB 300 1 ML-CD automatic

Code	Description
Skillair® 400 LUBRICATOR	
6181001A	LUB 400 without end plates
6181004A	LUB 400 CD manual without end plates
6181006A	LUB 400 ML-CD automatic without end plates
6181001	LUB 400 1
6181004	LUB 400 1 CD manual
6181006	LUB 400 1 ML-CD automatic
6281001	LUB 400 1 1/4
6281004	LUB 400 1 1/4 CD manual
6281006	LUB 400 1 1/4 ML-CD automatic
6381001	LUB 400 1 1/2
6381004	LUB 400 1 1/2 CD manual
6381006	LUB 400 1 1/2 ML-CD automatic
6481001	LUB 400 2
6481004	LUB 400 2 CD manual
6481006	LUB 400 2 ML-CD automatic

Skillair® SHUT-OFF VALVE

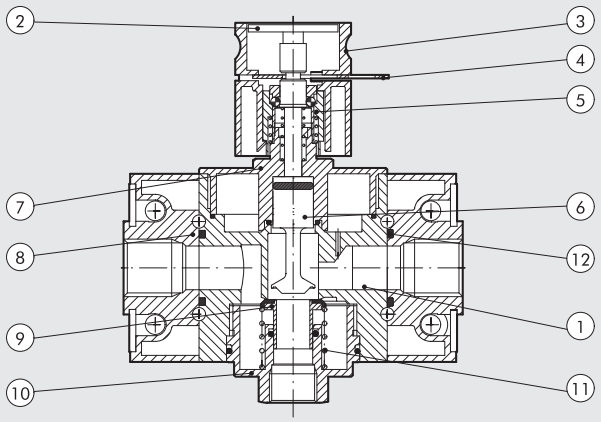
The job of this valve is to make the circuit independent from the air supply. It is basically a three-way valve. In the closed position, it cuts off the air supply and discharges the downstream circuit at the same time, which is means it is particularly useful during servicing operations. The hand-operated version can be padlocked to lock the knob in a closed position so that it can only be opened by someone with the right key. An interlocked version is available for low pressure operation.

N.B.: With size 400, when the V3V is mounted upstream of the regulator, the pilot regulator must be piloted at a pressure taken upstream of the V3V, otherwise when the system is relieved, most of the air downstream will be relieved by the regulator and not the V3V relief port.
For connecting instruction see page **C3**.23

TECHNICAL DATA		V3V 100		V3V 200			V3V 300			V3V 400			
Threaded port		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1″1/4	1″1/2	2″
Min. inlet pressure for solenoid version **	MPa	0.3		0.3			0.2			0.3			0.3
	bar	3		3			2			3			3
	psi	43.5		43.5			29			43.5			43.5
Max. input pressure*	MPa	1.5		1.3			1.3			1.3			1.3
	bar	15		13			13			13			13
	psi	217		188			188			188			188
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	1300		2400			3200			13000			14000
ΔP 0.5 bar (0.05 MPa to 7 psi)	scfm	46		85			113			460			494
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	1650		3000			4700			-			-
ΔP 1 bar (0.1 MPa to 14 psi)	scfm	58		106			166			-			-
Max temperature	°C	50		50			50			50			50
	°F	122		122			122			122			122
Weight	kg	~ 0.5		~ 0.8			~ 1.2			4.8			5.6
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70			M6 x 110			M6 x 110
Type of control		Manual - Pneumatic - Solenoid								Manual - Pneumatic - Solenoid			
		Solenoid pilot-assisted								Solenoid pilot-assisted - Key-operated			
Mounting position		In any position.											
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.											
Note		* 1 MPa - 10 bar - 145 psi for solenoid version											
		** 0.01 MPa – 0.1 bar – 1.45 psi for manual, pneumatic and pilot-assisted versions with controls min. 0.3 MPa 3 bar 43.5 psi.											

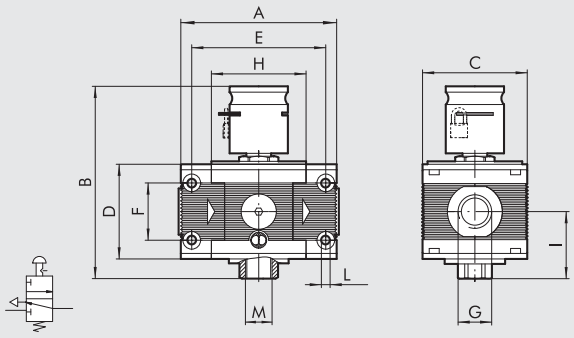
COMPONENTS

① Technopolymer body
② Operating button
③ Technopolymer knob
④ Stainless steel safety lamination
⑤ Locking unit
⑥ OT58 brass piston rod
⑦ OT58 brass top plug
⑧ Zamak end plate
⑨ Valve with vulcanized NBR gasket
⑩ OT58 brass bottom plug
⑪ Stainless steel valve spring
⑫ NBR gaskets

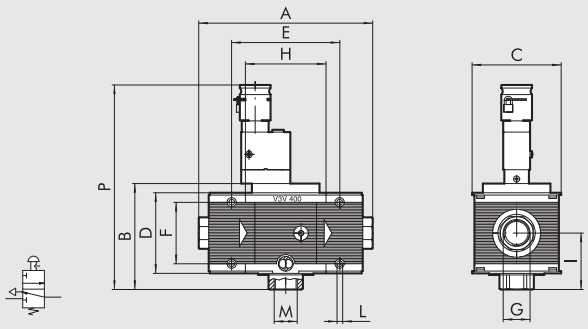


DIMENSIONS OF V3V MANUAL VERSION

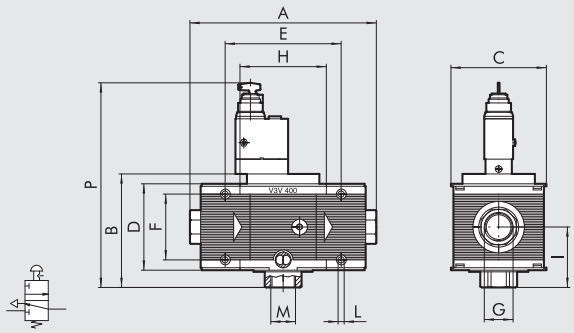
100 - 200 - 300 LOCKABLE



400 LOCKABLE



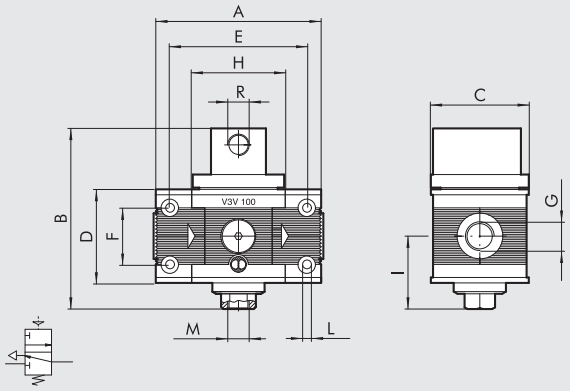
400 KEY-OPERATED



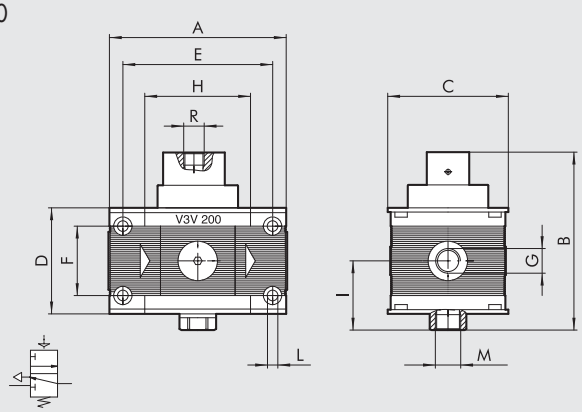
	V3V 100		V3V 200			V3V 300			V3V 400			
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A	78		93.5			110		112	225 to 255			283 to 313
B	106		119			132			137			
C	50		63			72			116			
D	43		55			65			105			
E	63		78.5			92			141.4			
F	26		36			42			80			
H	43		55.5			65			105.4			
I	33.5		40			46.5			72.5			
L	M4 hole		M5 hole			M5 hole			M6 hole			
M (relief)	1/8″		1/4″			3/8″			1″			
P manual	-		-			-			266			
key-operated	-		-			-			249			

DIMENSIONS OF V3V PNEUMATIC VERSION

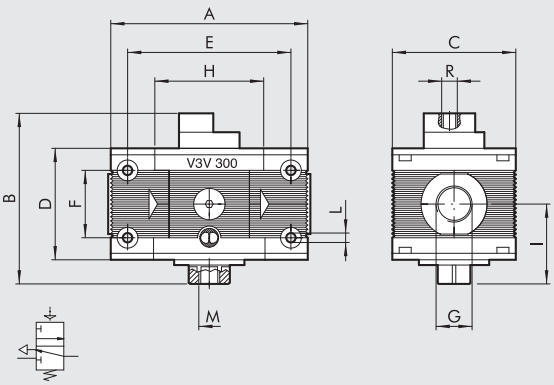
100



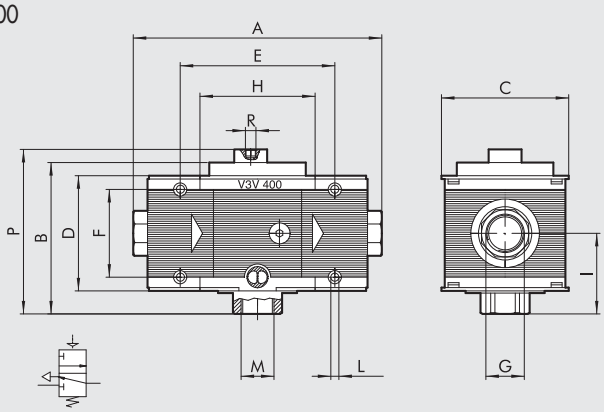
200



300



400

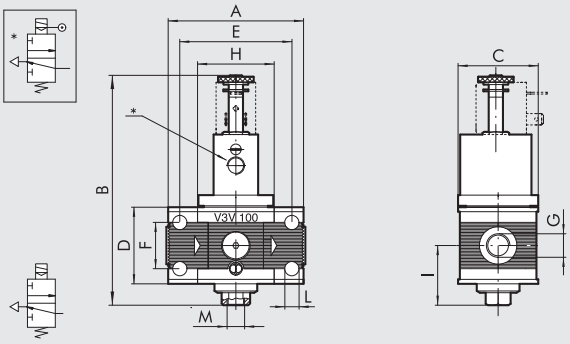


	V3V 100		V3V 200			V3V 300			V3V 400			
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A	78		93.5			110		112	225 to 255			283 to 313
B	83		96			106			137			
C	50		63			72			116			
D	43		55			65			105			
E	63		78.5			92			141.4			
F	26		36			42			80			
H	43		55.5			65			105.4			
I	33.5		40			46.5			72.5			
L	M4 hole		M5 hole			M5 hole			M6 hole			
M (relief)	1/8″		1/4″			3/8″			1″			
R (pilot)	1/8″		1/8″			1/8″			1/8″			
P	-		-			-			150			

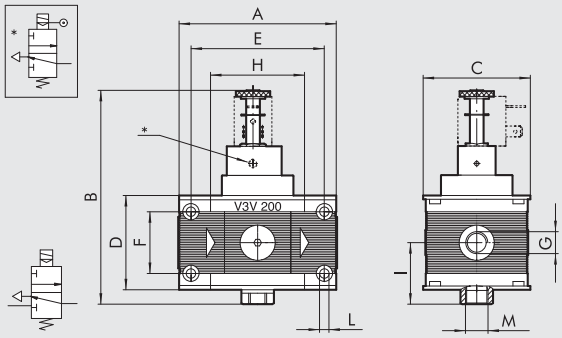
METAL WORK PNEUMATIC

DIMENSIONS OF V3V SOLENOID/SOLENOID PILOT-ASSISTED VALVE

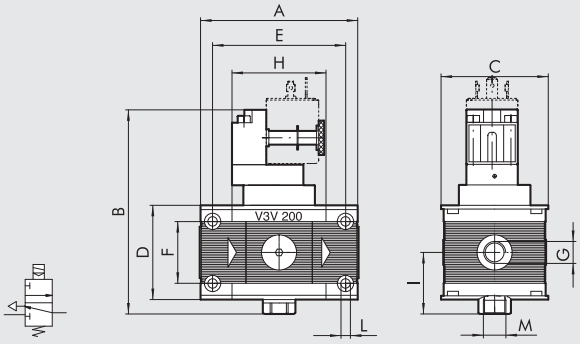
100 SOLENOID/SOLENOID PILOT-ASSISTED VALVE



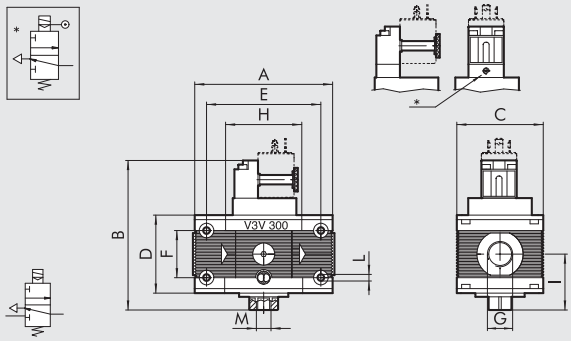
200 SOLENOID/SOLENOID PILOT-ASSISTED VALVE



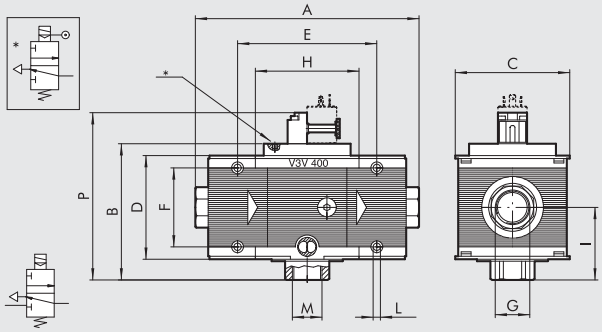
200 CNOMO



300 CNOMO SOLENOID/CNOMO SOLENOID PILOT-ASSISTED VALVE



400 CNOMO SOLENOID/CNOMO SOLENOID PILOT-ASSISTED VALVE



	V3V 100		V3V 200			V3V 300			V3V 400			
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A	78		93.5			110		112	225 to 255			283 to 313
B Solenoid	128		129			152			137			
Solenoid pilot-ass.	129		129			-			116			
CNOMO control	-		123			125			105			
CNOMO pilot-ass.	-		-			138			141.4			
C	50		63			72			80			
D	43		55			65			-			
E	63		78.5			92			-			
F	26		36			42			-			
H	43		55.5			65			105.4			
I	33.5		40			46.5			72.5			
L	M4 hole		M5 hole			M5 hole			M6 hole			
M (relief)	1/8″		1/4″			3/8″			1″			
*** (pilot)**	1/8″		M5			M5			M5			
P	-		-			-			169			

SYNOPTIC, SIZES AND VERSIONS

V3V ELEMENT	100 SIZE	1/4 THREADED PORT	MANUAL TYPE OF COMMAND
V3V	100	1/4 3/8	Manual (lockable)
	200	1/4 3/8 1/2	Pneumatic
	300	1/2 3/4 1	Solenoid pilot assisted
	400	1 1 1/4 1 1/2 2	Solenoid Key-operated (400)

ORDERING CODES

Code	Description
Skillair® 100 3-WAY VALVE	
3270001A	V3V 100 lockable without end plates
3269000A	V3V 100 pneumatic without end plates
3269001A	V3V 100 solenoid without end plates
3269002A	V3V 100 solenoid pilot assisted without end plates
3270001	V3V 100 1/4 lockable
3269000	V3V 100 1/4 pneumatic
3269001	V3V 100 1/4 solenoid
3269002	V3V 100 1/4 solenoid pilot assisted
3370001	V3V 100 3/8 lockable
3369000	V3V 100 3/8 pneumatic
3369001	V3V 100 3/8 solenoid
3369002	V3V 100 3/8 solenoid pilot assisted
Skillair® 200 3-WAY VALVE	
3470001A	V3V 200 lockable without end plates
3469000A	V3V 200 pneumatic without end plates
3469001A	V3V 200 solenoid without end plates
3469002A	V3V 200 solenoid pilot assisted without end plates
3469004A	V3V 200 solenoid cnomo comm. w/end plate
3469005A	V3V 200 solenoid cnomo ass. comm. w/end plate
3470001	V3V 200 1/4 lockable
3469000	V3V 200 1/4 pneumatic
3469001	V3V 200 1/4 solenoid
3469002	V3V 200 1/4 solenoid pilot assisted
3469004	V3V 200 1/4 solenoid cnomo comm.
3469005	V3V 200 1/4 solenoid cnomo pilot-assisted
3570001	V3V 200 3/8 lockable
3569000	V3V 200 3/8 pneumatic
3569001	V3V 200 3/8 solenoid
3569002	V3V 200 3/8 solenoid pilot assisted
3569004	V3V 200 3/8 solenoid cnomo comm.
3569005	V3V 200 3/8 solenoid cnomo pilot-assisted
3670001	V3V 200 1/2 lockable
3669000	V3V 200 1/2 pneumatic
3669001	V3V 200 1/2 solenoid
3669002	V3V 200 1/2 solenoid pilot assisted
3669004	V3V 200 1/2 solenoid cnomo comm.
3669005	V3V 200 1/2 solenoid cnomo pilot-assisted

Code	Description
Skillair® 300 3-WAY VALVE	
4470001A	V3V 300 lockable without end plates
4469000A	V3V 300 pneumatic without end plates
4469004A	V3V 300 solenoid cnomo without end plates
4469005A	V3V 300 solenoid cnomo pilot-assisted w/end plates
4470001	V3V 300 1/2 lockable
4469000	V3V 300 1/2 pneumatic
4469004	V3V 300 1/2 solenoid cnomo
4469005	V3V 300 1/2 solenoid cnomo assisted
4570001	V3V 300 3/4 lockable
4569000	V3V 300 3/4 pneumatic
4569004	V3V 300 3/4 solenoid cnomo
4569005	V3V 300 3/4 solenoid cnomo assisted
4669000	V3V 300 1 pneumatic
4669004	V3V 300 1 solenoid cnomo
4669005	V3V 300 1 solenoid cnomo assisted
4670001	V3V 300 1 lockable

Code	Description
Skillair® 400 3-WAY VALVE	
6169010A	V3V 400 key-operated without end plates
6169000A	V3V 400 pneumatic without end plates
6169004A	V3V 400 solenoid cnomo without end plates
6169005A	V3V 400 solenoid cnomo pilot-assisted w/end plates
6170002A	V3V 400 lockable without end plates
6169010	V3V 400 1 key-operated
6169000	V3V 400 1 pneumatic
6169004	V3V 400 1 solenoid cnomo
6169005	V3V 400 1 solenoid cnomo assisted
6269010	V3V 400 1 1/4 key-operated
6269000	V3V 400 1 1/4 pneumatic
6269004	V3V 400 1 1/4 solenoid cnomo
6269005	V3V 400 1 1/4 solenoid cnomo assisted
6369010	V3V 400 1 1/2 key-operated
6369000	V3V 400 1 1/2 pneumatic
6369004	V3V 400 1 1/2 solenoid cnomo
6369005	V3V 400 1 1/2 solenoid cnomo assisted
6469010	V3V 400 2 key-operated
6469000	V3V 400 2 pneumatic
6469004	V3V 400 2 solenoid cnomo
6469005	V3V 400 2 solenoid cnomo assisted
6170002	V3V 400 1 lockable
6270002	V3V 400 1 1/4 lockable
6370002	V3V 400 1 1/2 lockable
6470002	V3V 400 2 lockable

Skillair® PROGRESSIVE START VALVE

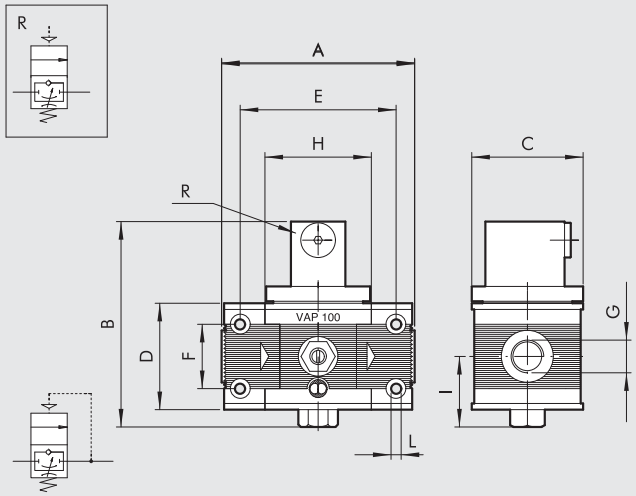
METAL WORK PNEUMATIC

The 2/2 progressive valve comes in two versions, with solenoid or pneumatic actuation.
STD progressive start valve: a differential balanced valve automatically opens the air port fully when the downstream pressure is about 50% of the upstream pressure.
Progressive start valve with pneumatic or solenoid actuation: without a pilot, the upstream air flows downstream through the regulation needle.
When an external or pneumatic solenoid signal is generated, the valve opens the main port to create full flow. It does not relieve the downstream circuit.

TECHNICAL DATA		VAP 100	
Threaded port		1/4"	3/8"
Min. inlet pressure **	MPa	0.3	
	bar	3	
	psi	43.5	
Max. inlet pressure*	MPa	1.5	
	bar	15	
	psi	217	
Flow rate at 6 bar (0.6 MPa to 87 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	1300	
	scfm	46	
Flow rate at 6 bar (0.6 MPa to 87 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	2000	
	scfm	71	
Max temperature	°C	50	
	°F	122	
Weight	kg	0.5 ~	
Wall fixing screws		M4 x 50	
Mounting position		In any position	
Type of control		Automatic - Pneumatic – Solenoid – Solenoid pilot-assisted	
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous	

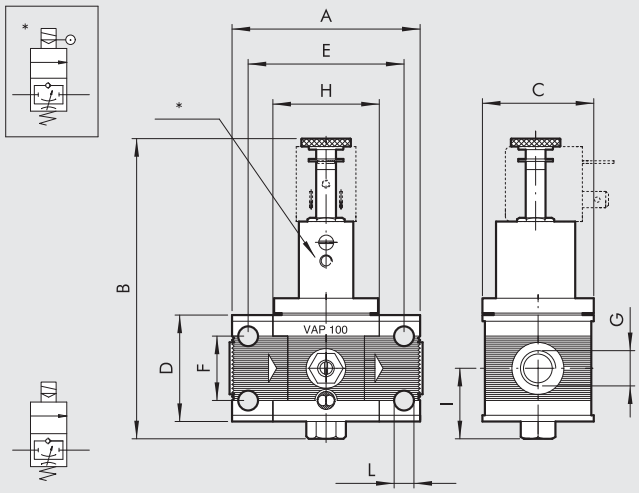
** 0.01 MPa – 0.1 bar – 1.45 psi for pneumatic and pilot-assisted versions with controls at min. 0.3 MPa 3 bar 43.5 psi.
* 1 MPa – 10 bar – 1.45 psi

DIMENSIONS OF VAP 100 STD/PNEUMATIC VALVE



	VAP 100	
Threaded port G	1/4″	3/8″
A	78	
B	83.5	
C	50	
D	43	
E	63	
F	26	
H	43	
I	29	
L	M4 hole	
R (pilot - pneumatic version)	1/8″	

DIMENSIONS OF VAP 100 SOLENOID/SOLENOID PILOT-ASSISTED VALVE



	VAP 100	
Threaded port G	1/4″	3/8″
A	78	
B	122.5	
C	50	
D	43	
E	63	
F	26	
H	43	
I	29	
L	M4 hole	
O	89	
*** (pilot assisted)**	M5	

ORDERING CODES

Code	Description
3271000A	VAP 100 without end plates
3271500A	VAP 100 pneumatic without end plates
3271600A	VAP 100 solenoid without end plates
3271700A	VAP 100 solenoid pilot-assisted without end plates
3271000	VAP 100 1/4
3271500	VAP 100 1/4 pneumatic
3271600	VAP 100 1/4 solenoid
3271700	VAP 100 1/4 solenoid pilot-assisted
3371000	VAP 100 3/8
3371500	VAP 100 3/8 pneumatic
3371600	VAP 100 3/8 solenoid
3371700	VAP 100 3/8 solenoid pilot-assisted

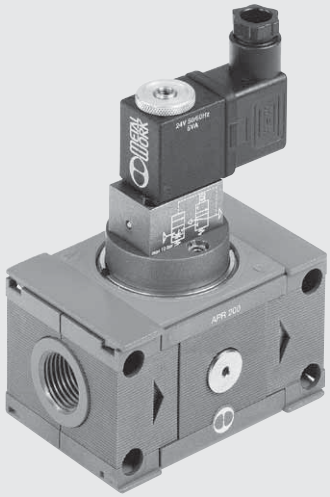
NOTES

Skillair® PROGRESSIVE STARTER

METAL WORK PNEUMATIC

The job of the progressive starter is to feed air into the circuit gradually with controlled flow. It comes in two versions with solenoid or pneumatic actuation. Both control signals cause the valve to open, which allows the air controlled by the flow regulator to flow slowly towards the downstream circuit.
In the APR, when the pressure in the downstream circuit reaches 50%-60% of the upstream pressure, the valve opens the main inlet duct connecting.
The time elapsing between starting and opening the valve can be adjusted via the built-in flow regulator. If it is necessary to relieve the downstream circuit quickly, merely operate the control valve which cuts off air flow in the pipe. This closes the valve and starts relieving the downstream circuit.
The progressive starter acts both as an actuator positioner, which eliminates the risk of sudden kickback, and as a valve.

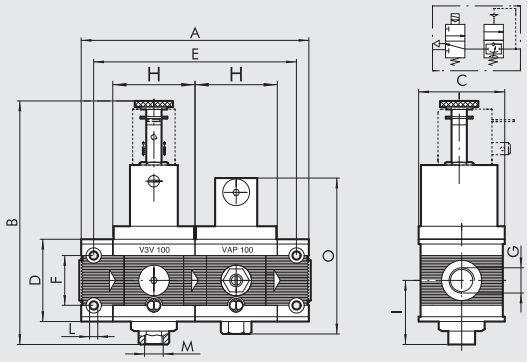
N.B. With size 400, when the APR is mounted upstream of the regulator, the pilot regulator must be piloted at a pressure taken upstream of the APR, otherwise when the system is relieved, most of the air downstream will be relieved by the regulator and not the APR relief port.
For connecting instruction see page **C3**.23



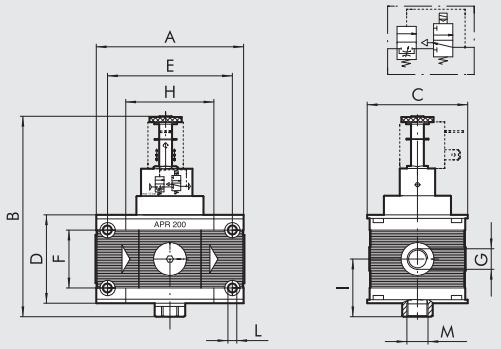
TECHNICAL DATA		APR 100		APR 200			APR 300			APR 400			
Threaded port		1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	2"
Min. inlet pressure	MPa	0.3		0.3			0.4			0.3			0.3
	bar	3		3			4			3			3
	psi	43.5		43.5			58			43.5			43.5
Max. inlet pressure*	MPa	1.5		1.3			1.3			1			1
	bar	15		13			13			10			10
	psi	217		188.5			188.5			145			145
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	1300		2000			2400			13000			14000
ΔP 0.5 bar (0.05 MPa to 7 psi)	scfm	46		71			85			460			494
Flow rate at 6.3 bar (0.63 MPa to 91 psi)	Nl/min	2000		3200			3600			-			-
ΔP 1 bar (0.1 MPa to 14 psi)	scfm	71		113			127			-			-
Max temperature	°C	50		50			50			50			50
	°F	122		122			122			122			122
Weight	kg	~ 0.8		~ 0.9			~ 1.5			5.6			6.4
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70			M6 x 110			M6 x 110
Type of control		Pneumatic		Pneumatic			Pneumatic			Pneumatic - Solenoid			
		Solenoid		Solenoid			CNOMO Solenoid						
				CNOMO Solenoid									
Mounting position		In any position											
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.											
Notes on use		For the pneumatic version 200 the pilot pressure must range between the inlet P and the inlet P + 2 bar.											
		For pneumatic version 300, the pilot pressure must be greater or equal to the input pressure.											
		* 1 MPa - 10 bar - 145 psi for solenoid version											

DIMENSIONS APR SOLENOID

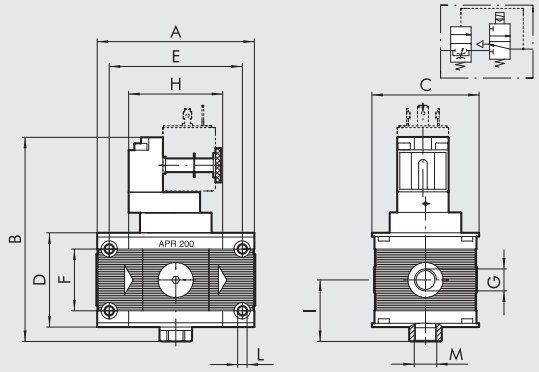
APR 100 SOLENOID



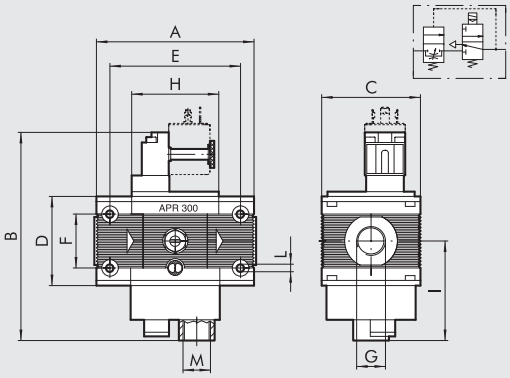
APR 200 SOLENOID



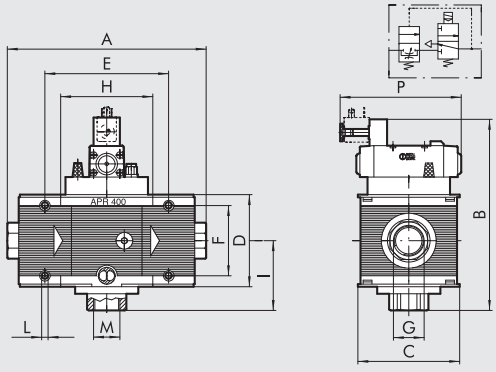
APR 200 CNOMO SOLENOID



APR 300 CNOMO SOLENOID



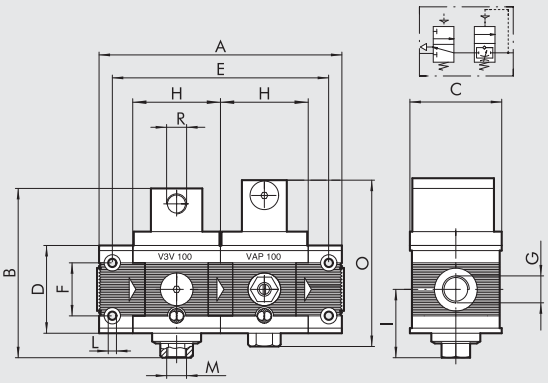
APR 400 SOLENOID



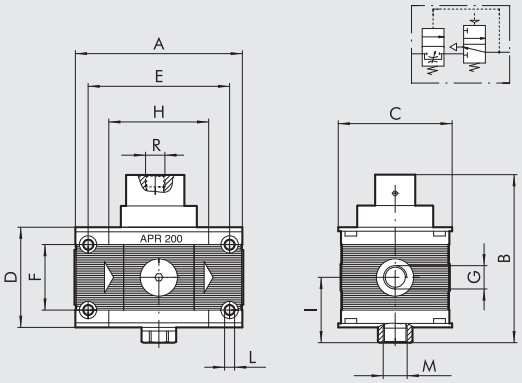
	APR 100 ELPN		APR 200 ELPN			APR 200 ELPN CNOMO			APR 300 ELPN CNOMO			APR 400 ELPN			
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A	121		93.5			93.5			110		112	225 to 255			283 to 313
B	128		125			120			152			218			
C	50		63			63			72			106			
D	43		55			55			65			105			
E	106		78.5			78.5			92			141.4			
F	26		36			36			42			80			
H	43		55.5			55.5			65			105.4			
I	34.5		36			36			74			80			
L	M4 hole		M5 hole			M5 hole			M5 hole			M6 hole			
M (relief)	1/8″		1/4″			1/4″			1/2″			1″			
0	83.5		-			-			-			-			
P	-		-			-			-			138			

DIMENSIONS APR PNEUMATIC

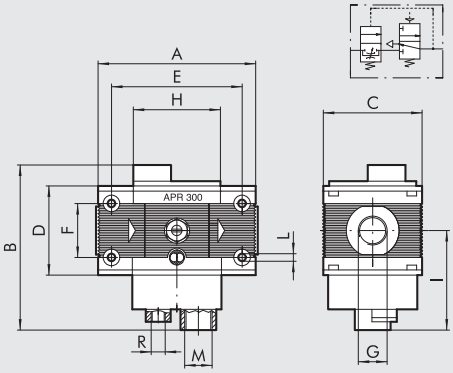
APR 100 PNEUMATIC



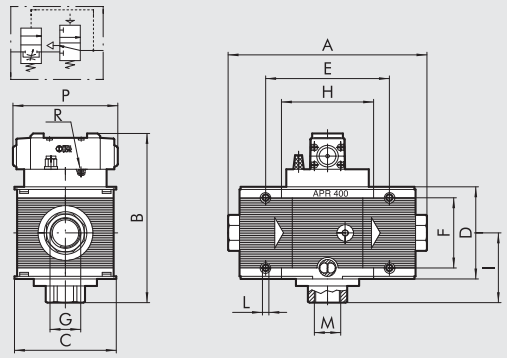
APR 200 PNEUMATIC



APR 300 PNEUMATIC



APR 400 PNEUMATIC



	APR 100 PN		APR 200 PN			APR 300 PN			APR 400 PN			
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A	121		93.5			110		112	225 to 255			283 to 313
B	83		92			122			193			
C	50		63			72			116			
D	43		55			65			105			
E	106		78.5			92			141.4			
F	26		36			42			80			
H	43		55.5			65			105.4			
I	34.5		36			74			80			
L	M4 hole		M5 hole			M5 hole			M6 hole			
M (relief)	1/8″		1/4″			1/2″			1″			
R (pilot)	1/8″		1/8″			1/4″			M5			
P	-		-			-			119			

SYNOPTIC, SIZES AND VERSIONS

APR ELEMENT	100 SIZE	1/4 THREADED PORT	PNEUMATIC TYPE OF CONTROL
APR	100	1/4 3/8	Pneumatic Solenoid
	200	1/4 3/8 1/2	
	300	1/2 3/4 1	
	400	1 1 1/4 1 1/2 2	

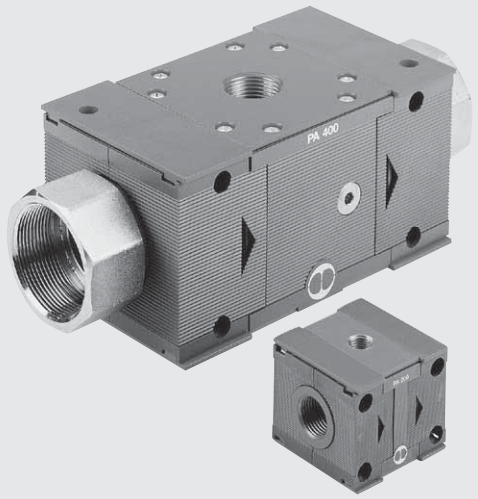
ORDERING CODES

Code	Description
Skillair® 100 PROGRESSIVE STARTER	
3267001A	APR 100 pneumatic without end plates
3267051A	APR 100 solenoid without end plates
3267001	APR 100 1/4 pneumatic
3267051	APR 100 1/4 solenoid
3367001	APR 100 3/8 pneumatic
3367051	APR 100 3/8 solenoid
Skillair® 200 PROGRESSIVE STARTER	
3471000A	APR 200 pneumatic without end plates
3471001A	APR 200 solenoid without end plates
3471004A	APR 200 solenoid cnomo without end plates
3471000	APR 200 1/4 pneumatic
3471001	APR 200 1/4 solenoid
3471004	APR 200 1/4 solenoid cnomo control
3571000	APR 200 3/8 pneumatic
3571001	APR 200 3/8 solenoid
3571004	APR 200 3/8 solenoid cnomo control
3671000	APR 200 1/2 pneumatic
3671001	APR 200 1/2 solenoid
3671004	APR 200 1/2 solenoid cnomo control

Code	Description
Skillair® 300 PROGRESSIVE STARTER	
4471900A	APR 300 pneumatic without end plates
4471901A	APR 300 solenoid cnomo without end plates
4471900	APR 300 1/2 pneumatic
4471901	APR 300 1/2 solenoid cnomo control
4571900	APR 300 3/4 pneumatic
4571901	APR 300 3/4 solenoid cnomo control
4671900	APR 300 1 pneumatic
4671901	APR 300 1 solenoid cnomo control
Skillair® 400 PROGRESSIVE STARTER	
6171002A	APR 400 pneumatic without end plates
6171003A	APR 400 solenoid without end plates
6171002	APR 400 1 pneumatic
6171003	APR 400 1 solenoid
6271002	APR 400 1 1/4 pneumatic
6271003	APR 400 1 1/4 solenoid
6371002	APR 400 1 1/2 pneumatic
6371003	APR 400 1 1/2 solenoid
6471002	APR 400 2 pneumatic
6471003	APR 400 2 solenoid

Skillair® AIR TAKE-OFF

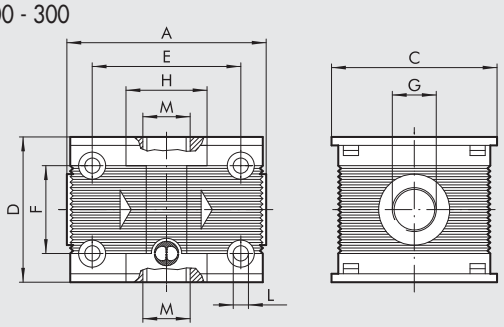
The air take-off takes air from the Skillair® FRL unit irrespective of the assembly position. It is necessary when air needs to be taken from the FRL unit at any stage of the treatment (normal, filtered and regulated, lubricated, etc.). If used separately from the FRL unit, which is infinitely modular, it acts as a distributor allowing air take-off through the threaded ports.



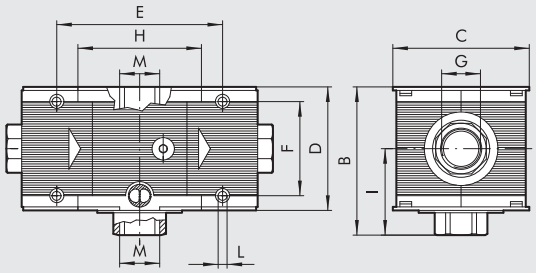
TECHNICAL DATA		PA 100		PA 200			PA 300			PA 400			
Threaded port		1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	2"
Max. working temperature	°C	50		50			50			50			
at: 1 MPa; 10 bar; 145 psi	°F	122		122			122			122			
Max. operating pressure	MPa	1.5		1.3			1.3			1.3			
	bar	15		13			13			13			
	psi	217		188			188			188			
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70			M6 x 110			
Threaded port		G 1/4		G 1/4			G 3/8			G 1			
Weight	kg	0.3		0.5			0.8			4.3			5.1

DIMENSIONS AND ORDERING CODES

100 - 200 - 300



400

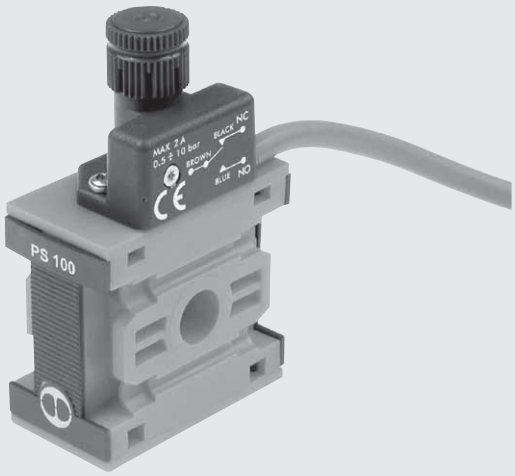


	PA 100		PA 200			PA 300			PA 400			
Threaded port G	1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	2"
A	59		63			117		119	225 to 255			283 to 313
B	-		-			-			120			
C	50		63			72			116			
D	43		55			65			105			
E	44		48			59			141.4			
F	26		36			42			80			
H	24		25			32			105.4			
I	-		-			-			67.5			
L	M4 hole		M5 hole			M5 hole			M6 hole			
M	1/4"		1/4"			3/8"			1"			

Code	Description
9200402A	PA 100 without end plates
9200402	PA 100 1/4
9300401	PA 100 3/8
9300402A	PA 200 without end plates
9300404	PA 200 1/2
9300402	PA 200 1/4
9300403	PA 200 3/8
9400402A	PA 300 without end plates
9500402	PA 300 1
9400402	PA 300 1/2
9500401	PA 300 3/4
9700401A	PA 400 without end plates
9700401	PA 400 1
9700403	PA 400 1 1/2
9700402	PA 400 1 1/4
9700404	PA 400 2

Skillair® PRESSURE SWITCHES

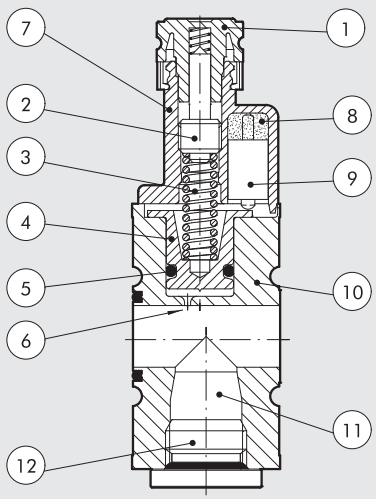
Skillair® pressure switches feature a high degree of miniaturisation and a modern attractive design. As they are extremely modular, the Skillair® series can be installed facing up or down.
They come ready assembled with a 2-metre cable or an M8 connector with a 300-mm cable.
The contact is the switching type, which means it can be normally open or normally closed. It can be regulated via a knurled push-lock handle.
On the side opposite the regulation handle is a threaded air inlet port that can be used by removing the threaded plug.



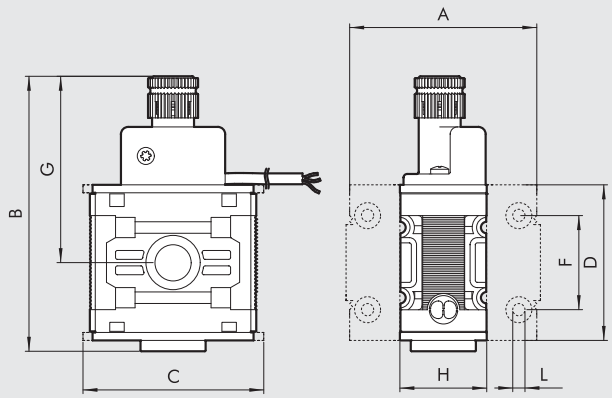
TECHNICAL DATA		PS 100	PS 200	PS 300
Adjustable pressure interval	bar	0.5 to 10		
Hysteresis (not adjustable)	bar	from 0.4 to 0.8 (See diagram)		
Maximum pressure	bar	15	13	13
	MPa	1.5	1.3	1.3
	psi	217	188	188
Operating temperature range at: 1 MPa; 10 bar; 145 psi	°C	-10 to 50		
	°F	14 to 122		
Lower threaded port		1/4″	1/4″	3/8″
Maximum current	A	2		
Maximum voltage	V	250		
Outside diameter of cable	mm	4.9		
Number of wires and cross section		3 x 0.5 mm^2		
Contacts		Normally-Open (NO) and Normally-Closed (NC)		
Protection		IP65		
Number of switchings		5 x 10^6		
Fluid		Filtered lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.		
Mounting position		In any position.		
Weight	kg	0.160	0.185	0.250

COMPONENTS

① Technopolymer adjusting push-lock handle
② Brass adjusting screw
③ Steel piston spring
④ Brass piston
⑤ NBR gasket
⑥ Choke to reduce peaks in pressure
⑦ Technopolymer pressure switch body
⑧ Resin finish for IP65
⑨ Electrical contact
⑩ Technopolymer body
⑪ Supplementary air inlet port
⑫ A7 plug



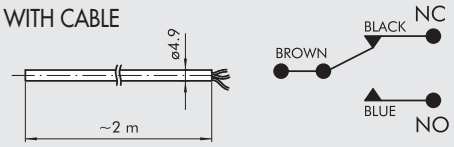
DIMENSIONS



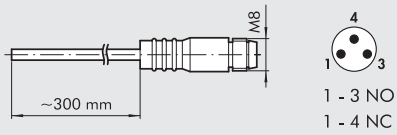
	PS 100	PS 200	PS 300
A	59	63	177
B	76	85	99
C	50	63	72
D	43	55	65
F	26	36	42
G	52	58	63
H	24	25	32
L	M4 hole	M5 hole	M5 hole

WIRING DIAGRAM

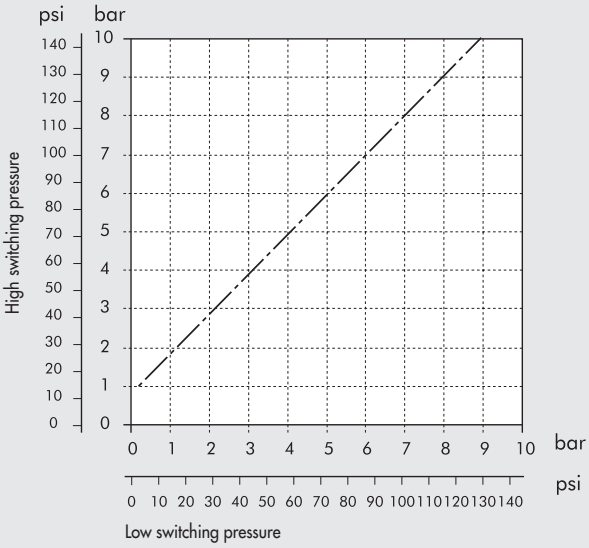
VERSION WITH CABLE



VERSION WITH M8 CONNECTOR



HYSTERESIS GRAPH

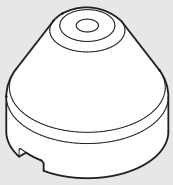


ORDERING CODES

Code	Description
Skillair® 100 PRESSURE SWITCHES	
3240000A	PS 100 2A NO/NC 2 m cable without end plates
3240001A	PS 100 2A NO/NC M8 connector without end plates
Skillair® 200 PRESSURE SWITCHES	
3440000A	PS 200 2A NO/NC 2 m cable without end plates
3440001A	PS 200 2A NO/NC M8 connector without end plates
Skillair® 300 PRESSURE SWITCHES	
4440000A	PS 300 2A NO/NC 2 m cable without end plates
4440001A	PS 300 2A NO/NC M8 connector without end plates

ACCESSORIES

SECURITY KNOB

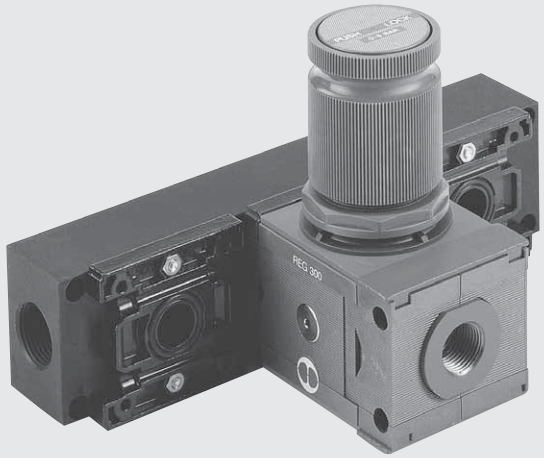


Code	Description
9200703	Acc. security knob

NOTE: Pull outwards to remove the knob from the pressure switch on the unit. Insert the security knob and regulate the pressure switch. Then press the handle firmly to lock it in position. If the pressure switch needs to be reset, remove the security knob by forcing it laterally with a screwdriver.

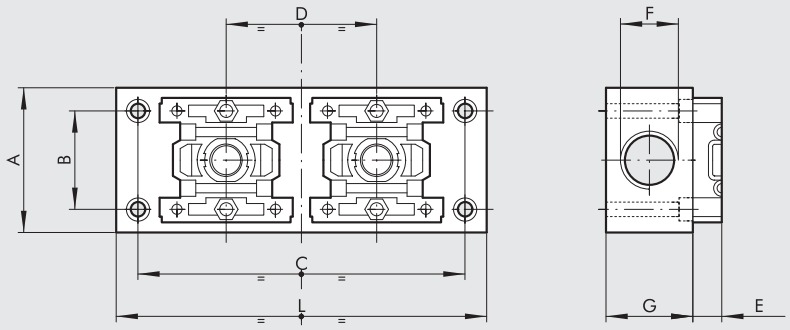
Skillair® SUB-BASE AND ADAPTER BASE

The adapter base is used to adapt the Skillair® FRL system to various assemblies without affecting modularity or servicing.
If you use the universal adopter base plus the intermediate plate, you can assemble several elements of different sizes.

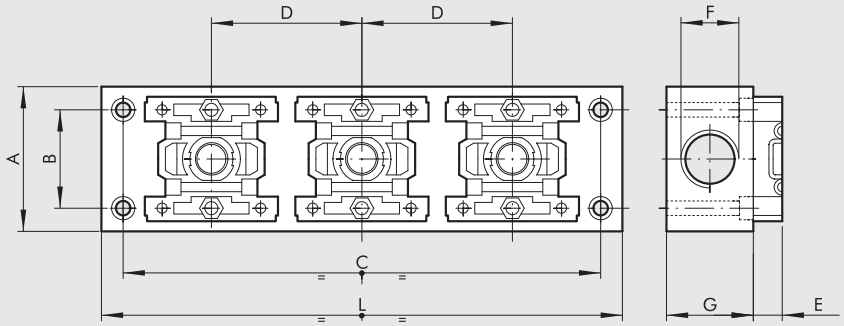


DIMENSIONS

2-POSITION SUB-BASE

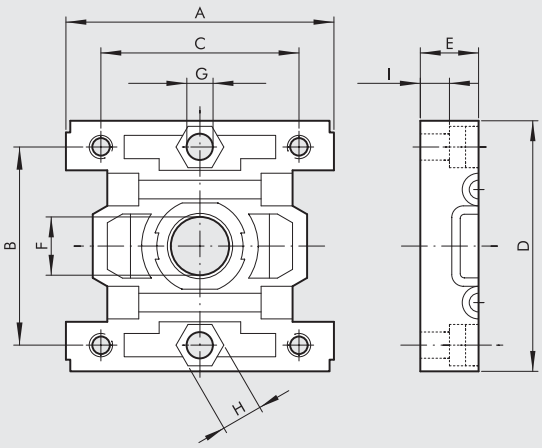


3-POSITION SUB-BASE



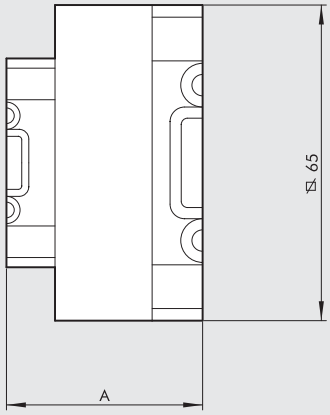
	100 - 2 POS.	100 - 3 POS.	200 - 2 POS.	200 - 3 POS.	300 - 2 POS.	300 - 3 POS.
A	50	50	55	55	60	60
B	34	34	44	44	49	49
C	113	165	135	200	155	230
D	52	52	65	65	75	75
E	10	10	8.5	8.5	10.5	10.5
F	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"
G	30	30	40	40	40	40
L	128	180	150	215	170	245

DIMENSIONS OF ADAPTER BASE



	BA 100	BA 200	BA 300
A	46	59	69
B	34	44	49
C	34	44	49
D	43	55	65
E	10	8.5	10.5
F	10	15	18
G	M4 hole	M4 hole	M5 hole
H	Es. 7	Es. 7	Es. 7
I	5	2	5

DIMENSIONS OF SIZE ADAPTERS



	BA 100 - 200	BA 100 - 300	BA 200 - 300
A	38.5	40.5	39

ORDERING CODES

Code	Description
MULTIPLE SUB-BASES FOR REGULATORS	
9200202	SB 2 100
9300202	SB 2 200
9400202	SB 2 300
9200302	SB 3 100
9300302	SB 3 200
9400302	SB 3 300
ADAPTER BASE	
9201801	BA 100
9321801	BA 200
9401801	BA 300
SIZE ADAPTER	
9301801	BA 100 - 200
9301802	BA 100 - 300
9301803	BA 200 - 300

NOTES

FIL + REG + LUB Skillair®

Refer to the sections on the single modules for a further description, components and other technical data.

TECHNICAL DATA		FRL 100		FRL 200			FRL 300			FRL 400			
Threaded port		1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"	1"	1"1/4	1"1/2	2"
Setting range		0 to 8 - 0 to 12		0 to 8 - 0 to 12			0 to 8 - 0 to 12			Depending on pilot regulator			
Degree of filtration	µm	5 - 20		5 - 20			5 - 20			5 - 20 - 50			5 - 20 - 50
Max. inlet pressure	MPa	1.5		1.3			1.3			1.3			1.3
	bar	15		13			13			13			13
	psi	217		188			188			188			188
Flow rate at 6.3 bar ΔP 0.5 bar	Nl/min	300		1300			2500			9000			14000
	scfm	11		46			89			320			500
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	800		3000			4500			-			-
	scfm	28		106			160			-			-
Max temperature at 10 bar	°C	50		50			50			50			50
	°F	122		122			122			122			122
Weight	kg	0.75		1.5			2.9			~ 10			~ 10
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70			M6 x 110			M6 x 110
Fluid		Compressed air											
Notes on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.** **Do not take air from pressure gauge ports.**											

SYNOPTIC, SIZES AND VERSIONS

FRL	100	1/4	20	08	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	TYPE OF CONDEN-SATION DRAIN
FRL	100	1/4 3/8	5 = 5 µm 20 = 20 µm 50 = 50 µm	08 = 0 to 8 bar 012 = 0 to 12 bar	RMSA SAC
	200	1/4 3/8 1/2			RMSA SAC RA
	300	1/2 3/4 1			RMSA RA
	400	1 1 1/4 1 1/2 2			

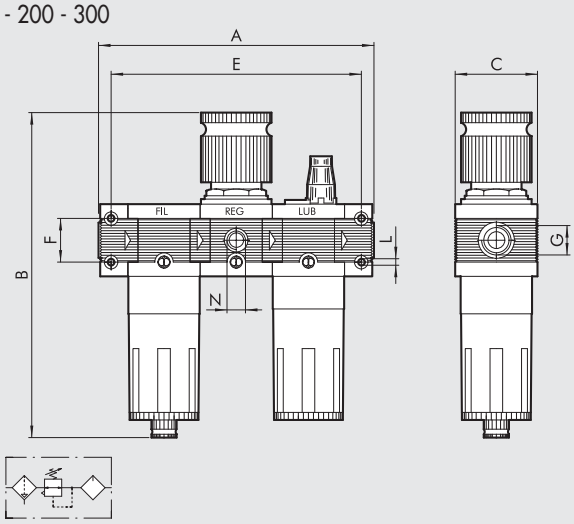
RMSA: drain with manual condensate discharge and automatic discharge at zero pressure

RA: automatic drain with condensate discharge, independent of pressure and flow rate.
(for size 200, 300 and 400)

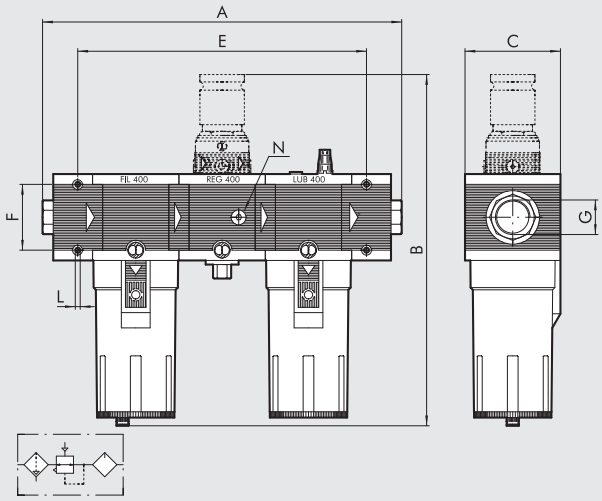
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.
(for size 100 and 200)

DIMENSIONS FIL + REG + LUB

100 - 200 - 300



400



	FIL + REG + LUB 100		FIL + REG + LUB 200			FIL + REG + LUB 300			FIL + REG + LUB 400			
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A	164		204.5			240	240	242	436 to 466			494 to 524
B RMSA	199		245			278			444			
B RA	-		249			282			448			
B SAC	203		249			282			448			
C	50		63			72			116			
E	149		189.5			222			352			
F	26		36			42			80			
L	M4 hole		M5 hole			M5 hole			M6 hole			
N (pressure gauge port)	1/8″		1/8″			1/8″			1/4″			

ORDERING CODES

Code	Description
FIL+REG+LUB Skillair® 100	
3282008	FRL 100 1/4 20 08 RMSA
3282011	FRL 100 1/4 20 012 RMSA
3382008	FRL 100 3/8 20 08 RMSA
3382011	FRL 100 3/8 20 012 RMSA
FIL+REG+LUB Skillair® 200	
3482008	FRL 200 1/4 20 08 RMSA
3482011	FRL 200 1/4 20 012 RMSA
3582008	FRL 200 3/8 20 08 RMSA
3582011	FRL 200 3/8 20 012 RMSA
3682008	FRL 200 1/2 20 08 RMSA
3682011	FRL 200 1/2 20 012 RMSA
FIL+REG+LUB Skillair® 300	
4482005	FRL 300 1/2 20 08 RMSA
4482008	FRL 300 1/2 20 012 RMSA
4582005	FRL 300 3/4 20 08 RMSA
4582008	FRL 300 3/4 20 012 RMSA
4682005	FRL 300 1 20 08 RMSA
4682008	FRL 300 1 20 012 RMSA
FIL+REG+LUB Skillair® 400	
6182002	FRL 400 1 20 RMSA
6182005	FRL 400 1 20 RA
6282002	FRL 400 1 1/4 20 RMSA
6382002	FRL 400 1 1/2 20 RMSA
6482002	FRL 400 2 20 RMSA

The following versions are available on request:
- with 5 µm or 50 µm degree of filtration
- with SAC or RA condensate discharge

FR + LUB Skillair®

Refer to the sections on the single modules for a further description, components and other technical data.

TECHNICAL DATA		FR + LUB 100		FR + LUB 200			FR + LUB 300		
Threaded port		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″
Setting range		0 to 8 - 0 to 12		0 to 8 - 0 to 12			0 to 8 - 0 to 12		
Degree of filtration	µm	5 - 20 - 50		5 - 20 - 50			5 - 20 - 50		
Max. inlet pressure	MPa	1.5		1.3			1.3		
	bar	15		13			13		
	psi	217		188			188		
Flow rate at 6.3 bar ΔP 0.5 bar	Nl/min	300		1200			2300		
	scfm	11		43			82		
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	800		2400			4000		
	scfm	28		85			142		
Max temperature at 10 bar	°C	50		50			50		
	°F	122		122			122		
Weight	kg	0.7		1.35			2.7		
Wall fixing screws		M4 x 50		M4 x 60			M5 x 70		
Fluid		Compressed air							
Notes on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**							
		Do not take air from pressure gauge ports.							

SYNOPTIC, SIZES AND VERSIONS

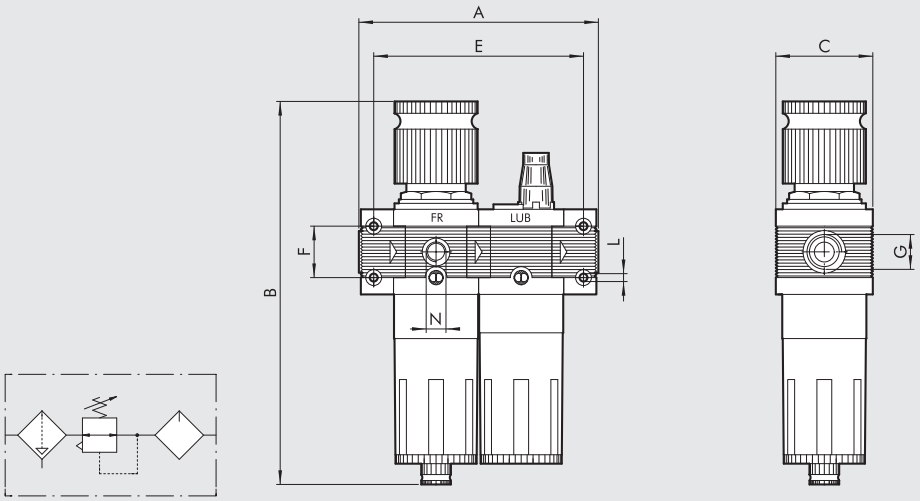
FR+L	100	1/4	20	08	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	TYPE OF CONDEN-SATION RANGE
FR+L	100	1/4	5 = 5 µm	08 = 0 to 8 bar	RMSA
		3/8	20 = 20 µm	012 = 0 to 12 bar	SAC
	200	1/4	50 = 50 µm		RMSA
		3/8			SAC
		1/2			RA
	300	1/2			RMSA
		3/4			RA
		1			

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure

RA: automatic drain with condensate discharge, independent of pressure and flow rate. (for size 200, 300)

SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.** (for size 100 and 200)

DIMENSIONS FR + L



		FR + LUB 100		FR + LUB 200			FR + LUB 300		
Threaded port G		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″
A		121		149			175		177
B	RMSA	199		245			278		
	RA	-		249			282		
	SAC	203		249			282		
C		50		63			72		
E		106		134			157		
F		26		36			42		
L		M4 hole		M5 hole			M5 hole		
N (pressure gauge port)		1/8″		1/8″			1/8″		

ORDERING CODES

Codie	Description
FR+L Skillair® 100	
3284008	FR+L 100 1/4 20 08 RMSA
3284011	FR+L 100 1/4 20 012 RMSA
3384008	FR+L 100 3/8 20 08 RMSA
3384011	FR+L 100 3/8 20 012 RMSA
FR+L Skillair® 200	
3484008	FR+L 200 1/4 20 08 RMSA
3484011	FR+L 200 1/4 20 012 RMSA
3584008	FR+L 200 3/8 20 08 RMSA
3584011	FR+L 200 3/8 20 012 RMSA
3684008	FR+L 200 1/2 20 08 RMSA
3684011	FR+L 200 1/2 20 012 RMSA
FR+L Skillair® 300	
4484005	FR+L 300 1/2 20 08 RMSA
4484008	FR+L 300 1/2 20 012 RMSA
4584005	FR+L 300 3/4 20 08 RMSA
4584008	FR+L 300 3/4 20 012 RMSA
4684005	FR+L 300 1 20 08 RMSA
4684008	FR+L 300 1 20 012 RMSA

The following versions are available on request:
- with 5 µm or 50 µm degree of filtration
- with SAC or RA condensate discharge

V3V + FR + LUB Skillair®

Refer to the sections on the single modules for a further description, components and other technical data.

TECHNICAL DATA		V + FR + L 100		V + FR + L 200			V + FR + L 300		
Threaded port		1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"
Setting range		0 to 8 - 0 to 12		0 to 8 - 0 to 12			0 to 8 - 0 to 12		
Degree of filtration	µm	5 - 20 - 50		5 - 20 - 50			5 - 20 - 50		
Max. inlet pressure	MPa	1.5		1.3			1.3		
	bar	15		13			13		
	psi	217		188			188		
Flow rate at 6.3 bar ΔP 0.5 bar	Nl/min	300		1200			2300		
	scfm	11		43			82		
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	800		2400			4000		
	scfm	28		85			142		
Max temperature at 10 bar	°C	50		50			50		
	°F	122		122			122		
Weight	kg	1		1.8			3.2		
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70		
Fluid		Compressed air.							
Notes on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**							
		Do not take air from pressure gauge ports.							

SYNOPTIC, SIZES AND VERSIONS

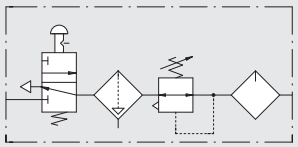
VFR+L	100	1/4	20	08	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	TYPE OF CONDEN-SATE DRAIN
VFRL+L	100	1/4	5 = 5 µm	08 = 0 to 8 bar	RMSA
		3/8	20 = 20 µm	012 = 0 to 12 bar	SAC
	200	1/4	50 = 50 µm		RMSA
		3/8			SAC
		1/2			RA
	300	1/2			RMSA
		3/4			RA
		1			

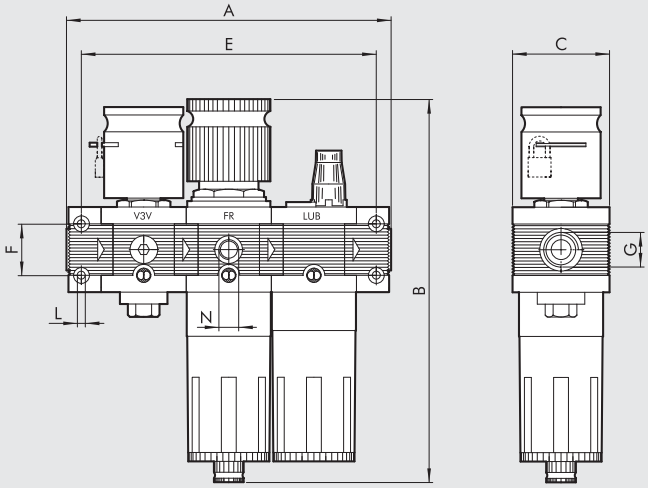
RMSA: drain with manual condensate discharge and automatic discharge at zero pressure

RA: automatic drain with condensate discharge, independent of pressure and flow rate. (for size 200, 300)

SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.** (for size 100 and 200)

DIMENSIONS V3V + FR + L





	V3V + FR + LUB 100		V3V + FR + LUB 200			V3V + FR + LUB 300		
Threaded port G	1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″
A	164		204.5			240		242
B RMSA	199		245			278		
RA	-		249			282		
SAC	203		249			282		
C	50		63			72		
E	149		189.5			222		
F	26		36			42		
L	M4 hole		M5 hole			M5 hole		
N (pressure gauge port)	1/8″		1/8″			1/8″		

ORDERING CODES

Code	Description
VFR+L Skillair® 100	
3272008	VFR+L 100 1/4 20 08 RMSA
3272011	VFR+L 100 1/4 20 012 RMSA
3372008	VFR+L 100 3/8 20 08 RMSA
3372011	VFR+L 100 3/8 20 012 RMSA
VFR+L Skillair® 200	
3472008	VFR+L 200 1/4 20 08 RMSA
3472011	VFR+L 200 1/4 20 012 RMSA
3572008	VFR+L 200 3/8 20 08 RMSA
3572011	VFR+L 200 3/8 20 012 RMSA
3672008	VFR+L 200 1/2 20 08 RMSA
3672011	VFR+L 200 1/2 20 012 RMSA
VFR+L Skillair® 300	
4472005	VFR+L 300 1/2 20 08 RMSA
4472008	VFR+L 300 1/2 20 012 RMSA
4572005	VFR+L 300 3/4 20 08 RMSA
4572008	VFR+L 300 3/4 20 012 RMSA
4672005	VFR+L 300 1 20 08 RMSA
4672008	VFR+L 300 1 20 012 RMSA

The following versions are available on request:
- with 5 µm or 50 µm degree of filtration
- with SAC or RA condensate discharge

FIL + LUB Skillair®

Refer to the sections on the single modules for a further description, components and other technical data.

TECHNICAL DATA		F + L 100		F + L 200			F + L 300			F + L 400		
Threaded port		1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	2"
Degree of filtration	µm	5 - 20 - 50		5 - 20 - 50			5 - 20 - 50			5 - 20 - 50			
Max. inlet pressure	MPa	1.5		1.3			1.3			1.3			
	bar	15		13			13			13			
	psi	217		188			188			188			
Flow rate at 6.3 bar ΔP 0.5 bar	Nl/min	600		1800			3200			9000			14000
	scfm	21		64			113			320			500
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	1200		3200			4500			-			-
	scfm	42		113			160			-			-
Max temperature at 10 bar	°C	50		50			50			50			
	°F	122		122			122			122			
Weight	kg	0.5		1.1			2.2			~ 8			
Wall fixing screws		M4 x 50		M5 x 60			M5 x 70			M6 x 110			
Fluid		Compressed air.											
Notes on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**											

SYNOPTIC, SIZES AND VERSIONS

F+L	100	1/4	20	RMSA
ELEMENT	SIZE	THAREADED PORT	DEGREE OF FILTRATION	TYPE OF CONDENSATE DRAIN
F+L	100	1/4	5 = 5 µm	RMSA
		3/8	20 = 20 µm	SAC
	200	1/4	50 = 50 µm	RMSA
		3/8		RA
		1/2		
	300	1/2		
		3/4		
		1		
	400	1		
		1 1/4		
		1 1/2		
		2		

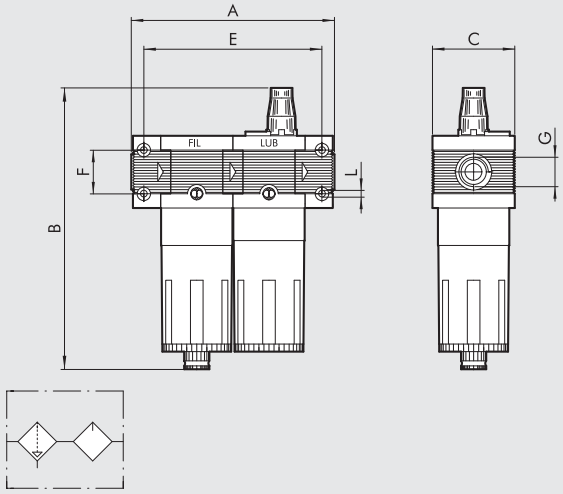
RMSA: drain with manual condensate discharge and automatic discharge at zero pressure

RA: automatic drain with condensate discharge, independent of pressure and flow rate. (for size 200, 300 and 400)

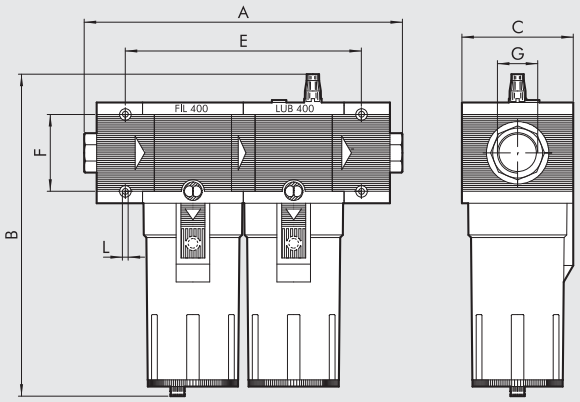
SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.** (for size 100 and 200)

DIMENSIONS FIL + LUB

100 - 200 - 300



400



		FIL + LUB 100		FIL + LUB 200			FIL + LUB 300			FIL + LUB 400			
Threaded port G		1/4″	3/8″	1/4″	3/8″	1/2″	1/2″	3/4″	1″	1″	1 1/4″	1 1/2″	2″
A		121		149			175		177	330 to 360			388 to 418
B	**RMSA**	172.5		203.5			223.5			349.5			
	RA	-		207.5			227.5			353.5			
	SAC	176.5		207.5			227.5			353.5			
C		50		63			72			116			
E		106		134			157			247			
F		26		36			42			80			
L		M4 hole		M5 hole			M5 hole			M6 hole			

ORDERING CODES

Code	Description
F+L Skillair® 100	
3285002	F+L 100 1/4 20 RMSA
3385002	F+L 100 3/8 20 RMSA
F+L Skillair® 200	
3485002	F+L 200 1/4 20 RMSA
3585002	F+L 200 3/8 20 RMSA
3685002	F+L 200 1/2 20 RMSA
F+L Skillair® 300	
4485002	F+L 300 1/2 20 RMSA
4585002	F+L 300 3/4 20 RMSA
4585005	F+L 300 3/4 20 RA
4685002	F+L 300 1 20 RMSA
F+L Skillair® 400	
6185002	F+L 400 1 20 RMSA
6185005	F+L 400 1 20 RA
6285002	F+L 400 1 1/4 20 RMSA
6385002	F+L 400 1 1/2 20 RMSA
6485002	F+L 400 2 20 RMSA

The following versions are available on request:
- with 5 µm or 50 µm degree of filtration
- with SAC or RA condensate discharge

FIL + DEP Skillair®

Refer to the sections on the single modules for a further description, components and other technical data.

TECHNICAL DATA			F + D 100		F + D 200			F + D 300			F + D 400			
Threaded port			1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	2"
Degree of filtration	Filter	µm	5		5			5			5			
	Depurator	µm	0.01		0.01			0.01			0.01			
Max. inlet pressure		MPa	1.5		1.3			1.3			1.3			
		bar	15		13			13			13			
		psi	217		188			188			188			
Max temperature at 10 bar		°C	50		50			50			50			
		°F	122		122			122			122			
Weight		kg	0.6		1.3			2.2			~ 7			
Wall fixing screws			M4 x 50		M5 x 60			M5 x 70			M6 x 110			
Maximun suggested flow rate			Please look at the flow rate curves at page **C3**.12											
Fluid			Compressed air.											
Notes on use			**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**											

SYNOPTIC, SIZES AND VERSIONS

F+D	100	1/4	5	RMSA
ELEMENT	SIZE	THREADED PORT	DEGREE OF FILTRATION	TYPE OF CONDENSATE DRAIN
F+D	100	1/4	5 = 5 µm	RMSA
		3/8		SAC
	200	1/4		RMSA
		3/8		RA
		1/2		
	300	1/2		
		3/4		
		1		
	400	1		
		1 1/4		
		1 1/2		
		2		

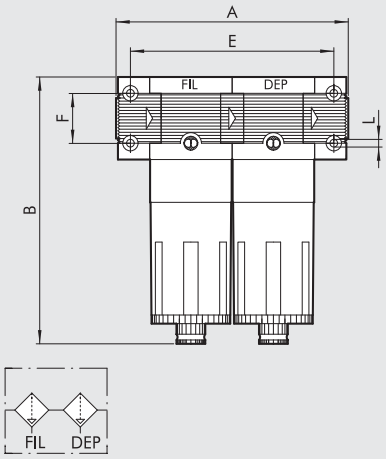
RMSA: drain with manual condensate discharge and automatic discharge at zero pressure

RA: automatic drain with condensate discharge, independent of pressure and flow rate. (for size 300 and 400)

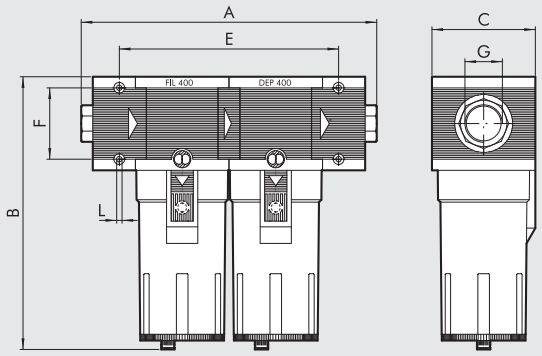
SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.** (for size 100 and 200)

DIMENSIONS FIL + DEP

100 - 200 - 300



400



		FIL + DEP 100		FIL + DEP 200			FIL + DEP 300			FIL + DEP 400			
Threaded port G		1/4"	3/8"	1/4"	3/8"	1/2"	1/2"	3/4"	1"	1"	1" 1/4"	1" 1/2"	2"
A		121		149			175		177	330 to 360			388 to 418
B	**RMSA**	144		175			195			320			
	RA	-		179			199			324			
	SAC	148		179			199			324			
C		50		63			72			116			
E		106		134			157			247			
F		26		36			42			80			
L		M4 hole		M5 hole			M5 hole			M6 hole			

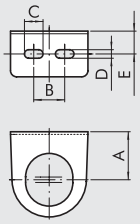
ORDERING CODES

Code	Description
F+D Skillair® 100	
3289001	F+D 100 1/4 5 RMSA-RMSA
3289005	F+D 100 1/4 5 SAC-RMSA
3289006	F+D 100 1/4 5 SAC-SAC
3389001	F+D 100 3/8 5 RMSA-RMSA
3389005	F+D 100 3/8 5 SAC-RMSA
3389006	F+D 100 3/8 5 SAC-SAC
F+D Skillair® 200	
3489001	F+D 200 1/4 5 RMSA-RMSA
3489005	F+D 200 1/4 5 SAC-RMSA
3489006	F+D 200 1/4 5 SAC-SAC
3589001	F+D 200 3/8 5 RMSA-RMSA
3589005	F+D 200 3/8 5 SAC-RMSA
3589006	F+D 200 3/8 5 SAC-SAC
3689001	F+D 200 1/2 5 RMSA-RMSA
3689005	F+D 200 1/2 5 SAC-RMSA
3689006	F+D 200 1/2 5 SAC-SAC

Code	Description
F+D Skillair® 300	
4489001	F+D 300 1/2 5 RMSA-RMSA
4489002	F+D 300 1/2 5 RA-RA
4589001	F+D 300 3/4 5 RMSA-RMSA
4589002	F+D 300 3/4 5 RA-RA
4689001	F+D 300 1 5 RMSA-RMSA
4689002	F+D 300 1 5 RA-RA
F+D Skillair® 400	
6189001	F+D 400 1 5 RMSA-RMSA
6189002	F+D 400 1 5 RA-RA
6289001	F+D 400 1 1/4 5 RMSA-RMSA
6289002	F+D 400 1 1/4 5 RA-RA
6389001	F+D 400 1 1/2 5 RMSA-RMSA
6389002	F+D 400 1 1/2 5 RA-RA
6489001	F+D 400 2 5 RMSA-RMSA
6489002	F+D 400 2 5 RA-RA

Skillair® ACCESSORIES

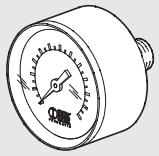
MOUNTING BRACKET FOR REG.

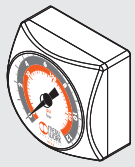


Code	Description
9200701	SF100- BIT-ND1/4
9400701	SF200-ND-3/8 1/2
9400702	SF300

Code	A	B	C	D	E
9200701	32	20	12	5.5	14.2
9400701	42	40	12	5.5	15
9400702	48	49	12	5.5	17

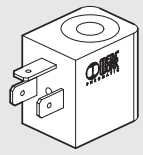
PRESSURE GAUGES





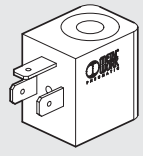
Code	Description
9700101	M 40 1/8 012
9700102	M 40 1/8 04
9800101	M 50 1/8 012
9800102	M 50 1/8 04
9900101	M 63 1/4 012
9700109	M 40x40 1/8 04
9700110	M 40x40 1/8 012

COIL 22 mm FOR APR AND V3V ELPN



Code	Description
W0215000151	Coil 22 Ø 8 BA 2W-12VDC
W0215000101	Coil 22 Ø 8 BA 2W-24VDC
W0215000111	Coil 22 Ø 8 BA 3.5VA-24VAC
W0215000121	Coil 22 Ø 8 BA 3.5VA-110VAC
W0215000131	Coil 22 Ø 8 BA 3.5VA-220VAC

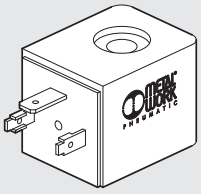
COIL 22 mm FOR APR AND V3V ELPN



Code	Description
W0215000251	Coil 22 Ø 8 BA 2W-12VDC UR
W0215000201	Coil 22 Ø 8 BA 2W-24VDC UR
W0215000211	Coil 22 Ø 8 BA 3.5VA-24VAC UR
W0215000221	Coil 22 Ø 8 BA 3.5VA-110VAC UR
W0215000231	Coil 22 Ø 8 BA 3.5VA-220VAC UR

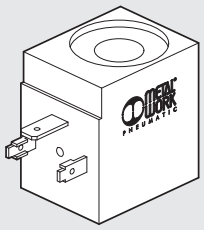
c UL us

COIL 30 mm FOR APR AND V3V ELPN



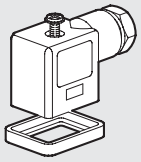
Code	Description
W0210010100	Coil 30 Ø 8 2W-24VDC
W0210011100	Coil 30 Ø 8 3.5VA-24VAC 50/60 HZ
W0210012100	Coil 30 Ø 8 3.5VA-110VAC 50/60 HZ
W0210013100	Coil 30 Ø 8 3.5VA-220VAC 50/60 HZ

COIL FOR CDV CDML LUBRICATOR



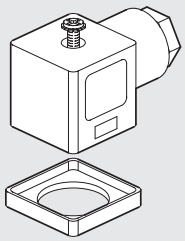
Code	Description
W0216001001	Coil 24 V CC
W0216001011	Coil 24V 50/60HZ
W0216001021	Coil 110V 50/60HZ
W0216001031	Coil 220V 50/60HZ

ELECTRIC CONNECTOR 22 mm FOR APR AND V3V ELPN



Code	Description
W0970510011	Connector standard
W0970510012	Connector 22 LED 24V
W0970510013	Connector 22 LED 110V
W0970510014	Connector 22 LED 220V
W0970510015	Connector 22 LED VDR 24V
W0970510016	Connector 22 LED VDR 110V
W0970510017	Connector 22 LED VDR 220V
W0970510070	Connector 22 ATEX II 2 GD

ELECTRIC CONNECTOR 30 mm FOR APR AND V3V ELPN

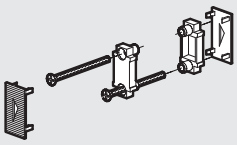


Code	Description
W0970520033	Connector 30 STD
W0970520034	Connector 30 LED 24V
W0970520035	Connector 30 LED 110V
W0970520036	Connector 30 LED 220V
W0970520037	Connector 30 LED VDR 24V
W0970520038	Connector 30 LED VDR 110V
W0970520039	Connector 30 LED VDR 220V

Skillair® SPARE PARTS

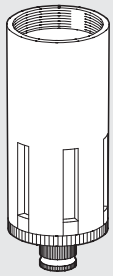
METAL WORK PNEUMATIC

CONNECTOR KIT FOR SKILLAIR CODE A



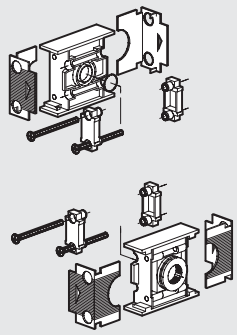
Code	Description
9230301	Connector kit 100
9330301	Connector kit 200
9430301	Connector kit 300
9630301	Connector kit 400

FILTER BOWL



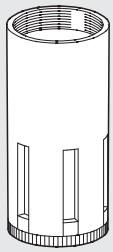
Code	Description
9253301	Spares TF 100 RMSA
9255301	Spares TF 100 SAC
9353301	Spares TF 200 RMSA
9355301	Spares TF 200 SAC
9453401	Spares TF 300 RA
9453301	Spares TF 300 RMSA
9653401	Spares TF 400 RA
9653301	Spares TF 400 RMSA

INPUT/OUTPUT END PLATE KIT



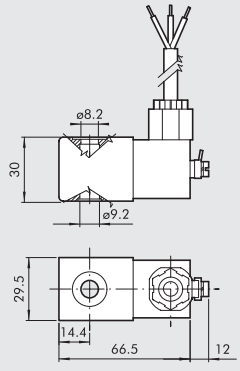
Code	Description
9230401	IN/OUT end plate kit 100 1/4
9330501	IN/OUT end plate kit 100 3/8
9330601	IN/OUT end plate kit 200 1/4
9330701	IN/OUT end plate kit 200 3/8
9330801	IN/OUT end plate kit 200 1/2
9430701	IN/OUT end plate kit 300 1/2
9530901	IN/OUT end plate kit 300 3/4
9531001	IN/OUT end plate kit 300 1
9631001	IN/OUT end plate kit 400 1
9631101	IN/OUT end plate kit 400 1 1/4
9631201	IN/OUT end plate kit 400 1 1/2
9631301	IN/OUT end plate kit 400 2

LUBRICATOR BOWL



Code	Description
9253501	Spares TL 100
9202503	Spares TL 100 CA
9202502	Spares TL 100 CD
9202501	Spares TL 100 ML
9353501	Spares TL 200
9302501	Spares TL 200 CA
9302503	Spares TL 200 CD
9302502	Spares TL 200 ML
9453501	Spares TL 300
9202401	Spares TL 300 CA
9202403	Spares TL 300 CD
9202402	Spares TL 300 ML
9653501	Spares TL 400
9653502	Spares TL 400 CA
9653504	Spares TL 400 CD
9653503	Spares TL 400 ML

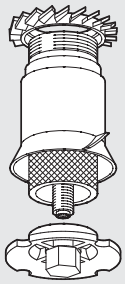
KIT FOR COIL EEXM (FOR V3V-APR-LUB)



Code	Description
0227606913	Kit for coil 30 24 VDC EEXMT5 cable 3 m
0227606915	Kit for coil 30 24 VDC EEXMT5 cable 5 m
0227608013	Kit for coil 30 24 VAC EEXMT5 cable 3 m
0227608015	Kit for coil 30 24 VAC EEXMT5 cable 5 m
0227608023	Kit for coil 30 110 VAC EEXMT5 cable 3 m
0227608025	Kit for coil 30 110 VAC EEXMT5 cable 5 m
0227608033	Kit for coil 30 230 VAC EEXMT5 cable 3 m
0227608035	Kit for coil 30 230 VAC EEXMT5 cable 5 m

According to Atex 94/9 CE rule,
Ⓔx II 2G Ex mb IIC T4/T5 Gb
Ⓔx II 2D Ex tb IIIC T130/T95 °C IP66 Db

FILTERING ELEMENTS



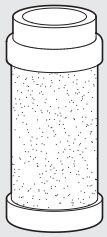
Code	Description
9251705	Spares FP 100 5
9251706	Spares FP 100 20
9251707	Spares FP 100 50
9351705	Spares FP 200 5
9351706	Spares FP 200 20
9351707	Spares FP 200 50
9451705	Spares FP 300 5
9451706	Spares FP 300 20
9451707	Spares FP 300 50
9651705	Spares FP 400 5
9651706	Spares FP 400 20
9651707	Spares FP 400 50

KIT COIL SIDE 22 IP65 (FOR V3V-APR-LUB)

Code	Description
0222100100	Kit for coils 22 - IP65

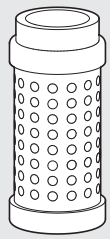
Improved IP65 protection, even after prolonged exposure to atmospheric agents. Applicable to valves with a technopolymer control.

FILTERING/PURIFICATION ELEMENTS



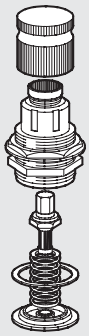
Code	Description
9251711	Spares FP DEP. 100
9351711	Spares FP DEP. 200
9451711	Spares FP DEP. 300
9651711	Spares FP DEP. 400

CARTRIDGE AC



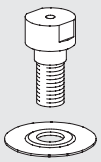
Code	Description
9251713	Spares cartridge 100 AC
9351713	Spares cartridge 200 AC
9451713	Spares cartridge 300 AC
9651712	Spares cartridge 400 AC

UPPER COVER FOR REGULATOR AND FR



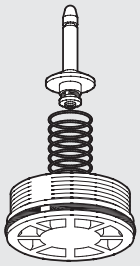
Code	Description
9250800	Spares CS 100 02
9250810	Spares CS 100 04
9250811	Spares CS 100 08
9250812	Spares CS 100 012
9350800	Spares CS 200 02
9350810	Spares CS 200 04
9350811	Spares CS 200 08
9350812	Spares CS 200 012
9450805	Spares CS 300 04
9450806	Spares CS 300 08
9450807	Spares CS 300 012
9450808	Spares CS 300 02

VENTURI LUBRICATOR DIAPHRAGM



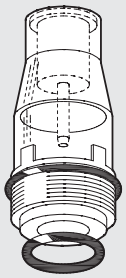
Code	Description
9252001	Spares MB 100 ND 1/4
9352001	Spares MB 200 ND 3/8-1/2
9452001	Spares MB 300
9652601	Spares MB 400

COMPLETE POPPET FOR REGULATORS



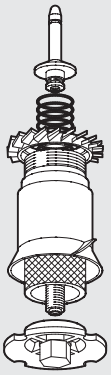
Code	Description
9250704	Spares OTR 100
9350704	Spares OTR 200
9450704	Spares OTR 300
9650704	Spares OTR 400

TRANSPARENT LUBRICATOR COVER



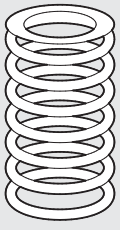
Code	Description
9251302	Spares CVL 100-200-300-400 BIT

COMPLETE POPPET FOR FR



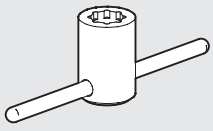
Code	Description
9250902	Spares OTFR 100 5
9250903	Spares OTFR 100 20
9250904	Spares OTFR 100 50
9350902	Spares OTFR 200 5
9350903	Spares OTFR 200 20
9350904	Spares OTFR 200 50
9450902	Spares OTFR 300 5
9450903	Spares OTFR 300 20
9450904	Spares OTFR 300 50

SPRINGS FOR REDUCERS AND FRS



Code	Description
9250605	Spares MO 100 02
9250606	Spares MO 100 04
9250607	Spares MO 100 08
9250608	Spares MO 100 012
9350605	Spares MO 200 02
9350606	Spares MO 200 04
9350607	Spares MO 200 08
9350608	Spares MO 200 012
9450605	Spares MO 300 04
9450606	Spares MO 300 08
9450607	Spares MO 300 012
9450608	Spares MO 300 02

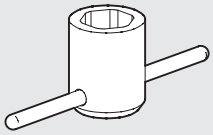
UPPER COVER DISASSEMBLY SPANNER



Code	Description
9220701	Spares cover spanner

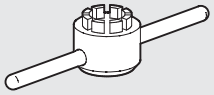
METAL WORK PNEUMATIC

REG AND FR VISUAL DOME DISASSEMBLY SPANNER



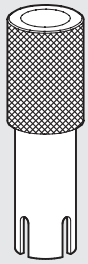
Code	Description
9220401	Spares dome dis. spanner 100
9323401	Spares dome dis. spanner 200
9420401	Spares dome dis. spanner 300

POPPET DISASSEMBLY SPANNER (FOR REG.)



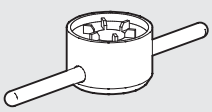
Code	Description
9220501	Spares R cap disass. WR. 100
9323501	Spares R cap disass. WR. 200
9420501	Spares R cap disass. WR. 300

POPPET DISASSEMBLY SPANNER (FOR FR)



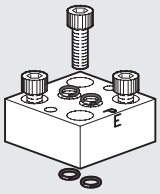
Code	Description
9220801	Spares FR cap disass. WR. 100
9320801	Spares FR cap disass. WR. 200
9420801	Spares FR cap disass. WR. 300

CAP DISASSEMBLY SPANNER



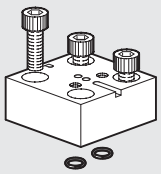
Code	Description
9220601	Spares cap disass. 100
9323601	Spares cap disass. 200
9420601	Spares cap disass. 300

PROVISION FOR SOLENOID CONTROL TO CNOMO FOR APR-300



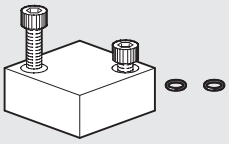
Code	Description
9454001	Spares PCE to Cnomo

PROVISION FOR MICRO SOLENOID CONTROL FOR APR-300



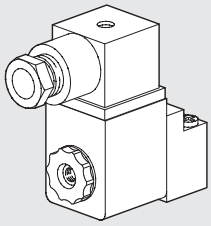
Code	Description
9453601	Spares PCE micro

PROVISION FOR PNEUMATIC CONTROL FOR APR-300



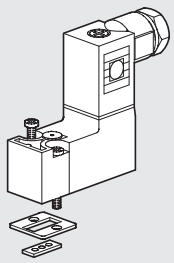
Code	Description
9453701	Spares PCP pneumatic

CNOMO SOLENOID CONTROL FOR APR-300 and V3V 300



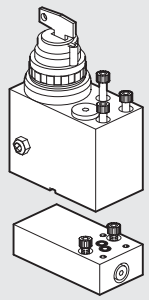
Code	Description
9453901	Spares CEC Cnomo 24CC
9453902	Spares CEC Cnomo 24V
9453903	Spares CEC Cnomo 110V
9453904	Spares CEC Cnomo 220V

MICRO SOLENOID CONTROL FOR APR-300 and V3V 300 (NO MORE IN THE CATALOGUE)



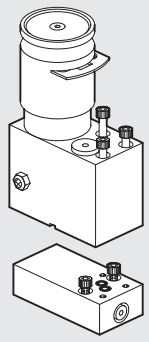
Code	Description
9453801	Spares CEM micro 24CC
9453802	Spares CEM micro 24V
9453803	Spares CEM micro 110V
9453804	Spares CEM micro 220V

KEY-OPERATED V3V 400



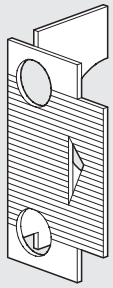
Code	Description
9455401	Spares kit C.C. 400

MANUAL LOCKABLE V3V 400



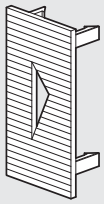
Code	Description
9455601	Spares kit lockable 400

INPUT/OUTPUT COVER PLATE



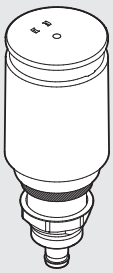
Code	Description
9152103	Spares OUTPUT cover plate 100
9152105	Spares INPUT cover plate 100
9152115	Spares OUTPUT cover plate 200
9152116	Spares INPUT cover plate 200
9152104	Spares OUTPUT cover plate 300
9152106	Spares INPUT cover plate 300
9152118	Spares OUTPUT cover plate 400
9152119	Spares INPUT cover plate 400

INTERMEDIATE COVER PLATE



Code	Description
9152107	Spares intermediate cover plate 100
9152114	Spares intermediate cover plate 200
9152108	Spares intermediate cover plate 300
9152117	Spares intermediate cover plate 400

AUTOMATIC DRAIN (RA)



Code	Description
9000802	Spares RA automatic drain

AUTOMATIC DRAIN (SAC)

Code	Description
9000803	Spares SAC automatic drain

NOTES

METAL WORK PNEUMATIC

NOTES

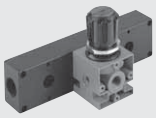
NOTES

NOTES

SUMMARY New deal

	● GENERAL TECHNICAL DATA New deal	C4.4
	● New deal FILTER	C4.6
	● New deal DEPURATOR	C4.9
	● New deal REGULATOR	C4.11
	● New deal PADLOCKABLE REGULATOR	C4.14
	● New deal PILOT-ASSISTED REGULATOR	C4.16
	● New deal REGULATOR AND REGULATOR WITH V3V 3/4"-1"	C4.17
	● New deal FILTER REGULATOR	C4.20
	● New deal LUBRICATOR	C4.23
	● New deal SHUT-OFF VALVE	C4.26
	● New deal 3/4"-1" SHUT-OFF VALVE	C4.28

● **New deal AIR TAKE-OFF** C4.30



● **New deal SUB-BASE** C4.31

● **New deal AUTOMATIC CONDENSATE DRAIN** C4.32

● **FIL + REG + LUB New deal** C4.33

● **FRPL 3/4"-1" New deal** C4.35

● **FR + LUB New deal** C4.37

● **V3V + FR + LUB New deal** C4.39

● **FIL + DEP New deal** C4.41

● **FIL + LUB New deal** C4.43

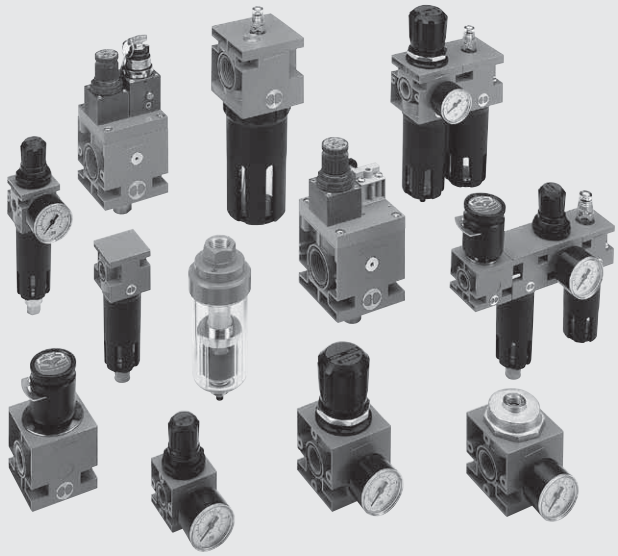
● **New deal ACCESSORIES** C4.45

● **New deal SPARE PARTS** C4.47

GENERAL TECHNICAL DATA Newdeal

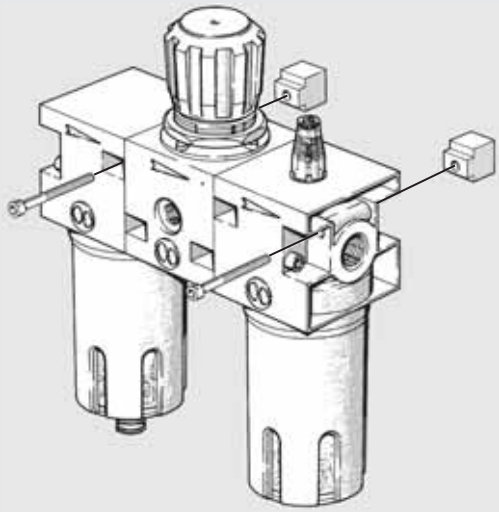
Newdeal is the forerunner of all air treatment units by Metal Work.
The entire range is top quality, heavy-duty and reliable.
These units are designed for use at high pressures* and in applications where the temperature and quality of the ambient area are critical.

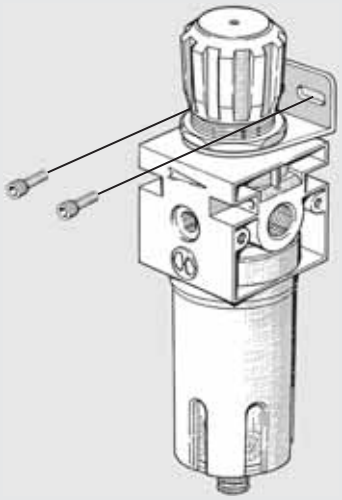
*For further details, refer to the Specification for the item in question.



TECHNICAL DATA		ND 1/4"	ND 3/8"	ND 1/2"	ND 3/4"	ND 1"
Threaded port		1/4"	3/8"	1/2"	3/4"	1"
Degree of filtration	µm	4 - 20 - 50				
Degree of purification	µm	99.97% at 0.01				
Setting range	bar	0 to 2 - 0 to 4 - 0 to 8 - 0 to 12				
Max. input pressure	MPa	1.8				
	bar	18				
	psi	261				
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	from 200 at 12000				
Fluid		Lubricated or unlubricated compressed air				
Temperature range at 1 MPa; 10 bar; 145 psi	°C	–10 to +50				
	°F	14 to 122				
Elements comprising the range		Filter, Depurator, Regulator, Pilot operated Regulator, In-series Regulator, Filter-regulator, Lubricator, Circuit Shut-off Valve				
Compatibility with oils		See **chapter Z1**				

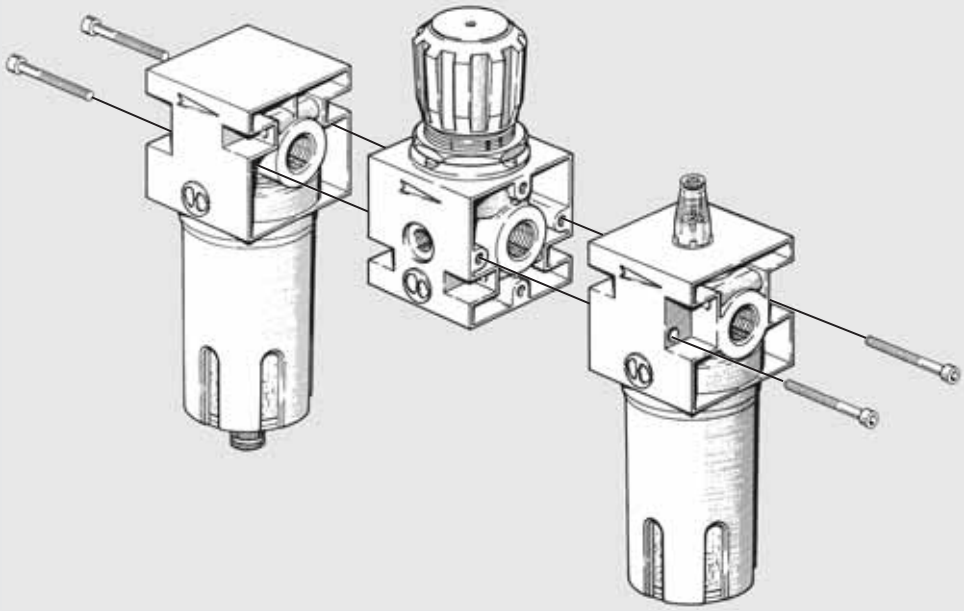
WALL MOUNTING



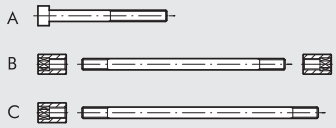


METAL WORK PNEUMATIC

ASSEMBLY DIAGRAM



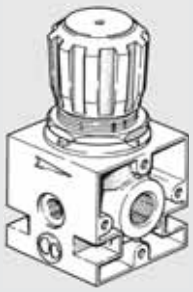
ASSEMBLY TIE RODS



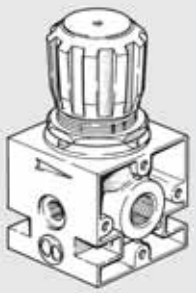
Elements that can be assembled	1/4			3/8 - 1/2			3/4 - 1		
	Type	Code	Ref.	Type	Code	Ref.	Type	Code	Ref.
F/L + R/FR	A	**9250001**	CVA 1/4 4x40	A	**9450001**	CVA 1/2 5x55	A	**9650001**	CVA 1 6x70
V3V + R/FR	A	**9250001**	CVA 1/4 4x40	A	**9450002**	CVA 1/2 5x60	-	-	-
V3V + F/L + R/FR	A	**9250002**	CVA 1/4 4x82	A	**9450003**	CVA 1/2 5x120	C	**9604402**	V3V + F + R T 3/4-1
F/L/D + F/L/D	B	**9200901**	F + L T 1/4	B	**9400901**	F + L T 3/8-1/2	B	**9600901**	F + L T 3/4-1

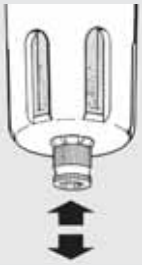
GENERAL RULES - USE AND MAINTENANCE

The knob can be locked so that the set pressure cannot be altered.

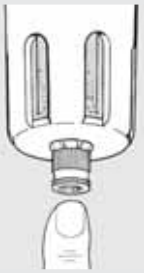


The air pressure must always be set upwards.

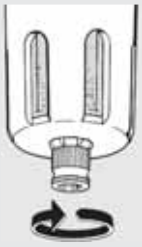




With the knob in the centre position, the drain is semi-automatic.
The drain operates when the bowl is not pressurized and closes when it is.



Press the button to drain condensate when the bowl is pressurized.



Turn the knob anticlockwise to close the valve with bowl pressurized or not pressurized.

To clean or replace the filter element unscrew the screen of the centrifuge assembly. Use a no. 3 compass spanner to unscrew the bowl.

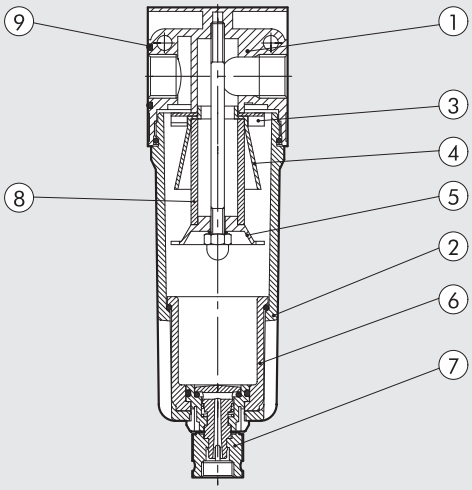
New deal FILTER

Filter with different impurity filtration degrees.
- Metal bowl with external viewing
- Semi-automatic and condensate drainage

TECHNICAL DATA		FIL ND 1/4"	FIL ND 3/8"	FIL ND 1/2"	FIL ND 3/4"	FIL ND 1"
Threaded port		1/4"	3/8"	1/2"	3/4"	1"
Degree of filtration	µm	4 - 20 - 50	4 - 20 - 50		4 - 20 - 50	
Max. inlet pressure	MPa	1.8	1.8		1.8	
	bar	18	18		18	
	psi	261	261		261	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	1300	3100		9100	
	scfm	46	110		324	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	1720	4100		11000	
	scfm	61	146		391	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50°	50°		50°	
	°F	122°	122°		122°	
Weight	kg	0.4	0.9		1.2	
Wall fixing screws		M4 x 40	M4 x 55		M6 x 75	
Bowl capacity	cm^3	10	45		170	
Mounting position		Vertical	Vertical		Vertical	
Drain		RMSA - SAC	RMSA - SAC - RA		RMSA - RA	
		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure. RA: automatic drain with condensate discharge, independent of pressure and flow rate. SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**				
Fluid		Compressed air				
Note on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**				

COMPONENTS

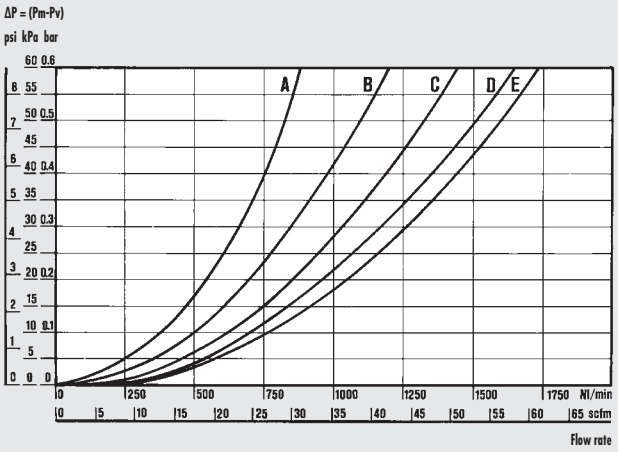
① Zamak body
② Aluminium bowl
③ Technopolymer centrifuge
④ Technopolymer baffle plug
⑤ Technopolymer screen
⑥ Clear technopolymer bowl
⑦ Drain (RMSA)
⑧ HDPE bronze filter cartridge (1/4 - 3/8 - 1/2), sintered bronze (1")
⑨ NBR gaskets



METAL WORK PNEUMATIC

FLOW CHARTS

FIL 1/4



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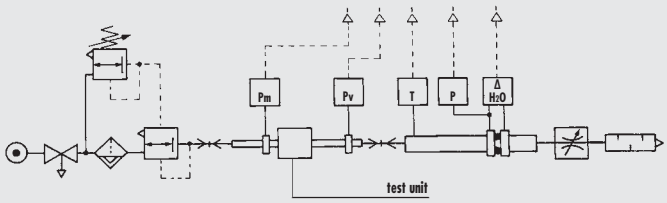
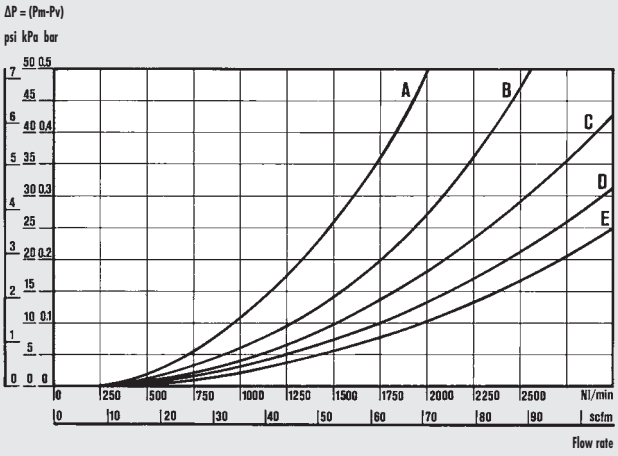


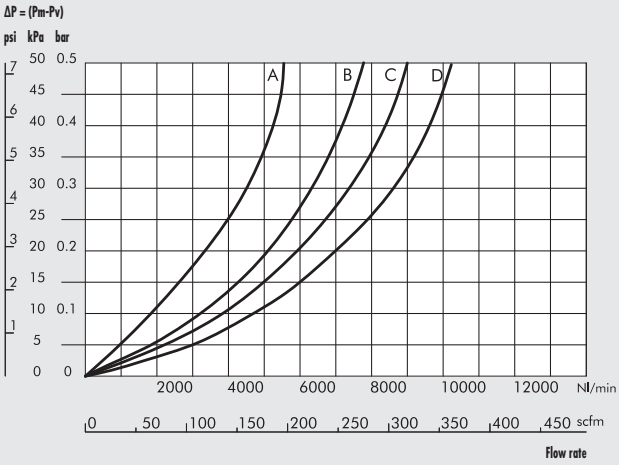
• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

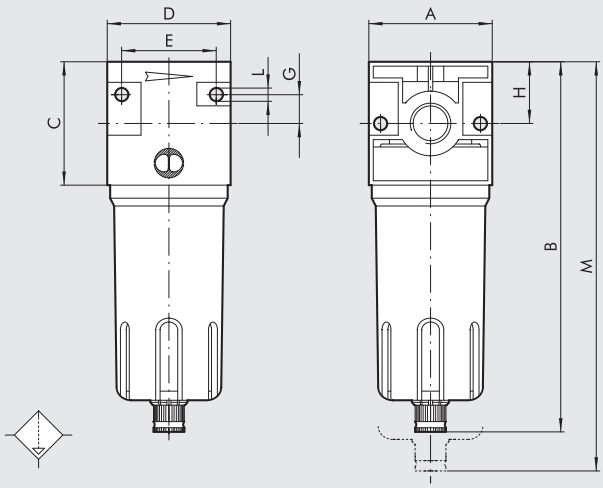
FIL 3/8 - 1/2



FIL 3/4 - 1"



DIMENSIONS



		FIL ND 1/4"	FIL ND 3/8"	FIL ND 1/2"	FIL ND 3/4"	FIL ND 1"
Threaded port		1/4"	3/8"	1/2"	3/4"	1"
A		42	60		80	
B	RMSA	142	180		235	
	RA	-	184		239	
	SAC	146	184		239	
C		42	60		80	
D		42	60		80	
E		32	46		66	
G		10	14		22	
H		21	30		40	
L		M4 hole	M4 hole		M6 hole	
M	RMSA	185	230		325	
	RA	-	234		329	
	SAC	189	234		329	

SYNOPTIC, SIZES AND VERSIONS

FIL ELEMENT	1/4 THREADED PORT	4 DEGREE OF FILTRATION	RMSA TYPE OF CONDENSATE DRAIN
FIL.	1/4	4 µm	RMSA
		20 µm	SAC
	3/8	50 µm	RMSA
	1/2		SAC
			RA
	3/4		RMSA
	1		RA

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

ORDERING CODES

Code	Description
New deal FILTER 1/4"	
1221005	FIL 1/4 4 RMSA
1221013	FIL 1/4 4 SAC
1221006	FIL 1/4 20 RMSA
1221014	FIL 1/4 20 SAC
1221008	FIL 1/4 50 RMSA
1221016	FIL 1/4 50 SAC
New deal FILTER 3/8"	
1321005	FIL 3/8 4 RMSA
1321009	FIL 3/8 4 RA
1321013	FIL 3/8 4 SAC
1321006	FIL 3/8 20 RMSA
1321010	FIL 3/8 20 RA
1321014	FIL 3/8 20 SAC
1321008	FIL 3/8 50 RMSA
1321012	FIL 3/8 50 RA
1321016	FIL 3/8 50 SAC
New deal FILTER 1/2"	
1421005	FIL 1/2 4 RMSA
1421009	FIL 1/2 4 RA
1421013	FIL 1/2 4 SAC
1421006	FIL 1/2 20 RMSA
1421010	FIL 1/2 20 RA
1421014	FIL 1/2 20 SAC
1421008	FIL 1/2 50 RMSA
1421012	FIL 1/2 50 RA
1421016	FIL 1/2 50 SAC
New deal FILTER 3/4"	
1521005	FIL 3/4 4 RMSA
1521009	FIL 3/4 4 RA
1521006	FIL 3/4 20 RMSA
1521010	FIL 3/4 20 RA
1521008	FIL 3/4 50 RMSA
1521012	FIL 3/4 50 RA
New deal FILTER 1"	
1621005	FIL 1 4 RMSA
1621009	FIL 1 4 RA
1621006	FIL 1 20 RMSA
1621010	FIL 1 20 RA
1621008	FIL 1 50 RMSA
1621012	FIL 1 50 RA

NOTES

Newdeal DEPURATOR

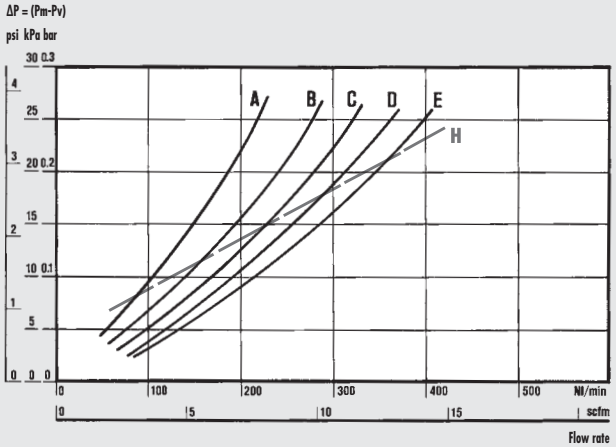
METAL WORK PNEUMATIC

Oil-proof depurator with coalescing cartridge
- Metal bowl with external viewing
- Manual/semi-auto or automatic condensate drain

TECHNICAL DATA		DEP ND 3/8"	DEP ND 1/2"
Threaded port		3/8"	1/2"
Degree of depuration	µm	99.97% a 0.01	
Max. inlet pressure	MPa	1.8	
	bar	18	
	psi	261	
Maximum suggested flow rate		please look at the flow rate curves	
Suggested flow rate at 6 bar	Nl/min	230	
	scfm	8	
Fluid		Filtered air 4 µm	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	kg	0.9	
Wall fixing screws		M4 x 55	
Bowl capacity	cm^3	45	
Mounting position		Vertical	
Drain		RMSA - SAC - RA	
		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.	
		RA: automatic drain with condensate discharge, independent of pressure and flow rate.	
		SAC: automatic drain with condensate discharge.	
		Operates by depression – requires variable air take-offs.	
Note on use		It is advisable to mount a 4 µm filter upstream the depurator acting as a rough filter.	
		The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.	

FLOW CHARTS

D 3/8 - 1/2



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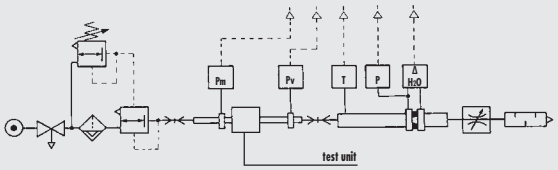
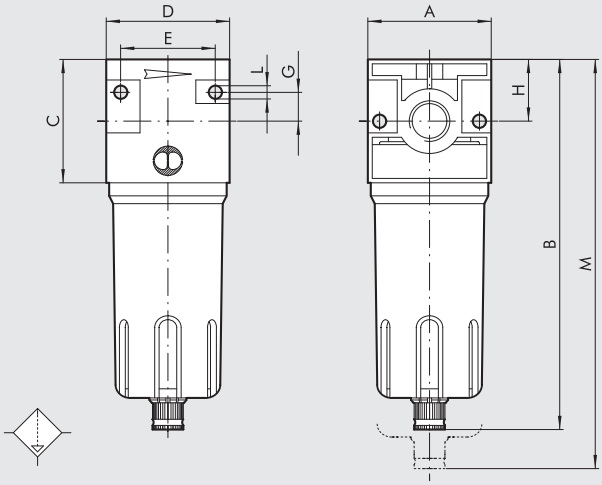


- Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi
(H) = maximum flow rate recommended for optimal operation

DIMENSIONS



		DEP ND 3/8″	DEP ND 1/2″
Threaded port		3/8″	1/2″
A		60	
B	**RMSA**	180	
	RA	184	
	SAC	184	
C		60	
D		60	
E		46	
G		14	
H		30	
L		M4 hole	
M	**RMSA**	230	
	RA	234	
	SAC	234	

SYNOPTIC, SIZES AND VERSIONS

DEP	3/8	RMSA
ELEMENT	**THREADED PORT**	**CONDENSATE DRAIN**
DEP	3/8 1/2	RMSA RA SAC

RMSA: Manual/semi-auto drain
RA: Automatic drain. Float-type operation irrespective of the pressure and flow rate.
SAC: Automatic drain. **Operates by depression - requires variable air take-offs**.

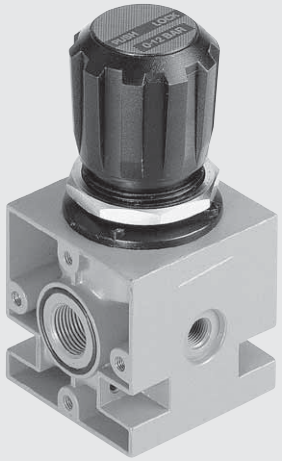
ORDERING CODES

Code	Description
DEPURATOR 3/8″	
1322002	DEP 3/8 RMSA
1322003	DEP 3/8 RA
1322004	DEP 3/8 SAC
DEPURATOR 1/2″	
1422002	DEP 1/2 RMSA
1422003	DEP 1/2 RA
1422004	DEP 1/2 SAC

NOTES

New deal REGULATOR

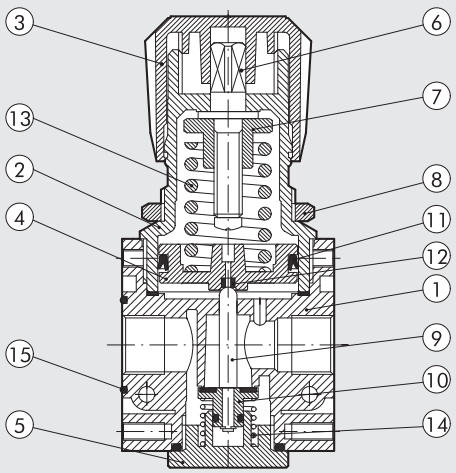
Highly reliable, heavy-duty piston-operated regulator.
- Stability of the set pressure as the upstream pressure varies
- Standard overpressure blowoff valve
- Can be fixed to the wall using the holes is the sides of the body.



TECHNICAL DATA		REG ND 1/4"	REG ND 3/8"	REG ND 1/2"	REG ND 3/4"	REG ND 1"
Threaded port		1/4"	3/8"	1/2"	3/4"	1"
Setting range	bar	0 to 4 - 0 to 8 - 0 to 12	0 to 4 - 0 to 8 - 0 to 12		0 to 4 - 0 to 8 - 0 to 12	
Max. inlet pressure	MPa	1.8	1.8		1.8	
	bar	18	18		18	
	psi	261	261		261	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	200	1100		2500	
	scfm	7	39		89	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	650	2500		4500	
	scfm	23	89		160	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	50		50	
	°F	122	122		122	
Weight	kg	0.3	0.8		1.5	
Wall fixing screws		M4 x 40	M4 x 55		M6 x 75	
Gauge port		1/8"	1/8"		1/4"	
Mounting position		In any position				
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.				
Note on use		The regulator pressure must always be set upwards.				
		For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value.				
		Do not take off air from gauge ports.				

COMPONENTS

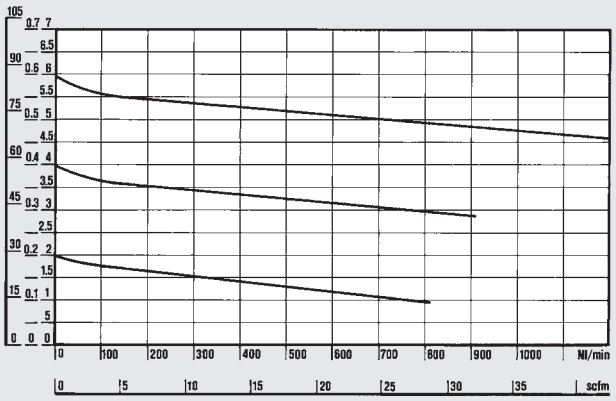
① Zamak body
② Technopolymer bell
③ Technopolymer knob
④ Technopolymer piston rod
⑤ Technopolymer plug
⑥ OT58 brass adjusting screw
⑦ OT58 brass nut
⑧ Ring nut : technopolymer (ND 1/4-3/8-1/2) brass (ND 3/4-1)
⑨ OT brass rod
⑩ Valve with NBR vulcanized gasket
⑪ NBR lip seal
⑫ NBR relieving seal
⑬ Steel adjusting spring
⑭ Steel valve compression spring
⑮ NBR gaskets



FLOW CHARTS

REG 1/4

Pm = 0.7 MPa - 7 bar - 100 psi
Inlet pressure
psi MPa bar



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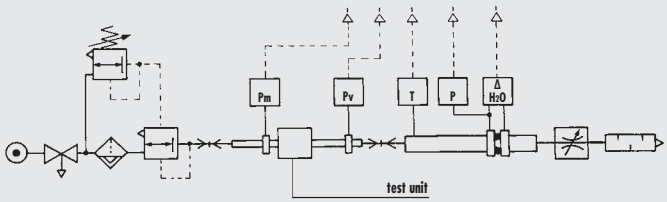
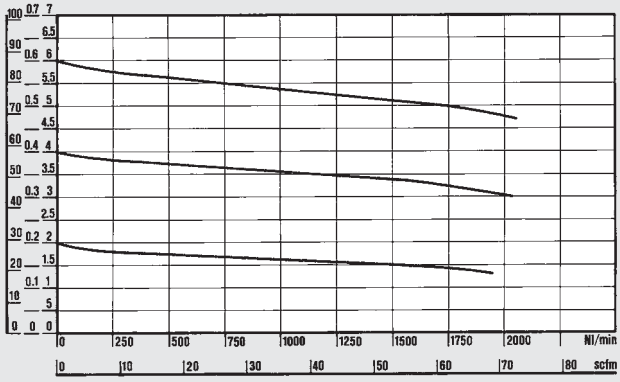


• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

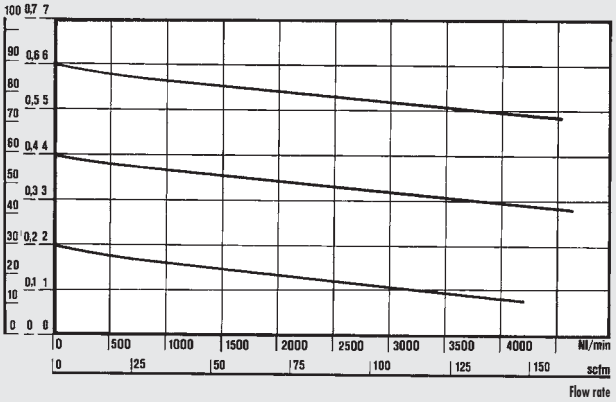
REG 3/8 - 1/2

Pm = 0.7 MPa - 7 bar - 100 psi
Inlet pressure
psi MPa bar

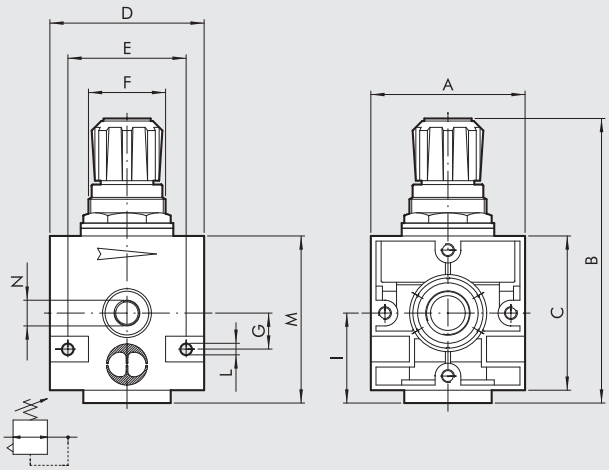


REG 3/4 - 1″

Pm = 0.7 MPa - 7 bar - 100 psi
Inlet pressure
psi MPa bar



DIMENSIONS



	REG ND 1/4″	REG ND 3/8″	REG ND 1/2″	REG ND 3/4″	REG ND 1″
Threaded port	1/4″	3/8″	1/2″	3/4″	1″
A	42	60		80	
B	94	130		184	
C	42	60		80	
D	42	60		80	
E	32	46		66	
F	30 x 1.5	38 x 2		55 x 2	
G	10	14		22	
I	25	35		47	
L	M4 hole	M4 hole		M6 hole	
M	49	70		94	
N (pressure gauge port)	1/8″	1/8″		1/4″	

SYNOPTIC, SIZES AND VERSIONS

REG	1/4	04
ELEMENT	THREADED PORT	SETTING RANGE
REG	1/4 3/8 1/2 3/4 1	04 = 0 to 4 bar 08 = 0 to 8 bar 012 = 0 to 12 bar

ORDERING CODES

Code	Description
New deal REGULATOR 1/4"	
1202001	REG 1/4 04
1202002	REG 1/4 08
1202003	REG 1/4 012
1202004	REG 1/4 02
New deal REGULATOR 3/8"	
1302001	REG 3/8 04
1302002	REG 3/8 08
1302003	REG 3/8 012
New deal REGULATOR 1/2"	
1402001	REG 1/2 04
1402002	REG 1/2 08
1402003	REG 1/2 012
New deal REGULATOR 3/4"	
1502001	REG 3/4 04
1502002	REG 3/4 08
1502003	REG 3/4 012
New deal REGULATOR 1"	
1602001	REG 1 04
1602002	REG 1 08
1602003	REG 1 012

NOTES

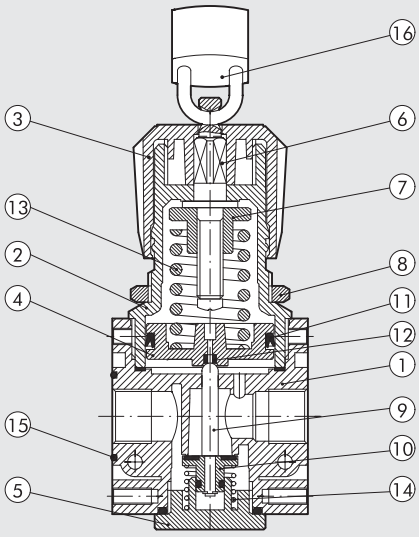
New deal PADLOCKABLE REGULATOR

The New deal padlockable regulator has a pin with a hole in it that projects from the top of the knob. When the knob is in the push-lock position, the padlock can be inserted in the hole, preventing the knob from being operated. A padlock and two keys are supplied with the regulator.

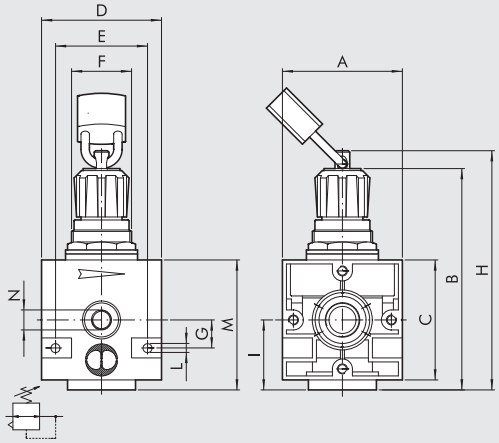
Refer to the regulator for technical data and flow curves.

COMPONENTS

① Zamak body
② Technopolymer bell
③ Technopolymer knob
④ Technopolymer piston rod
⑤ Technopolymer plug
⑥ Nickel-plated brass OT58 adjusting screw
⑦ OT58 brass nut
⑧ Technopolymer ring nut
⑨ OT brass rod
⑩ Valve with NBR vulcanized gasket
⑪ NBR lip seal
⑫ NBR relieving seal
⑬ Steel adjusting spring
⑭ Steel valve compression spring
⑮ NBR gaskets
⑯ Padlock



DIMENSIONS



	REG KEY ND 1/4"	REG KEY ND 3/8"	REG KEY ND 1/2"
Threaded port	1/4"	3/8"	1/2"
A	42	60	
B	90 to 94	126 to 130	
C	42	60	
D	42	60	
E	32	46	
F	30 x 1.5	38 x 2	
G	10	14	
H	96	131	
I	25	35	
L	M4 hole	M4 hole	
M	49	70	
N (pressure gauge port)	1/8"	1/8"	

SYNOPTIC, SIZES AND VERSIONS

REG KEY	1/4	02
ELEMENT	THREADED PORT	SETTING RANGE
REG KEY = padlockable regulator	1/4	02 = 0 to 2 bar 04 = 0 to 4 bar 08 = 0 to 8 bar 012 = 0 to 12 bar
	3/8 1/2	04 = 0 to 4 bar 08 = 0 to 8 bar 012 = 0 to 12 bar

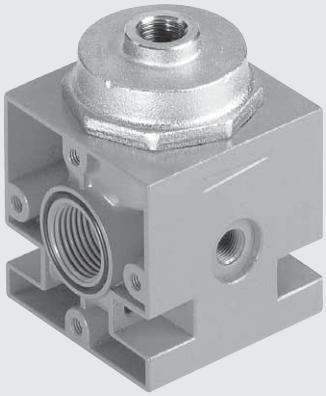
ORDERING CODES

Code	Description
New deal PADLOCKABLE REGULATOR 1/4"	
1210011	REG KEY 1/4 02
1210012	REG KEY 1/4 04
1210013	REG KEY 1/4 08
1210014	REG KEY 1/4 012
New deal PADLOCKABLE REGULATOR 3/8"	
1310012	REG KEY 3/8 04
1310013	REG KEY 3/8 08
1310014	REG KEY 3/8 012
New deal PADLOCKABLE REGULATOR 1/2"	
1410012	REG KEY 1/2 04
1410013	REG KEY 1/2 08
1410014	REG KEY 1/2 012

NOTES

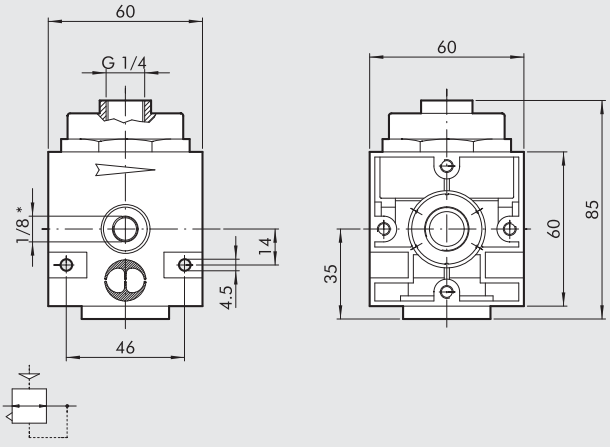
New deal PILOT-ASSISTED REGULATOR

Remote pilot-assisted piston regulator for heavy-duty use.
- Stability of the set pressure as the upstream pressure varies;
- Can be fixed to the wall using the holes is the sides of the body.



TECHNICAL DATA		REG PIL 3/8″	REG PIL 1/2″
Threaded port		3/8″	1/2″
Setting range	bar	Depending on pilot	
Max. inlet pressure	MPa	1.8	
	bar	18	
	psi	261	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	3500	
	scfm	124	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	4500	
	scfm	160	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	kg	0.8	
Wall fixing screws		M4 x 55	
Gauge port		1/8″	
Mounting position		In any position	
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.	
Note on use		The regulator pressure must always be set upwards. Overpressure relieving from the pilot.	

DIMENSIONS



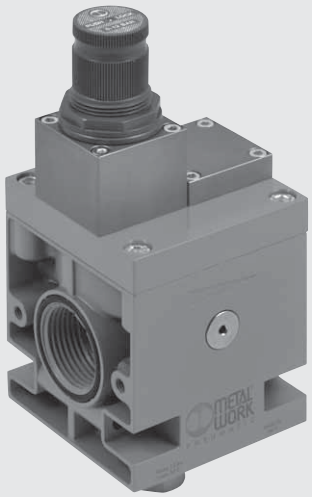
*Pressure gauge port

ORDERING CODES

Code	Description
1302004	RP 3/8 pilot-assisted regulator
1402004	RP 1/2 pilot-assisted regulator

New deal REGULATOR AND REGULATOR WITH V3V 3/4"-1"

Piloted regulator with integrated function, manual, electropneumatic or pneumatic stop valve as required.
It performs two functions in the space usually occupied by a single module, which ensures a high flow rate at all ΔP values including low ones.
Extremely quick responses in both discharge and feed.
The integrated pilot regulator is available with controlled leak.



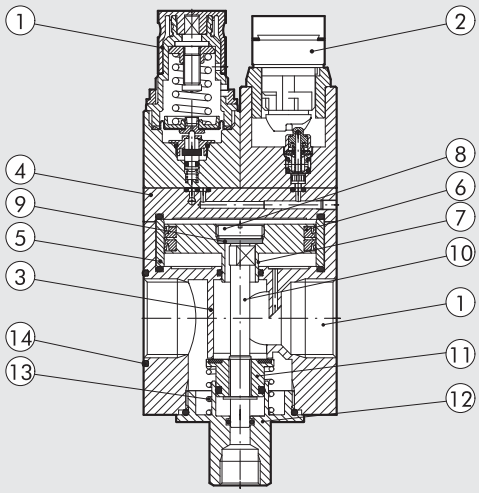
TECHNICAL DATA

Threaded port		3/4"	1"
Setting range	bar	0 to 2 - 0 to 4 - 0 to 8 - 0 to 12	
*Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	12000	
	scfm	423	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	13000	
	scfm	460	
Fluid		Lubricated or unlubricated filtered air. If lubrication is used, it must be continous.	
Drain flow rate at 6 bar (0.6 MPa to 87 psi)	Nl/min	1800	
	scfm	64	
Max temperature at 10 bar (1 Mpa to 145 psi)	°C	50	
	°F	122	
Weight	kg	1.7	
Wall fixing screws		M6 x 75	
Mounting position		In any position	
Note on use		**Do not take air from pressure gauge ports.**	

* Version Reg + V3V Cnomo (1 Mpa - 10 bar -145 psi)

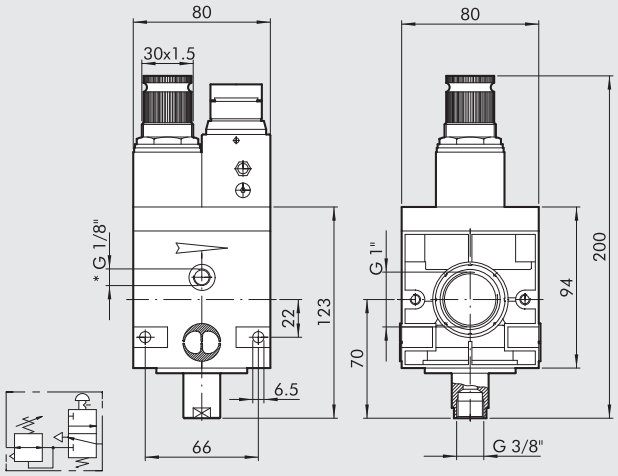
COMPONENTS

① Pilot Reg. sub-assembly
② Manual V3V control sub-assembly
③ Aluminium regulator body
④ Aluminium upper plate
⑤ Aluminium spacer
⑥ NBR lip seal
⑦ Aluminium Ø 63 piston rod
⑧ Cap for OT 58 brass plain gasket
⑨ NBR plain gasket
⑩ OT 58 brass rod
⑪ OT 58 brass valve
⑫ Aluminium lower cap
⑬ Steel valve compression spring
⑭ NBR gaskets



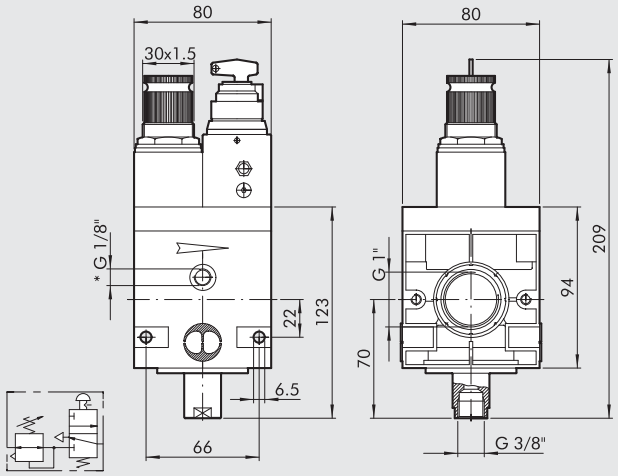
DIMENSIONS

REG P + V3V MANUAL



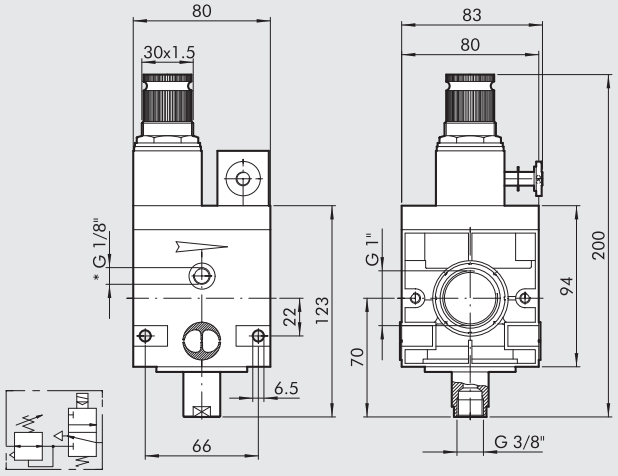
*Pressure gauge port

REG P + V3V KEY



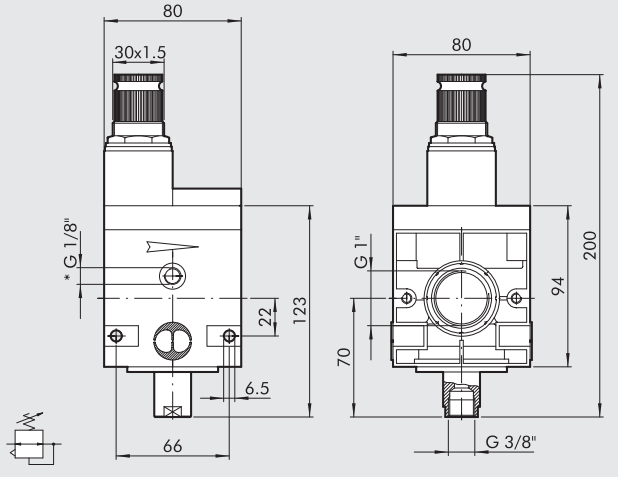
*Pressure gauge port

REG P + V3V ELPN CNOMO



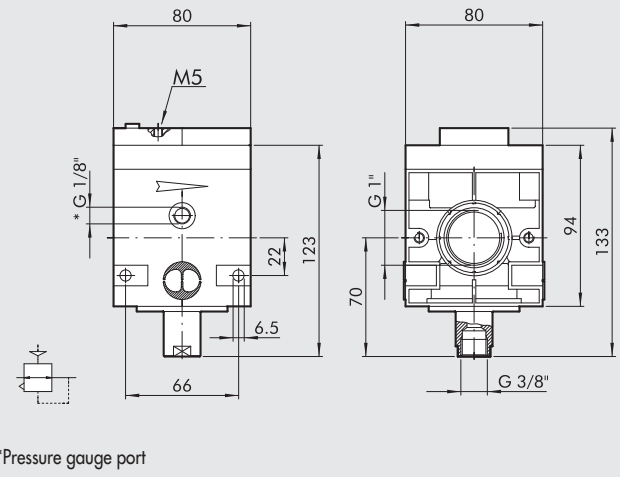
*Pressure gauge port

REG P



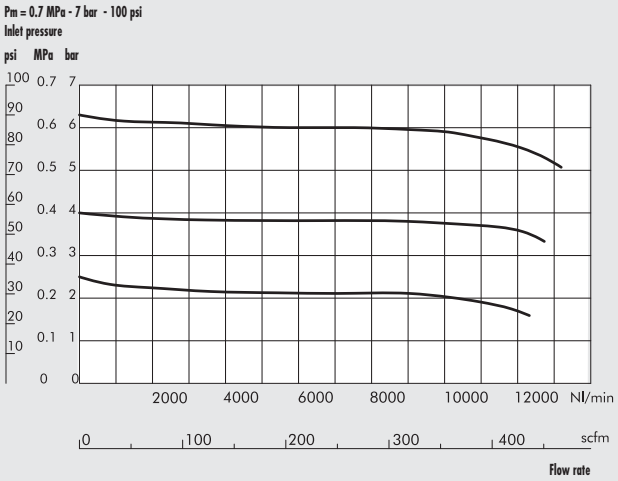
*Pressure gauge port

REG P 00



*Pressure gauge port

FLOW CHARTS

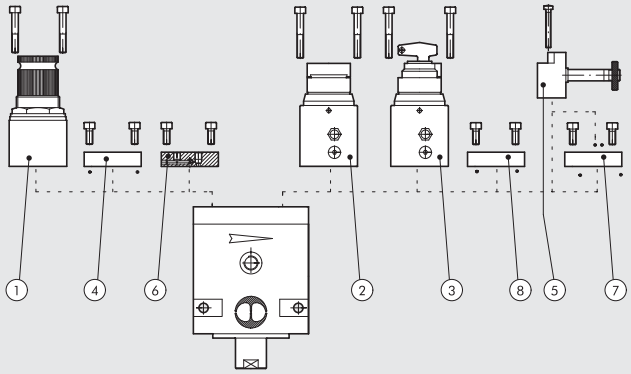


SYNOPTIC, SIZES AND VERSIONS

RV3V	1	02	ELPN
ELEMENT	THREADED PORT	SETTING RANGE	ELPN V3V CONTROL
RV3V REGP	1″ 3/4″	00 = without pilot 02 = 0 to 2 bar 04 = 0 to 4 bar 08 = 0 to 8 bar 012 = 0 to 12 bar	ELPN KEY MANUAL

RV3V: Regulator with built-in shut-off valve.
ELPN: CNOMO solenoid
REGP: Piloted regulator

ASSEMBLY OPTIONS



This modular system makes it possible to make the following combinations:

A) Regulator with pilot regulator ① or remote control ⑥, the end plate is mounted on the right-hand side ⑧.

B) V3V with manual lever-operated control ② or key control ③ or solenoid CNOMO ⑤. the end plate is mounted on the left-hand side ④.

C) Regulator + V3V is the result of the free combination of the versions specified above.

	Code	Description
①	**9640501-02-03-04**	Pilot regulator kit
②	**9640401**	V3V manual lever-operated control kit
③	**9640301**	V3V manual key-operated control kit
④	**9640101**	End plate kit for V3V
⑤	**9453922**	V3V ELPN CNOMO bistable control kit
⑤	**9453920**	V3V ELPN CNOMO monostable control kit
⑥	**9640001**	Remote control plate kit
⑦	**9640201**	Plate kit to mount Cnomo rotated by 180°
⑧	**9640101**	End plate kit for piloted regulator

ORDERING CODES

Code	Description
New deal PILOTED REGULATOR 3/4″	
1519001	REGP 3/4 00
1518001	REGP 3/4 02
1518002	REGP 3/4 04
1518003	REGP 3/4 08
1518004	REGP 3/4 012
New deal REGULATOR WITH BUILT-IN SHUT-OFF VALVE 3/4″	
1517001	RV3V 3/4 02 ELPN
1517002	RV3V 3/4 04 ELPN
1517003	RV3V 3/4 08 ELPN
1516101	RV3V 3/4 02 key
1516102	RV3V 3/4 04 key
1516103	RV3V 3/4 08 key
1516104	RV3V 3/4 012 key
1516001	RV3V 3/4 02 manual
1516002	RV3V 3/4 04 manual
1516003	RV3V 3/4 08 manual
1516004	RV3V 3/4 012 manual
New deal PILOTED REGULATOR 1″	
1619001	REGP 1 00
1618001	REGP 1 02
1618002	REGP 1 04
1618003	REGP 1 08
1618004	REGP 1 012
New deal REGULATOR WITH BUILT-IN SHUT-OFF VALVE 1″	
1617001	RV3V 1 02 ELPN
1617002	RV3V 1 04 ELPN
1617003	RV3V 1 08 ELPN
1616101	RV3V 1 02 key
1616102	RV3V 1 04 key
1616103	RV3V 1 08 key
1616104	RV3V 1 012 key
1616001	RV3V 1 02 manual
1616002	RV3V 1 04 manual
1616003	RV3V 1 08 manual
1616004	RV3V 1 012 manual

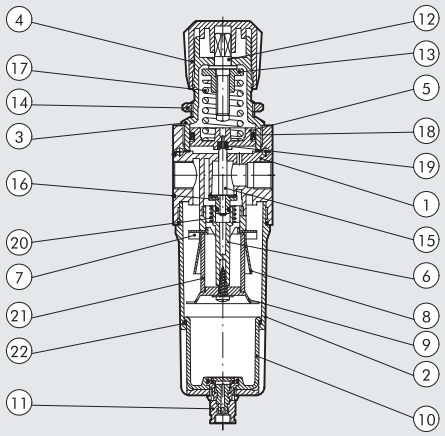
New deal FILTER REGULATOR

Highly reliable piston-operated filter regulator.
- Stability of the set pressure as the upstream pressure varies
- Standard overpressure blow-off valve
- Can be fixed to the wall using the holes is the sides of the body
- Metal bowl with external viewing
- Manual/semi-auto or automatic condensate drainage

TECHNICAL DATA		FR ND 1/4"	FR ND 3/8"	FR ND 1/2"
Threaded port		1/4"	3/8"	1/2"
Setting range	bar	0 to 8 - 0 to 12	0 to 8 - 0 to 12	
Degree of filtration	µm	4 - 20 - 50	4 - 20 - 50	
Max. inlet pressure	MPa	1.8	1.8	
	bar	18	18	
	psi	261	261	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	260	1000	
	scfm	9.2	35.5	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	700	2500	
	scfm	25	88.5	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	50	
	°F	122	122	
Weight	kg	0.5	1	
Wall fixing screws		M4 x 40	M4 x 55	
Gauge port		1/8"	1/8"	
Bowl capacity	cm^3	10	45	
Mounting position		Vertical	Vertical	
Drain		RMSA - SAC	RMSA - SAC - RA	
		RMSA: drain with manual condensate discharge and automatic discharge at zero pressure RA: automatic drain with condensate discharge, independent of pressure and flow rate SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**		
Fluid		Compressed air		
Note on use		The regulator pressure must always be set upwards. **The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.** **Do not take air from pressure gauge ports.**		

COMPONENTS

① Zamak body
② Aluminium bowl
③ Technopolymer bell
④ Technopolymer knob
⑤ Technopolymer piston rod
⑥ Technopolymer plug
⑦ Technopolymer centrifuge
⑧ Technopolymer baffle plug
⑨ Technopolymer screen
⑩ Technopolymer bowl
⑪ Drain (RMSA)
⑫ OT58 brass adjusting screw
⑬ OT58 brass nut
⑭ Technopolymer ring nut
⑮ OT58 brass rod
⑯ Valve with NBR vulcanized gasket
⑰ Steel adjusting spring
⑱ NBR lip seal
⑲ NBR relieving seal
⑳ Steel valve compression spring
㉑ Sintered HDPE filter cartridge
㉒ NBR gaskets

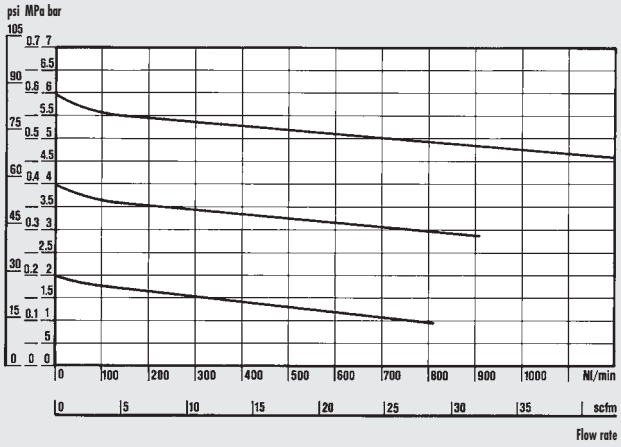


METAL WORK PNEUMATIC

FLOW CHARTS

FR 1/4

Pm = 0.7 MPa - 7 bar - 100 psi
Inlet pressure



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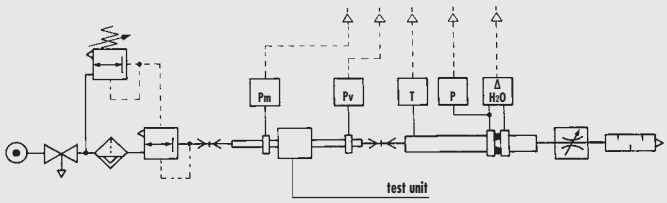
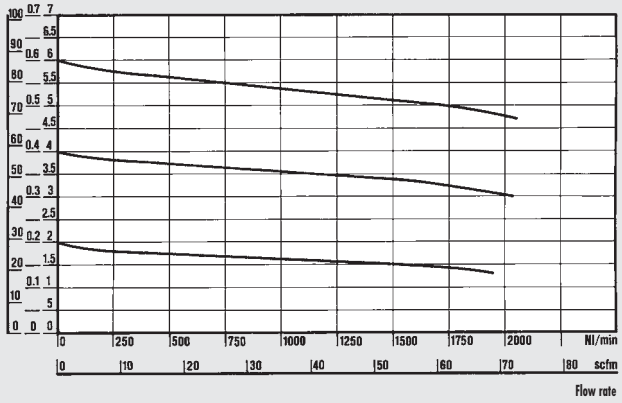


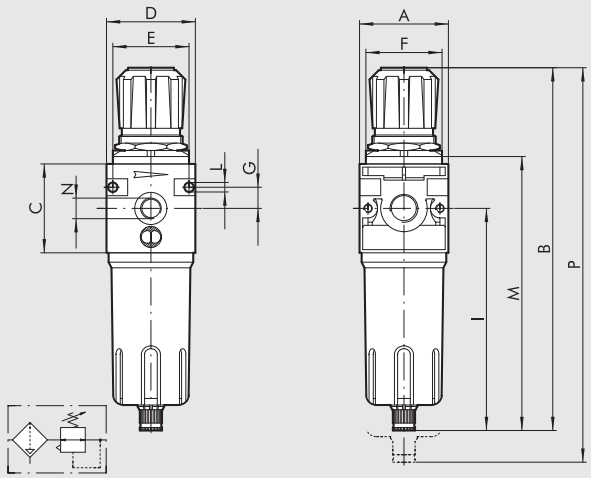
• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

FR 3/8 - 1/2

Pm = 0.7 MPa - 7 bar - 100 psi
Inlet pressure



DIMENSIONS



		FR ND 1/4"	FR ND 3/8"	FR ND 1/2"
Threaded port		1/4"	3/8"	1/2"
A		42	60	
B	RMSA	190	245	
	RA	-	249	
	SAC	194	249	
C		42	60	
D		42	60	
E		36	52	
F		30 x 1.5	38 x 2	
G		10	14	
I		121	150	
L		M4 hole	M4 hole	
M	RMSA	145	185	
	RA	-	189	
	SAC	149	189	
N (Pressure gauge port)		1/8"	1/8"	
P	RMSA	233	295	
	RA	-	299	
	SAC	237	299	

SYNOPTIC, SIZES AND VERSIONS

FR	1/4	4	08	RMSA
ELEMENT	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	CONDENSATE DRAIN
FR	1/4 3/8 1/2	4 = 4 µm 20 = 20 µm 50 = 50 µm	08 = 0 to 8 bar 012 = 0 to 12 bar	RMSA SAC RA*

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.
* For ND 3/8 and 1/2 with RA, please contact our sales assistance department

ORDERING CODES

Code	Description
New deal FILTER REGULATOR 1/4"	
1225029	FR 1/4 4 08 RMSA
1225053	FR 1/4 4 012 RMSA
1225509	FR 1/4 4 08 SAC
1225513	FR 1/4 4 012 SAC
1225030	FR 1/4 20 08 RMSA
1225510	FR 1/4 20 08 SAC
1225054	FR 1/4 20 012 RMSA
1225514	FR 1/4 20 012 SAC
1225032	FR 1/4 50 08 RMSA
1225511	FR 1/4 50 08 SAC
1225056	FR 1/4 50 012 RMSA
1225516	FR 1/4 50 012 SAC
New deal FILTER REGULATOR 3/8"	
1325029	FR 3/8 4 08 RMSA
1325509	FR 3/8 4 08 SAC
1325053	FR 3/8 4 012 RMSA
1325513	FR 3/8 4 012 SAC
1325030	FR 3/8 20 08 RMSA
1325510	FR 3/8 20 08 SAC
1325054	FR 3/8 20 012 RMSA
1325514	FR 3/8 20 012 SAC
1325032	FR 3/8 50 08 RMSA
1325512	FR 3/8 50 08 SAC
1325056	FR 3/8 50 012 RMSA
1325516	FR 3/8 50 012 SAC
New deal FILTER REGULATOR 1/2"	
1425029	FR 1/2 4 08 RMSA
1425509	FR 1/2 4 08 SAC
1425053	FR 1/2 4 012 RMSA
1425513	FR 1/2 4 012 SAC
1425030	FR 1/2 20 08 RMSA
1425510	FR 1/2 20 08 SAC
1425054	FR 1/2 20 012 RMSA
1425514	FR 1/2 20 012 SAC
1425032	FR 1/2 50 08 RMSA
1425512	FR 1/2 50 08 SAC
1425056	FR 1/2 50 012 RMSA
1425516	FR 1/2 50 012 SAC

NOTES

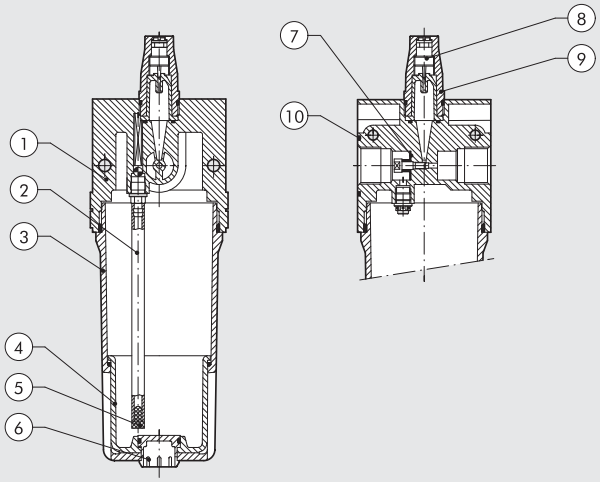
New deal LUBRICATOR

Lubricator with high lubrication stability.
- Quantity of lubricant proportioned to air flow
- Micrometric regulation of lubricant flow
- Activates at low flow rates
- All-round oil level viewing

TECHNICAL DATA		LUB ND 1/4"	LUB ND 3/8"	LUB ND 1/2"	LUB ND 3/4"	LUB ND 1"
Threaded port		1/4"	3/8"	1/2"	3/4"	1"
Type of lubrication		Mist	Mist		Mist	
Bowl capacity	cm^3	50	150		380	
Max. inlet pressure	MPa	1.8	1.8		1.8	
	bar	18	18		18	
	psi	261	261		261	
Flow rate at 6 bar (0.6 MPa to 87 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	700	3000		12800	
	scfm	25	107		452	
Flow rate at 6 bar (0.6 MPa to 87 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	1100	4300		16000	
	scfm	39	153		565	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	50		50	
	°F	122	122		122	
Weight	kg	0.4	0.9		1.3	
Wall fixing screws		M4 x 40	M4 x 55		M6 x 75	
Mounting position		Vertical				
Fluid		Filtered compressed air				
Note on use:		• Use the screw provided to set the drip rate to drop every 300-600 Nl.				
		• Fit the lubricator as close as possible to the point of use				
		• Fill the bowl with oil before pressurizing the system				
		• Do not use cleaning oil, brake fluid or solvents in general				
		• Recommended lubricants: ISO and UNI FD22 - E.g. Energol HLP 22 (BP) - Spinesso 22 (Esso) - Mobil DTE 22 (Mobil) - Tellus Oil 22 (Shell)				

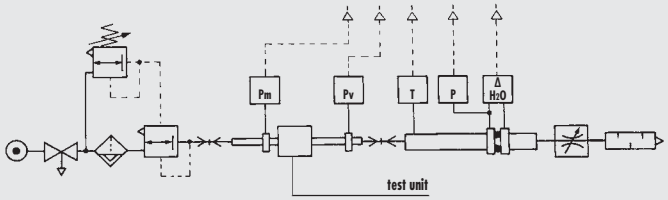
COMPONENTS

① Zamak body
② Rilsan® oil suction pipe
③ Aluminium bowl
④ Clear technopolymer bowl
⑤ Filter
⑥ Technopolymer plug
⑦ Venturi NBR diaphragm
⑧ OT 58 brass oil flow regulation needle
⑨ Clear technopolymer cover
⑩ NBR gaskets



FLOW CHARTS

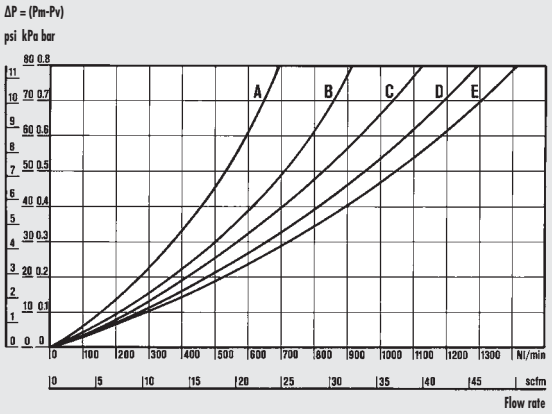
Department of Mechanics
Turin Polytechnic

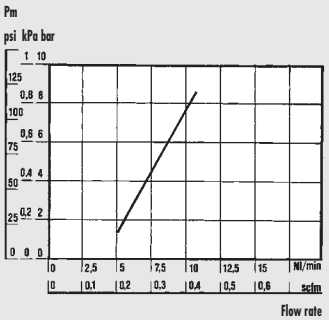


• Flow tests carried out at the Department of Mechanics, Turin Polytechnic, using the computerized test bench following CETOP RP50R recommendations (ISO DIS 6358-2-approved) with ISO 5167 diaphragm gauge.

(A) = 2 bar - 0.2 MPa - 29 psi
(B) = 4 bar - 0.4 MPa - 58 psi
(C) = 6 bar - 0.6 MPa - 87 psi
(D) = 8 bar - 0.8 MPa - 116 psi
(E) = 10 bar - 1 MPa - 145 psi

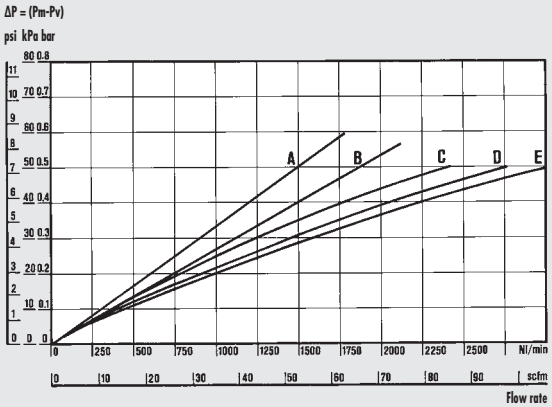
LUB 1/4

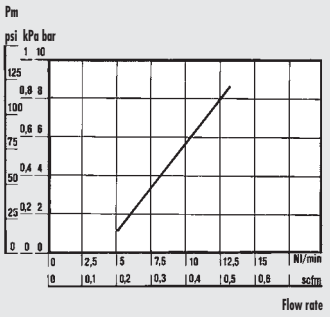




MINIMUM ACTIVATION FLOW CHARTS
The minimum activation flow charts were carried out in compliance with ISO/DP 6301/2

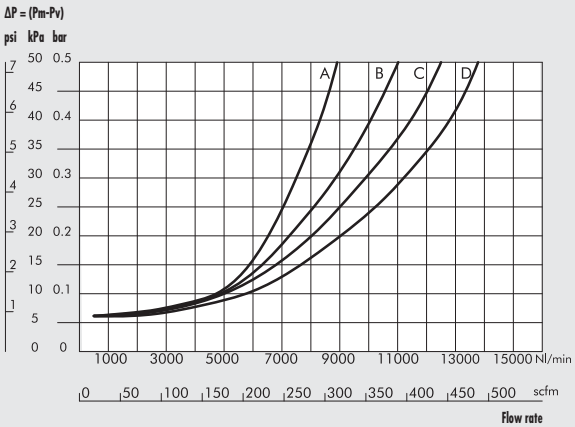
LUB 3/8 - 1/2

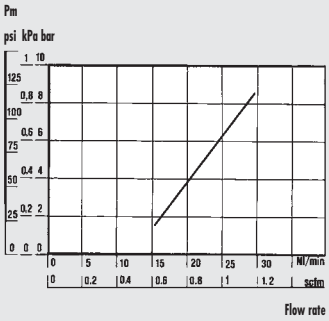




MINIMUM ACTIVATION FLOW CHARTS
The minimum activation flow charts were carried out in compliance with ISO/DP 6301/2

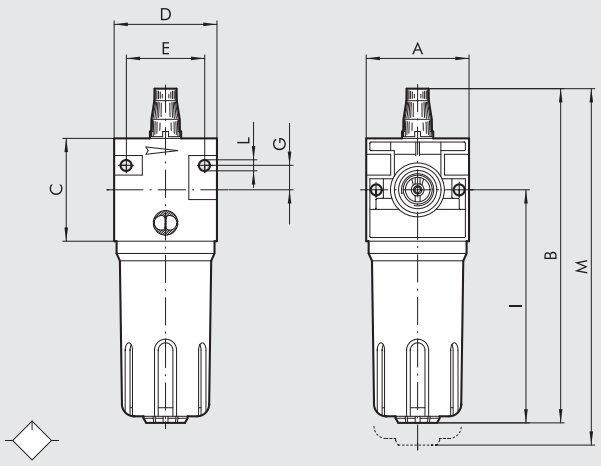
LUB 3/4 - 1"





MINIMUM ACTIVATION FLOW CHARTS
The minimum activation flow charts were carried out in compliance with ISO/DP 6301/2

DIMENSIONS



	LUB ND 1/4"	LUB ND 3/8"	LUB ND 1/2"	LUB ND 3/4"	LUB ND 1"
Threaded port	1/4"	3/8"	1/2"	3/4"	1"
A	42	60		80	
B	156	195		260	
C	42	60		80	
D	42	60		80	
E	32	46		66	
G	10	14		22	
I	107	136		182	
L	M4 hole	M4 hole		M6 hole	
M	176	220		290	

ORDERING CODES

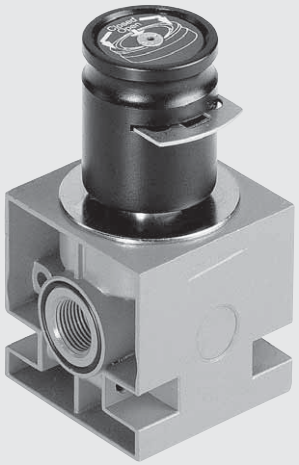
Code	Description
1223001	LUB 1/4
1323001	LUB 3/8
1423001	LUB 1/2
1523001	LUB 3/4
1623001	LUB 1

NOTES

New deal SHUT-OFF VALVE

Manually-operated circuit shut-off valve.

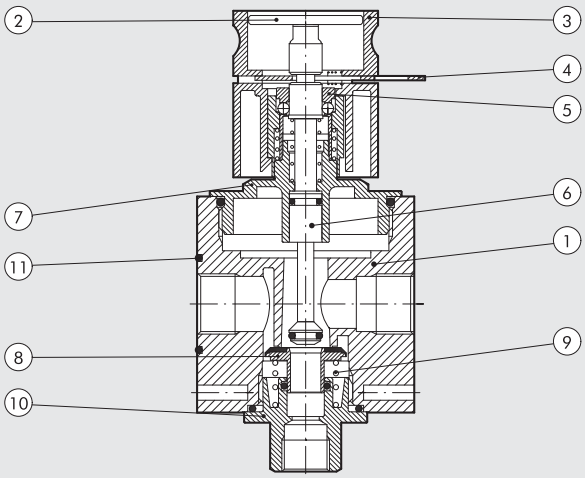
- Poppet seat system to ensure high flow rate
- Quick-actuation knob
- Possible triple locking
- The valve is actuated by pressing the actuation disk until it clicks. Press the knob downwards to relieve pressure. In this position you can extract the shim and fit a lock to avoid accidental operation.



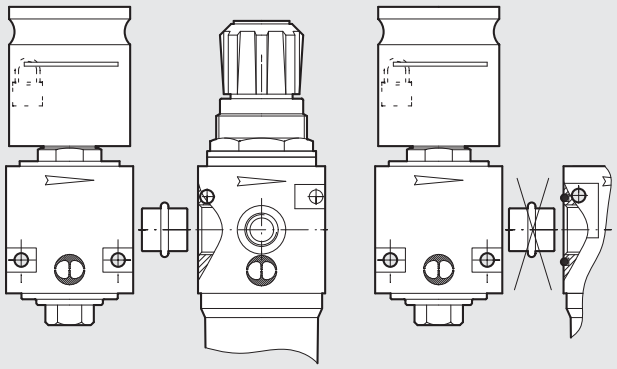
TECHNICAL DATA		V3V ND 1/4"	V3V ND 3/8"	V3V ND 1/2"
Threaded port		1/4"	3/8"	1/2"
Max. inlet pressure	MPa	1.8	1.8	
	bar	18	18	
	psi	261	261	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	1100	2200	
	scfm	38.8	78	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	1500	2900	
	scfm	53	103	
Flow rate on relieving at 6 bar (0.6 Mpa to 87 psi)	Nl/min	1600	2900	
with direct rilieving into the atmosphere	scfm	56.5	103	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	50	
	°F	122	122	
Weight	kg	0.35	0.8	
Wall fixing screws		M4 x 40	M4 x 55	
Mounting position		In any position		
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.		
Type of control		Manual		

COMPONENTS

① Zamak body
② Actuation disk
③ Technopolymer knob
④ Stainless steel safety shim
⑤ Clutching unit
⑥ OT 58 brass rod
⑦ Upper OT 58 brass plug
⑧ V3V valve with NBR vulcanized gasket
⑨ Stainless steel valve compression spring
⑩ Lower OT58 brass plug
⑪ NBR gaskets



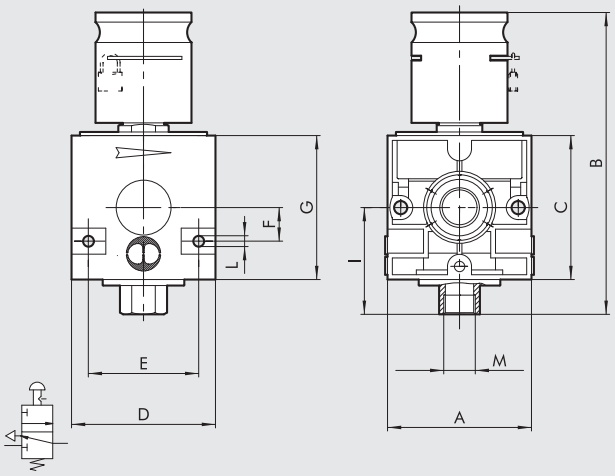
ASSEMBLY DIAGRAM



To assemble the V3V to the regulator filter 1/4", or depurator 3/8-1/2, use the adopter provided (see the assembly diagram at the left).

Adaptor V3V + FR 1/4" - code 9201001
Adaptor V3V + D 3/8" - code 9401001
Adaptor V3V + D 1/2" - code 9401002

DIMENSIONS



	V3V ND 1/4"	V3V ND 3/8"	V3V ND 1/2"
Threaded port	1/4"	3/8"	1/2"
A	42	60	
B	105	126	
C	42	60	
D	42	60	
E	32	46	
F	10	14	
G	42	60	
I	32	43	
L	M4 hole	M4 hole	
M	1/8"	1/4"	

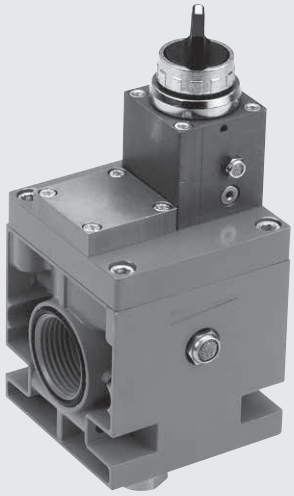
ORDERING CODES

Code	Description
1270001	V3V ND 1/4
1370001	V3V ND 3/8
1470001	V3V ND 1/2

NOTES

Newdeal 3/4"-1" SHUT-OFF VALVE

Circuit cut-off valve with three different controls:
- CNOMO electropneumatic
- Manual key-operated
- Manual lever-operated

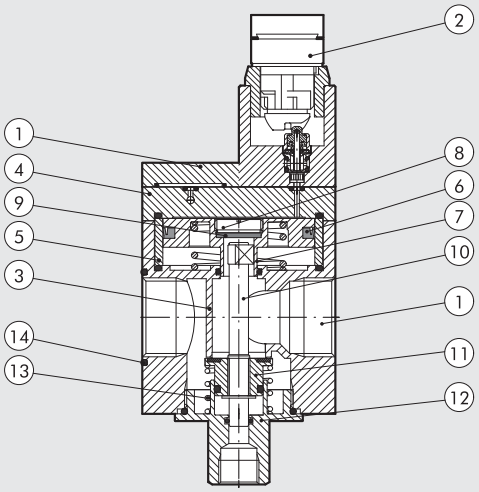


TECHNICAL DATA		V3V ND 3/4"	V3V ND 1"
Threaded port		3/4"	1"
Max. inlet pressure*	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	7600	
	scfm	268	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	10200	
	scfm	360	
Flow rate on relief at 6 bar (0.6 MPa; 87 psi)	Nl/min	1800	
	scfm	64	
Weight	kg	2.2	
Wall fixing screws		M6 x 75	
Mounting position		In any position	
Fluid		Filtered, lubricated or unlubricated compressed air. Lubrication, if used, must be continuous.	

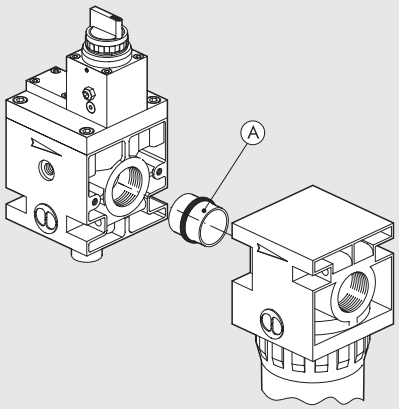
*V3V CNOMO -10 bar - 1 MPa - 145 Psi

COMPONENTS

① V3V plate
② V3V manual sub-assembly control
③ V3V aluminium body
④ Aluminium top plate
⑤ Aluminium spacer
⑥ NBR lip seal
⑦ Aluminium piston rod
⑧ Cap for OT 58 brass plain gasket
⑨ NBR plain gasket
⑩ OT 58 brass rod
⑪ OT 58 brass valve
⑫ Aluminium bottom cap
⑬ Steel valve spring
⑭ NBR gaskets



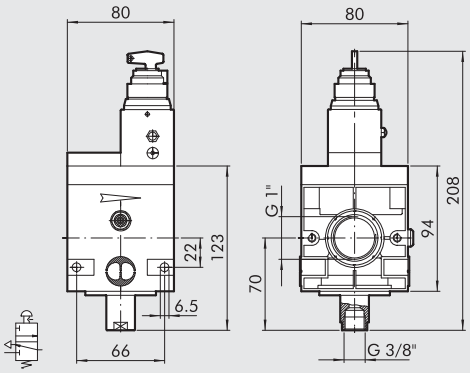
ASSEMBLY DIAGRAM V3V + F



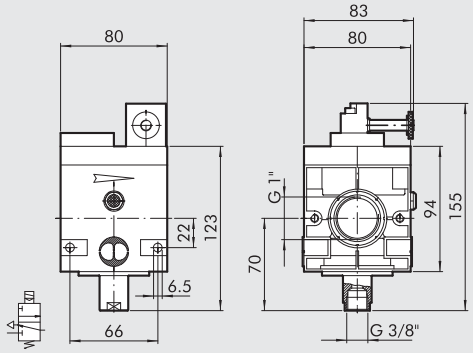
A= V3V ADAPTER + FIL 1" – code 9601001
to be used with filters not having o-ring seat

DIMENSIONS

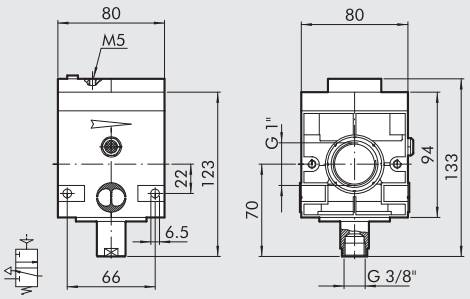
V3V 3/4"-1" KEY-OPERATED CONTROL



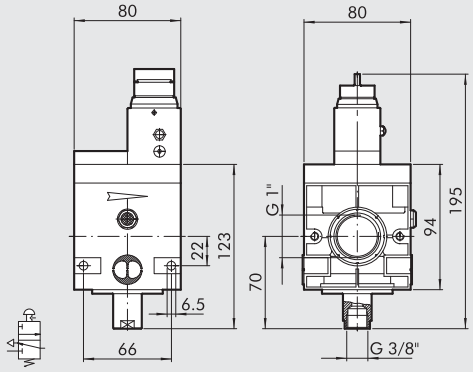
V3V 3/4"-1" ELPN CNOMO



V3V 3/4"-1" PNEUMATIC



V3V 3/4"-1" MANUAL CONTROL



SYNOPTIC, SIZES AND VERSIONS

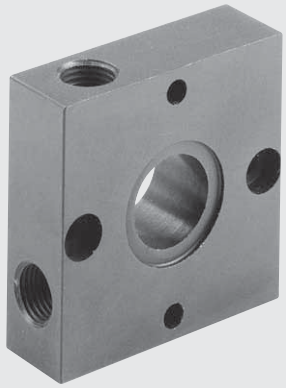
RV3V	3/4	ELPN
ELEMENT	THREADED PORT	CONTROL V3V
V3V	3/4" 1"	ELPN Key Manual Pneumatic

ORDERING CODES

Code	Description
SHUT-OFF VALVE New deal 3/4"	
1575001	V3V 3/4 ELPN Cnomo
1574101	V3V 3/4 key
1574001	V3V 3/4 manual
1576001	V3V 3/4 pneumatic
SHUT-OFF VALVE New deal 1"	
1675001	V3V 1 ELPN Cnomo
1674101	V3V 1 key
1674001	V3V 1 manual
1676001	V3V 1 pneumatic

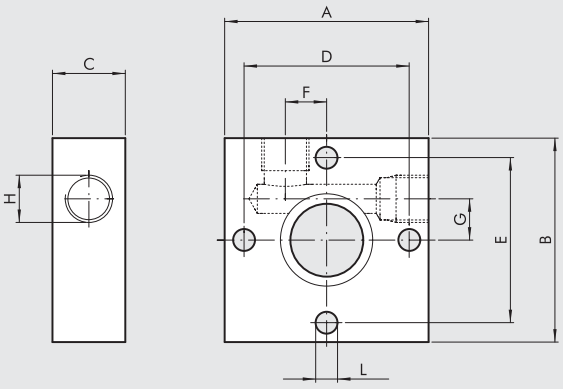
Newdeal AIR TAKE-OFF

The air take-off has the job to take off the air from the Newdeal FRL unit irrespective of the position where it is assembled.
It is required whenever you need to take off air from the FRL unit at different stages of the treatment (normal, filtered, filtered regulated, lubricated, etc.)



TECHNICAL DATA		PA ND 1/4"	PA ND 3/8"	PA ND 1/2"	PA ND 3/4"	PA ND 1"
Threaded port		1/8"	1/4"		1/2"	
Maximum working temperature at: 1 MPa; 10 bar; 145 psi	°C	50	50		50	
	°F	122	122		122	
Maximum admissible pressure	MPa	1.8	1.8		1.8	
	bar	18	18		18	
	psi	261	261		261	
Weight	kg	0.06	0.18		0.41	

DIMENSIONS



	PA ND 1/4"	PA ND 3/8"	PA ND 1/2"	PA ND 3/4"	PA ND 1"
Threaded port	1/8"	1/4"		1/2"	
A	42	60		80	
B	42	60		80	
C	15	20		30	
D	34	49		64	
E	34	49		64	
F	8.5	14		16	
G	8.5	14		16	
H (n° 2 pos.)	1/8"	1/4"		1/2"	
L	M4 hole	M5 hole		M6 hole	

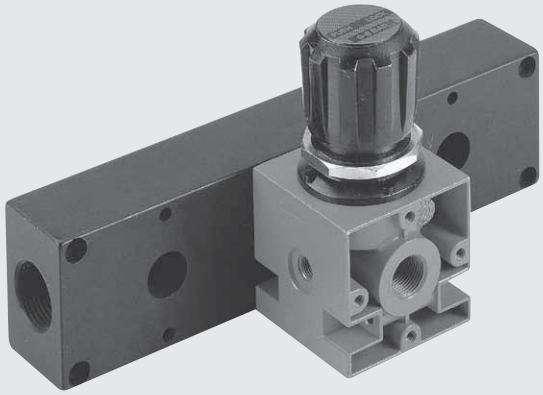
ORDERING CODES

Code	Description
9200401	PA 1/4 take-off
9400401	PA 1/2 take-off
9600401	PA 3/4 take-off

Comes with 2 screws for F/L and R/FR fixing.

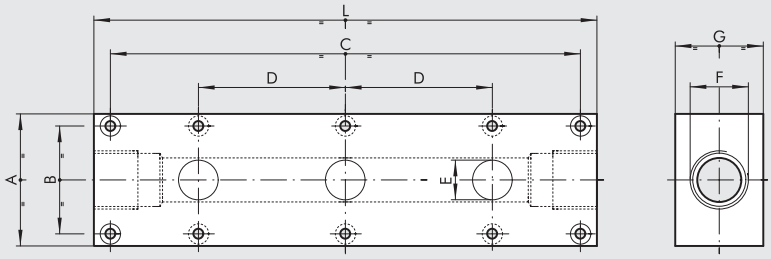
New deal SUB-BASE

With the New deal sub-base, more than one regulators can be mounted in parallel using a single pressure supply source.

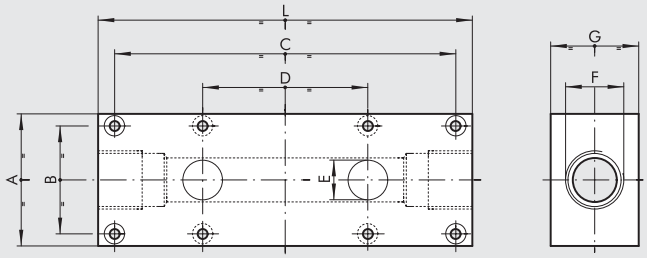


DIMENSIONS

3 POSITION



2 POSITION



	ND 1/4"		ND 3/8" - 1/2"		ND 3/4" - 1"	
	2 positions	3 positions	2 positions	3 positions	2 positions	3 positions
A	50	50	60	60	80	80
B	34	34	49	49	64	64
C	113	165	155	230	190	280
D	52	52	75	75	90	90
E	1/4"	1/4"	18	18	31	31
F	1/2"	1/2"	3/4"	3/4"	1 1/4"	1 1/4"
G	30	30	40	40	50	50
L	128	180	170	245	210	300
Weight [kg]	0.45	0.62	0.94	1.4	1.5	1.7

ORDERING CODES

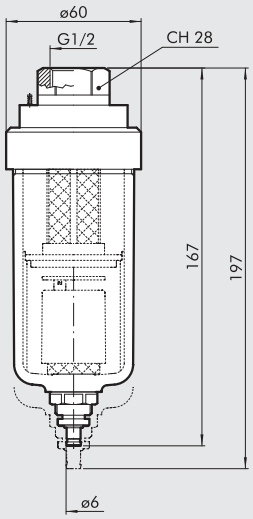
Code	Description
9200201	SB 1/4 sub-base 2 pos.
9400201	SB 1/2 sub-base 2 pos.
9600201	SB 3/4 sub-base 2 pos.
9200301	SB 1/4 sub-base 3 pos.
9400301	SB 1/2 sub-base 3 pos.
9600301	SB 3/4 sub-base 3 pos.

New deal AUTOMATIC CONDENSATE DRAIN

System supply condensate drain:
- All-round condensate level viewing
- Automatic drain from inside the bowl
- Axial coupling

TECHNICAL DATA		SCAL ND 1/2"
Threaded port		1/2"
Maximum working temperature at: 1 MPa; 10 bar; 145 psi	°C	50
	°F	122
Maximum admissible pressure	MPa	1
	bar	10
	psi	145
Weight	kg	0.5

DIMENSIONS



ORDERING CODES

Code	Description
4589003	Autom. cond. drain 1/2 in line

FIL + REG + LUB Newdeal

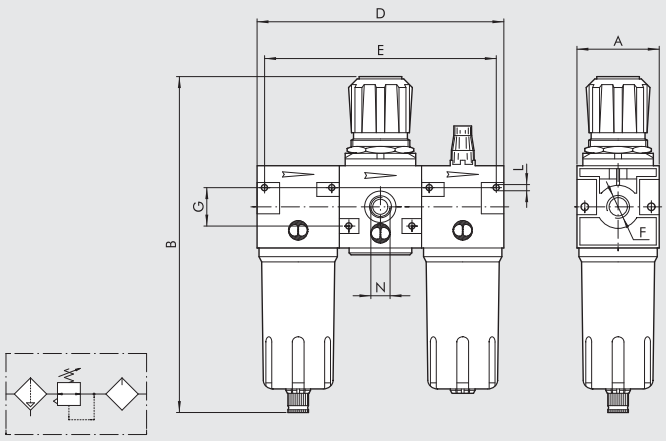
Highly reliable heavy-duty piston-operated FRL unit.
- Stability of the set pressure as the upstream pressure varies
- Metal bowl with external sight glass
- Semi-automatic and automatic condensate drain
- Lubrication proportional to flow rate
- Micrometric lubrication regulation
- Activation guaranteed with low flow rates

Refer to the sections on the single modules for a further description, components and other technical data.

TECHNICAL DATA

		FRL ND 1/4"	FRL ND 3/8"	FRL ND 1/2"	FRL ND 3/4"	FRL ND 1"
Threaded port		1/4"	3/8"	1/2"	3/4"	1"
Setting range	bar	0 to 8 - 0 to 12	0 to 8 - 0 to 12		0 to 8 - 0 to 12	
Degree of filtration	µm	4 - 20 - 50	4 - 20 - 50		4 - 20 - 50	
Max. inlet pressure	MPa	1.8	1.8		1.8	
	bar	18	18		18	
	psi	261	261		261	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	140	1300		1900	2000
	scfm	5	46		68	71
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	400	2000		3600	3700
	scfm	14.2	71		128	132
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	50		50	
	°F	122	122		122	
Weight	kg	1	2.5		4	
Wall fixing screws		M4 x 40	M4 x 55		M6 x 75	
Fluid		Compressed air				
Note on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar. Do not take air from pressure gauge ports.**				

DIMENSIONS



		FRL ND 1/4"	FRL ND 3/8"	FRL ND 1/2"	FRL ND 3/4"	FRL ND 1"
Threaded port F		1/4"	3/8"	1/2"	3/4"	1"
A		42	60		80	
B	RMSA	190	245		332	
	RA	-	249		336	
	SAC	194	249		336	
D		126	180		240	
E		116	166		226	
G		20	28		44	
L		M4 hole	M4 hole		M6 hole	
N (pressure gauge port)		1/8"	1/8"		1/4"	

SYNOPTIC, SIZES AND VERSIONS

FRL	1/4	4	08	RMSA
ELEMENT	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	CONDENSATE DRAIN
FRL	1/4	4 = 4 µm	08 = 0 to 8 bar	RMSA
		20 = 20 µm	012 = 0 to 12 bar	SAC
	3/8	50 = 50 µm		RMSA
	1/2			SAC
				RA
	3/4			RMSA
	1			RA

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

ORDERING CODES

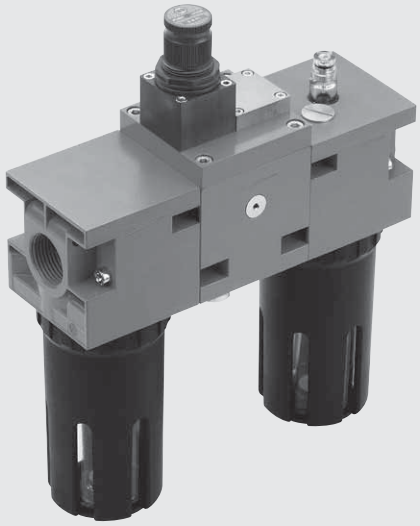
Code	Description
FRL 1/4"	
1224029	FRL 1/4 4 08 RMSA
1224409	FRL 1/4 4 08 SAC
1224030	FRL 1/4 20 08 RMSA
1224410	FRL 1/4 20 08 SAC
1224032	FRL 1/4 50 08 RMSA
1224412	FRL 1/4 50 08 SAC
1224053	FRL 1/4 4 012 RMSA
1224413	FRL 1/4 4 012 SAC
1224054	FRL 1/4 20 012 RMSA
1224414	FRL 1/4 20 012 SAC
1224056	FRL 1/4 50 012 RMSA
1224416	FRL 1/4 50 012 SAC

Code	Description
FRL 3/8"	
1324029	FRL 3/8 4 08 RMSA
1324033	FRL 3/8 4 08 RA
1324409	FRL 3/8 4 08 SAC
1324030	FRL 3/8 20 08 RMSA
1324034	FRL 3/8 20 08 RA
1324410	FRL 3/8 20 08 SAC
1324032	FRL 3/8 50 08 RMSA
1324036	FRL 3/8 50 08 RA
1324412	FRL 3/8 50 08 SAC
1324053	FRL 3/8 4 012 RMSA
1324057	FRL 3/8 4 012 RA
1324413	FRL 3/8 4 012 SAC
1324054	FRL 3/8 20 012 RMSA
1324058	FRL 3/8 20 012 RA
1324414	FRL 3/8 20 012 SAC
1324056	FRL 3/8 50 012 RMSA
1324060	FRL 3/8 50 012 RA
1324416	FRL 3/8 50 012 SAC
FRL 1/2"	
1424029	FRL 1/2 4 08 RMSA
1424033	FRL 1/2 4 08 RA
1424409	FRL 1/2 4 08 SAC
1424030	FRL 1/2 20 08 RMSA
1424034	FRL 1/2 20 08 RA
1424410	FRL 1/2 20 08 SAC
1424032	FRL 1/2 50 08 RMSA
1424036	FRL 1/2 50 08 RA
1424412	FRL 1/2 50 08 SAC
1424053	FRL 1/2 4 012 RMSA
1424057	FRL 1/2 4 012 RA
1424413	FRL 1/2 4 012 SAC
1424054	FRL 1/2 20 012 RMSA
1424058	FRL 1/2 20 012 RA
1424414	FRL 1/2 20 012 SAC
1424056	FRL 1/2 50 012 RMSA
1424060	FRL 1/2 50 012 RA
1424416	FRL 1/2 50 012 SAC

Code	Description
FRL 3/4"	
1524017	FRL 3/4 4 08 RMSA
1524021	FRL 3/4 4 08 RA
1524018	FRL 3/4 20 08 RMSA
1524022	FRL 3/4 20 08 RA
1524020	FRL 3/4 50 08 RMSA
1524024	FRL 3/4 50 08 RA
1524029	FRL 3/4 4 012 RMSA
1524033	FRL 3/4 4 012 RA
1524030	FRL 3/4 20 012 RMSA
1524034	FRL 3/4 20 012 RA
1524032	FRL 3/4 50 012 RMSA
1524036	FRL 3/4 50 012 RA
FRL 1"	
1624017	FRL 1 4 08 RMSA
1624021	FRL 1 4 08 RA
1624018	FRL 1 20 08 RMSA
1624022	FRL 1 20 08 RA
1624020	FRL 1 50 08 RMSA
1624024	FRL 1 50 08 RA
1624029	FRL 1 4 012 RMSA
1624033	FRL 1 4 012 RA
1624030	FRL 1 20 012 RMSA
1624034	FRL 1 20 012 RA
1624032	FRL 1 50 012 RMSA
1624036	FRL 1 50 012 RA

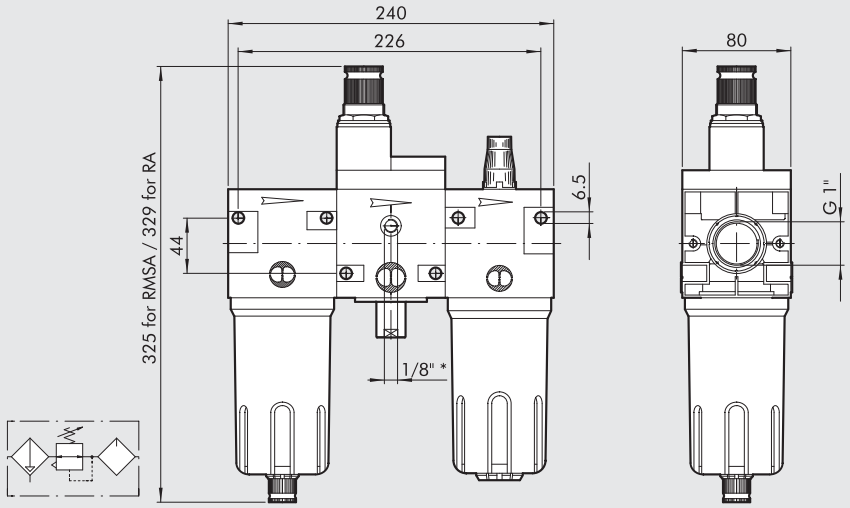
FRPL 3/4"-1" Newdeal

Refer to the sections on the single modules for a further description, components and other technical data.



TECHNICAL DATA		FRPL ND 3/4"	FRPL ND 1"
Threaded port		3/4"	1"
Setting range		0 to 8 - 0 to 12	
Max. temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Degree of filtration	µm	4 - 20 - 50	
Max. inlet pressure	MPa	1.3	
	bar	13	
	psi	188	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	7500	
	scfm	235	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	8500	
	scfm	266	
Weight	kg	3.6	
Wall fixing screws		M6 x 75	
Drain		RMSA - RA	
		RMSA: manual - semi-auto; RA: automatic.	
Fluid		Compressed air	
Bowl capacity	cm^3	170	
Note on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**	
		Do not take air from pressure gauge ports.	

DIMENSIONS



*Pressure gauge port

SYNOPTIC, SIZES AND VERSIONS

FRPL	1/4	4	08	RMSA
ELEMENT	THREADED PORT	DEGREE OF FILTRATION	SETTING RANGE	TYPE OF DRAIN
FRPL	1″ 3/4″	4 = 4 µm 20 = 20 µm 50 = 50 µm	08 = 0 to 8 bar 012 = 0 to 12 bar	RMSA RA

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate. (for size 300 and 400).
FRPL: Filter + pilotable regulator + lubricator.

ORDERING CODES

Code	Description
FRPL 3/4″	
1528007	FRPL 3/4 4 08 RMSA
1528019	FRPL 3/4 4 08 RA
1528010	FRPL 3/4 4 012 RMSA
1528022	FRPL 3/4 4 012 RA
1528008	FRPL 3/4 20 08 RMSA
1528020	FRPL 3/4 20 08 RA
1528011	FRPL 3/4 20 012 RMSA
1528023	FRPL 3/4 20 012 RA
1528009	FRPL 3/4 50 08 RMSA
1528021	FRPL 3/4 50 08 RA
1528012	FRPL 3/4 50 012 RMSA
1528024	FRPL 3/4 50 012 RA
FRPL 1″	
1628007	FRPL 1 4 08 RMSA
1628019	FRPL 1 4 08 RA
1628010	FRPL 1 4 012 RMSA
1628022	FRPL 1 4 012 RA
1628008	FRPL 1 20 08 RMSA
1628020	FRPL 1 20 08 RA
1628011	FRPL 1 20 012 RMSA
1628023	FRPL 1 20 012 RA
1628009	FRPL 1 50 08 RMSA
1628021	FRPL 1 50 08 RA
1628012	FRPL 1 50 012 RMSA
1628024	FRPL 1 50 012 RA

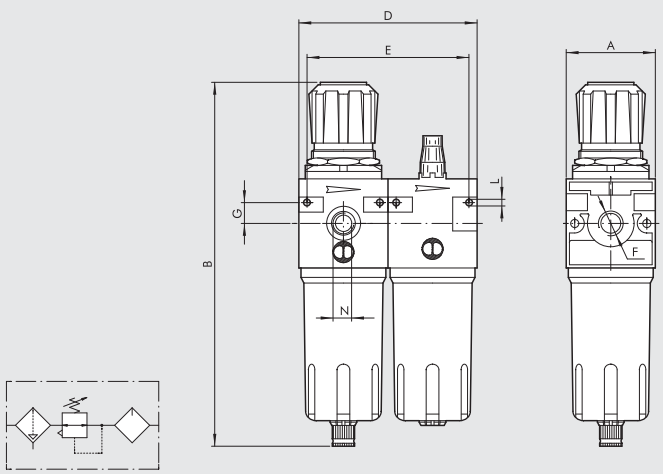
FR + LUB Newdeal

Heavy duty and reliable piston-operated FR + L unit.
- Stability of the set pressure as the upstream pressure varies
- Metal bowl with external sight glass
- Semi-automatic and automatic condensate drain
- Quantity of lubricant proportioned to air flow
- Micrometric lubrication regulation
- Activation guaranteed with low flow rates

Refer to the sections on the single modules for a further description, components and other technical data.

TECHNICAL DATA		FR + L ND 1/4"	FR + L ND 3/8"	FR + L ND 1/2"
Threaded port		1/4"	3/8"	1/2"
Setting range	bar	0 to 8 - 0 to 12	0 to 8 - 0 to 12	
Degree of filtration	µm	4 - 20 - 50	4 - 20 - 50	
Max. inlet pressure	MPa	1.8	1.8	
	bar	18	18	
	psi	261	261	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	150	1300	
	scfm	5.3	46	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	500	2200	
	scfm	18	78	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	50	
	°F	122	122	
Weight	kg	0.9	2	
Wall fixing screws		M4 x 40	M4 x 55	
Fluid		Compressed air		
Note on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar. Do not take air from pressure gauge ports.**		

DIMENSIONS



		FR + L ND 1/4"	FR + L ND 3/8"	FR + L ND 1/2"
Threaded port F		1/4"	3/8"	1/2"
A		42	60	
B	RMSA	190	245	
	RA	-	249	
	SAC	194	249	
D		84	120	
E		76	109	
G		10	14	
L		M4 hole	M4 hole	
N (pressure gauge port)		1/8"	1/8"	

SYNOPTIC, SIZES AND VERSIONS

FR + L ELEMENT	1/4 THREADED PORT	4 DEGREE OF FILTERING	08 SETTING RANGE	RMSA CONDENSATE DRAIN
FR + L	1/4	4 = 4 µm	08 = 0 to 8 bar	RMSA
		20 = 20 µm	012 = 0 to 12 bar	SAC
	3/8	50 = 50 µm		RMSA
	1/2			SAC
				RA*

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.
* For ND 3/8 and 1/2 with RA, please contact our sales assistance department.

ORDERING CODES

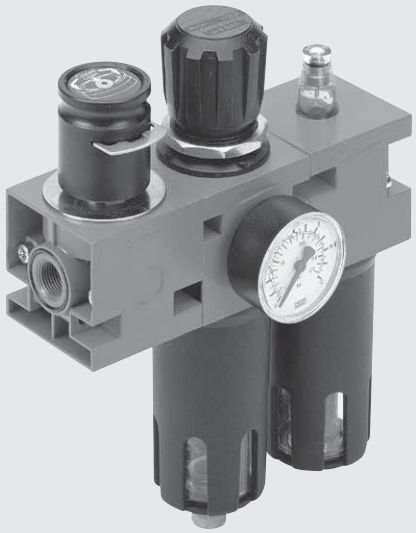
Code	Description
FR + L 1/4"	
1226029	FR+L 1/4 4 08 RMSA
1226409	FR+L 1/4 4 08 SAC
1226053	FR+L 1/4 4 012 RMSA
1226413	FR+L 1/4 4 012 SAC
1226030	FR+L 1/4 20 08 RMSA
1226410	FR+L 1/4 20 08 SAC
1226054	FR+L 1/4 20 012 RMSA
1226414	FR+L 1/4 20 012 SAC
1226032	FR+L 1/4 50 08 RMSA
1226412	FR+L 1/4 50 08 SAC
1226056	FR+L 1/4 50 012 RMSA
1226416	FR+L 1/4 50 012 SAC

Code	Description
FR + L 3/8"	
1326029	FR+L 3/8 4 08 RMSA
1326409	FR+L 3/8 4 08 SAC
1326053	FR+L 3/8 4 012 RMSA
1326413	FR+L 3/8 4 012 SAC
1326030	FR+L 3/8 20 08 RMSA
1326034	FR+L 3/8 20 08 RA
1326410	FR+L 3/8 20 08 SAC
1326054	FR+L 3/8 20 012 RMSA
1326058	FR+L 3/8 20 012 RA
1326414	FR+L 3/8 20 012 SAC
1326032	FR+L 3/8 50 08 RMSA
1326412	FR+L 3/8 50 08 SAC
1326056	FR+L 3/8 50 012 RMSA
1326416	FR+L 3/8 50 012 SAC
FR + L 1/2"	
1426029	FR+L 1/2 4 08 RMSA
1426409	FR+L 1/2 4 08 SAC
1426053	FR+L 1/2 4 012 RMSA
1426413	FR+L 1/2 4 012 SAC
1426030	FR+L 1/2 20 08 RMSA
1426034	FR+L 1/2 20 08 RA
1426410	FR+L 1/2 20 08 SAC
1426054	FR+L 1/2 20 012 RMSA
1426058	FR+L 1/2 20 012 RA
1426414	FR+L 1/2 20 012 SAC
1426032	FR+L 1/2 50 08 RMSA
1426412	FR+L 1/2 50 08 SAC
1426056	FR+L 1/2 50 012 RMSA
1426416	FR+L 1/2 50 012 SAC

V3V + FR + LUB Newdeal

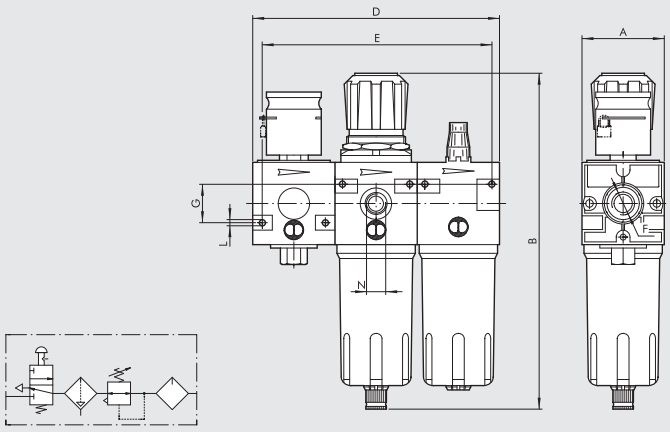
Highly reliable heavy-duty piston-operated FRFL unit.
- Stability of the set pressure as the upstream pressure varies
- Metal bowl with external sight glass
- Semi-automatic and automatic condensate drain
- Quantity of lubricant proportionate to the air flow
- Micrometric lubrication regulation
- Activation guaranteed at low air flows
- Quick filling and drainage of the downstream circuit with the V3V element

Refer to the sections on the single modules for a further description, components and other technical data.



TECHNICAL DATA		VFR + L ND 1/4"	VFR + L ND 3/8"	VFR + L ND 1/2"
Threaded port		1/4"	3/8"	1/2"
Setting range	bar	0 to 8 - 0 to 12	0 to 8 - 0 to 12	
Degree of filtration	µm	4 - 20 - 50	4 - 20 - 50	
Max. inlet pressure	MPa	1.8	1.8	
	bar	18	18	
	psi	261	261	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	140	1000	
	scfm	5	35.5	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	480	1900	
	scfm	17	67.5	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	50	
	°F	122	122	
Weight	kg	1.1	1.8	
Wall fixing screws		M4 x 40	M4 x 55	
Fluid		Compressed air		
Note on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar. Do not take air from pressure gauge ports.**		

DIMENSIONS



		VFR + L ND 1/4"	VFR + L ND 3/8"	VFR + L ND 1/2"
Threaded port F		1/4"	3/8"	1/2"
A		42	60	
B	RMSA	190	245	
	RA	-	249	
	SAC	194	249	
D		126	180	
E		116	166	
G		20	28	
L		M4 hole	M4 hole	
N (pressure gauge port)		1/8"	1/8"	

SYNOPTIC, SIZES AND VERSIONS

VFR + L	1/4	20	08	RMSA
ELEMENT	THREADED PORT	DEGREE OF FILTERING	SETTING RANGE	CONDENSATE DRAIN
VFR + L	1/4	4 = 4 µm	08 = 0 to 8 bar	RMSA
		20 = 20 µm	012 = 0 to 12 bar	SAC
	3/8	50 = 50 µm		RMSA
	1/2			SAC
				RA

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

ORDERING CODES

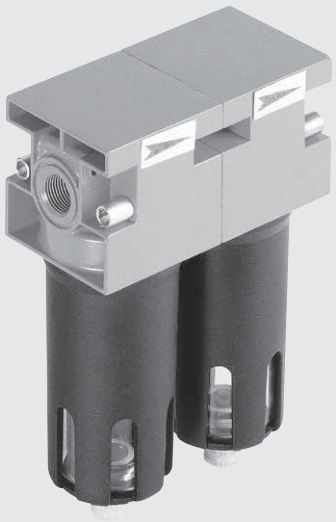
Code	Description
1272030	VFR+L 1/4 20 RMSA 08
1272054	VFR+L 1/4 20 RMSA 012
1372030	VFR+L 3/8 20 RMSA 08
1372054	VFR+L 3/8 20 RMSA 012
1472030	VFR+L 1/2 20 RMSA 08
1472054	VFR+L 1/2 20 RMSA 012
1472032	VFR+L 1/2 50 RMSA 08
1472056	VFR+L 1/2 50 RMSA 012

The following versions are available on request:
- with 4 µm or 50 µm degree of filtration
- with SAC or RA condensate discharge

FIL + DEP Newdeal

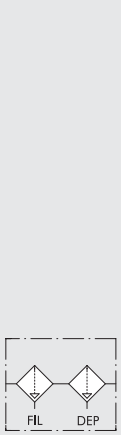
Filter + depurator unit for fine filtering followed by purification by coalescence
- Metal bowl with external sight glass
- Semi-automatic condensate drain

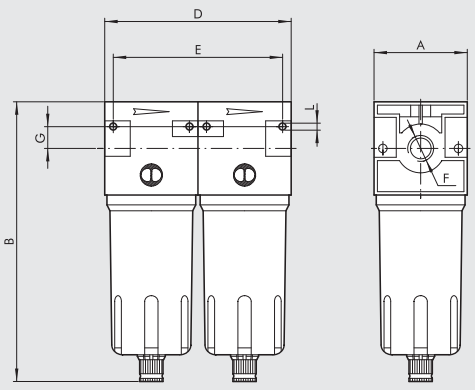
Refer to the sections on the single modules for a further description, components and other technical data.



TECHNICAL DATA		F + D ND 3/8"	F + D ND -1/2"
Threaded port		3/8"	1/2"
Degree of filtration	µm	4	
Degree of depuration	µm	99.97% 0.01	
Max. inlet pressure	MPa	1.8	
	bar	18	
	psi	261	
Maximum suggested flow rate		Please look at the flow rate curves at page **C4**.9	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	
	°F	122	
Weight	kg	1.8	
Wall fixing screws		M4 x 55	
Fluid		Compressed air	
Note on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**	

DIMENSIONS





		F + D ND 3/8"	F + D ND -1/2"
Threaded port F		3/8"	1/2"
A		60	
B	**RMSA**	180	
	RA	184	
	SAC	184	
D		120	
E		106	
G		14	
L		M4 hole	

SYNOPTIC, SIZES AND VERSIONS

F + D ELEMENT	3/8 THREADED PORT	4 DEGREE OF FILTERING	RMSA CONDENSATE DRAIN	RMSA CONDENSATE DRAIN
F + D	3/8 1/2	4 = 4 µm	RMSA SAC RA	RMSA RA

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

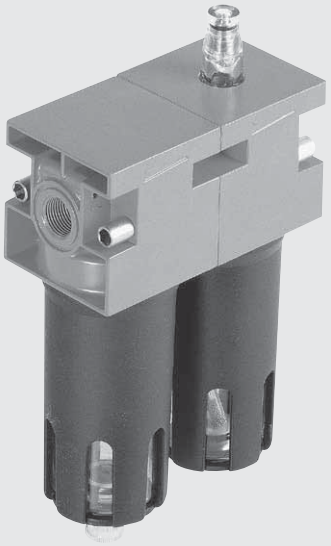
ORDERING CODES

Code	Description
1327004	F+D 3/8 4 RMSA-RMSA
1327007	F+D 3/8 4 RA-RA
1327104	F+D 3/8 4 SAC-RMSA
1427004	F+D 1/2 4 RMSA-RMSA
1427007	F+D 1/2 4 RA-RA
1427104	F+D 1/2 4 SAC-RMSA

FIL + LUB Newdeal

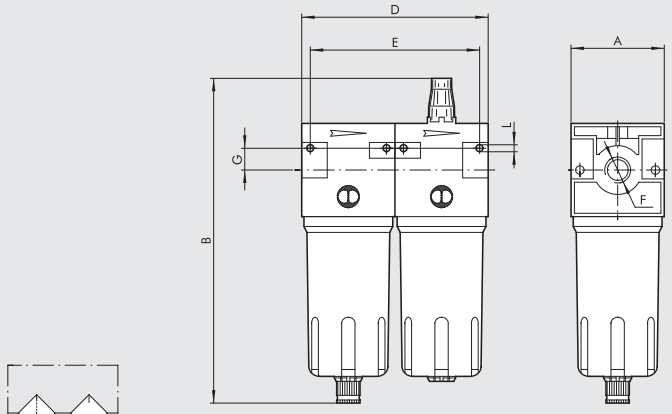
Filter + lubricator unit offering various degrees of filtration and high lubrication stability.
- Metal bowl with external sight glass
- Semi-automatic and automatic condensate drain
- Micrometric lubrication regulation
- Activation guaranteed at low air flows

Refer to the sections on the single modules for a further description, components and other technical data.



TECHNICAL DATA		F + L ND 1/4"	F + L ND 3/8"	F + L ND 1/2"	F + L ND 3/4"	F + L ND 1"
Threaded port		1/4"	3/8"	1/2"	3/4"	1"
Lubrication		mist	mist		mist	
Degree of filtration	µm	4 - 20 - 50	4 - 20 - 50		4 - 20 - 50	
Max. inlet pressure	MPa	1.8	1.8		1.8	
	bar	18	18		18	
	psi	261	261		261	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 0.5 bar (0.05 MPa to 7 psi)	Nl/min	600	2500		8000	
	scfm	21	89		282	
Flow rate at 6.3 bar (0.63 MPa to 91 psi) ΔP 1 bar (0.1 MPa to 14 psi)	Nl/min	1000	3500		9500	
	scfm	35.5	124		335	
Max temperature at 1 MPa; 10 bar; 145 psi	°C	50	50		50	
	°F	122	122		122	
Weight	kg	0.8	1.8		2.5	
Wall fixing screws		M4 x 40	M4 x 55		M6 x 75	
Fluid		Compressed air				
Note on use		**The maximum inlet pressure for the version with RA automatic condensate drainage must not exceed 10 bar.**				

DIMENSIONS



		F + L ND 1/4"	F + L ND 3/8"	F + L ND 1/2"	F + L ND 3/4"	F + L ND 1"
Threaded port F		1/4"	3/8"	1/2"	3/4"	1"
A		42	60		80	
B	RMSA	170	209		273	
	RA	-	213		277	
	SAC	174	213		277	
D		84	120		160	
E		74	106		146	
G		10	14		22	
L		M4 hole	M4 hole		M6 hole	

SYNOPTIC, SIZES AND VERSIONS

F + L	1/4	4	RMSA
ELEMENT	THREADED PORT	DEGREE OF FILTERING	CONDENSATE DRAIN
F + L	1/4	4 = 4 µm	RMSA
			SAC
	3/8	20 = 20 µm	RMSA
	1/2		SAC
			RA
	3/4	50 = 50 µm	RMSA
	1		RA

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.
RA: automatic drain with condensate discharge, independent of pressure and flow rate.
SAC: automatic drain with condensate discharge.
Operates by depression – requires variable air take-offs.

ORDERING CODES

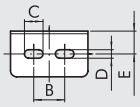
Code	Description
1233006	F+L 1/4 20 RMSA
1333006	F+L 3/8 20 RMSA
1433006	F+L 1/2 20 RMSA
1533006	F+L 3/4 20 RMSA
1633006	F+L 1 20 RMSA

The following versions are available on request:
- with 4 µm or 50 µm degree of filtration
- with SAC or RA condensate discharge

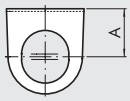
Newdeal ACCESSORIES

METAL WORK PNEUMATIC

MOUNTING BRACKET FOR REG.

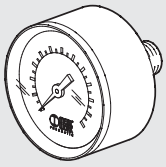


Code	Description
9200701	SF 1/4
9400701	SF 1/2

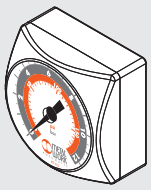


Code	A	B	C	D	E
9200701	32	20	12	5.5	14.2
9400701	42	40	12	5.5	15

PRESSURE GAUGE

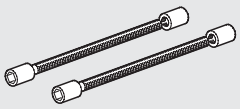


Code	Description
9700102	M 40 1/8 04
9700101	M 40 1/8 012
9800102	M 50 1/8 04
9800101	M 50 1/8 012
9900101	M 63 1/4 012

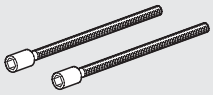


Code	Description
9700109	M 40x40 1/8 04
9700110	M 40x40 1/8 012

TIE RODS



Code	Description
9200901	T 1/4 F+L tie rods
9400901	T 1/2 F+L tie rods
9600901	T 3/4 F+L tie rods

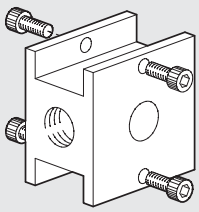


Code	Description
9604402	V3V+F+R 3/4-1 tie rods

ADAPTER FOR V3V

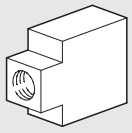
Code	Description
9201001	Adapt. X V3V+FR/D 1/4
9401001	Adapt. X V3V+D 3/8
9401002	Adapt. X V3V+D 1/2
9601001	Adapt. X V3V+F 1

REGULATOR CONNECTION BLOCK



Code	Description	Weight [g]
9200501	BC 1/4 block	90
9400501	BC 1/2 block	244
9600501	BC 3/4 block	428

SPACERS FOR FRL WALL MOUNTING



Code	Description
9200601	DF 1/4 spacer
9400601	DF 1/2 spacer
9600601	DF 3/4 spacer

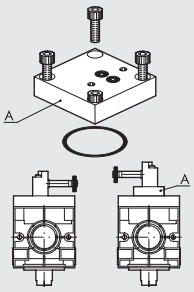
DISASSEMBLY TOOL FOR BOWL

Code	Description
9601501	Disassembloy key

ASSEMBLY SCREWS (2 PIECES)

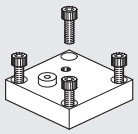
Code	Description
9250001	CVA 1/4 screw M4x40
9250002	CVA 1/4 screw M4x82 V3V+F+R
9450001	CVA 1/2 screw M5x55
9450002	CVA 3/8 1/2 screw M5x60 V3V+R
9450003	CVA 3/8 1/2 screw M5x120 V3V+F+R
9650001	CVA 3/4 screw M6X70

REVERSE PLATE CNOMO CONTROL FOR V3V 3/4"-1"



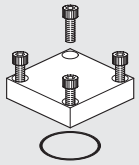
Code	Description	Weight [g]
9640201	Reverse plate kit V3V cnomo control	86

PLATE FOR REMOTE CONTROL FOR V3V 3/4"-1"



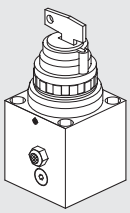
Code	Description	Weight [g]
9640001	Remote control plate kit	84

REG OR V3V END PLATE



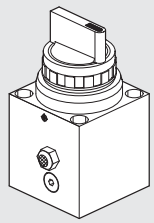
Code	Description	Weight [g]
9640101	End plate kit for regulator or V3V	82

KEY CONTROL FOR V3V 3/4"-1"



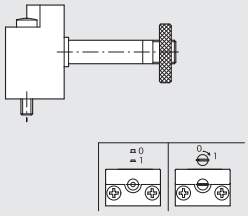
Code	Description	Weight [g]
9640301	Key control kit for V3V	364

MANUAL CONTROL FOR V3V 3/4"-1"



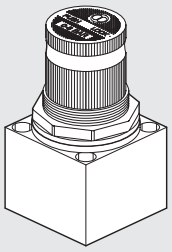
Code	Description	Weight [g]
9640401	Manual control kit for V3V	340

CNOMO CONTROL FOR V3V 3/4"-1"



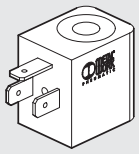
Code	Description
9453920	Elpn cnomo control kit, manual monostable
9453922	Elpn cnomo control kit, manual bistable

PILOT REGULATOR FOR ND 3/4-1"



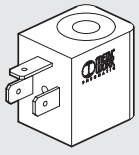
Code	Description	Weight [g]
9640501	02 pilot regulator kit	220
9640502	04 pilot regulator kit	220
9640503	08 pilot regulator kit	220
9640504	012 pilot regulator kit	220

COIL 22 mm FOR V3V ELPN



Code	Description
W0215000151	Coil 22 Ø 8 BA 2W-12VDC
W0215000101	Coil 22 Ø 8 BA 2W-24VDC
W0215000111	Coil 22 Ø 8 BA 3.5VA-24VAC
W0215000121	Coil 22 Ø 8 BA 3.5VA-110VAC
W0215000131	Coil 22 Ø 8 BA 3.5VA-220VAC

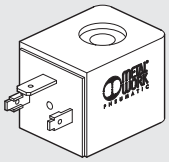
COIL 22 mm FOR V3V ELPN



Code	Description
W0215000251	Coil 22 Ø 8 BA 2W-12VDC UR
W0215000201	Coil 22 Ø 8 BA 2W-24VDC UR
W0215000211	Coil 22 Ø 8 BA 3.5VA-24VAC UR
W0215000221	Coil 22 Ø 8 BA 3.5VA-110VAC UR
W0215000231	Coil 22 Ø 8 BA 3.5VA-220VAC UR

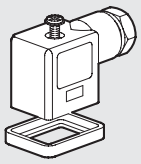
c UL us

COIL 30 mm FOR V3V ELPN



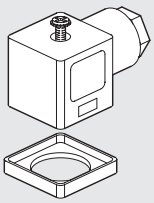
Code	Description
W0210010100	Coil 30 Ø 8 2W 24VDC
W0210011100	Coil 30 Ø 8 3.5VA 24VAC 50/60HZ
W0210012100	Coil 30 Ø 8 3.5VA 110VAC 50/60HZ
W0210013100	Coil 30 Ø 8 3.5VA 220VAC 50/60HZ

ELECTRIC CONNECTOR 22 mm FOR V3V ELPN



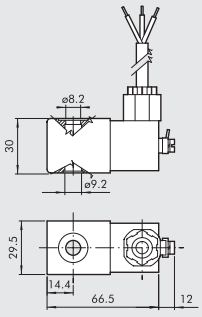
Code	Description
W0970510011	Connector standard
W0970510012	Connector 22 LED 24V
W0970510013	Connector 22 LED 110V
W0970510014	Connector 22 LED 220V
W0970510015	Connector 22 LED VDR 24V
W0970510016	Connector 22 LED VDR 110V
W0970510017	Connector 22 LED VDR 220V
W0970510070	Connector 22 ATEX II 2 GD

ELECTRIC CONNECTOR 30 mm FOR V3V ELPN



Code	Description
W0970520033	Connector standard
W0970520034	Connector 30 LED 24V
W0970520035	Connector 30 LED 110V
W0970520036	Connector 30 LED 220V
W0970520037	Connector 30 VDR 24V
W0970520038	Connector 30 VDR 110V
W0970520039	Connector 30 VDR 220V

KIT COIL EEXM



Code	Description
0227606913	Kit for coil 30 24 VDC EEXMT5 cable 3m
0227606915	Kit for coil 30 24 VDC EEXMT5 cable 5m
0227608013	Kit for coil 30 24 VAC EEXMT5 cable 3m
0227608015	Kit for coil 30 24 VAC EEXMT5 cable 5m
0227608023	Kit for coil 30 110 VAC EEXMT5 cable 3m
0227608025	Kit for coil 30 110 VAC EEXMT5 cable 5m
0227608033	Kit for coil 30 230 VAC EEXMT5 cable 3m
0227608035	Kit for coil 30 230 VAC EEXMT5 cable 5m

According to Atex 94/9 CE rule,
⟨Ex⟩ II 2G Ex mb IIC T4/T5 Gb
⟨Ex⟩ II 2D Ex tb IIIC T130/T95 °C IP66 Db

KIT FOR COIL SIDE 22 IP65

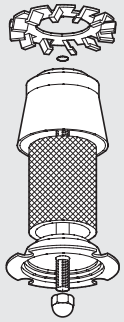
Code	Description
0222100100	Kit for coil 22 - IP65

Improved IP65 protection, even after prolonged exposure to atmospheric agents.
Applicable to valves with a technopolymer control.

Newdeal SPARE PARTS

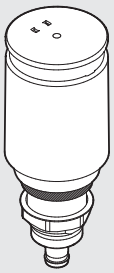
METAL WORK PNEUMATIC

FILTER AND FILTER REGULATOR FILTERING ELEMENT



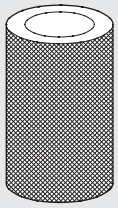
Code	Description
9450102	Spares FP 1/2 20
9450103	Spares FP 1/2 4
9450101	Spares FP 1/2 50
9250102	Spares FP 1/4 20
9250103	Spares FP 1/4 4
9250101	Spares FP 1/4 50
9650103	Spares FP 3/4 4
9650102	Spares FP 3/4 20
9650101	Spares FP 3/4 50

AUTOMATIC DRAIN (RA)



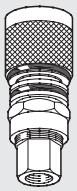
Code	Description
9000802	Spares RA automatic drain

FILTERING ELEMENT FOR DEPURATOR



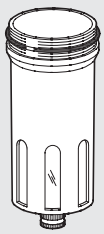
Code	Description
9450105	Spares kit FP DEP. 3/8 1/2

AUTOMATIC DRAIN (SAC)



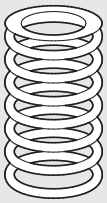
Code	Description
9000803	Spares SAC automatic drain

METAL FILTER BOWL



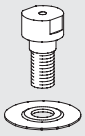
Code	Description
9450301	Spares TMVF 1/2 RMSA
9455201	Spares TMVF 1/2 SAC
9250301	Spares TMVF 1/4 RMSA
9255201	Spares TMVF 1/4 SAC
9650301	Spares TMVF 3/4 1 RMSA

SPRINGS FOR REGULATORS AND FILTER REGULATOR



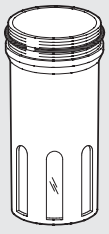
Code	Description
9250601	Spares MO 02 1/4
9250602	Spares MO 04 1/4
9250603	Spares MO 08 1/4
9250604	Spares MO 12 1/4
9450601	Spares MO 04 1/2
9450602	Spares MO 08 1/2
9450603	Spares MO 12 1/2
9650601	Spares MO 04 3/4
9650602	Spares MO 08 3/4
9650603	Spares MO 12 3/4

VENTURI LUBRICATOR DIAPHRAGM



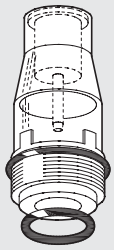
Code	Description
9252001	Spares MB 100 1/4
9352001	Spares MB 200 1/4 3/8 1/2
9652002	Spares MB 3/4-1

METAL LUBRICATOR BOWL



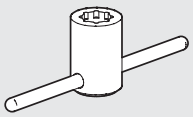
Code	Description
9251201	Spares TMVL 1/4
9451201	Spares TMVL 1/2
9651201	Spares TMVL 3/4

TRANSPARENT LUBRICATOR COVER



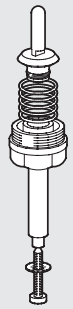
Code	Description
9251302	Spares CVL 100-200-300-400 BIT

DOME DISASSEMBLY SPANNER



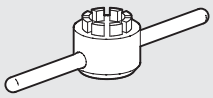
Code	Description
9220701	Acc cover LUB spanner

COMPLETE POPPET FOR FILTER REGULATOR



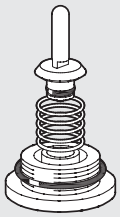
Code	Description
9250901	Spares OTFR 1/4
9450901	Spares OTFR 1/2

POPPET DISASSEMBLY SPANNER (FOR REG)



Code	Description
9220501	R cap disass. wr. 100

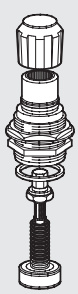
COMPLETE POPPER FOR REGULATOR



Code	Description
9250701	Spares OTR 1/4
9450701	Spares OTR 1/2
9650701	Spares OTR 3/4

NOTES

UPPER COVER FOR REGULATOR AND FILTER REGULATOR



Code	Description
9250801	Spares CS 1/4 02
9250802	Spares CS 1/4 04
9250803	Spares CS 1/4 08
9250804	Spares CS 1/4 012
9450801	Spares CS 1/2 04
9450802	Spares CS 1/2 08
9450803	Spares CS 1/2 12
9650801	Spares CS 3/4 04
9650802	Spares CS 3/4 08
9650803	Spares CS 3/4 12

SUMMARY ONE

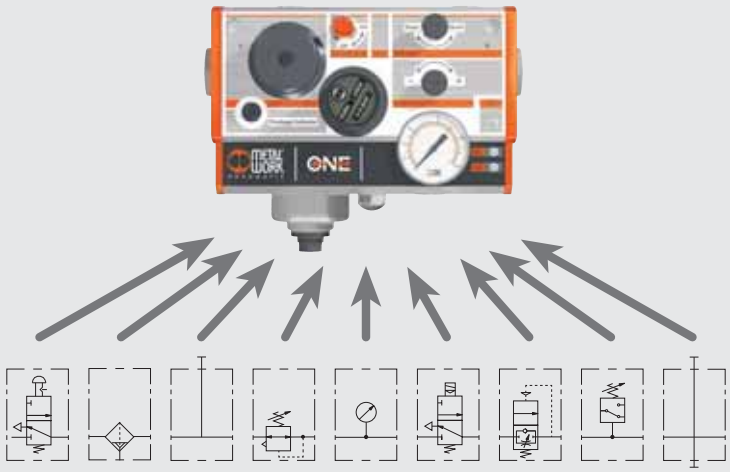
- LEARNING ABOUT C5.2
- SPECIFICATIONS C5.6
- HOW TO ORDER C5.10
- ACCESSORIES C5.12
- SPARE PARTS C5.13

LEARNING ABOUT

In the world of pneumatics, which is considered mature, it is rare to encounter completely new and different products.
ONE a compressed air treatment unit with a high degree of integration, that encompassed numerous pneumatic functions. In fact, it contains so many innovations that a single patent is not enough to safeguard it against imitation – three separate patent applications have been registered with a total of 39 claims. This unit is so innovative that it won the international novelty award at Fluidtrans Compomac.
ONE has a single high-performance valve on the main flow that handles all the functions from regulation to relief. It is controlled by a high-precision pilot regulator with controlled relief, in series with the manual on-off valve, the electric valve and the progressive actuator. Unification of the valve has led to a significant reduction in overall dimensions, enhanced capacity, precision and response speed.

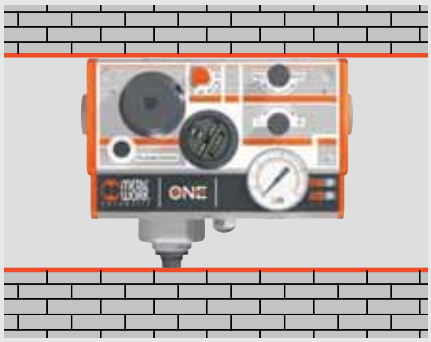
INTEGRATION

One single unit houses the threaded ports, filter, condensate drain, pressure regulator, shut-off valve, soft start valve, pressure switch and three supplementary air intakes.



MINIATURISATION

Extremely reduced dimensions, considering the extra-high performance and flow rate reachable.



No clearance is required above and below it to make adjustments or change the filter or other components. The actual space occupied is thus further reduced.

It weighs slightly more than one kilo instead of the 4 to 8 kilos of conventional units.

EASY ADJUSTMENTS AND LITTLE MAINTENANCE

The entire user interface is at the front, which means that everything is visible and easy to reach. All the adjustments are made using the push-lock knobs (no need for wrenches or screwdrivers), thus preventing accidental operations or manoeuvres.

CONFIGURABILITY

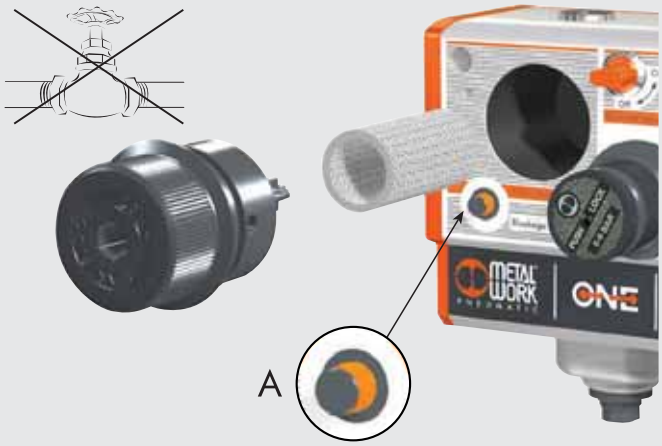
Considering that ONE is reduced in size but highly performing, and it can integrate tenths of functions, a single unit can cover the entire range of applications, with cut-clear advantages in terms of standardisation and reduction of the number of codes handled and goods in stock.
With a single size there are thousands of different configurations.
For example, there is choice between 1/4", 3/8", 1/2", 3/4" or 1" threaded ports, manual and/or electric on-off or progressive valves, etc.
The customer decides the configuration he wants and creates the code, using the key-to-coding table shown below in this catalogue.
He will receive the unit he wants marked with its code and the correct pneumatic diagram.

WHAT YOU CAN SEE FROM THE OUTSIDE

① Air intake, with swivel threaded port
② Fixing hole
③ Access to filter cartridge
④ Pressure regulation
⑥ Manual override (shut-off valve electrical)
⑦ Soft start valve regulation
⑧ Switching pressure regulation
⑨ Air outlet, with swivel threaded port
⑩ LED signalling unit ON
⑪ LED signalling pressure below the value set on pressure switch
⑫ LED signalling pressure over the value set on pressure switch
⑬ 5-pin M12x1 electrical connector
⑭ Pressure gauge
⑮ 1/4" air intake. Another regulated air intake and a filtered non-regulated air intake are situated on the top
⑯ Air exhaust with a G1/4"silencer
⑰ Condensate tank
⑱ Condensate drain
⑲ Clogged filter signal

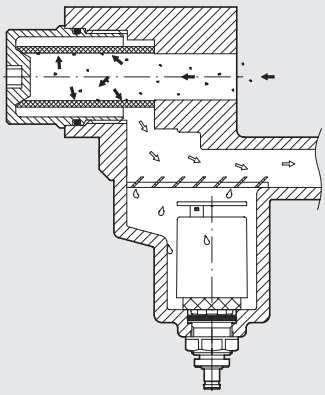
THREADED PORTS

- The threaded ports at the air intake and outlet are the swivel type to facilitate coupling with the supply and delivery pipes. In this way, the unit can be mounted or removed without dismounting the pipes.
- A range of 5 different threads, 1/4", 3/8", 1/2", 3/4" and 1" is also available.
- The thread for the supply pipe may differ from that of the delivery one.



- If the filter gets so clogged up that it causes an excessive drop in pressure as the air passes through, the optical filter blockage indicator will project (see detail A) to indicate that the filter cartridge must be replaced.
- The cartridge can be replaced by unscrewing a plug at the front. This system is functional and, unlike conventional filters, does not require manoeuvring space below the unit.
- An automatic stop on-off valve is incorporated in the unit: when the filter plug is unscrewed, the valve closes automatically. This means there is not need to a tap upstream and there is no risk of the plug being ejected violently.

CONDENSATE DRAIN



- The condensate drain is located downstream of the filter and thus uses cleaner air. This prevents the known problem of air leaks due to the deposit of dirt on the condensate discharge valve.
- You can request ONE with two types of condensate drain:
  - semi-automatic, type RMSA
  - automatic, of the floating type RA

SINGLE AIR EXHAUST

The air in the circuit is relieved via one outlet situated below the unit and fitted with silencer. If you want to convey air relief to prevent the emission of polluted air into the atmosphere, you can replace the silencer and install a fitting. (a pipe with a diameter of at least 6 mm is recommended)
Next to the air outlet there is the condensate drain, which in the RA version conveys the draining by inserting the pipe having internal diameter 6 mm in the lower port.

SUPPLEMENTARY PORTS

In addition to the main outlet, there are three supplementary air ports with a 1/4" thread.

- one for filtered non-regulated air (A) for use, for example, with a compressed air gun.
- two for filtered regulated air (B).

The unit comes complete with supplementary plugged ports for use with A7 fittings.

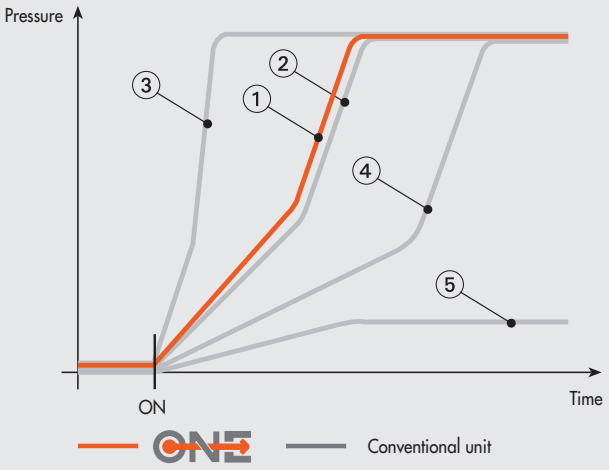
PANEL MOUNTING

ONE can be mounted inside the guard of the machine leaving only the front visible. This is a considerable advantage in terms of functionality and aesthetics as the user interface is entirely at the front.
Among the accessories to be ordered separately, there is the kit of brackets for panel mounting.

ELECTRICAL CONNECTION

A standard five-pin M12x1 connector, with IP67 protection is used for the opening solenoid valve and the pressure switch.
One cable only is required, thus improving reliability and reducing wiring times.

SOFT START VALVE



① Regulation for: ONE does not change with flow rate!
② Initial regulation of conventional unit
③ Low flow rate: activation too abrupt
④ High flow rate: activation too slow
⑤ Even higher flow rate: never cuts in!

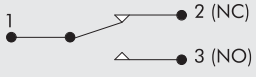
The soft start valve is an absolutely innovative feature among the functions provided by ONE.
Soft start valve available from the trade are generally based on the principle of leaving the passage of a small amount of air until the downstream pressure reaches a set value, and then opening the passage fully. In this way, the rate at which the pressure increases depends on the flow rate of the utilities, which often feature a continuous flow rate, for example a blow, and thus the starter can hardly activate. The solution offered by One is such that the pressure increases gradually and it is independent of the flow rate of the utilities. Pressure increase can be regulated precisely via the knob at the front.
Another piece of news, among the several possible configurations you can have the soft start valve operated by the manual V3V

SPECIFICATIONS

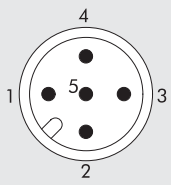
TECHNICAL DATA		1/4"	3/8"	1/2"	3/4"	1"
Flow rate at 6.3 bar (0.6 Mpa; 91 psi) ΔP 0.5 bar (0.05 Mpa; 7 psi)	Nl/min	2200	2900		3600	
	scfm	78	102		127	
Flow rate at 6.3 bar (0.6 Mpa; 91 psi) ΔP 1 bar (0.1 Mpa; 14 psi)	Nl/min	2400	3300		4000	
	scfm	85	116		141	
Flow rate on discharge at 6 bar (0.1 Mpa; 14 psi)	Nl/min	1600				
	scfm	56				
1/4" port flow rate of non-regulated filtered air	Nl/min	1800				
at 6.3 bar (0.6 Mpa; 91 psi) Δp 1 bar	scfm	64				
* Flow rate of each supplementary 1/4" filtered	Nl/min	2400				
and regulated air port at 6.3 bar (0.6 Mpa; 91 psi) ΔP 1 bar	scfm	85				
Fluid		Compressed air				
Setting range	bar	0.5 to 2 - 0.5 to 4 + 0.5 to 8				
Degree of filtration	µm	5 (yellow) or 20 (white)				
Operating pressure range	bar	10				
	MPa	1				
	psi	145				
Operating temperature range	°C	-10 to 50				
	°F	-14 to 122				
Class of protection		IP 65 with connector				
Insulation class of the solenoid valve		F155				
Switching time		100% ED				
Electrical connector		M12 x 1.5-pin to CEI IEC 60947-5-2				
Solenoid valve power	W	3/0.3				
Solenoid valve voltage	V	24 VDC± 10%				
Pressure interval settable on the pressure switch	bar	0.5 to 10				
Pressure switch hysteresis (not adjustable)	bar	bar 0.4 to 0.8 (see diagram)				
Maximum pressure switch current	A	0.5				
Maximum pressure switch voltage	V	3 to 30 AC/DC				
Pressure switch contacts		Normally open (NO) and normally closed (NC)				
Number of switching		5×10^6				
Weight	kg	From 1.15 to 1.25 according to configurations				
Wall fixing (max. panel thickness 10 mm):		Front, with M5 x 75 screws or back, with M6 x 70 screws				
		The screws are included in the supply				
Mounting position		Vertical				
Direction of flow		From left to right				
* Total flow rate from two supplementary outlets and the main one cannot exceed 4000 Nl/min at 6.3 bar with ΔP=1						
Compatibility with oils		See **chapter Z1**				

WIRING DIAGRAM

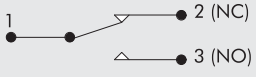
Version with solenoid valve and pressure switch

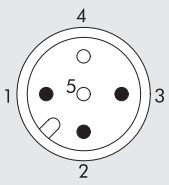


4 +24V DC
5 0V DC



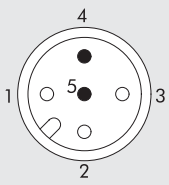
Version with pressure switch



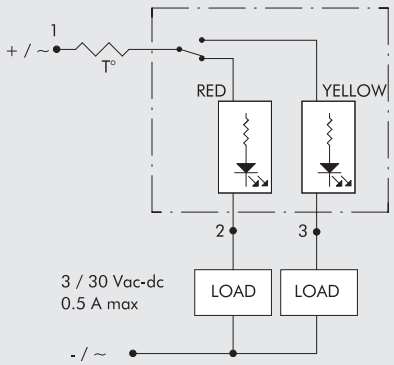


Version with solenoid valve

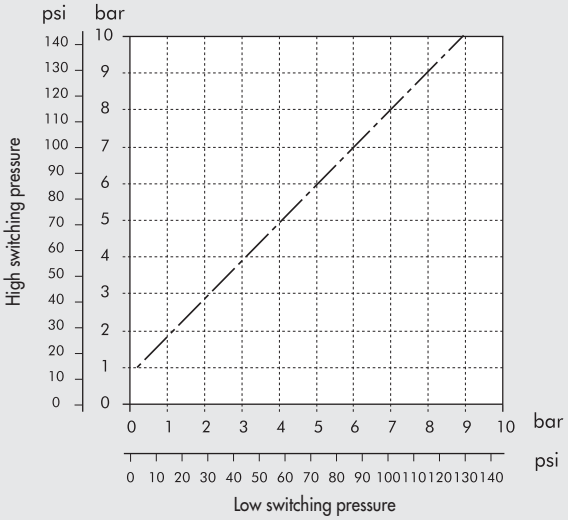
4 +24V DC
5 0V DC



PRESSURE SWITCH WIRING DIAGRAM



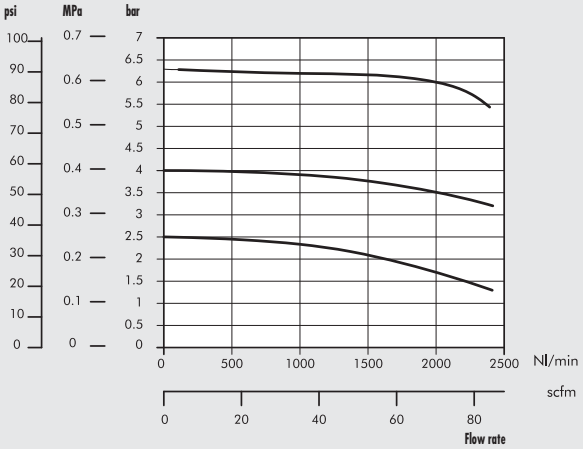
PRESSURE SWITCH HYSTERESIS CHART



FLOW CHARTS

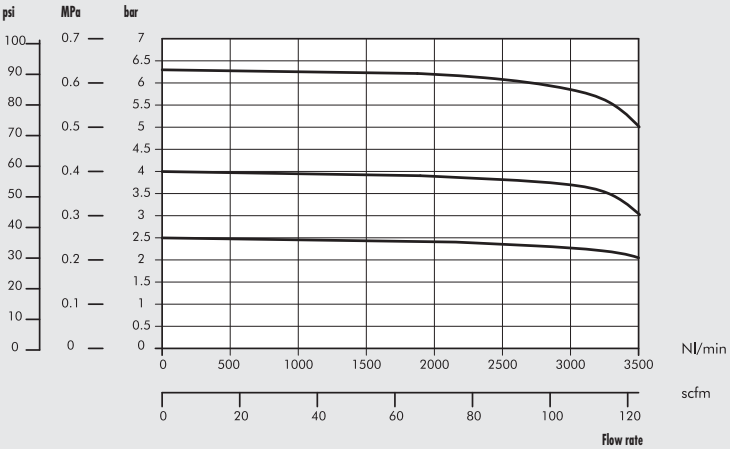
1/4"

Pm = 8 bar - 0.8 MPa - 116 psi
Preset pressure



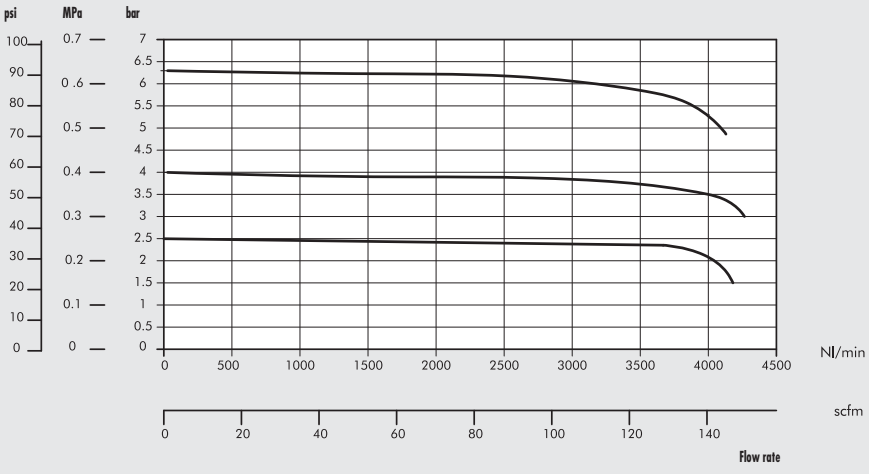
3/8"

Pm = 8 bar - 0.8 MPa - 116 psi
Preset pressure

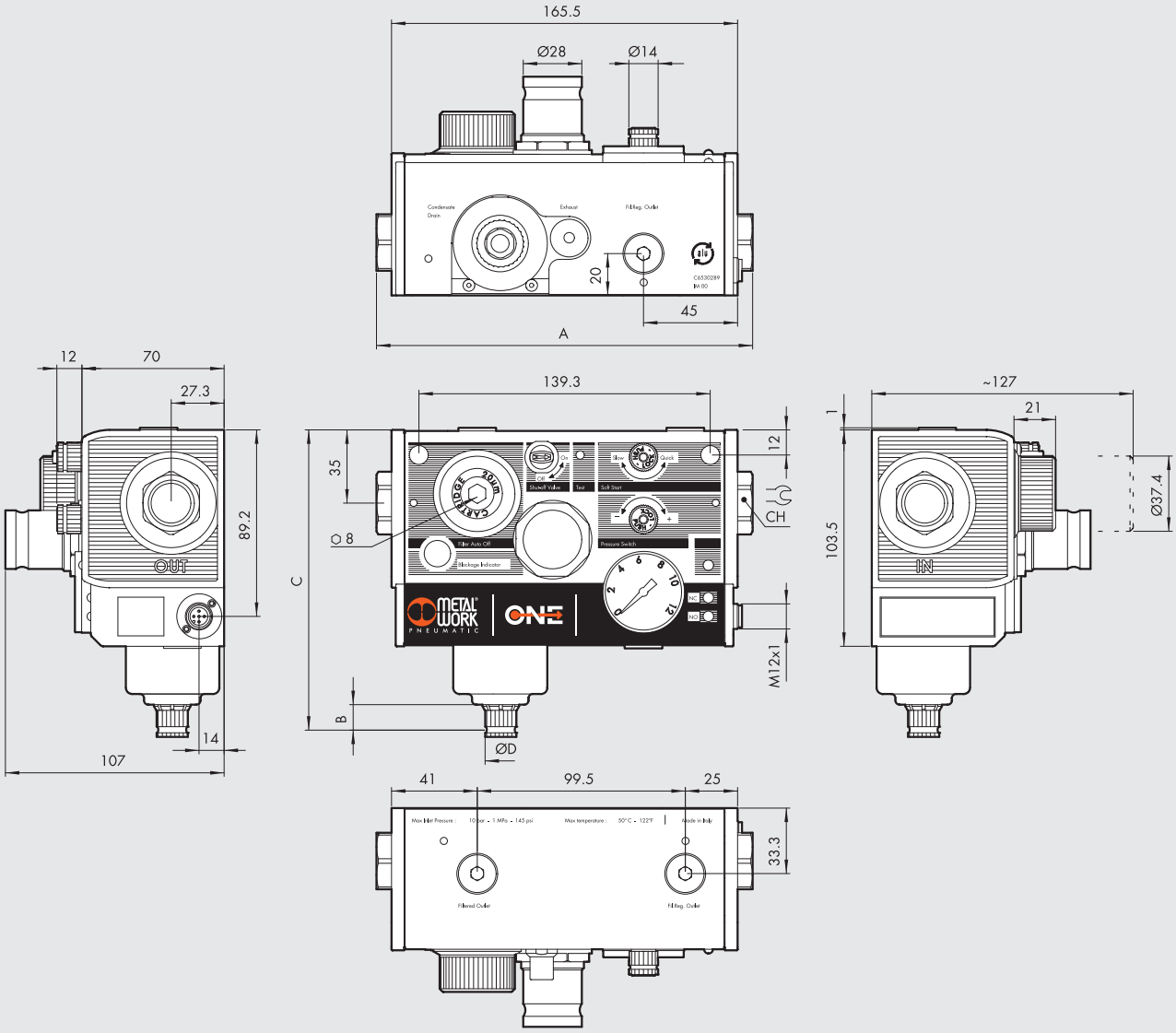


1/2" - 3/4" - 1"

Pm = 8 bar - 0.8 MPa - 116 psi
Preset pressure



DIMENSIONS

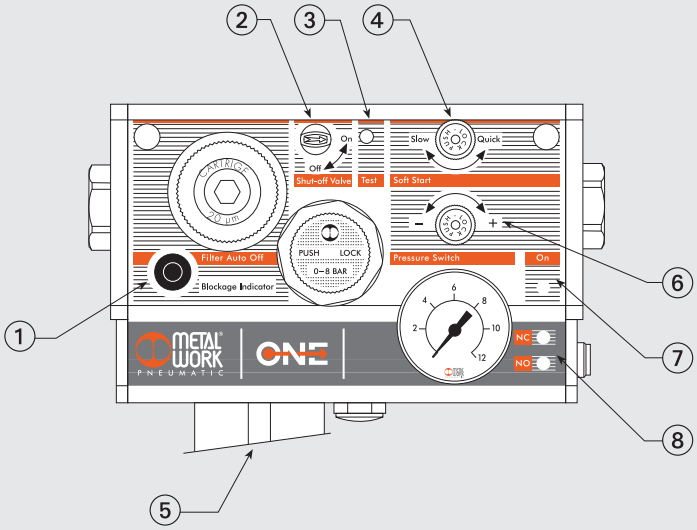


	1/4"	3/8"	1/2"	3/4"	1"
A		180		195	
CH	19	22	27	32	36

	RA	RMSA
B	20.4	16.4
C	152	148
Ø D	For pipe internal diameter 6 mm	15

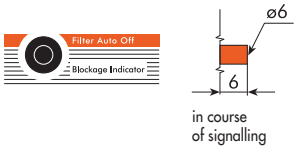
EXTERNAL DESIGN

You can get thousands of different configurations. The external design differs according on the versions chosen.



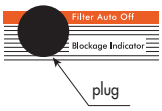
CLOGGED FILTER SIGNAL ①

PRESENT



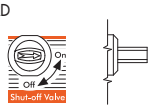
in course of signalling

NOT PRESENT

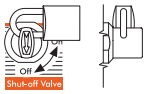


V3V MANUAL ②

STANDARD



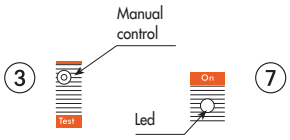
LOCKABLE



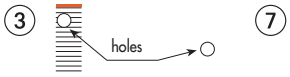
NOT PRESENT

V3V ELECTRICAL

PRESENT



NOT PRESENT
in some versions holes are present



in other configurations the cover has no holes

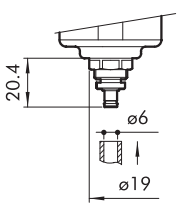
SOFT START VALVE ④

PRESENT

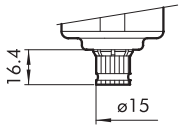
NOT PRESENT

CONDENSATE DRAIN ⑤

AUTOMATIC (RA)

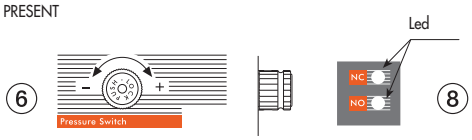


RMSA



PRESSURE SWITCH

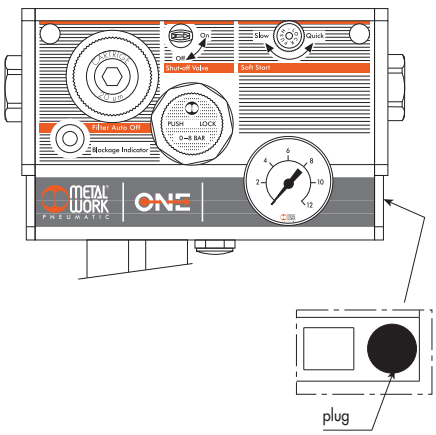
PRESENT



NOT PRESENT
in some versions holes are present

in other configurations the cover has no holes

ONE NON-ELECTRICAL



HOW TO ORDER

ORDERING CODES

You can choose among numerous variants and options. The product code so personalised is made up by compiling the diagram below.
The code so compiled must be specified on the order. A label showing the code and its pneumatic diagram is affixed onto the product.

	A	B	C	D	E	F	G	H	I	L	
	ONE electrical or ONE non-electrical	Air intake	Degree of filtration	Clogged filter signal	Condensate drain	Pressure regulation	Valves	Pressure switch	Air outlet	Miscellaneous, special version	
EXAMPLE	54	3	2	1	1	2	7	1	3	0	0
	53 ONE non-electric	1 1/4″	2 20µm	0 NO	0 RMSA	2 0,5 to 2 bar	0 None	0 NO	1 1/4″	00 Standard	
	54 ONE electric*	2 3/8″	5 5µm	1 YES	1 auto-matic (RA)	4 0,5 to 4 bar	1 V3V manual	1 YES ●	2 3/8″		
		3 1/2″				8 0,5 to 8 bar	2 V3V manual with padlock		3 1/2″		
		4 3/4″					3 V3V manual and soft start valve		4 3/4″		
		5 1″					4 V3V manual with padlock and soft start valve		5 1″		
							5 V3V manual and V3V electric ●				
							6 V3V manual with padlock and V3V electric ●				
							7 V3V manual and APR electric ●				
							8 V3V manual with padlock and APR electric ●				
							9 only V3V electric ●				
							A only APR electric ●				

* a pressure switch version and/or electric V3V and/or electric progressive actuator.

● **NB: versions valid only for the electric ONE (code 54…)**

A **ONE electric or non-electric**
ONE non-electric: there is no component actuated electrically: select code 53. In this case, the unit comes without any M12x1 connector, LED, pressure switch,or electric V3V.
ONE electric: there is at least one component actuated electrically, and thus the pressure switch and/or electric V3V (and/or the electrical soft sta valve) select code 54. In this case, the unit comes with the M12x1 connector and 3 LEDs. Only the LEDs associated with the functions installed will be active.

B **Air intake**
There are 5 different gas cylindrical threads: 1/4", 3/8", 1/2", 3/4" and 1".

C **Degree of filtration**
A cartridge with a degree of filtering of 5 µm (yellow) or 20 µm (white) is available. This value is marked on the plug.

D **Clogged filter signal**
If the filter gets so clogged up that it causes an excessive drop in pressure as the air passes through, the orange indicator will project from the body by a few millimetres.

E **Condensate drain**
RMSA: the condensate is drained out automatically only by relieving the air pull the knurled knob for having the same result.
Automatic (RA): a floating system that automatically drains the condensate out whenever the level of water in the bowl reaches the set value.

F **Pressure regulation**
There are three possible regulation fields.
The value is marked on the regulation knob..

G **Valves**
There are 11 different combinations. The electric valves are clearly selectable only if the initial code is 54, i.e. ONE electric.

- 0 - No valves present
- 1 - V3V manual: is a 3/2 valve that in a set position allows the air to flow and in the other it closes the passage and discharges the pressure downstream.
- 2 - V3V manual with padlock: like the previous one, with the possibility of inserting a padlock (included in the supply with 2 keys) in the valve closed position.
- 3 - V3V manual and soft start valve: when the manual V3V valve is operated, the pressure starts to increase slowly, with a fine adjustable ramp, and when it reaches about 30-40% of the set value, the valve opens completely and the pressure rises to the set value.
- 4 - V3V manual with padlock and soft start valve: like the previous, with the padlock device on the manual V3V in "OFF" position.
- 5 - V3V manual and V3V electric: two V3V in series are present, one is manual the other electrical. By operating both the valve the air flow is allowed. If one or two are switched OFF, the air downstream is relieved. The electrical one can also be operated manually by reefing pushed the "TEST" button
- 6 - V3V manual with padlock and V3V electric: like the previous, with the padlock device in "OFF" position.
- 7 - V3V manual and APR electric: One manual V3V and one soft start valve are present. When both are operated, the pressure starts to increase slowly, with a fine adjustable ramp, and when it reaches about 30-40% of the set value, the valve opens completely and the pressure rises to the set value.
- 8 - V3V manual with padlock and APR electric: like the previous, with the padlock device on the manual V3V in "OFF" position.
- 9 - V3V elettric: It's present only the electrical V3V. The valve will open if it is powered on. When the power supply is switched off, the valve closes and air downstream is relieved. The valve can also be operated manually by keeping pushed the test button.
- A - APR elettric: It's present only the electric soft start valve. Whent it is powered ON, the pressure starts to increase slowly,with a fine adjustable ramp, and when it reaches about 30-40% of the set value, the valve opens completely and the pressure rises to the set value.

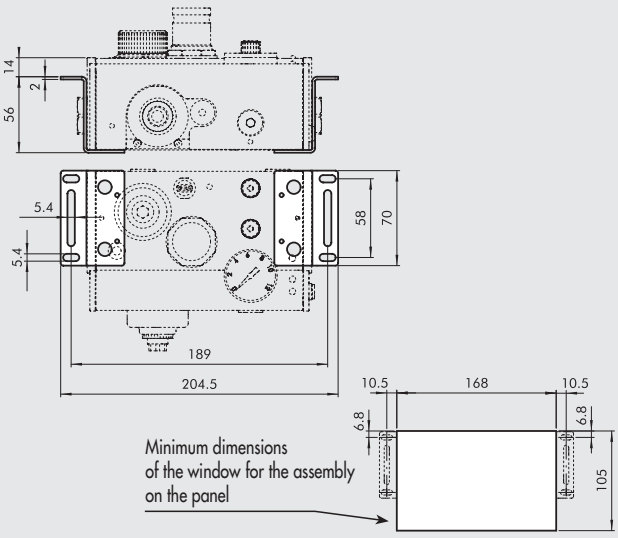
H **Pressure switch**
The pressure switch has a switching contact, which means you can have a normally-open signal or a normally-close signal. It is also connected to the NC and NO LEDs which come on if the actual pressure is less or greater than the set pressure, respectively. The LEDs only come on if an electric charge is connected to them.

I **Air outlet**
Five different gas cylindrical threads are available: 1/4", 3/8", 1/2", 3/4" and 1". It is possible to choose a thread other than the one on the inlet port.

L Free positions for special executions.

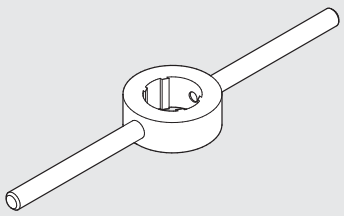
ACCESSORIES ONE

PANEL MOUNTING BRACKETS



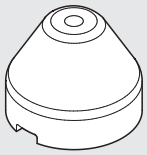
Code	Description
9200702	Kit – panel mounting brackets **N.B.:** fixing screws included

COVER DISASSEMBLY WRENCH



Code	Description
9170401	Cover disassembly wrench

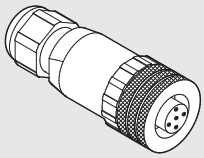
SECURITY KNOB



Code	Description
9200703	Security knob apr/pressure switch

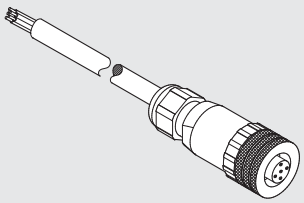
NOTE: Pull outwards to remove the knob from the APR/pressure switch on the unit. Insert the security knob and regulate the APR/ pressure switch. Then press the handle firmly to lock it in position. If the APR/pressure switch needs to be reset, remove the security knob by forcing it laterally with a screwdriver.

STRAIGHT CONNECTOR



Code	Description
W0970513001	5-PIN M12X1 straight connector

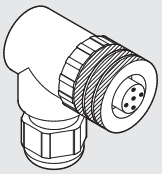
STRAIGHT CONNECTOR WITH WIRE



Pin	Cable color
1	Brown
2	White
3	Blue
4	Black
5	Grey

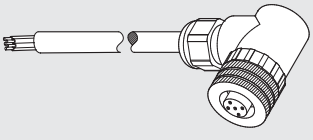
Code	Description
W0970513002	5-PIN M12X1 straight connector with wire L = 5 m

90° CONNECTOR



Code	Description
W0970513003	M12X1 5-PIN 90° connector

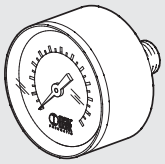
90° CONNECTOR WITH WIRE



Pin	Cable color
1	Brown
2	White
3	Blue
4	Black
5	Grey

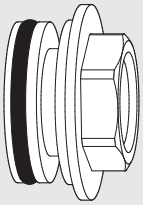
Code	Description
W0970513004	M12X1 5-PIN 90° connector with wire L = 5 m

PRESSURE GAUGE



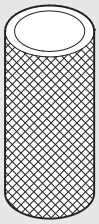
Code	Description
9700106	M 39 1/8 0-4
9700107	M 39 1/8 0-12

THREADED PORT



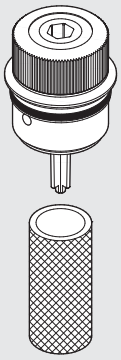
Code	Description
9232001	1/4" spare thr. port for ONE
9232002	3/8" spare thr. port for ONE
9232003	1/2" spare thr. port for ONE
9232004	3/4" spare thr. port for ONE
9232005	1" spare thr. port for ONE

FILTER ELEMENT



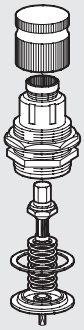
Code	Description
9251720	Spare filter element 5 µm for ONE
9251721	Spare filter element 20 µm for ONE

FILTER PLUG WITH FILTER ELEMENT



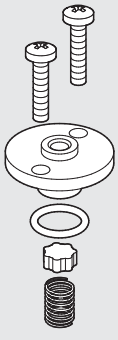
Code	Description
9251723	Spare plug + filter element 5 µm ONE
9251724	Spare plug + filter element 20 µm ONE

PILOT REGULATOR



Code	Description
9250820	Spare pilot reg. 0.5 to 2 bar for ONE
9250821	Spare pilot reg. 0.5 to 4 bar for ONE
9250822	Spare pilot reg. 0.5 to 8 bar for ONE

POPPET

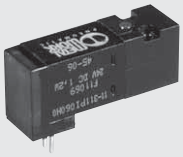


Code	Description
9250707	Spare poppet for ONE

SOLENOID VALVE

NEW

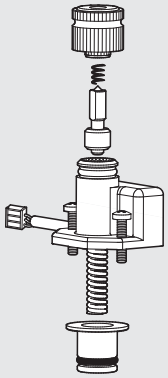
OLD



Code	Description
722123840101	PLT-10 722123840101

Note: Spare part no longer available. If the solenoid valve to be replaced is the same as the one shown here on the left, please contact our sales department.

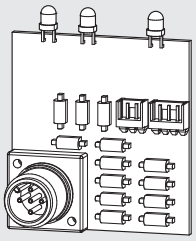
PRESSURE SWITCH



Code	Description
9000500	Spare press. switch for ONE

Note: with this kit we suggest you should order also the gauge, as it could get damaged during the disassembly.

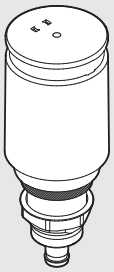
ELECTRIC BOARD



Code	Description
9232010	Spare electric board for ONE

Note: with this kit we suggest you should order also the gauge, as it could get damaged during the disassembly.

AUTOMATIC DRAIN (RA)

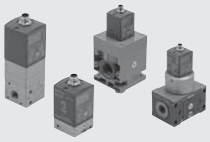


Code	Description
9000802	Spare RA automatic drain

NOTES

SUMMARY PRECISION REGULATION AND PRESSURE CONTROL

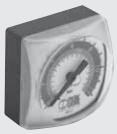
- **PRECISION PRESSURE REGULATOR WITH HIGH EXAUST FLOW, SERIE GS** C6.2



- **PROPORTIONAL PRECISION PRESSURE REGULATOR REGTRONIC SERIES** C6.6

- **PRESSURE SWITCHES** C6.17

- **DIGITAL PRESSURE SWITCH** C6.19



- **SQUARE DIAL PRESSURE GAUGE** C6.22

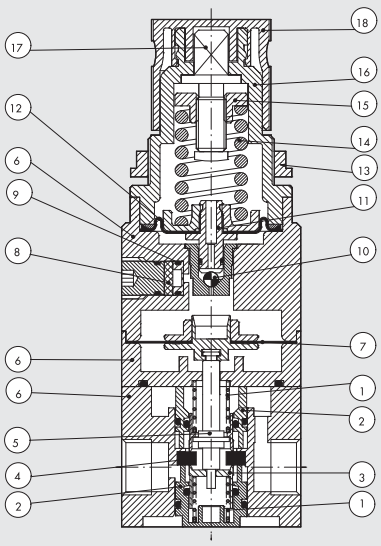
PRECISION PRESSURE REGULATOR WITH HIGH EXAUST FLOW, SERIE GS

GS is a series of precision regulators, designed for rapid relief of overpressure and a high flow rate.
They feature identical and opposing regulation valves on the inlet and outlet sides. This enables the regulator to behave symmetrically – precise regulation with a high rate of flow both in and out.
The pressure setting is virtually insensitive to changes in the upstream pressure (see diagram below), which guarantees accuracy even when the mains pressure fluctuates considerably.
A slight escape of air is required for correct operation of the regulator – it must not be considered a defect.
The regulator can be fixed using the through holes in the body or a bracket accessory.
The body has a 1/8" pressure gauge fitting.
GS regulators are suitable for applications requiring good accuracy in maintaining the pressure and a certain sensitivity in relieving pressure peaks, e.g. to supply low-friction cylinders, reel tensioners and coil winders.
Two sizes of compressed air fitting are available: 1/8" and 1/4".
Three different setting ranges are available: 0 to 2 bar, 0 to 4 bar and 0 to 8 bar.

TECHNICAL DATA		1/8"	1/4"
Threaded port		1/8"	1/4"
Setting range	bar	0 to 2 - 0 to 4 - 0 to 8	
Max. input pressure	bar	10	
Flow rate at 6.3 bar ΔP 0.5 bar	Nl/min	900	1170
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	1200	1380
Fluid		Unlubricated filtered air	
		The air must be at least 10 µm pre-filtered	
Temperature range	°C	From -10 to +50	
Mounting position		In any position	
Pressure gauge port		G 1/8"	
Weight	g	600	
Exaust flow rate at 4 bar (regulated pressure)			
ΔP 0.1 bar	Nl/min	450	810
ΔP 0.5 bar	Nl/min	900	1190
Variation in regulated pressure (2 bar) with changes in upstream pressure (4-10 bar)	mbar	± 20	
Relieving sensitivity	mbar	30	
Air consumption – continuous escape	Nl/min	< 0.1	
Notes		The regulator pressure must always be set upwards.	
		For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value.	
		Do not take air from pressure gauge ports.	

COMPONENTS

① Spring: stainless steel
② Cartridges: nickel-plated brass
③ Poppet: nickel-plated brass
④ Ring: vulcanized NBR
⑤ Control lever: brass
⑥ Bodies: painted aluminium
⑦ Control diaphragm: oil-proof rubber
⑧ Filter: sintered bronze
⑨ Throttle cartridge: brass
⑩ Ball: stainless steel
⑪ Ball valve: brass
⑫ Regulation diaphragm: NBR
⑬ Ring nut: technopolymer
⑭ Adjusting spring: steel
⑮ Scroll: brass
⑯ Bell: technopolymer
⑰ Adjusting screw: brass
⑱ Knob: technopolymer



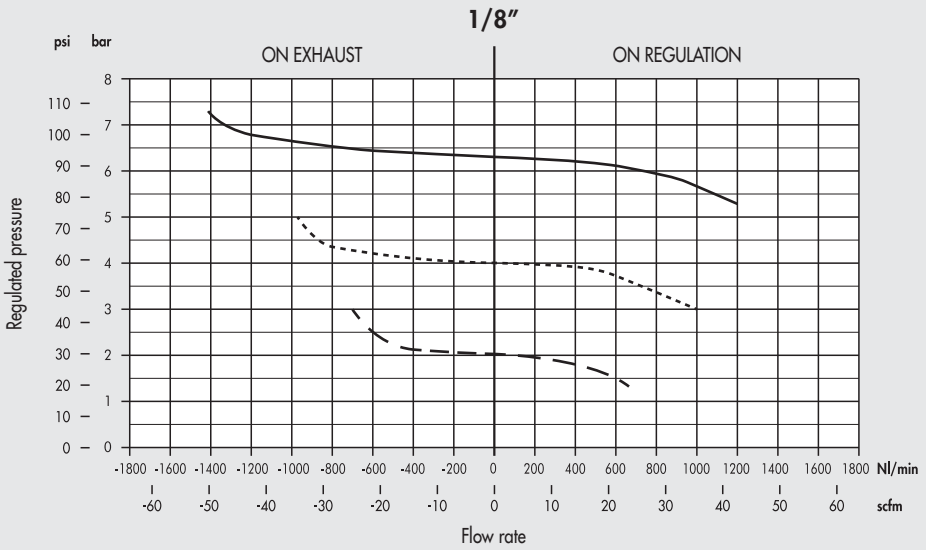
FLOW RATE

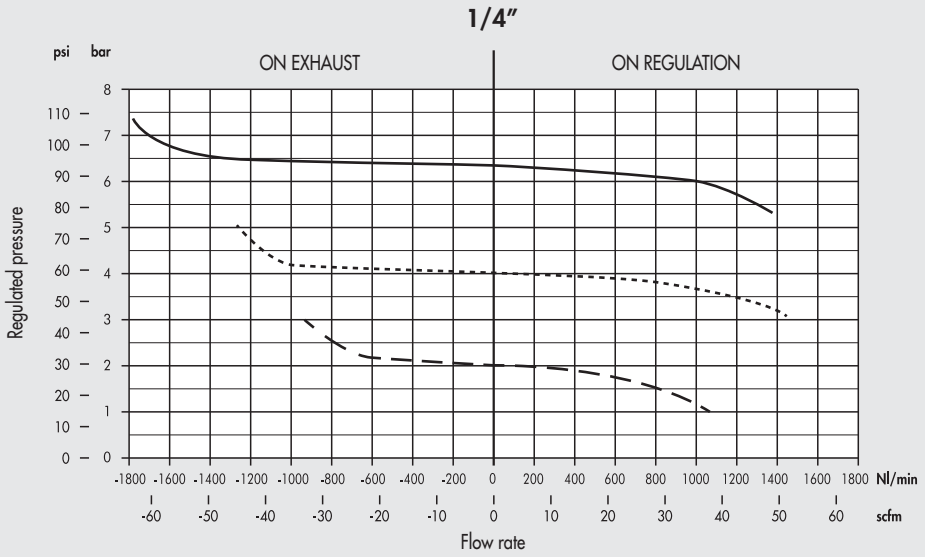
Upstream pressure = 10 bar

P reg = 2 bar

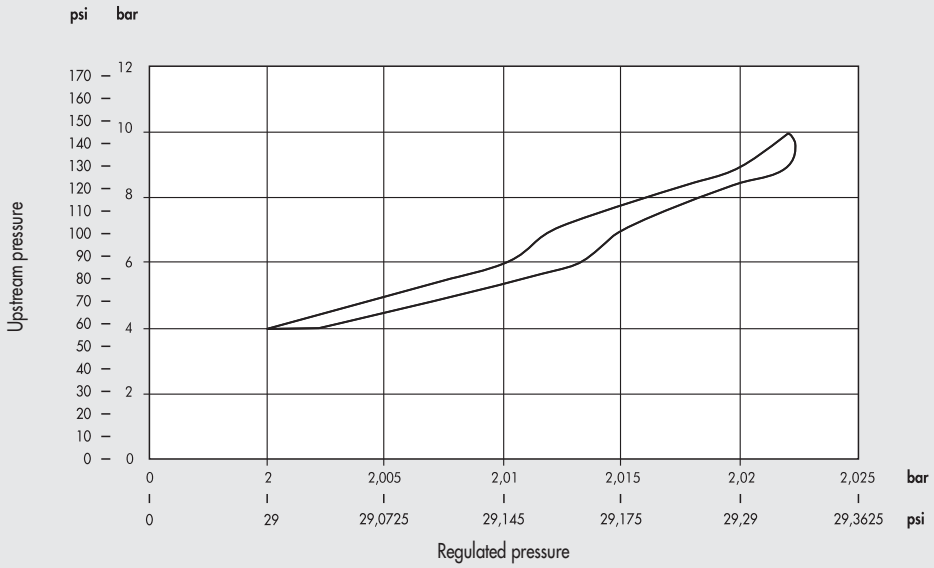
P reg = 6.3 bar

P reg = 4 bar

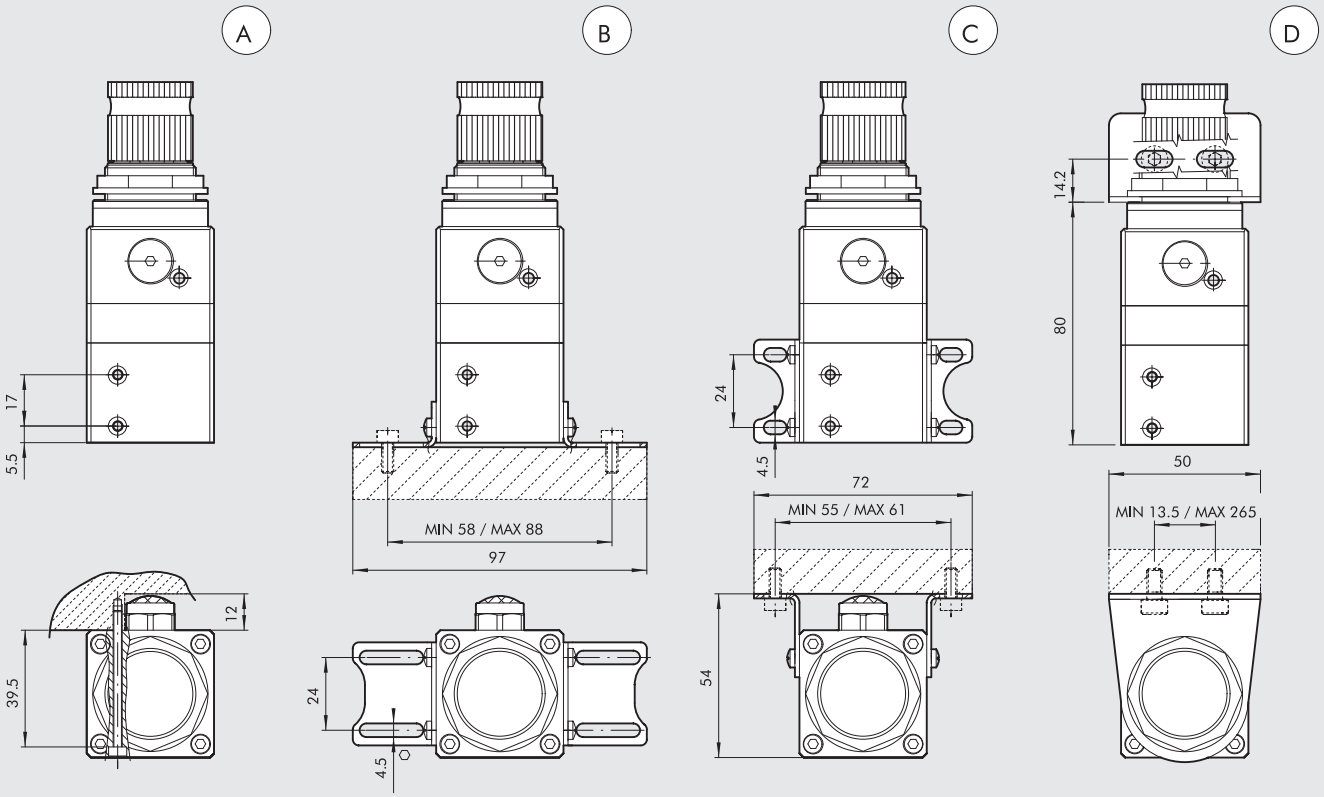




UPSTREAM PRESSURE SENSITIVITY

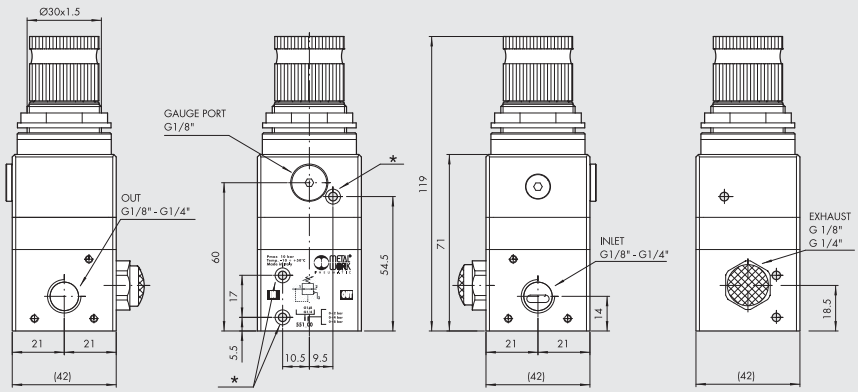


INSTALLATION



Ⓐ On the wall with 2 M3 hex screws
Ⓑ On the base with legs code 9200710
Ⓒ On the wall with legs code 9200710
Ⓓ On the wall with bracket code 9200701

DIMENSIONS



* M3 hole

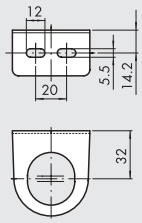
Code	Description
5511200	REG. GS 1/8 02
5511300	REG. GS 1/8 04
5511400	REG. GS 1/8 08
5512200	REG. GS 1/4 02
5512300	REG. GS 1/4 04
5512400	REG. GS 1/4 08

METAL WORK PNEUMATIC

ACCESSORIES

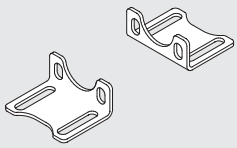
SPARES PARTS

R/FR FIXING BRACKET



Code	Description
9200701	SF100 - BIT - ND 1/4 - SY1

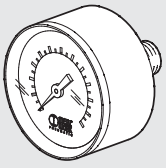
FIXING BRACKET KIT



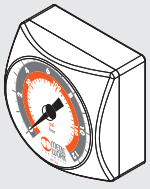
Code	Description
9200710	Fixing bracket kit

N.B. supplied complete with four M4X6 screws

PRESSURE GAUGE

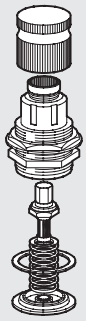


Code	Description
9700102	M 40 1/8 04
9700101	M 40 1/8 012



9700109	M 40x40 1/8 04
9700110	M 40x40 1/8 012

UPPER COVER FOR REG GS

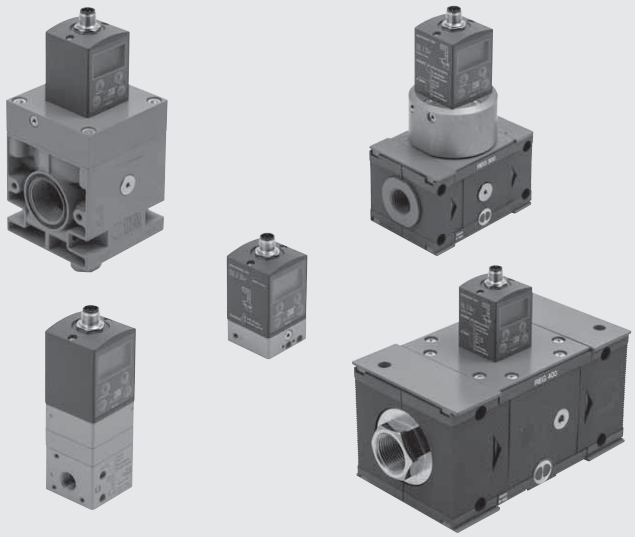


Code	Description
9250835	SPARES CS REG GS 02
9250836	SPARES CS REG GS 04
9250837	SPARES CS REG GS 04

NOTES

PROPORTIONAL PRECISION PRESSURE REGULATOR REGTRONIC SERIES

Proportional pressure regulators series REGTRONIC have the job of precisely regulating the pressure in a system, the variables depending on the input command. Remote control regulators are controlled by means of an M12x1 cable and connector and can have Volt, mA or RS232 control. Regulators with a display can be controlled via a cable or directly using the keys below the display. The pressure value and a series of information and diagnostics are visible at all times on the graphic display.
The user-display interface, LEDs and buttons are all on one side.
The programming and reading software is comprehensive, simple and intuitive. Pressure control takes place in a "closed-loop" with an electronic precision pressure sensor that measures the downstream pressure, a control system that compares it with the desired pressure, and two mini solenoid valves that adjust the pressure to reach the target value.



TECHNICAL DATA		REGTRONIC			REGTRONIC NEW DEAL		REGTRONIC 300			REGTRONIC 400			
Threaded port		M5	1/8"	1/4"	3/4"	1"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"	2"
Fluid		Filtered, unlubricated air. The air must be filtered at least 10 µm											
MIN inlet pressure	bar	Regulation pressure + 1 bar											
MAX inlet pressure	bar	11											
Temperature range	°C	0 - 50											
Pressure regulation range	bar	0.05 - 10 (settable full scale and minimum pressure)											
Flow rate at 6.3 bar ΔP 0.5	Nl/min	10	770	1490	10000		4500			18000			20000
Flow rate at 6.3 bar ΔP 0.1	Nl/min	10	1050	1700	13000		7000			-			-
Exhaust flow rate at 6.3 bar with 0.1 bar overpressure	Nl/min	2	320	500	1800		250			400			400
Exhaust flow rate at 6.3 bar with 0.5 bar overpressure	Nl/min	9	650	1200	2000		500			850			850
Weight	kg	0.2	0.38	0.38	1.3		1.5			5			5.8
Class of protection		65											
Power supply		24 Vcc +10% -5% I max 110 mA											
Input signal (input impedence)	Voltage	0 - 5 Vcc, 0 -10 Vcc (approx. 6.3 KΩ)											
	Current	4 - 20 mA (approx. 100 Ω)											
	Serial ports	RS 232											
	Manual	Keypad											
Output signal	Analog	0 - 10 Vcc (1 V=1bar) - 1 mA max											
	Digital	PNP open collector output: max 24V 60 mA											
		NPN open collector output: max 24V 60 mA											
Linearity		≤ ± 0.5% (Full scale)											
Hysteresis		≤ ± 0.2% (Full scale)											
Repeatability		≤ ± 0.2% (Full scale)											
Sensitivity/Dead-band		setting range 10 - 100 mbar											
Output pressure (display version)	Accuracy	≤ ± 0.3% (Full scale)											
	Unit of measurement	bar, MPa, psi											
	Minimum resolution	0.01 bar - 0.001 MPa - 0.01 psi											
Analog output accuracy		≤ ± 0.4% (Full scale)											
Temperature characteristics		max 2 mbar / °C											
Response time with ΔP =1 bar		volume 100 cc			volume 1000 cc								
from 6 to 7 bar	s	0.5	0.2		0.3		0.45			0.35			
from 7 to 6 bar	s	0.55	0.3		0.3		0.45			0.7			
Installation position		In any position											
Notes		The features shown refer to the static condition only. With air consumption on the output side, the pressure may vary.											
		On all versions you can set the parameters using the software "MWRegtronic" downloadable from the website www.metalwork.eu.											
		To connect the PC to Regtronic you can use the cable code W0970513019.											

REMOTE-CONTROL VERSION

The remote-control version of the Regtronic has two LED message lines.

DISPLAY VERSION

The display version also has buttons for entering the various parameters.

PROGRAMMABLE AND FLEXIBLE

Setting options:

- LANGUAGE
- UNIT OF MEASUREMENT
- TYPE OF INPUT
- TYPE OF DIGITAL OUTPUT
- DEAD-BAND
- FULL SCALE
- MINIMUM PRESSURE

PRECISION

Linearity
± 0.5 % (full scale)

Hysteresis
± 0.2 % (full scale)

Repeatability
± 0.2 % (full scale)

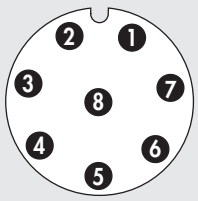
Sensitivity
range 10 to100 mbar

M12 x 1 CONNECTOR

8-pin connector
- standard
- available from the trade

CONFIGURATION OF THE M12X1 8-PIN CONNECTOR

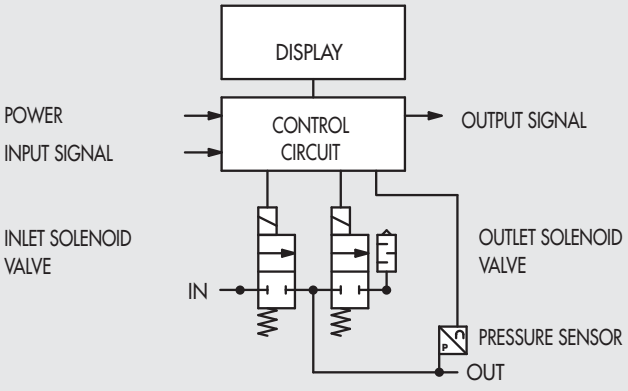
1 = TX (RS232)	(White)
2 = RX (RS232)	(Brown)
3 = set 0-10 V / 0-5 V / 4-20 mA	(Green)
4 = digital out 0-24 V NPN	(Yellow)
5 = analog out 0-10 V	(Grey)
6 = digital out 0-24 V PNP	(Pink)
7 = 0 V (GND)	(Blue)
8 = power supply +24V	(Red)



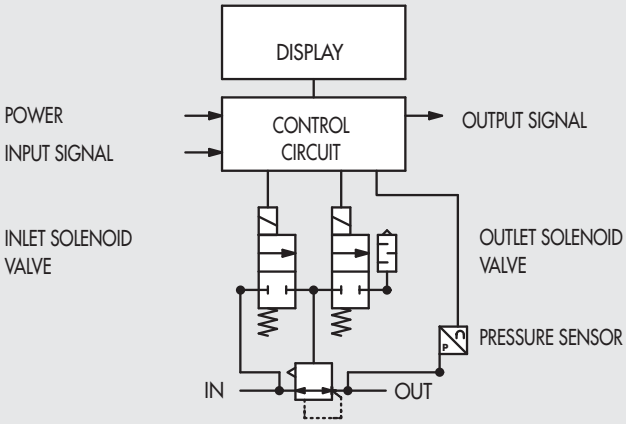
Regulator connectorviewed from above

SCHEMA FUNCTION DIAGRAM

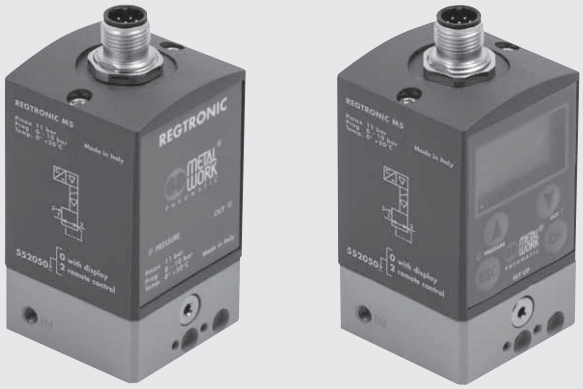
REGTRONIC M5



REGTRONIC 1/8" - 1/4" - SK300 - SK400 - NEW DEAL

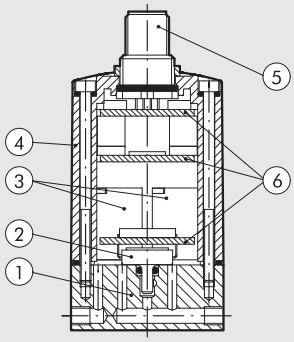


REGTRONIC M5

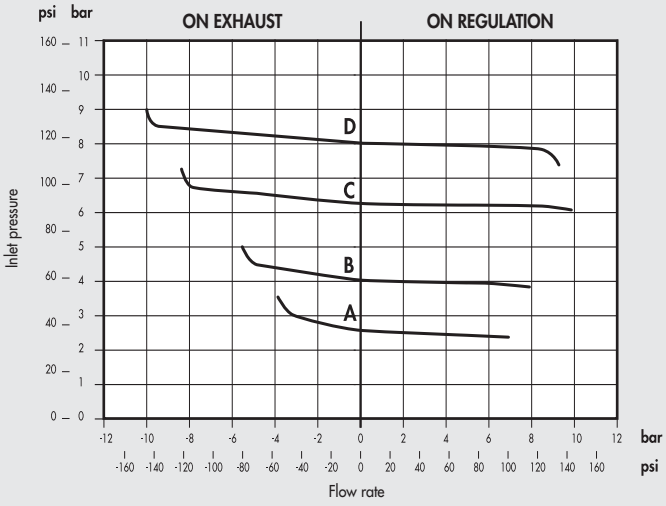


COMPONENTS

① BODY: painted aluminium
② PRESSURE SENSOR
③ SOLENOID VALVE: 10 mm series PLT-10
④ SHELL: technopolymer
⑤ CONNECTOR M12 8 pin
⑥ ELECTRONIC BOARDS

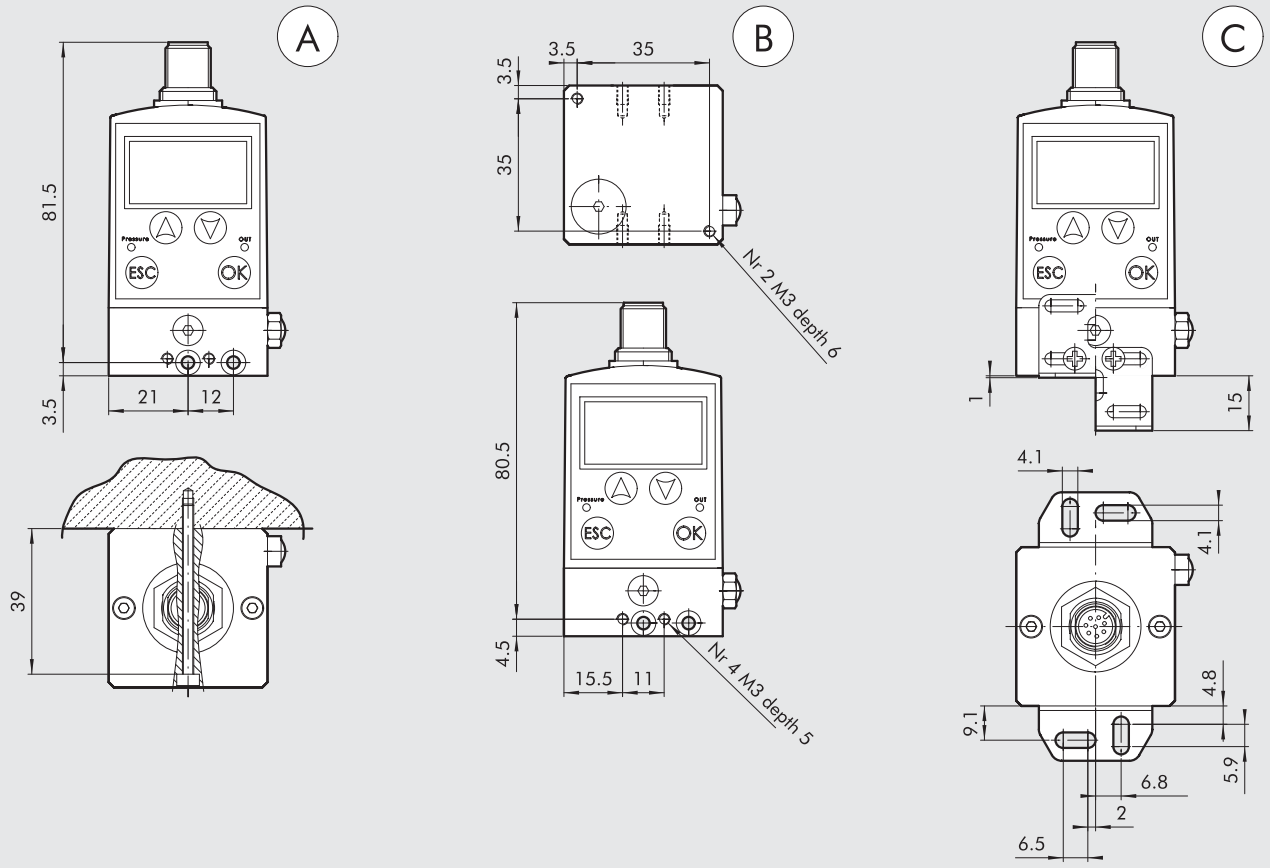


FLOW CHARTS



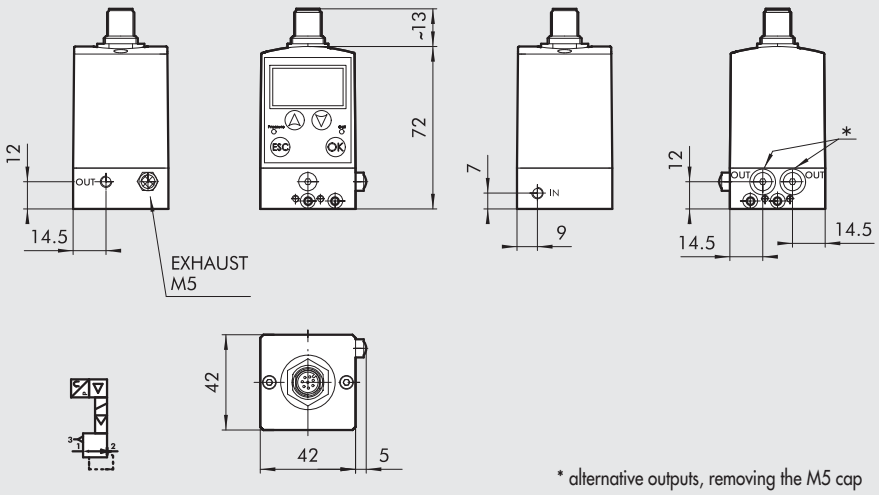
A = 2.5 bar B = 4 bar C = 6.3 bar D = 8 bar Pm = 10 bar

INSTALLATION



Ⓐ On the wall with 2 M3 hex screws, with through holes
Ⓑ On the wall using the M3 threaded holes on the front, rear and underside
Ⓒ on the wall with legs code 9200711

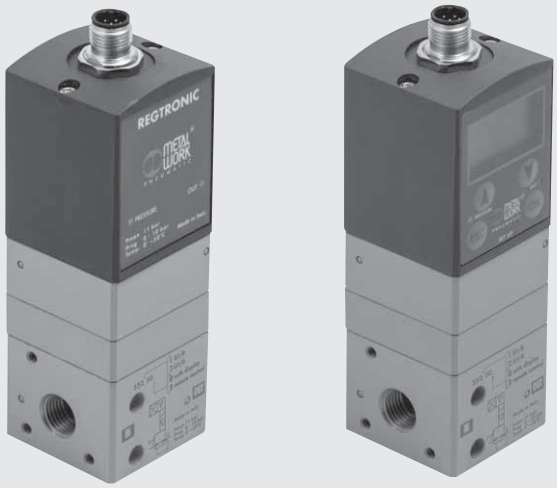
DIMENSIONS AND ORDERING CODES



* alternative outputs, removing the M5 cap

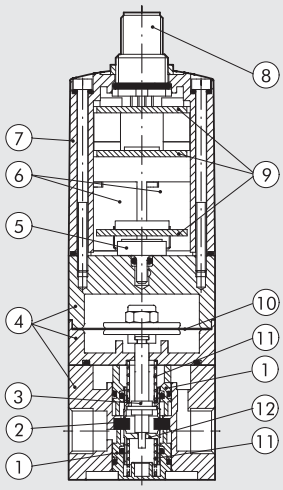
Code	Code
5520500	REGTRONIC M5 with dispaly
5520502	REGTRONIC M5 remote control

REGTRONIC 1/8"; 1/4"



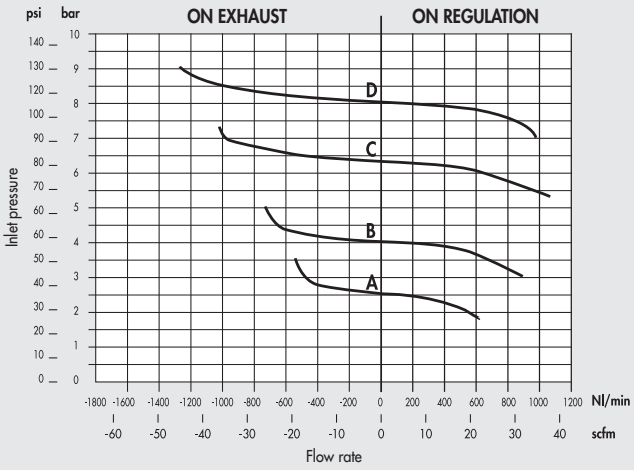
COMPONENTS

① CARTRIDGES: nickel-plated brass
② RING: vulcanized NBR
③ ROD: steel
④ BODIES: painted aluminium
⑤ PRESSURE SENSOR
⑥ SOLENOID VALVE: 10 mm series PLT-10
⑦ SHELL: technopolymer
⑧ CONNECTOR M12 8 pin
⑨ ELECTRONIC BOARDS
⑩ CONTROL DIAPHRAGM: anti-oil rubber
⑪ SPRING: stainless steel
⑫ POPPET: nickel-plated brass

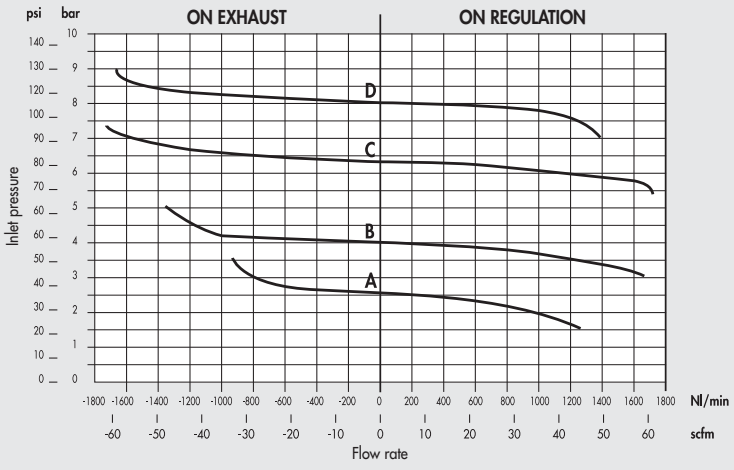


FLOW CHARTS

1/8"

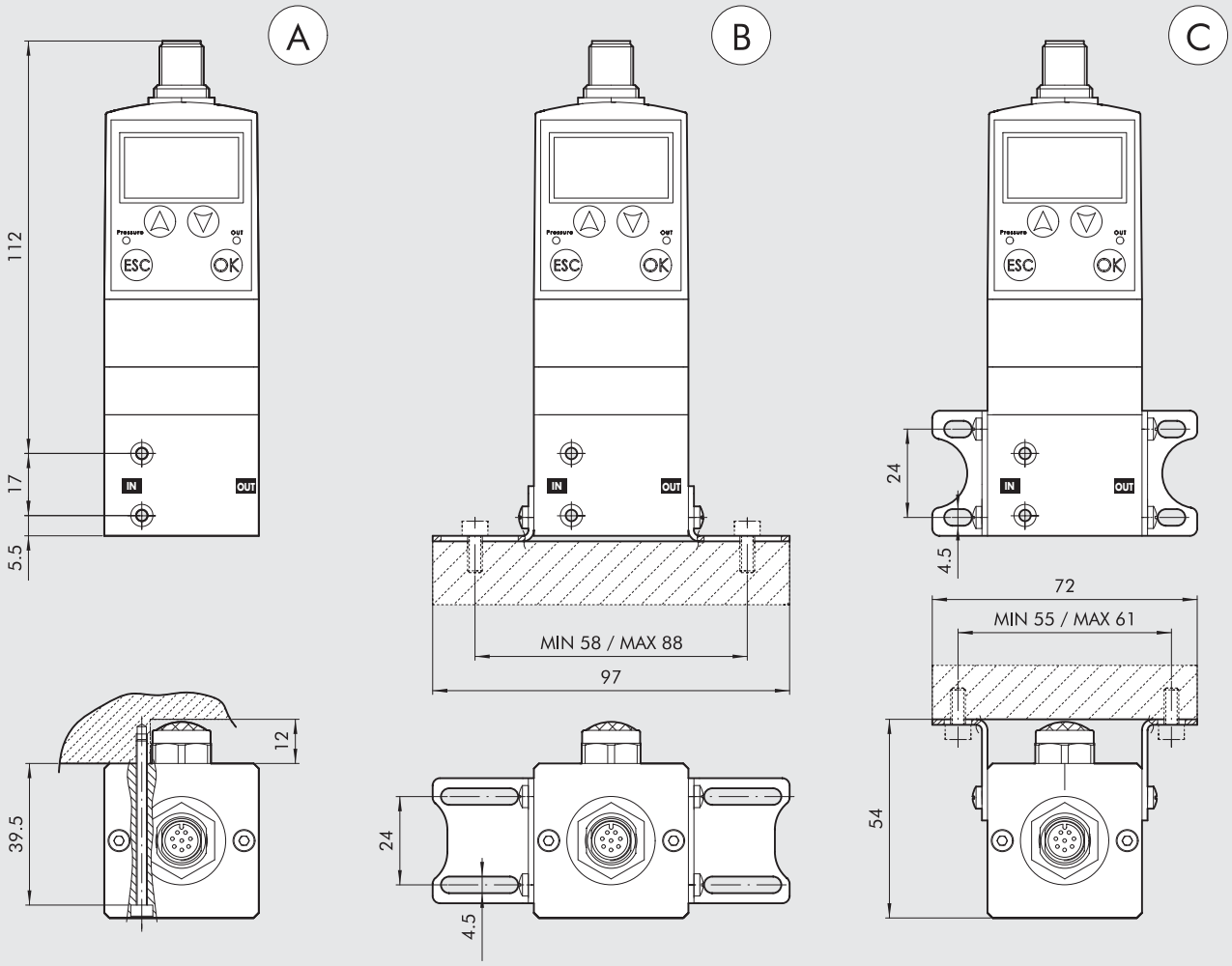


1/4"



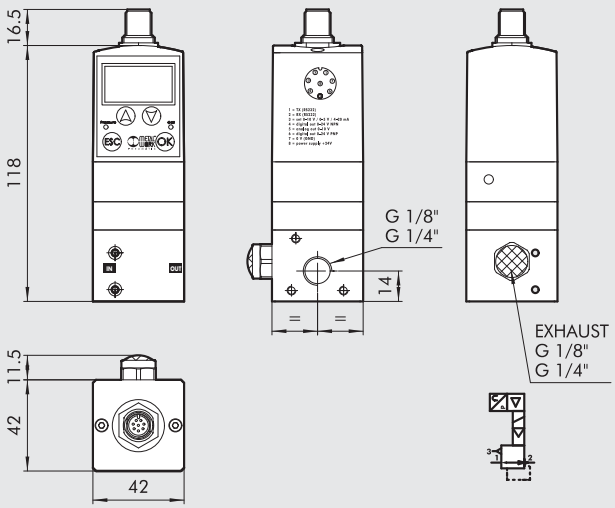
A = 2.5 bar B = 4 bar C = 6.3 bar D = 8 bar Pm = 10 bar

INSTALLATION



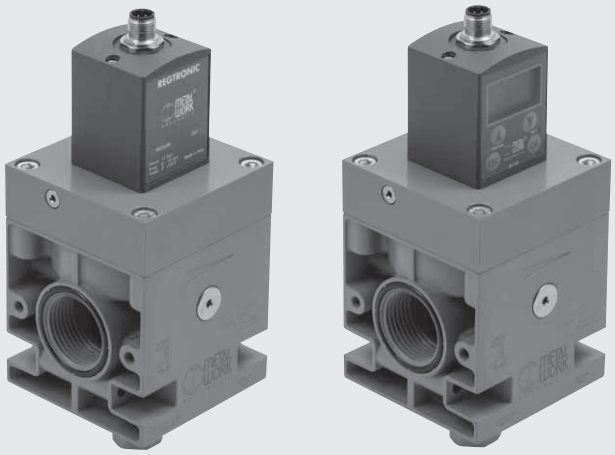
Ⓐ On the wall with 2 M3 hex screws
Ⓑ On the base with legs code 9200710
Ⓒ On the wall with legs code 9200710

DIMENSIONS AND ORDERING CODES



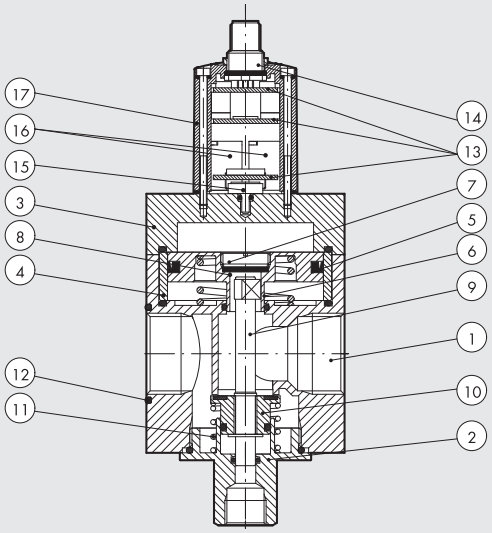
Code	Description
5521500	REGTRONIC 1/8 with display
5521502	REGTRONIC 1/8 remote control
5522500	REGTRONIC 1/4 with display
5522502	REGTRONIC 1/4 remote control

REGTRONIC Newdeal

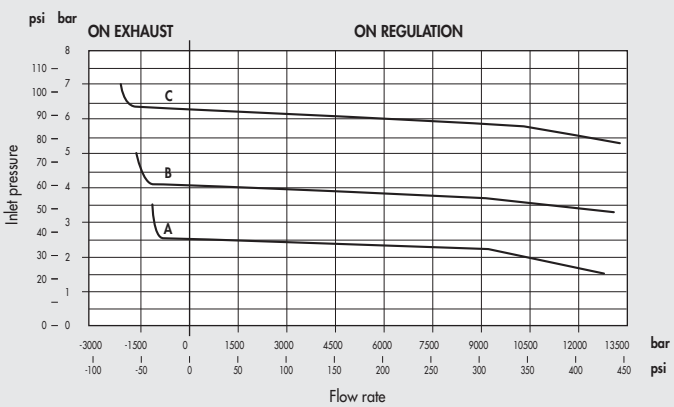


COMPONENTS

① REGULATOR BODY: aluminium
② LOWER CAP: aluminium
③ UPPER PLATE: aluminium
④ SPACER: aluminium
⑤ GASKET: NBR
⑥ PISTON ROD: aluminium
⑦ CAP FOR PLAIN GASKET: OT58 brass
⑧ PLAIN GASKET: NBR
⑨ ROD: OT58 brass
⑩ VALVE: OT58 brass
⑪ VALVE SPRING: steel
⑫ GASKETS: NBR
⑬ ELECTRONIC BOARDS
⑭ CONNECTOR M12 8 PIN
⑮ PRESSURE SENSOR
⑯ SOLENOID VALVE: 10 mm series PLT-10
⑰ SHELL: tecnopolymer

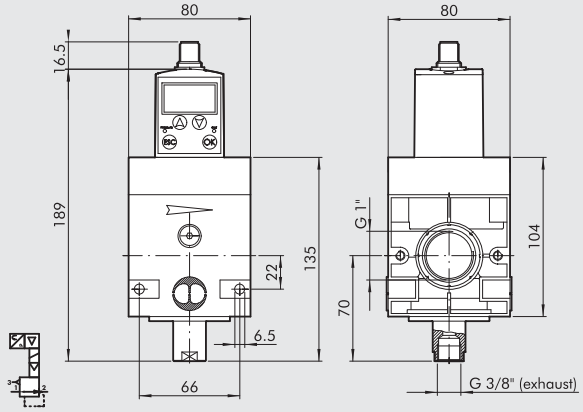


FLOW CHARTS



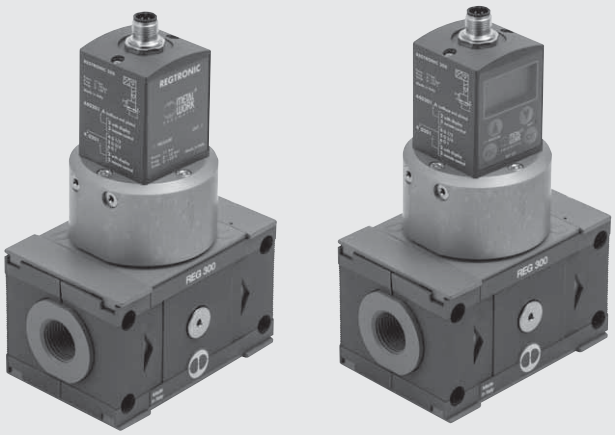
A = 2.5 bar B = 4 bar C = 6.3 bar Pm = 10 bar

DIMENSIONS AND ORDERING CODES



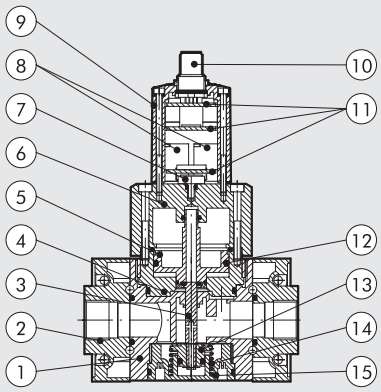
Code	Description
1520003	REGTRONIC 3/4 with display
1520004	REGTRONIC 3/4 remote control
1620003	REGTRONIC 1 with display
1620004	REGTRONIC 1 remote control

REGTRONIC 300

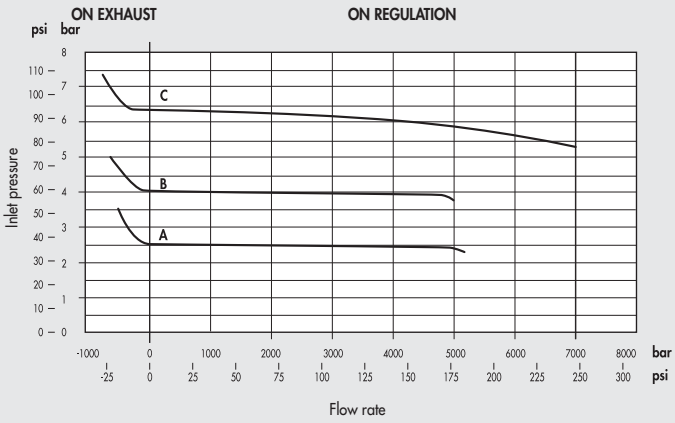


COMPONENTS

① BODY: tecnopolymer
② END PLATE: zamak
③ STEM: OT58 brass
④ UPPER CUP: aluminium
⑤ PISTON: OT58 brass
⑥ CUP: aluminium
⑦ PRESSURE SENSOR
⑧ SOLENOID VALVE: 10 mm series PLT-10
⑨ SHELL: tecnopolymer
⑩ CONNECTOR M12 8 PIN
⑪ ELECTRONIC BOARDS
⑫ GASKET: NBR
⑬ VALVE WITH NBR VULCANIZED GASKET
⑭ VALVE SPRING: stainless steel
⑮ LOWER CUP: tecnopolymer

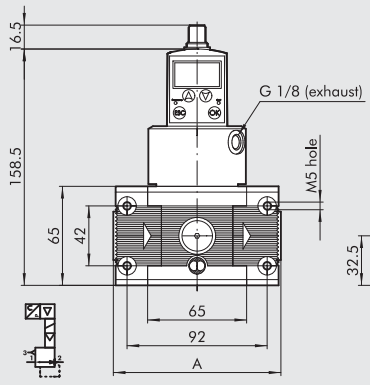


FLOW CHARTS



A = 2.5 bar B = 4 bar C = 6.3 bar Pm = 10 bar

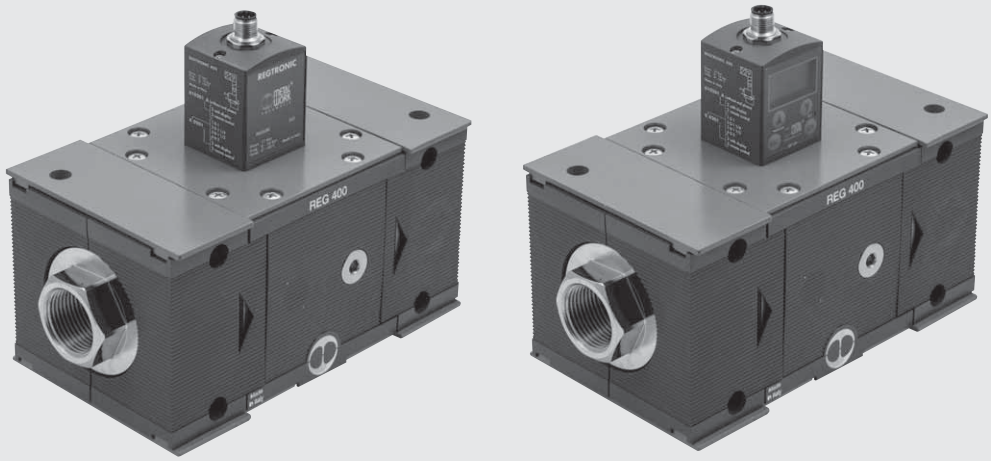
DIMENSIONS AND ORDERING CODES



G	A
1/2"	110
3/4"	110
1"	112

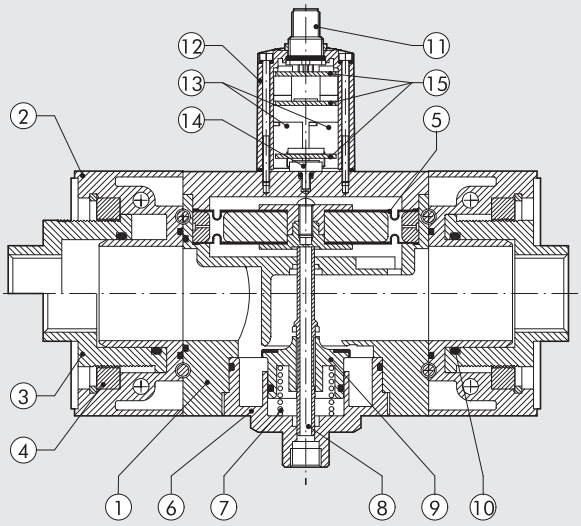
Code	Description
4402012A	REGTRONIC 300 with display without end plates
4402013A	REGTRONIC 300 remote control without end plates
4402012	REGTRONIC 300 1/2 with display
4402013	REGTRONIC 300 1/2 remote control
4502012	REGTRONIC 300 3/4 with display
4502013	REGTRONIC 300 3/4 remote control
4602012	REGTRONIC 300 1 with display
4602013	REGTRONIC 300 1 remote control

REGTRONIC 400



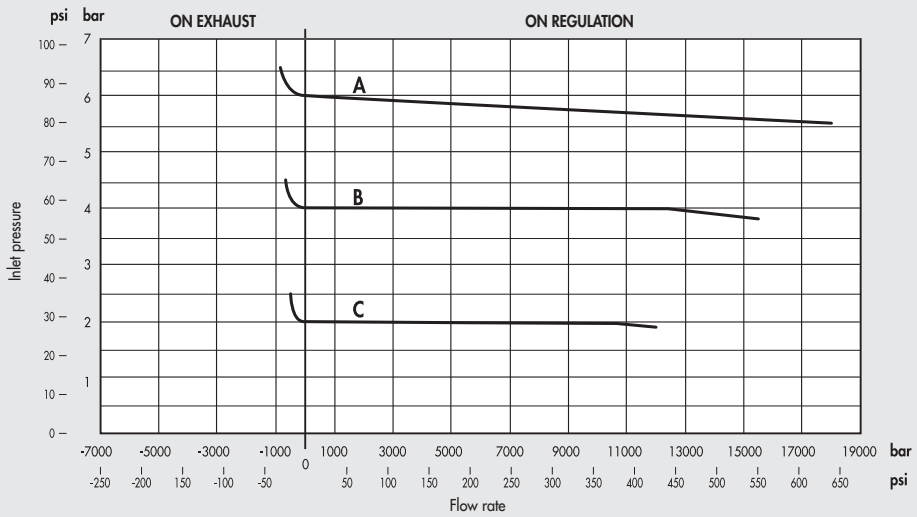
COMPONENTS

① BODY: Aluminium
② END PLATE: Aluminium
③ THREADED BUSH, AXIAL ADJUSTMENT: OT58 brass
④ RETAINING RING: OT58 brass
⑤ ROLLING DIAPHRAGM
⑥ BRASS PLUG: OT58 brass
⑦ VALVE SPRING: Stainless steel
⑧ STEM: OT58 brass with air relief hole
⑨ VALVE WITH NBR VULCANIZED GASKET
⑩ GASKETS: NBR
⑪ CONNECTOR M12 8 PIN
⑫ SHELL: technopolymer
⑬ SOLENOID VALVE: 10 mm series PLT-10
⑭ PRESSURE SENSOR
⑮ ELECTRONIC BOARDS



FLOW CHARTS

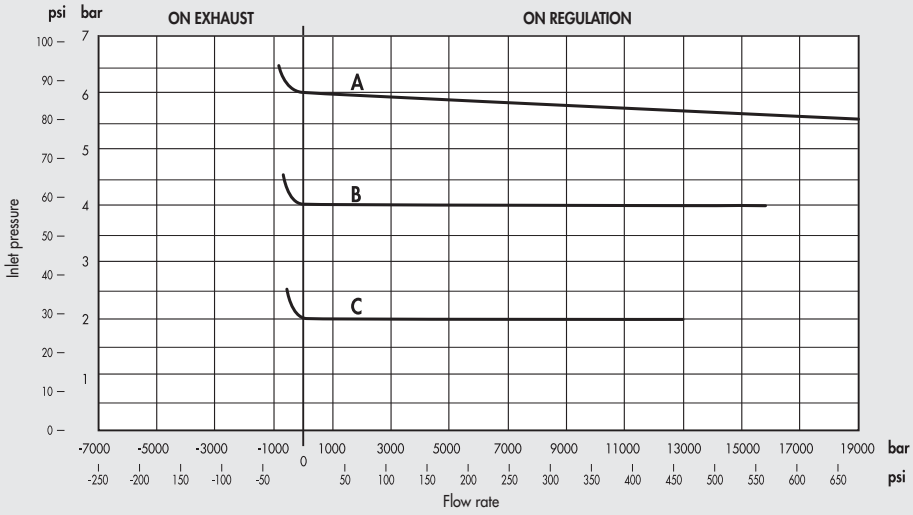
REGTRONIC 400 1" to 1 1/2"



A = 6 bar
B = 4 bar
C = 2 bar

Pm = 7 bar

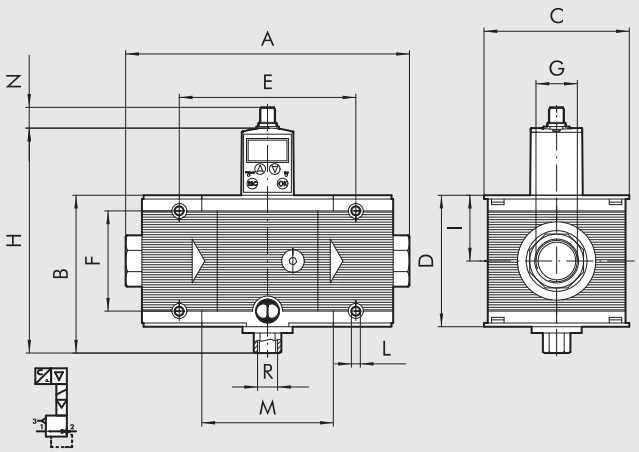
REGTRONIC 400 2"



A = 6 bar
B = 4 bar
C = 2 bar

Pm = 7 bar

DIMENSIONS



	REGTRONIC 400			
Threaded port G	1"	1 1/4"	1 1/2"	2"
A	225 to 255			283 to 313
B	127			
C	116			
D	105			
E	141.4			
F	80			
H	182			
I	52.5			
L	M6 hole			
M	105.4			
N	16.5			
R (exhaust)	1/4"			

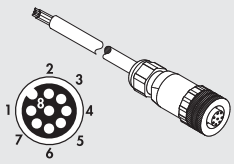
ORDERING CODES

Code	Description
6102012A	REGTRONIC 400 with display without end plates
6102013A	REGTRONIC 400 control remote without end plates
6102012	REGTRONIC 400 1 with display
6102013	REGTRONIC 400 1 control remote
6202012	REGTRONIC 400 1 1/4 with display
6202013	REGTRONIC 400 1 1/4 control remote
6302012	REGTRONIC 400 1 1/2 with display
6302013	REGTRONIC 400 1 1/2 control remote
6402012	REGTRONIC 400 2 with display
6402013	REGTRONIC 400 2 control remote

NOTES

ACCESSORIES REGTRONIC

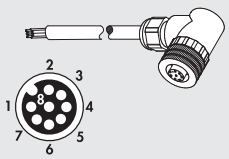
M12x1 PRE-WIRED 8-PIN FEMALE STRAIGHT CONNECTOR



Code	Description
W0970513010	M12X1 pre-wired 8-PIN strainght connector, cable L = 5 m

Pin	Cable color
1	White
2	Brown
3	Green
4	Yellow
5	Grey
6	Pink
7	Blue
8	Red

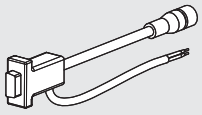
M12x1 PRE-WIRED 8-PIN FEMALE 90° CONNECTOR



Code	Description
W0970513011	M12X1 pre-wired 8-PIN 90° connector, cable L= 5 m

Pin	Cable color
1	White
2	Brown
3	Green
4	Yellow
5	Grey
6	Pink
7	Blue
8	Red

CONFIGURATION CABLE

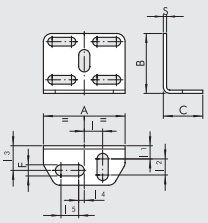


Code	Description
W0970513019	Configuration cable Regtronic

The cable consists of:
- M12 female connector to be connected to Regtronic
- RS232 serial connector to be connected to PC
- 2 wires to supply 24 VDC power

The package also includes a RS232-USB adapter

FIXING BRACKET KIT FOR REGTRONIC M5

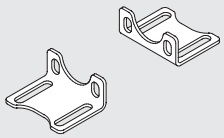


Code	Description
9200711	Regtronic M5 Fixing bracket kit

A	B	C	F	I	I1	I2	I3	I4	I5	S
30	22	14.5	4.2	6.8	4.8	5.9	9.1	2	6.5	1.2

N.B. supplied complete with four M3x6 screws

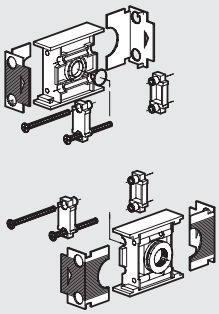
FIXING BRACKET KIT FOR REGTRONIC 1/8" E 1/4"



Code	Description
9200710	Fixing bracket kit

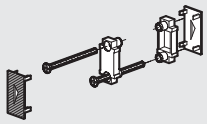
N.B. supplied complete with four M4X6 screws

INPUT/OUTPUT END PLATE KIT FOR SKILLAIR



Code	Description
9430701	IN/OUT end plates kit 300 1/2
9530901	IN/OUT end plates kit 300 3/4
9531001	IN/OUT end plates kit 300 1
9631001	IN/OUT end plates kit 400 1
9631101	IN/OUT end plates kit 400 1 1/4
9631201	IN/OUT end plates kit 400 1 1/2
9631301	IN/OUT end plates kit 400 2

CONNECTOR KIT FOR SKILLAIR CODE A



Code	Description
9430301	Connector kit 300
9630301	Connector kit 400

NOTES

PRESSURE SWITCHES

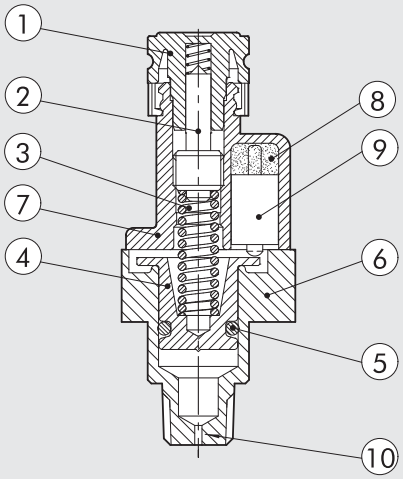
This type of pressure switch features a high degree of miniaturisation and a modern attractive design.
It can be installed in any position and also mounted onto a wall by means of two transversal holes.
In order to reduce wiring times, it is supplied ready assembled with a 2-metre electric cable or an M8 connector with a 300-mm cable.
The contact is the switching type, which means it can be normally open or normally closed.
A knurled push-lock handle is provided for regulation

TECHNICAL DATA

Adjustable pressure interval	bar	0.5 to 10
Hysteresis (not adjustable)	bar	from 0.4 to 0.8 (See diagram)
Maximum pressure	bar	15
	MPa	1.5
	psi	217
Operating temperature range at: 1 MPa; 10 bar; 145 psi	°C	50
	°F	122
Lower threaded port		R 1/8"
Maximum current	A	2
Maximum voltage	V	250
Outside diameter of cable	mm	4.9
Number of wires and cross section		3 x 0.5 mm^2
Contacts		Normally-Open (NO) and Normally-Closed (NC)
Protection		IP65
Number of switchings		5 x 10^6
Fluid		Filtered lubricated or unlubricated compressed air. Lubrication, if used, must be continuous
Mounting position		In any position.
Weight	kg	0.121

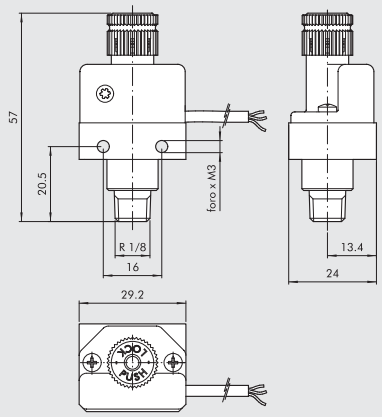
COMPONENTS

① Technopolymer adjusting push-lock handle
② Brass adjusting screw
③ Steel piston spring
④ Brass piston
⑤ NBR gasket
⑥ Body made of anodized aluminium
⑦ Technopolymer pressure switch body
⑧ Resin finish for IP65
⑨ Electrical contact
⑩ Choke to reduce peaks in pressure



ACCESSORIES

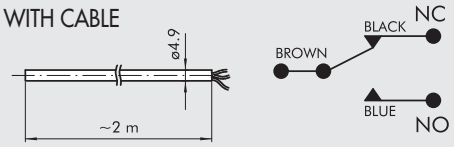
DIMENSIONS AND ORDERING CODES



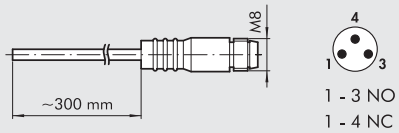
Code	Description
9000401	1/8 2A NO/NC pressure switch, 2-metre cable
9000402	1/8 2A NO/NC pressure switch, M8 connector

WIRING DIAGRAM

VERSION WITH CABLE

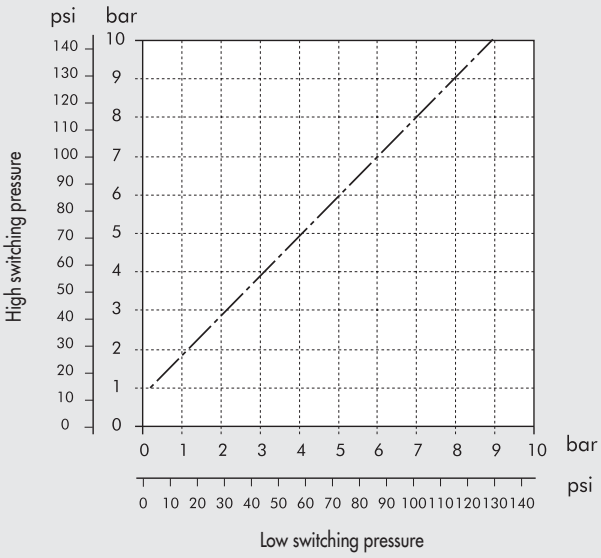


VERSION WITH M8 CONNECTOR

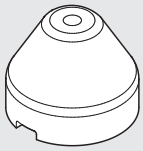


1 - 3 NO
1 - 4 NC

HYSTERESIS GRAPH



SECURITY KNOB



Code	Description
9200703	Acc. security knob

NOTE: Pull outwards to remove the knob from the pressure switch on the unit. Insert the security knob and regulate the pressure switch. Then press the handle firmly to lock it in position. If the pressure switch needs to be reset, remove the security knob by forcing it laterally with a screwdriver.

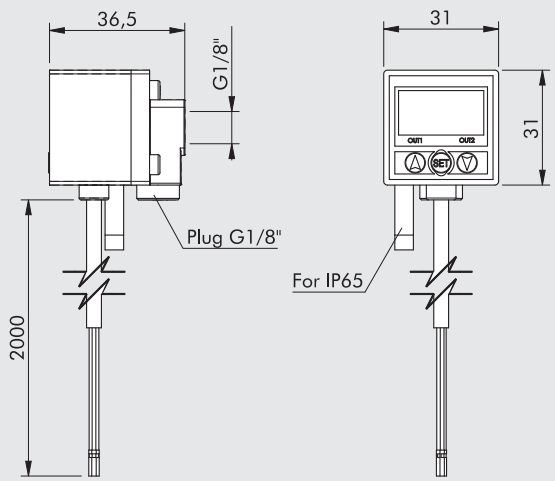
NOTES

DIGITAL PRESSURE SWITCH

The digital pressure switch allows both the transmission of electrical pressure signals and the instant display of pressure. Two digital outputs, which can be set according to the two pressure values reached, are available.
An analogue output of a voltage proportional to the pressure reading is also available. The values are clearly displayed on a LED video and different parameters can be entered from the keypad.
Hysteresis can be adjusted and the unit of measurement for pressure can be modified.
Two models are available:
Series **600** (historical version), characterised by G1/8" female pneumatic ports, one at the bottom and one at the back (pressure switch supplied with bottom port covered with a removable plug); one-colour LED; pre-wired cable.
Series **640** (the latest version), characterised by R1/8" male pneumatic ports (taper thread) and M5 female thread inside on the rear side; two-colour LED displays that can be programmed depending on the pressure signal; cable with connector. A kit of accessories is provided for fixing to the top or wall, or to a panel.

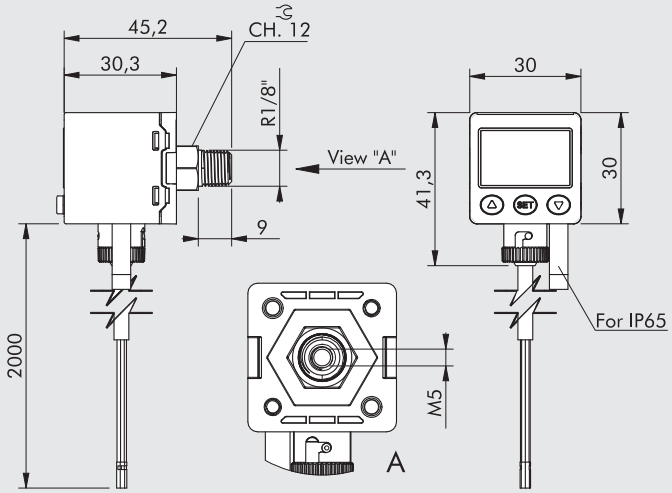
TECHNICAL DATA		SERIES 600	SERIES 640
Working pressure range	bar	-1 to 10	
	MPa	-0.1 to 1	
Maximum admissible pressure	bar	15	
	MPa	1.5	
Readable resolution	bar	0.01	
	MPa	0.001	
	kg/cm²	0.01	
	psi	0.1	
Power supply	VDC	12 to 24 ± 10%, max ripple 10%	
Current consumption	mA	≤ 55	≤ 40
Digital outputs		2 type PNP, with max current 80 mA, max voltage 24 VDC; residual voltage ≤ 1V (at 80 mA)	2 type PNP, with max current 125 mA, max voltage 24 VDC; residual voltage ≤ 1.5 V (at 125 mA)
Digital output repeatability		≤ ±0.2 % full scale ±1 digits	
Hysteresis		Adjustable or fixed at 3 digits for operation within a pressure range	
Actuation response time	ms	≤ 2.5	
Interference suppression selectable at	ms	24, 192, 768	25, 100, 250, 500, 1000, 1500
Short-circuit protection at the outputs		Yes	
LED 7 segment display		3 ½ digit display	
Display colours		red	red/green
Display accuracy		±2% full scale ±1 digit, ambient temperature 25° ±3°C	
Indicators		green LED (output 1), red LED (output 2)	orange LED (output 1 and output 2)
Analogue output		1-5 V ±2.5 % (0 bar - 1V; 10 bar - 5V; it doesn't read the vacum)	
		Linearity ≤ 1% full scale	
		Output impedance: about 1 kΩ	
Thermal characteristic		≤ ±2% full scale of the calibration pressure (at 25°C), in the temperature range 0 - 50°C	
Compressed air ports		2 G1/8" female thread	1 R1/8" male taper thread (M5 female inside)
Power cable		2 m, with five 0.15 mm² wires, oil-resistant	
		pre-wired cable, not removable	removable connector
Certifications		CE, Rohs	
Weight	g	105, including 2 m cable	86, including 2 m cable
AMBIENT CONDITIONS			
Fluid		Filtered and unlubricated air, inert non-corrosive and non-explosive gas	
Degree of protection		IP 40 - IP65 (with accessory protection assembled)	
Temperature range	°C	0 to 50	
Storage temperature	°C	-20 to +60, but without condensate or ice	-10 to +60, but without condensate or ice
Ambient humidity		35 to 85% relative humidity; no condensate	
Insulation voltage		1000 VAC for one minute between casing and cable	
Resistance of Insulation		Min. 50 MΩ minimo (at 500 VDC between casing and cable)	
Vibration admitted		1.5 mm amplitude or 10G with scanning every minute from 10 to 55 Hz at 10 Hz, for 2 hours in each direction x, y and z	
Impact		980 m/s² (100 g), 3 times in each direction x, y and z	100 m/s² (10 g), 3 times in each direction x, y and z

DIMENSIONS AND ORDERING CODES SERIES 600



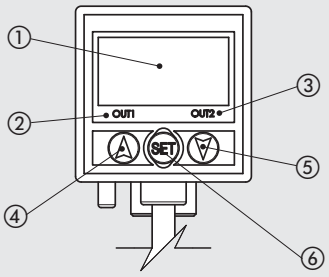
Code	Description
9000600	Digital pressure switch series 600

DIMENSIONS AND ORDERING CODES SERIES 640



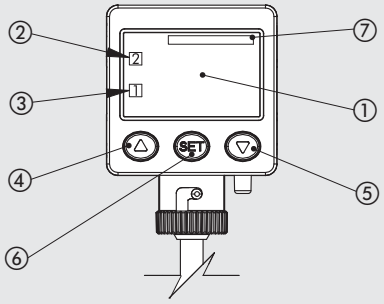
Code	Description
9000640	Digital pressure switch series 640

USER INTERFACE SERIES 600



① 3 ½ digit display, red: showing the pressure reading, all setting information, and the error code
② Digital output 1: green LED
③ Digital output 2: red LED
④ Button: modifies the value of the selected parameter
⑤ Button: modifies the value of the selected parameter
⑥ Setting button: selects the parameter to modify

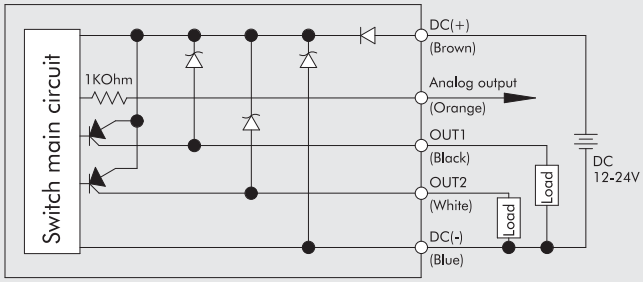
USER INTERFACE SERIES 640



① 3 ½ digit display, green and red: it displays the unit of measurement, the pressure value read, all setting information, the error code.
② Digital output 1: orange LED
③ Digital output 2: orange LED
④ Button: modifies the value of the selected parameter
⑤ Button: modifies the value of the selected parameter
⑥ Setting button: selects the parameter to modify
⑦ Unit of measurement selected

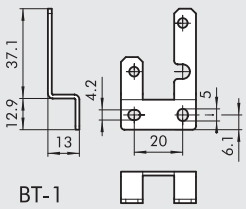
WIRING DIAGRAM SERIES 600 - 640

PNP output

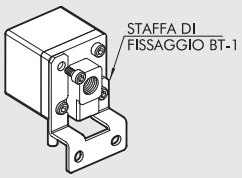


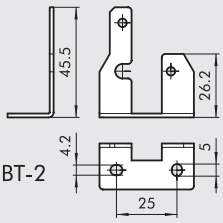
ACCESSORIES
SERIES 600

FIXING BRACKET KIT

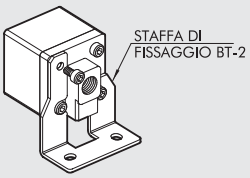


BT-1





BT-2

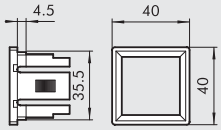


Code	Description
9000601	Kit of fixing brackets for digital pressure switches series 600

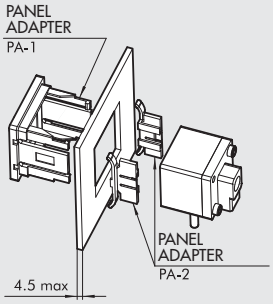
N.B.: Each kit contains a bracket for fixing on the back and one for fixing at the bottom.

PANEL FIXING KIT

PA-1

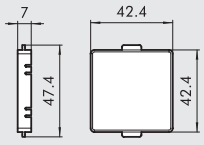


PA-2



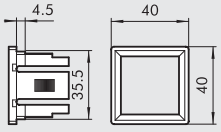
Code	Description
9000602	Kit for panel fixing for the digital pressure switch series 600

PANEL FIXING KIT WITH VIDEO SCREEN

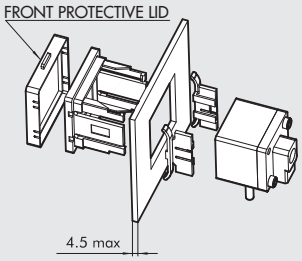


FPC-1

PA-1



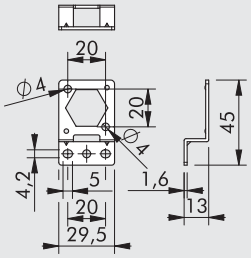
PA-2

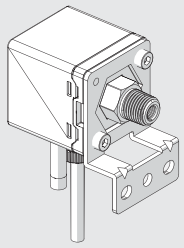


Code	Description
9000603	Kit for panel fixing with screen for the digital pressure switch series 600

SERIES 640

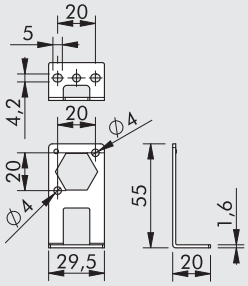
PARALLEL FIXING BRACKET KIT

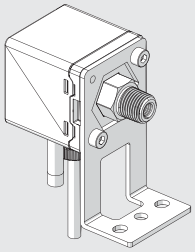




Code	Description
9000641	Parallel fixing bracket kit for digital pressure switch series 640

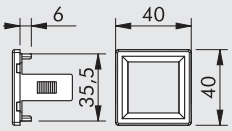
90° FIXING BRACKET KIT

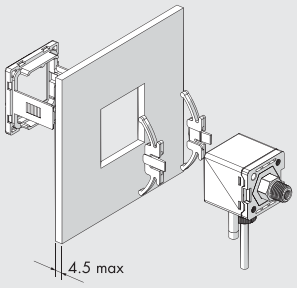




Code	Description
9000644	90° fixing bracket kit for digital pressure switch series 640

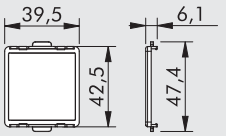
PANEL FIXING KIT

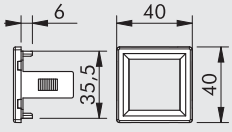


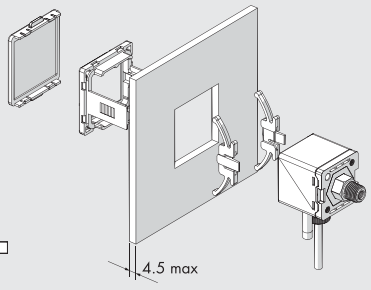


Code	Description
9000642	Kit for panel fixing for the digital pressure switch series 640

PANEL FIXING KIT WITH VIDEO SCREEN



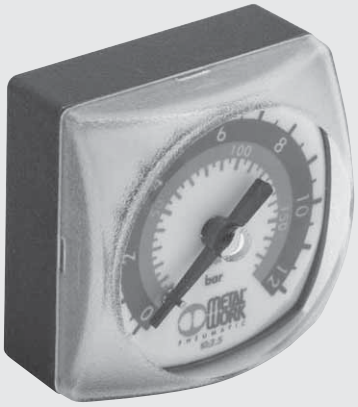




Code	Description
9000643	Kit for panel fixing with screen for the digital pressure switch series 640

SQUARE DIAL PRESSURE GAUGE

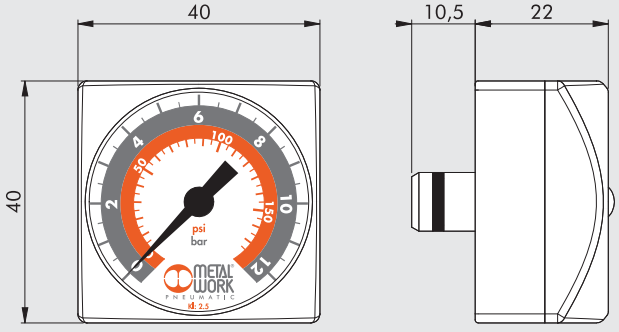
A compact pressure gauge with a square dial to go with air treatment units.
A PTFE ring seal mounted on the 1/8" thread of the fitting ensures a perfect pneumatic seal. To mount it, screw the gauge in as far as it will go, then loosen enough to align the dial. A sealant is not required. The pressure gauge has a neck to dampen pressure vibration and absorb water hammer. This improves overall reliability and guarantees longer life.



TECHNICAL DATA

Fitting thread		G 1/8"
Pressure range	bar	0-4 / 0-12
	psi	0-60 / 0-175
Precision class	EN 837	2.5
Pneumatic seal		PTFE ring seal
Vibration damping		Yes

DIMENSIONS



ORDERING CODES

Code	Description
9700109	M 40x40 1/8 04
9700110	M 40x40 1/8 012

METAL WORK PNEUMATIC

NOTES

METAL WORK PNEUMATIC

FITTINGS

- PUSH-IN FITTINGS D1
- FITTING SERIES A, B, C, D D2
- STAINLESS STEEL FITTINGS D3

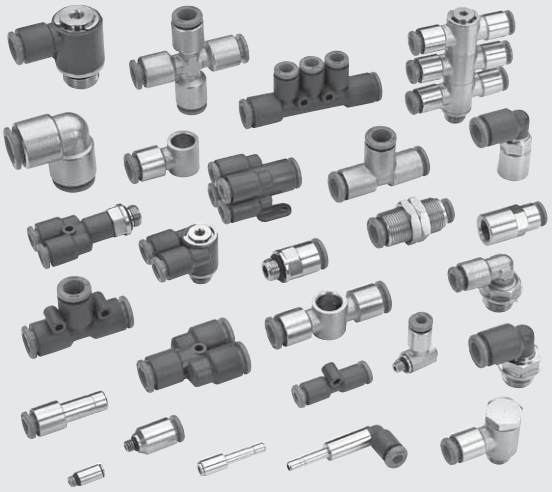
SUMMARY FITTINGS

● **PUSH-IN FITTINGS** D1.4

● **SERIES F-E / SERIES F-NSF PUSH-IN FITTINGS FOR USE IN THE FOOD INDUSTRY** D1.26

PUSH-IN FITTINGS

Push-in fittings by Metal Work are the best elements for connecting pipes and actuators.
Quick and easy to use, the Metal Work push-in fitting can be re-used thousands of times without affecting the pneumatic and mechanical seal in any way. It comes in various configurations and guarantees a virtually unlimited, highly flexible use. The clamping spring with its special shape grips the pipe without scratching or deforming it, which facilitates release.
In the fittings, the release bushing has patented screwdriver slots to facilitate release in applications not accessible to the fingers.
Configurations RL19, RL21, RL22, RL23, RL23M, RL24, RL44, and RL49 (except for Ø5), have a ring for fixing to the wall asymmetrically in order to contain the head of a screw within the overall dimensions of the fitting.

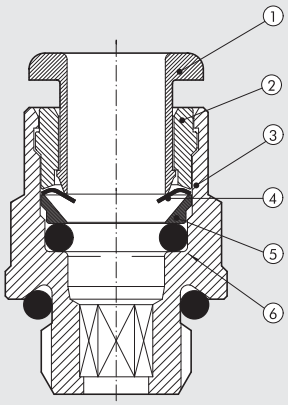


TECHNICAL DATA

Threaded coupling		M3 - M5 - M7 - 1/8" - 1/4" - 3/8" - 1/2"
Diameter	mm	Ø 3 - Ø 3.17 - Ø 4 - Ø 5 - Ø 6 - Ø 8 - Ø 10 - Ø 12 - Ø 14
Temperature range for brass fittings	°C	– 20 to + 80
	°F	– 4 to 176
Temperature range for technopolymer fittings	°C	– 20 to + 60
	°F	–4 to 140
Pressure range for brass fittings		– 0.99 bar ... 16 bar / – 0.099 MPa ... 1.6 MPa
Pressure range for technopolymer fittings		– 0.99 bar ... 12 bar / – 0.099 MPa ... 1.2 MPa
Recommended pipe		Rilsan PA 11 - Nylon 6 - Polyamide 12 - Polypropylene
Fluid		Vacuum - Compressed air

COMPONENTS

① Ring or release bushing: technopolymer
② Locking bushing: brass or technopolymer
③ Body: brass or technopolymer
④ Clamping spring: stainless steel (for pipes Ø 3 and Ø 3.17 and R31 Ø 5 and R32 Ø 5: brass gripper)
⑤ Spring supporting ring: technopolymer
⑥ Seal: NBR

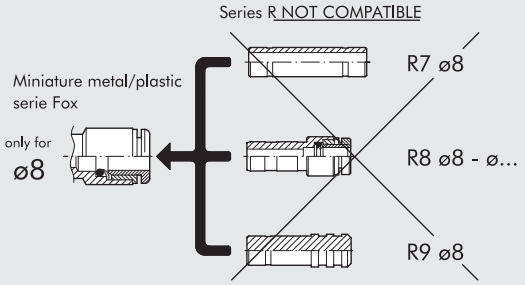


O-RING BELOW R FITTINGS

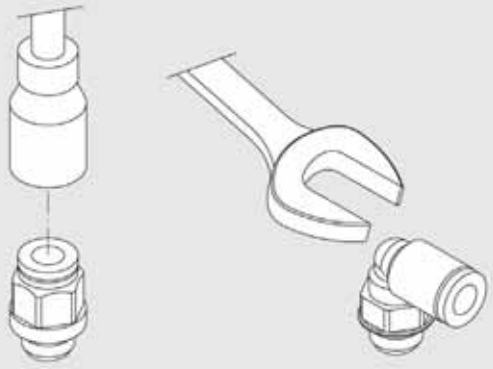
Thread	Initials	Dimensions of O-ring
M3	.....	2.6 x 1
M5 (for Ø 3 - Ø 3.17)	.....	3 x 1.2
M5	.....	3.5 x 1.2
M7	.....	5 x 1.5
M12x1.5	.....	9.75 x 1.78
1/8	2031	7.66 x 1.78
1/4	2043	10.82 x 1.78
3/8	2056	14 x 1.78
1/2	3068	17.13 x 2.62

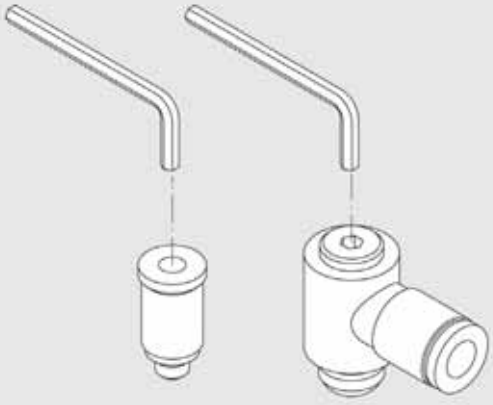
FOR Ø 8 PUSH-IN FITTINGS ONLY

The new series of Ø 8 miniature push-in fittings, identified in the code by a letter L and visually by the screwdriver slot on the release ring, are not compatible with fittings R7, R8 and R9 Ø 8 in the old series.



SCREWING METHOD





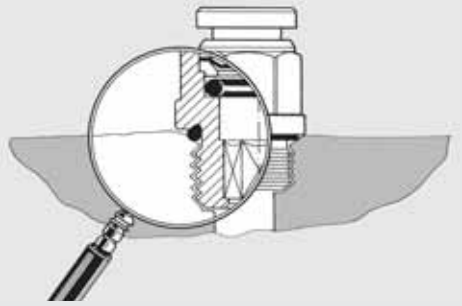
Thread	Max. Torque [Nm]
M3	0.4
M5	1.8
M7	2.5
M12x1.5	8
G 1/8"	6
G 1/4"	8
G 3/8"	10
G 1/2"	15

CH [mm]	Max. Torque [Nm]
1.5	0.4
2	0.7
2.5	1.2
3	2.5
4	5
5	8
Over 5	See the values concerning threads

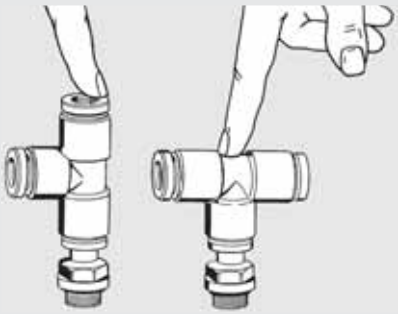
N.B.: When using a socket spanner, the torque must not exceed that of the thread (e.g. fitting RL1 6 M7, with a 4 mm thread, has a maximum torque of 2.5 Nm, highest value of the thread)

GENERAL FEATURES

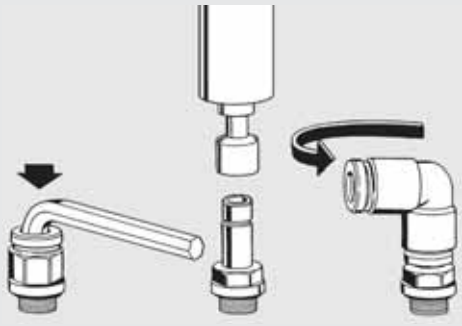
All fittings have cylindrical threading and incorporate a O-ring (Metal Work patent). The use of an O-ring considerably improves the seal of angled, rough, and slightly convex surfaces.
Teflon® (PTFE) is no longer used.



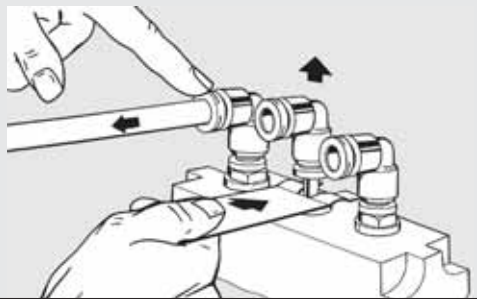
A single tee can give central tees and lateral tees.



Mounting fittings with an Allen wrench or pneumatic tool. All the elbows and tees are rotary. Drastic reduction in assembly times.

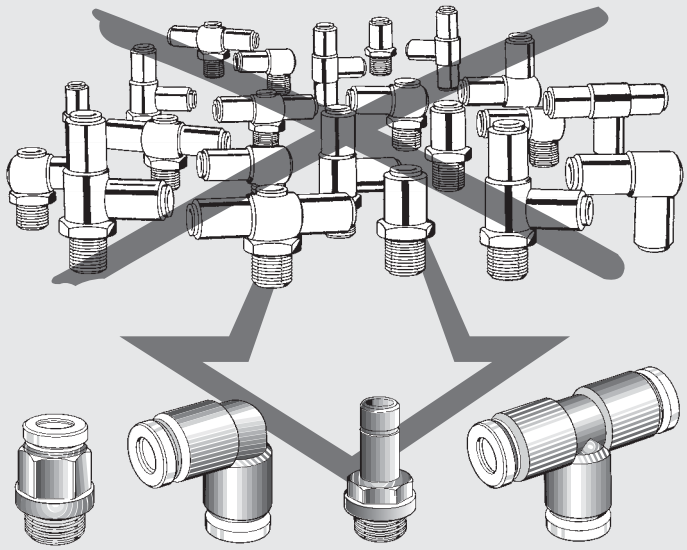


The pipe is easy to assemble by pressing lightly on the pusher ring.
To remove the fitting, merely push radially on the key.



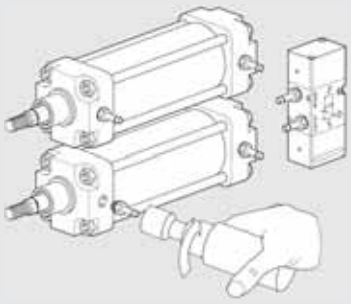
FROM AN IDEA, A SYSTEM

- Four basic fittings can be used to make all possible connections in a pneumatic circuit.
- Sharp drop in the number of fittings to be stocked and hence reduced operating costs.

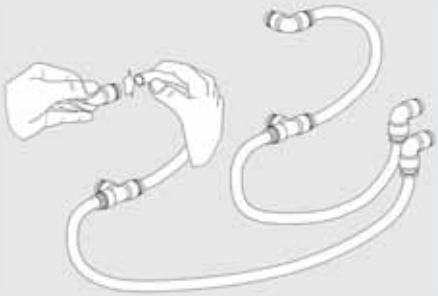


ASSEMBLY DIAGRAM

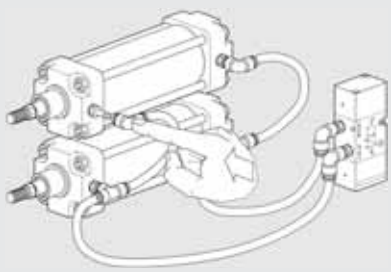
Pre-assembling fittings on the workbench with pneumatic tool even with very close centre distances.



Pre-assembling fittings and pipe sections on the workbench. Pre-assembled configurations can be stocked for assembly in series.

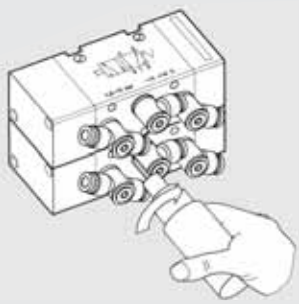


Quick connection and completion of the pneumatic circuit.

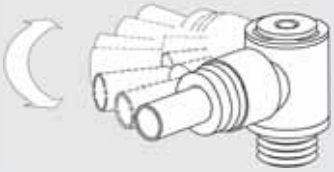


FROM A SYSTEM, INNOVATION

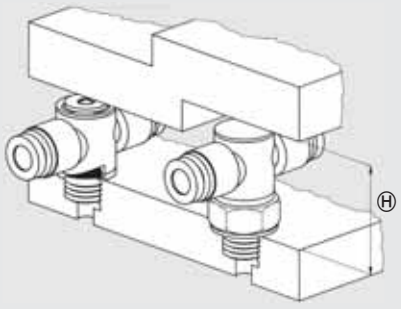
An Allen wrench is used to assemble rotary fittings even with very close centre distances.



The special configuration with two O-rings allows maximum orientation so as to follow pipe movement in the specific application.

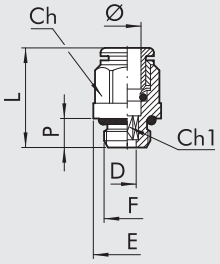


Fittings with a built-in gasket and reduced height (H) with the same threaded coupling and pipe diameter.



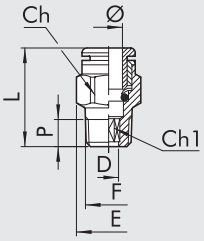
BRASS FITTINGS

STRAIGHT, CYLINDRICAL, MALE (R1)



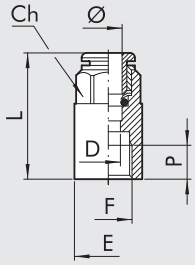
Code	Ref.	Ø	F	Ch	Ch1	P	L	D	E
2001B01	R1	3	M3	Ø 5.8	1.5	3	12.6	1.5	5.8
2001B02	R1	3	M5	Ø 5.8	2	3.5	13	2	5.8
2001A01	R1	3.17	M3	Ø 5.8	1.5	3	12.6	1.5	5.8
2001A02	R1	3.17	M5	Ø 5.8	2	3.5	13	2	5.8
2L01001	RL1	4	M5	Ø 9	2.5	4	20.3	2.6	9
2L01020	RL1	4	M7	Ø 9	3	5	18.9	3.1	9.8
2L01002	RL1	4	1/8	10	3	6	18	3.1	14
2L01003	RL1	4	1/4	10	3	8	19.8	3.1	18
2001004	R1	5	M5	Ø 12	2.5	4	22.5	2.6	12
2001005	R1	5	1/8	13	3	6	22	3.1	15
2001006	R1	5	1/4	12	3	8	24	3.1	18
2L01000	RL1	6	M5	Ø 11	2.5	4	21.9	2.6	11
2L01021	RL1	6	M7	Ø 11	4	5	23	4.1	11
2L01101	RL1	6	M12x1.5	12	4	8	23.2	4.1	17
2L01007	RL1	6	1/8	12	4	6	21.6	4.1	14
2L01008	RL1	6	1/4	12	4	8	20.3	4.1	18
2L01102	RL1	8	M12x1.5	14	6	8	24.5	6.2	17
2L01009	RL1	8	1/8	13	5	6	25.4	5.2	14
2L01010	RL1	8	1/4	14	6	8	24.4	6.2	18
2L01011	RL1	8	3/8	14	6	9	22.8	6.2	22
2L01012	RL1	10	1/4	16	7	8	29.2	7.2	18
2L01013	RL1	10	3/8	16	8	9	26.5	8.2	22
2L01018	RL1	10	1/2	16	8	11	29.8	8.2	26
2001019	RL1	12	1/4	19	7	8	30.5	7.2	21
2001014	RL1	12	3/8	19	10	9	28.1	10.2	22
2001015	RL1	12	1/2	19	10	11	29.3	10.2	26
2001016	RL1	14	3/8	22	10	9	33.8	10.2	24.6
2001017	RL1	14	1/2	22	12	11	31.5	12.2	26

STRAIGHT, CONICAL, MALE (R1C)



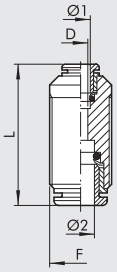
Code	Ref.	Ø	F	Ch	Ch1	D	E	L	P
2L01C02	RL1C	4	1/8	10	3	3.1	11.3	18.5	6.2
2L01C07	RL1C	6	1/8	12	4	4.1	13.5	22.5	6.2
2L01C08	RL1C	6	1/4	12	4	4.1	13.2	22.3	8.5
2001Z07	RL1Z	6	12x1 conical	12	4	4.1	13.2	23.5	9
2001Z08	RL1Z	6	12x1.25 conical	12	4	4.1	13.2	23.5	9
2L01C09	RL1C	8	1/8	13	6	6.2	14.3	26	6.2
2L01C10	RL1C	8	1/4	14	6	6.2	15.8	25.5	8.5
2L01C11	RL1C	8	3/8	14	6	6.2	16.6	24.9	9
2L01C13	RL1C	10	1/4	16	7	7.2	17.7	28.9	8.5
2L01C14	RL1C	10	3/8	16	8	8.2	17.7	26	9
2001C15	RL1C	12	3/8	19	10	10.2	21	28.5	9
2001C16	RL1C	12	1/2	19	10	10.2	21.3	26.6	11

STRAIGHT, FEMALE (R2)



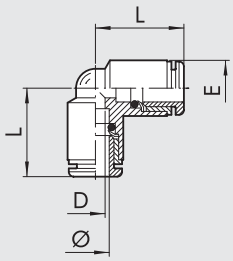
Code	Ref.	Ø	F	Ch	P	L	D	E
2002B02	R2	3	M5	7	4.5	15.7	2.5	7.8
2002A02	R2	3.17	M5	7	4.5	15.7	2.5	7.8
2L02001	RL2	4	1/8	10	7	26.2	3	14
2L02002	RL2	4	1/4	10	8	28.6	3	17
2002003	R2	5	1/8	12	7	27	4	14
2002004	R2	5	1/4	12	8	29.5	4	17
2L02005	RL2	6	1/8	12	7	27.1	5	14
2L02006	RL2	6	1/4	12	8	29.3	5	17
2L02007	RL2	8	1/8	13	7	28.1	7	14
2L02008	RL2	8	1/4	14	8	30	7	17
2L02009	RL2	10	1/4	16	8	31.8	8	17.7
2L02010	RL2	10	3/8	16	10	36.8	8	20.8
2L02011	RL2	12	3/8	19	10	37	10	20.8
2L02012	RL2	12	1/2	19	11	40.5	10	23.8

STRAIGHT, INTERMEDIATE (R3)



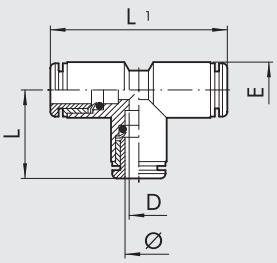
Code	Ref.	Ø 1	Ø 2	F	L	D
2003A02	R3	3	3	M8x0.75	18.4	2
2003A01	R3	3.17	3.17	M8x0.75	18.4	2
2L03001	RL3	4	4	M11x1	30.6	2.5
2003002	R3	5	5	M14x1	33.5	4
2L03003	RL3	6	6	M13x1	33	4.5
2L03004	RL3	8	8	M15x1	35.7	6.5
2L03005	RL3	10	10	M17x1	39.2	8
2003006	RL3	12	12	M20x1	40.7	10
2003007	RL3	14	14	M24x1	45.9	12
2L03301	RL3	4	6	M13x1	32.7	2.5
2L03302	RL3	4	8	M15x1	34.4	2.5
2L03303	RL3	6	8	M15x1	35	4.5
2L03304	RL3	6	10	M17x1	37.5	4.5
2L03306	RL3	6	12	M20x1	39	4.5
2L03305	RL3	8	10	M17x1	37.8	6.5
2L03307	RL3	8	12	M20x1	40.1	6
2L03308	RL3	10	12	M20x1	40.8	8

ELBOW, INTERMEDIATE (R4)



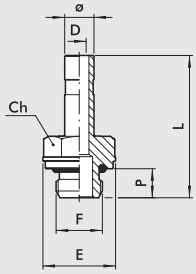
Code	Ref.	Ø	L	D	E
2004A02	R4	3	10.4	2	6.3
2004A01	R4	3.17	10.4	2	6.3
2L04001	RL4	4	16.7	2.5	9.5
2004002	R4	5	19.2	3	13.5
2L04003	RL4	6	19	4.5	11.5
2L04004	RL4	8	21.3	6.5	13.5
2L04005	RL4	10	23.3	8	16
2004006	RL4	12	26	10	20.5
2004007	RL4	14	29.3	12	22

TEE, INTERMEDIATE (R5)



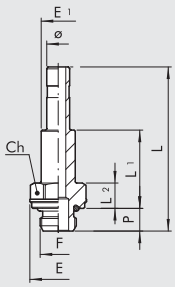
Code	Ref.	Ø	L	L1	D	E
2005A02	R5	3	10.4	20.8	2	6.3
2005A01	R5	3.17	10.4	20.8	2	6.3
2L05001	RL5	4	16.7	33.4	2.5	9.5
2005002	R5	5	19.2	38.4	3	13.5
2L05003	RL5	6	19	38	4.5	11.5
2L05004	RL5	8	21.3	42.6	6.5	13.5
2L05005	RL5	10	23.3	46.6	8	16
2005006	RL5	12	26	52	10	20.5
2005007	RL5	14	29.3	58.6	12	22

THREADED ADAPTER (R6)



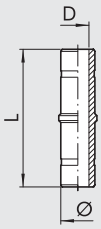
Code	Ref.	Ø	F	Ch	P	L	D	E
2006A02	R6	3	M5	5	3.5	17.1	2	5.8
2006A01	R6	3.17	M5	5	3.5	17.1	2	5.8
2006001	R6	4	M5	8	4	25.2	2.5	9
2006020	R6	4	M7	8	5	26.5	2.5	9.8
2006002	R6	4	1/8	13	6	28.9	2.5	15
2006003	R6	4	1/4	14	8	32.4	2.2	18
2006004	R6	5	M5	8	4	25.2	2.7	9
2006005	R6	5	1/8	13	6	28.9	3	15
2006006	R6	5	1/4	14	8	32.4	3	18
2006000	R6	6	M5	9	4	25.7	2.7	10
2006021	R6	6	M7	8	5	27	4	9.8
2006007	R6	6	1/8	13	6	29.4	4	15
2006008	R6	6	1/4	14	8	32.9	4	18
2006009	R6	8	1/8	13	6	30.6	5.5	15
2006010	R6	8	1/4	14	8	34	6	18
2006011	R6	8	3/8	17	9	35.4	6	22
2006012	R6	10	1/4	14	8	38.2	7.8	18
2006013	R6	10	3/8	17	9	38.7	8	22
2006022	R6	10	1/2	19	11	41	8	26
2006019	R6	12	1/4	14	8	40.7	7.8	18
2006014	R6	12	3/8	17	9	42.2	10	22
2006015	R6	12	1/2	22	11	44.2	10	26
2006016	R6	14	3/8	17	9	46.2	10	22
2006017	R6	14	1/2	22	11	48.2	12	26
2006101	R6	6	M12X1.5	13	8	33	4	17
2006102	R6	8	M12X1.5	13	8	33.7	6	17

EXTENDED THREADED ADAPTER (R18)



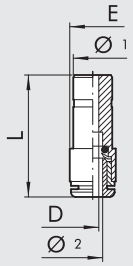
Code	Ref.	Ø	F	Ch	P	L	L1	L2	E	E1
2018002	R18	4	1/8	13	6	40.4	18.2	6.7	15	7
2018007	R18	6	1/8	13	6	43.4	20.7	6.7	15	9
2018008	R18	6	1/4	14	8	46.9	22.2	8.2	18	9
2018009	R18	8	1/8	13	6	46.5	22.7	6.7	15	11
2018010	R18	8	1/4	14	8	50	24.2	8.2	18	11
2018011	R18	8	3/8	17	9	51.4	24.7	8.7	22	13
2018012	R18	10	1/4	14	8	57.2	27.2	8.2	18	12
2018013	R18	10	3/8	17	9	58.7	27.7	8.7	22	12

EXTENSION (R7)



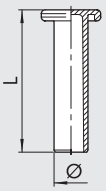
Code	Ref.	Ø	L	D
2007001	R7	4	34	2
2007002	R7	5	34	3
2007003	R7	6	37.5	4
2L07004	RL7	8	37.5	6
2007005	R7	10	45	8
2007006	R7	12	48	10
2007007	R7	14	58	12

REDUCER (R8)



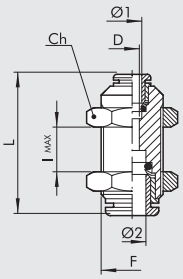
Code	Ref.	Ø 1	Ø 2	L	D	E
2008A01	R8	4	3	26	2	6.3
2008A02	R8	4	3.17	26	2	6.3
2008001	RL8	5	4	32.2	3	9.5
2L08002	RL8	6	4	29.9	2.8	9.5
2008003	R8	6	5	36	4	12
2L08004	RL8	8	4	28.7	2.8	9.5
2008005	R8	8	5	34.5	4	12
2L08006	RL8	8	6	31.9	4.5	11.5
2L08007	RL8	10	6	36.2	5	11.5
2L08008	RL8	10	8	40.8	7	14
2008009	RL8	12	4	36.7	3	13
2008010	RL8	12	6	42	5	13
2008011	RL8	12	8	40.1	7	14
2008015	RL8	12	10	44.3	8.2	16
2008014	RL8	14	8	44.1	7	15.5
2008017	RL8	14	10	44.3	8.2	16
2008018	RL8	14	12	50	10	19.5
ADDITION						
2009001	RL8/M	4	6	34.5	2.5	11.5

PLUG (R9)



Code	Rif.	Ø	L	MATERIAL
2010A02	R9	3	20	Brass
2L10A01	RL9T	3.17	19.6	Technopolymer
2L10001	RL9T	4	27	Technopolymer
2010002	R9	5	27	Brass
2L10003	RL9T	6	29.8	Technopolymer
2L10004	RL9T	8	33.6	Technopolymer
2L10005	RL9T	10	36.8	Technopolymer
2L10006	RL9T	12	39	Technopolymer
2010007	R9	14	39.5	Brass

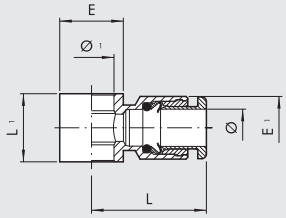
STRAIGHT, INTERMEDIATE, BULKMTAD (R10)



Code	Ref.	Ø 1	Ø 2	F	Ch	L	D	l max
2011A02	R10	3	3	M8x0.75	10	18.4	2	5
2011A01	R10	3.17	3.17	M8x0.75	10	18.4	2	5
2L11001	RL10	4	4	M11x1	13	30.6	2.5	11
2011002	R10	5	5	M14x1	17	33.5	4	8
2L11003	RL10	6	6	M13x1	16	33	4.5	12
2L11004	RL10	8	8	M15x1	17	35.7	6.5	13.5
2L11005	RL10	10	10	M17x1	20	39.2	8	17
2011006	RL10	12	12	M20X1	24	40.7	10	20.3
2011007	RL10	14	14	M24x1	27	45.9	12	21.9
2L11301	RL10	4	6	M13x1	16	32.7	2.5	11
2L11302	RL10	4	8	M15x1	17	34.4	2.5	12
2L11303	RL10	6	8	M15x1	17	35	4.5	13
2L11304	RL10	6	10	M17x1	20	37.5	4.5	14.5
2L11306	RL10	6	12	M20x1	24	39	4.5	16
2L11305	RL10	8	10	M17x1	20	37.8	6.5	15
2L11307	RL10	8	12	M20x1	24	40.1	6	17.5
2L11308	RL10	10	12	M20x1	24	40.8	8	19

METAL WORK PNEUMATIC

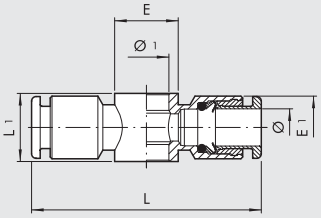
SINGLE RING (R13)



Code	Ref.	Ø	Ø 1	L	L1	E	E1
2012A02	R13	3	M5	12.9	9	9	7
2012A01	R13	3.17	M5	12.9	9	9	7
2012001	RL13	4	M5	20.2	9	9.5	9.5
2012002	RL13	4	1/8	21.3	15	14	9.5
2012003	R13	5	M5	23.8	9	9.5	12
2012004	R13	5	1/8	24.8	15	14	12
2012005	RL13	6	1/8	23	15	14	11.5
2012006	RL13	6	1/4	24.5	17	18	11.5
2012007	RL13	8	1/8	24.8	15	14	13.8
2012008	RL13	8	1/4	26.5	17	18	13.8
2012009	RL13	8	3/8	28.5	20	21	13.8
2012010	RL13	10	1/4	31.4	17	18	16.5
2012011	RL13	10	3/8	32.8	20	21	16
2012013	RL13	12	1/4	33	17	18	19.5
2012012	RL13	12	3/8	35.3	20	21	19.5
2012014	RL13	12	1/2	37	24	26	19.5

For the rods series D, see page **D2**.15

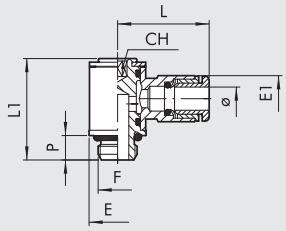
DUAL RING (R14)



Code	Ref.	Ø	Ø 1	L	L1	E	E1
2013001	RL14	4	M5	40.4	9	9.5	9.5
2013002	RL14	4	1/8	42.6	15	14	9.5
2013003	R14	5	M5	48	9	9.5	12
2013004	R14	5	1/8	49.5	15	14	13.5
2013005	RL14	6	1/8	46	15	14	11.5
2013006	RL14	6	1/4	49	17	18	11.5
2013007	RL14	8	1/8	49.6	15	14	13.8
2013008	RL14	8	1/4	53	17	18	13.8
2013009	RL14	8	3/8	57	20	21	13.8
2013010	RL14	10	1/4	62.8	17	18	16.5
2013011	RL14	10	3/8	65.6	20	21	16

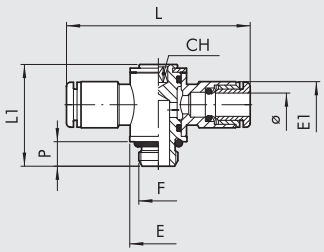
For the rods series D, see page **D2**.15

ROD, MALE SINGLE ROTARY RING (R15)



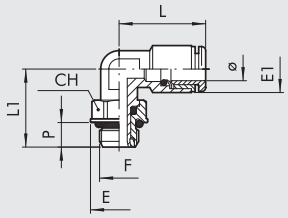
Code	Ref.	Ø	F	CH	P	L	L1	E	E1
2014101	R15	3	M3	1.5	3	12.2	13.2	5.8	5.8
2014102	R15	3.17	M3	1.5	3	12.2	13.2	5.8	5.8
2014103	R15	3	M5	2	3.5	12.7	13.7	5.8	7
2014104	R15	3.17	M5	2	3.5	12.7	13.7	5.8	7
2L14001	RL15	4	M5	2	4	20.2	18.4	9.5	9.5
2L14020	RL15	4	M7	3	5	20.2	18.5	9.8	9.5
2L14002	RL15	4	1/8	3	6	21.3	24.9	14	9.5
2014003	R15	5	M5	2	4	24	19	9.9	12
2014004	R15	5	1/8	3	6	25	27	14	12
2L14106	RL15	6	M5	2	4	23.5	18.4	9.5	11.3
2L14021	RL15	6	M7	3	5	23.5	18.5	9.8	11.3
2L14005	RL15	6	1/8	3	6	23	24.9	14	11.5
2L14007	RL15	6	1/4	4	8	24.5	29.4	18	11.5
2L14006	RL15	8	1/8	3	6	24.8	24.9	14	13.8
2L14008	RL15	8	1/4	4	8	26.5	29.4	18	13.8
2L14013	RL15	8	3/8	5	9	28.5	35.6	22	13.8
2L14009	RL15	10	1/4	4	8	31.4	29.4	18	16.5
2L14014	RL15	10	3/8	5	9	32.8	35.6	22	16
2014010	RL15	12	1/4	4	8	33	29.4	18	19.5
2014011	RL15	12	3/8	5	9	35.3	35.6	22	19.5
2014012	RL15	12	1/2	8	11	37	40.8	26	19.5

ROD, MALE DUAL ROTARY RING (R16)



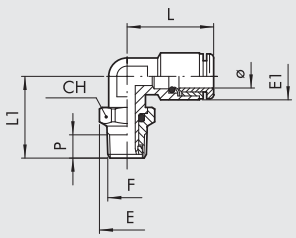
Code	Ref.	Ø	F	CH	P	L	L1	E	E1
2L15001	RL16	4	M5	2	4	40.4	18.4	9.5	9.5
2L15020	RL16	4	M7	3	5	40.4	18.5	9.8	9.5
2L15002	RL16	4	1/8	3	6	42.6	24.9	14	9.5
2015003	R16	5	M5	2	4	47.6	18.8	9.9	12
2015004	R16	5	1/8	3	6	49.5	27	14	13.5
2L15106	RL16	6	M5	2	4	47	18.4	9.5	11.3
2L15021	RL16	6	M7	3	5	47	18.5	9.8	11.3
2L15005	RL16	6	1/8	3	6	46	24.9	14	11.5
2L15007	RL16	6	1/4	4	8	49	29.4	18	11.5
2L15006	RL16	8	1/8	3	6	49.6	24.9	14	13.8
2L15008	RL16	8	1/4	4	8	53	29.4	18	13.8
2L15013	RL16	8	3/8	5	9	57	35.6	18	13.8
2L15009	RL16	10	1/4	4	8	62.8	29.4	22	16.5
2L15014	RL16	10	3/8	5	9	65.6	35.6	22	16
2015010	RL16	12	1/4	4	8	66	29.4	18	19.5
2015011	RL16	12	3/8	5	9	70.6	35.6	22	19.5
2015012	RL16	12	1/2	8	11	74	40.8	26	19.5

ROTARY ELBOW, MALE, CYLINDRICAL (R31)



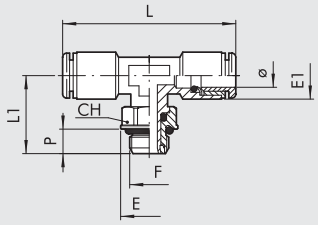
Code	Ref.	Ø	F	CH	E	E1	L	L1	P
2L31001	RL31	4	M5	9	9.9	9.5	18.6	15.3	4
2L31002	RL31	4	1/8	12	14	9.5	18.6	19.1	6
2L31003	RL31	4	1/4	14	18	9.5	18.6	21.1	8
2031004	R31	5	M5	9	9.9	13.5	22.8	17.5	4
2031005	R31	5	1/8	12	14	13.5	22.8	21	6
2031006	R31	5	1/4	14	18	13.5	22.8	24.5	8
2L31007	RL31	6	M5	9	9.9	11.8	21.9	15.3	4
2L31008	RL31	6	1/8	12	14	11.8	21.9	19.1	6
2L31009	RL31	6	1/4	14	18	11.8	21.9	21.1	8
2L31010	RL31	8	1/8	12	14	13.5	25.4	19.1	6
2L31011	RL31	8	1/4	14	18	13.5	25.4	21.1	8
2L31012	RL31	8	3/8	17	22	13.8	23.6	27.1	9
2L31013	RL31	10	1/4	14	18	16	27.2	24.8	8
2L31014	RL31	10	3/8	17	22	16	27.2	27.1	9
2031015	RL31	10	1/2	22	26	16	27.2	30.7	11
2031016	RL31	12	1/4	14	18	20	30	25.6	8
2031017	RL31	12	3/8	17	22	20	30	27.1	9
2031018	RL31	12	1/2	22	26	20	30	30.7	11
2031019	RL31	14	1/2	22	26	21.3	33	32.3	11

ROTARY ELBOW, MALE, CONICAL (R31C)



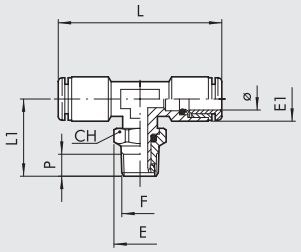
Code	Rif.	Ø	F	CH	E	E1	L	L1	P
2L31C02	RL31/C	4	1/8	12	13.3	9.5	18.6	19.8	6.2
2L31C03	RL31/C	4	1/4	14	15.4	9.5	18.6	22.6	8.5
2L31C08	RL31/C	6	1/8	12	13.3	11.8	21.9	19.8	6.2
2L31C09	RL31/C	6	1/4	14	15.4	11.8	21.9	22.6	8.5
2L31C10	RL31/C	8	1/8	12	13.3	13.5	25.4	19.8	6.2
2L31C11	RL31/C	8	1/4	14	15.4	13.5	25.4	23.6	8.5
2L31C12	RL31/C	8	3/8	17	19.2	13.8	23.6	27.1	9
2L31C13	RL31/C	10	1/4	14	15.4	16	27.2	26.3	8.5
2L31C14	RL31/C	10	3/8	17	19.2	16	27.2	27.1	9
2031C15	RL31/C	12	3/8	17	19.2	20	30	27.1	9
2031C16	RL31/C	12	1/2	22	24.6	20	30	31.9	11

CENTRAL TEE, MALE, CYLINDRICAL, ROTARY (R32)



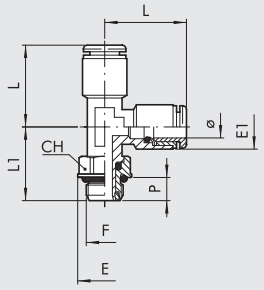
Code	Ref.	Ø	F	CH	E	E1	L	L1	P
2L32001	RL32	4	M5	9	9.9	9.5	37.2	15.3	4
2L32002	RL32	4	1/8	12	14	9.5	37.2	19.1	6
2L32003	RL32	4	1/4	14	18	9.5	37.2	21.1	8
2032005	R32	5	1/8	12	14	13.5	45.6	19.1	6
2L32004	RL32	6	M5	9	9.9	11.8	43.8	15.3	4
2L32008	RL32	6	1/8	12	14	11.8	43.8	19.1	6
2L32009	RL32	6	1/4	14	18	11.8	43.8	21.1	8
2L32010	RL32	8	1/8	12	14	13.5	50.8	19.1	6
2L32011	RL32	8	1/4	14	18	13.5	50.8	21.1	8
2L32012	RL32	8	3/8	17	22	13.8	47.2	27.1	9
2L32013	RL32	10	1/4	14	18	16	44.4	21.8	8
2L32014	RL32	10	3/8	17	22	16	44.4	27.1	9
2032017	RL32	12	3/8	17	22	20	60	27.1	9
2032018	RL32	12	1/2	22	26	20	60	30.7	11
2032019	RL32	14	1/2	22	26	21.3	66	32.3	11

CENTRAL TEE, MALE, CONICAL, ROTARY (R32C)



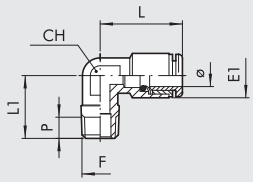
Code	Rif.	Ø	F	CH	E	E1	L	L1	P
2L32C02	RL32/C	4	1/8	12	13.3	9.5	37.2	19.8	6.2
2L32C03	RL32/C	4	1/4	14	15.4	9.5	37.2	22.6	8.5
2L32C08	RL32/C	6	1/8	12	13.3	11.8	43.8	19.8	6.2
2L32C09	RL32/C	6	1/4	14	15.4	11.8	43.8	22.6	8.5
2L32C10	RL32/C	8	1/8	12	13.3	13.5	50.8	19.8	6.2
2L32C11	RL32/C	8	1/4	14	15.4	13.5	50.8	23.6	8.5
2L32C12	RL32/C	8	3/8	17	19.2	13.8	47.2	27.1	9
2L32C13	RL32/C	10	1/4	14	15.4	16	44.4	26.3	8.5
2L32C14	RL32/C	10	3/8	17	19.2	16	44.4	27.1	9

LATERAL TEE, MALE, CYLINDRICAL, ROTARY (R38)



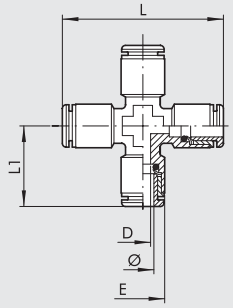
Code	Ref.	Ø	F	CH	E	E1	L	L1	P
2L38002	RL38	4	1/8	12	14	9.5	18.6	19.1	6
2038005	R38	5	1/8	12	14	13.5	22.8	19.1	6
2L38008	RL38	6	1/8	12	14	11.5	21.9	19.1	6
2L38009	RL38	6	1/4	14	18	11.5	21.9	21.1	8
2L38010	RL38	8	1/8	12	14	13.5	25.4	19.1	6
2L38011	RL38	8	1/4	14	18	13.5	25.4	22.1	8
2L38013	RL38	10	1/4	14	18	16	27.2	21.8	8
2L38014	RL38	10	3/8	17	22	16	27.2	27.1	9
2038015	RL38	12	3/8	17	22	20	30	27.1	9
2038016	RL38	12	1/2	22	26	20	30	30.7	11

ELBOW, MALE, CONICAL (R39C)



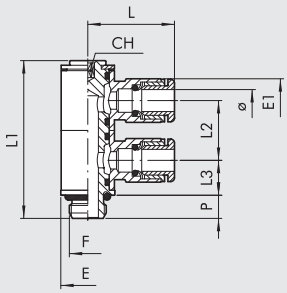
Code	Rif.	Ø	F	CH	E1	L	L1	P
2L39C02	RL39/C	4	1/8	10	9.5	18.6	16	6.2
2L39C08	RL39/C	6	1/8	10	11.8	21.9	16	6.2
2L39C09	RL39/C	6	1/4	10	11.8	21.9	18.5	8.5
2039Z07	RL39/Z	6	12x1 conical	10	11.8	21.9	17.5	7
2039Z08	RL39/Z	6	12x1.25 conical	10	11.8	21.9	17.5	7
2L39C10	RL39/C	8	1/8	10	13.5	25.4	16	6.2
2L39C11	RL39/C	8	1/4	10	13.5	25.4	18.5	8.5
2L39C13	RL39/C	10	1/4	14	16	27.2	22	8.5

CROSS FITTING (R40)



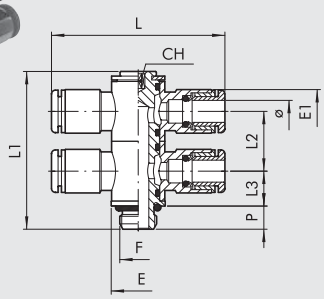
Code	Ref.	Ø	D	E	L	L1
2L40001	RL40	4	3	9.5	37.2	18.6
2L40003	RL40	6	4.5	11.3	43.8	21.9
2L40004	RL40	8	6.5	14	50.8	25.4

DUAL ROD SINGLE ROTARY RINGS (R50)



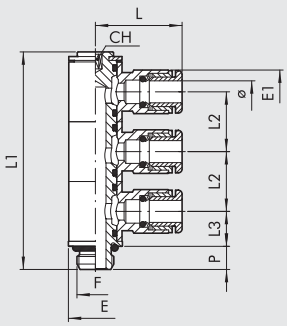
Code	Ref.	Ø	F	CH	E	E1	L	L1	L2	L3	P
2L50001	RL50	4	M5	2	9.5	9.5	20.2	30.3	11.5	6.8	4
2L50002	RL50	4	1/8	3	14	9.5	20.2	40.9	15.5	9.1	6
2033002	R33	5	1/8	5	14	12	25	42	15	10.5	6
2L50007	RL50	6	M5	2	9.5	11.3	23.5	30.3	11.5	6.8	4
2L50008	RL50	6	1/8	3	14	11.3	23.5	40.9	15.5	9.1	6
2L50009	RL50	6	1/4	4	18	11.5	23	47	17.2	10.2	8
2L50010	RL50	8	1/8	3	14	13.8	24.8	40.9	15.5	9.1	6
2L50011	RL50	8	1/4	4	18	13.8	26.5	47	17.2	10.2	8
2L50013	RL50	10	1/4	4	18	16.5	31.4	47	17.2	10.2	8

DUAL ROD DUAL ROTARY RINGS (R51)



Code	Ref.	Ø	F	CH	E	E1	L	L1	L2	L3	P
2L51001	RL51	4	M5	2	9.5	9.5	40.4	30.3	11.5	6.8	4
2L51002	RL51	4	1/8	3	14	9.5	40.4	40.9	15.5	9.1	6
2L51007	RL51	6	M5	2	9.5	11.3	47	30.3	11.5	6.8	4
2L51008	RL51	6	1/8	3	14	11.3	47	40.9	15.5	9.1	6
2L51009	RL51	6	1/4	4	18	11.5	46	47	17.2	10.2	8
2L51010	RL51	8	1/8	3	14	13.8	49.6	40.9	15.5	9.1	6
2L51011	RL51	8	1/4	4	18	13.8	53	47	17.2	10.2	8
2L51013	RL51	10	1/4	4	18	16.5	62.8	47	17.2	10.2	8

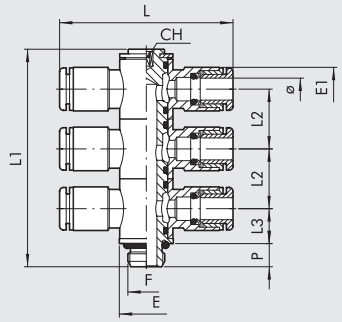
TRIPLE ROD SINGLE ROTARY RINGS (R52)



Code	Ref.	Ø	F	CH	E	E1	L	L1	L2	L3	P
2L52002	RL52	4	1/8	3	14	9.5	20.2	56.7	15.5	9.1	6
2L52008	RL52	6	1/8	3	14	11.3	23.5	56.7	15.5	9.1	6
2L52009	RL52	6	1/4	4	18	11.5	23	64.3	17.2	10.2	8
2L52010	RL52	8	1/8	3	14	13.8	24.8	56.7	15.5	9.1	6
2L52011	RL52	8	1/4	4	18	13.8	26.5	64.3	17.2	10.2	8
2L52013	RL52	10	1/4	4	18	16.5	31.4	64.3	17.2	10.2	8

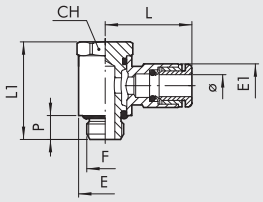
METAL WORK PNEUMATIC

TRIPLE ROD DUAL ROTARY RINGS (R53)



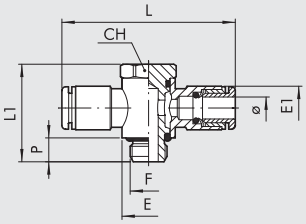
Code	Ref.	Ø	F	CH	E	E1	L	L1	L2	L3	P
2L53002	RL53	4	1/8	3	14	9.5	40.2	56.7	15.5	9.1	6
2L53008	RL53	6	1/8	3	14	11.3	47	56.7	15.5	9.1	6
2L53009	RL53	6	1/4	4	18	11.5	46	64.3	17.2	10.2	8
2L53010	RL53	8	1/8	3	14	13.8	49.6	56.7	15.5	9.1	6
2L53011	RL53	8	1/4	4	18	13.8	53	64.3	17.2	10.2	8
2L53013	RL53	10	1/4	4	18	16.5	62.8	64.3	17.2	10.2	8

MALE ROD, SINGLE SWIVEL RING (R54)



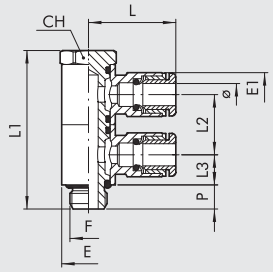
Code	Ref.	Ø	F	CH	E	E1	L	L1	P
2L54001	RL54	4	M5	9	9.5	9.5	20.2	18.7	4.5
2L54002	RL54	4	1/8	13	14	9.5	21.3	25.3	6.2
2L54007	RL54	6	M5	9	9.5	11.3	23.5	18.7	4.5
2L54008	RL54	6	1/8	13	14	11.5	23	25.3	6.2
2L54009	RL54	6	1/4	16	18	11.5	24.5	29.2	8
2L54010	RL54	8	1/8	13	14	13.8	24.8	25.3	6.2
2L54011	RL54	8	1/4	16	18	13.8	26.5	29.2	8
2L54012	RL54	8	3/8	20	21	13.8	28.5	35.4	9
2L54013	RL54	10	1/4	16	18	16.5	31.4	29.2	8
2L54014	RL54	10	3/8	20	21	16	32.8	35.4	9
2L54018	RL54	12	1/4	16	18	19.5	33	29.2	8
2L54016	RL54	12	3/8	20	21	19.5	35.3	35.4	9
2L54017	RL54	12	1/2	25	26	19.5	37	40	11

MALE ROD, DUAL SWIVEL RING (R55)



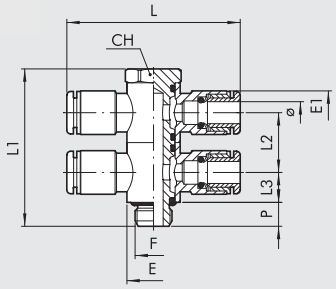
Code	Ref.	Ø	F	CH	E	E1	L	L1	P
2L55001	RL55	4	M5	9	9.5	9.5	40.4	18.7	4.5
2L55002	RL55	4	1/8	13	14	9.5	42.6	25.3	6
2L55007	RL55	6	M5	9	9.5	11.3	47	18.7	4.5
2L55008	RL55	6	1/8	13	14	11.5	46	25.3	6
2L55009	RL55	6	1/4	16	18	11.5	49	29.2	8
2L55010	RL55	8	1/8	13	14	13.8	49.6	25.3	6
2L55011	RL55	8	1/4	16	18	13.8	53	29.2	8
2L55012	RL55	8	3/8	20	21	13.8	57	35.4	9
2L55013	RL55	10	1/4	16	18	16.5	62.8	29.2	8
2L55014	RL55	10	3/8	20	21	16	65.6	35.4	9
2L55018	RL55	12	1/4	16	18	19.5	66	29.2	8
2L55016	RL55	12	3/8	20	21	19.5	70.6	35.4	9
2L55017	RL55	12	1/2	25	26	19.5	74	40	11

DUAL ROD, MALE SINGLE SWIVEL RINGS (R56)



Code	Ref.	Ø	F	CH	E	E1	L	L1	L2	L3	P
2L56001	RL56	4	M5	9	9.5	9.5	20.2	30.2	11.5	5.8	4.5
2L56002	RL56	4	1/8	13	14	9.5	21.3	41	15.5	7.8	6
2L56007	RL56	6	M5	9	9.5	11.3	23.5	30.2	11.5	5.8	4.5
2L56008	RL56	6	1/8	13	14	11.5	23	41	15.5	7.8	6
2L56009	RL56	6	1/4	16	18	11.5	24.5	46.4	17.2	8.6	8
2L56010	RL56	8	1/8	13	14	13.8	24.8	41	15.5	7.8	6
2L56011	RL56	8	1/4	16	18	13.8	26.5	46.4	17.2	8.6	8
2L56012	RL56	8	3/8	20	21	13.8	28.5	56.8	21.4	10.7	9
2L56013	RL56	10	1/4	16	18	16.5	31.4	46.4	17.2	8.6	8
2L56014	RL56	10	3/8	20	21	16	32.8	56.8	21.4	10.7	9
2L56016	RL56	12	3/8	20	21	19.5	35.3	56.8	21.4	10.7	9
2L56017	RL56	12	1/2	25	26	19.5	37	64	24	12	11

DUAL ROD, MALE DUAL SWIVEL RINGS (R57)



Code	Ref.	Ø	F	CH	E	E1	L	L1	L2	L3	P
2L57001	RL57	4	M5	9	9.5	9.5	40.4	30.2	11.5	5.8	4.5
2L57002	RL57	4	1/8	13	14	9.5	42.6	41	15.5	7.8	6
2L57007	RL57	6	M5	9	9.5	11.3	47	30.2	11.5	5.8	4.5
2L57008	RL57	6	1/8	13	14	11.5	46	41	15.5	7.8	6
2L57009	RL57	6	1/4	16	18	11.5	49	46.4	17.2	8.6	8
2L57010	RL57	8	1/8	13	14	13.8	49.6	41	15.5	7.8	6
2L57011	RL57	8	1/4	16	18	13.8	53	46.4	17.2	8.6	8
2L57012	RL57	8	3/8	20	21	13.8	57	56.8	21.4	10.7	9
2L57013	RL57	10	1/4	16	18	16.5	62.8	46.4	17.2	8.6	8
2L57014	RL57	10	3/8	20	21	16	65.6	56.8	21.4	10.7	9
2L57016	RL57	12	3/8	20	21	19.5	70.6	56.8	21.4	10.7	9
2L57017	RL57	12	1/2	25	26	19.5	74	64	24	12	11

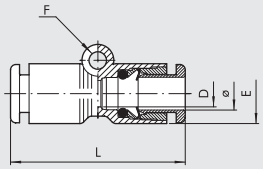
TAPERED THREAD BRASS FITTINGS WITH PTFE

Metal Work can supply fittings with a tapered thread coated in polytetrafluorethylene. This system provides the pneumatic seal between the fitting and the female thread. It is therefore not necessary to add other sealing systems during assembly, such as adhesives or Teflon tape. This significantly reduces assembly times. The physical and technical features of the material used ensure that the properties are maintained through time and in a wide range of operating temperatures.
This coating can be used with push-in fittings type R1C, R31C, R32C and R39C that have a 1/8" to 1/2" gas taper thread.

KEY TO CODES
Fittings with a PTFE thread have the same code as the standard fitting, with the addition of the suffix **T**.
For example RL1C 8 3/8 fitting has code **2L01C11**, so the PTFE version has code **2L01C11T**.

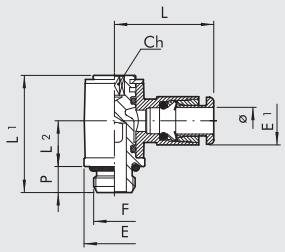
TECHNOPOLYMER FITTINGS

STRAIGHT, INTERMEDIATE, TECHNOPOLYMER (R19)



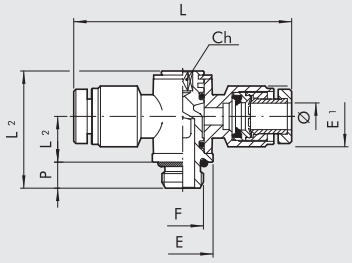
Code	Ref.	Ø	E	L	D	F
2019001	RL19	4	9.2	30.4	3	3.3
2019002	R19	5	14	33.5	4	–
2019003	RL19	6	11.3	33	5	3.3
2019004	RL19	8	13.8	36.2	6.5	3.3
2019005	RL19	10	16	38	8.5	3.3
2019006	RL19	12	19.5	40	10.5	3.3

MALE ROD, SINGLE ROTARY RING, TECHNOPOLYMER (R20)



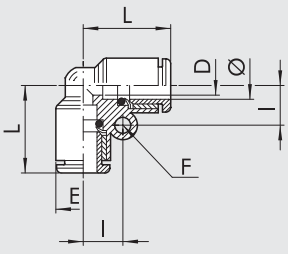
Code	Ref.	Ø	F	Ch	P	L	L1	L2	E	E1
2020001	RL20	4	M5	2	4	18.7	18.4	9.1	8	9.2
2020002	RL20	4	1/8	3	6	21	24.9	12.3	14	9.2
2020003	R20	5	M5	2	4	21.5	18.8	8.5	9.9	13.5
2020004	R20	5	1/8	3	6	23	27	10.5	14	13.5
2020016	RL20	6	M5	2	4	20.8	18.4	9.1	8	11.3
2020005	RL20	6	1/8	3	6	22.3	24.9	12.3	14	11.3
2020007	RL20	6	1/4	4	8	24.3	29.4	14.3	18	11.3
2020006	RL20	8	1/8	3	6	25.6	24.9	12.3	14	13.8
2020008	RL20	8	1/4	4	8	27.2	29.4	14.3	18	13.8
2020009	RL20	10	1/4	4	8	28.6	29.4	14.3	18	16
2L20017	RL20	10	3/8	5	9	30.5	35.6	15.3	22	16
2020010	RL20	12	1/4	4	8	31	29.4	14.3	18	19.5
2020011	RL20	12	3/8	5	9	32.4	35.6	17.5	22	19.5
2020012	RL20	12	1/2	8	11	34	40.8	19.2	26	19.5

MALE ROD, DUAL ROTARY RING, TECHNOPOLYMER (R20/A)



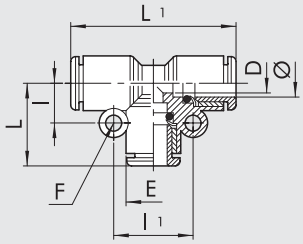
Code	Ref.	Ø	F	Ch	P	L	L1	L2	E	E1
2020A01	R20/A	4	M5	2	4	40	16.8	6.5	9.9	10.9
2020A02	R20/A	4	1/8	3	6	45	27	10.5	14	12.5
2020A03	R20/A	5	M5	2	4	43	18.8	8.5	9.9	13.5
2020A04	R20/A	5	1/8	3	6	46	27	10.5	14	13.5
2020A05	R20/A	6	1/8	3	6	45	27	10.5	14	15
2020A07	R20/A	6	1/4	4	8	48	31.5	11.5	18	15
2020A06	R20/A	8	1/8	3	6	51	27	10.5	14	16.3
2020A08	R20/A	8	1/4	4	8	54	31.5	11.5	18	16.3
2020A09	R20/A	10	1/4	4	8	64	31.5	11.5	18	18.5
2020A10	R20/A	12	1/4	4	8	64	31.5	11.5	18	21
2020A11	R20/A	12	3/8	5	9	68	36	13.5	22	21
2020A12	R20/A	12	1/2	8	11	72	42	16.2	26	21

ELBOW, INTERMEDIATE, TECHNOPOLYMER (R21)



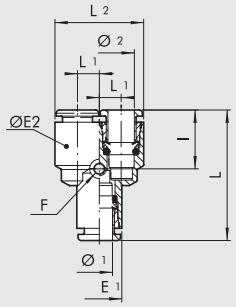
Code	Ref.	Ø	L	D	E	I	F
2L21001	RL21	4	16.7	2.5	9.2	7.2	3.3
2021002	R21	5	20	3.5	13.5	–	–
2L21003	RL21	6	19	4.2	11.3	8.2	3.3
2L21004	RL21	8	21.4	6.2	13.8	9.6	3.3
2021005	RL21	10	24	8.5	16	10.9	3.3
2021006	RL21	12	25.8	10.5	19.5	12.5	3.3

INTERMEDIATE TEE, TECHNOPOLYMER (R22)



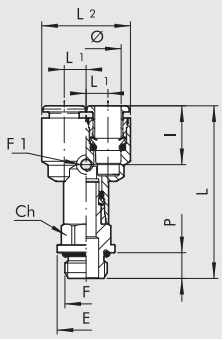
Code	Ref.	Ø	L	L1	D	E	I	I1	F
2L22001	RL22	4	16.7	33.4	2.5	9.2	7.2	14.4	3.3
2022002	R22	5	20	40	3.5	13.5	–	–	–
2L22003	RL22	6	19	38	4.2	11.3	8.2	16.4	3.3
2L22004	RL22	8	21.4	42.8	6.2	13.8	9.6	19.2	3.3
2022005	RL22	10	24	48	8.5	16	10.9	21.8	3.3
2022006	RL22	12	25.8	51.6	10.5	19.5	12.5	25	3.3

WYE (R23)



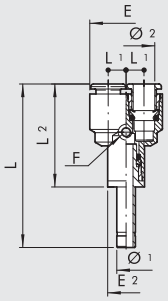
Code	Ref.	Ø1	Ø2	L	L1	E1	ØE2	I	F	L2
2023001	RL23	4	4	32.9	5	9.2	9.2	14.8	3.3	19.2
2023002	R23	5	5	35.5	6.5	13.5	13.5	–	–	26.5
2023003	RL23	6	6	35.5	5.8	11.3	11.3	15	3.3	22.8
2023004	RL23	8	8	39.5	7.2	13.8	13.8	15.8	3.3	28.2
2L23005	RL23	10	10	43.1	8.3	16	16	17.4	3.3	32.6
2L23006	RL23	12	12	48	10	19.5	19.5	18	3.3	39.5
2L23301	RL23	6	4	34.2	5	11.3	9.2	14.8	3.3	19.2
2L23303	RL23	8	6	37.8	5.8	13.8	11.3	15	3.3	22.8
2L23306	RL23	10	8	40.4	7.2	16	13.8	15.8	3.3	28.2
2L23309	RL23	12	10	44.2	8.3	19.5	16	17.4	3.3	32.6

Y TECHNOPOLYMER, THREADED INPUT (R23/M)



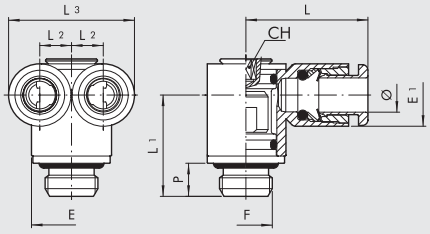
Code	Ref.	Ø	F	L	L1	L2	I	Ch	P	E	F1
2L23401	RL23/M	4	M5	38.7	5	19.2	14.8	9	4	9.9	3.3
2L23402	RL23/M	4	1/8	42.6	5	19.2	14.8	12	6	14	3.3
2L23403	RL23/M	4	1/4	46.6	5	19.2	14.8	14	8	18	3.3
2L23406	RL23/M	6	1/8	44.9	5.75	22.8	15	12	6	14	3.3
2L23407	RL23/M	6	1/4	47.9	5.75	22.8	15	14	8	18	3.3
2L23409	RL23/M	8	1/8	48.4	7.2	28.2	15.8	14	6	15	3.3
2L23410	RL23/M	8	1/4	52.8	7.2	28.2	15.8	14	8	18	3.3
2L23412	RL23/M	8	3/8	54.4	7.2	28.2	15.8	17	9	22	3.3
2L23413	RL23/M	10	1/4	53.8	8.3	32.6	17.4	16	8	18	3.3
2L23415	RL23/M	10	3/8	56	8.3	32.6	17.4	17	9	20	3.3
2L23419	RL23/M	12	3/8	62	10	39.5	18	19	9	22	3.3
2L23420	RL23/M	12	1/2	62.3	10	39.5	18	22	11	26	3.3

Y BRANCH WITH ADAPTER, TECHNOPOLYMER (R24)



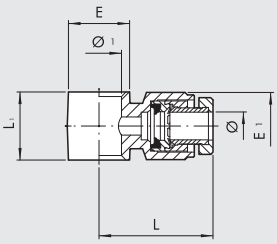
Code	Ref.	Ø1	Ø2	L	L1	L2	E1	E2	I	F
2024001	RL24	4	4	46.9	5	29.7	9.2	9.2	14.8	3.3
2024003	RL24	6	6	49.7	5.75	32	11.3	11.3	15	3.3
2L24004	RL24	8	8	55.1	7.2	35.9	13.8	13.8	15.8	3.3
2L24005	RL24	10	10	63.1	8.3	39.2	16	16	17.4	3.3
2L24006	RL24	12	12	70.5	10	44	19.5	19.5	18	3.3
2L24301	RL24	6	4	48.4	5	30.7	9.2	11.3	14.8	3.3
2L24303	RL24	8	6	53.4	5.75	34.2	11.3	13.8	15	3.3
2L24306	RL24	10	8	60.4	7.2	36.6	13.8	16	15.8	3.3
2L24309	RL24	12	10	66.7	8.3	40.2	16	19.5	17.4	3.3

TECHNOPOLYMER PARALLEL Y, THREADED INPUT (R25)



Code	Ref.	Ø	F	L	L1	L2	L3	E	E1	CH	P
2L25001	RL25	4	M5	17.7	13.1	5	19.2	8	9.2	2	4
2L25002	RL25	4	M7	17.7	14.6	5	19.2	9.8	9.2	3	5
2L25003	RL25	4	1/8	17.7	16.5	5	19.2	13	9.2	3	6
2L25004	RL25	6	1/8	23	18.3	5.75	22.8	14	11.3	3	6
2L25005	RL25	6	1/4	23	21.2	5.75	22.8	16.4	11.3	4	8
2L25008	RL25	8	1/4	25.8	22.2	7.2	28.2	18	13.8	4	8
2L25009	RL25	8	3/8	25.8	23.8	7.2	28.2	20	13.8	5	9

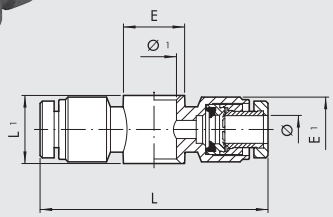
SINGLE RING, TECHNOPOLYMER (R28)



Code	Ref.	Ø	Ø 1	L	L1	E	E1
2012102	R28	4	1/8	22.5	17	15	12.5
2012104	R28	5	1/8	23	17	15	13.5
2012106	R28	6	1/8	22.5	17	15	15
2012107	R28	6	1/4	24	19	18	15
2012108	R28	8	1/8	25.5	17	15	16.5
2012109	R28	8	1/4	27	19	18	16.5
2012110	R28	8	3/8	29	22	21.5	16.5
2012111	R28	10	1/4	32	19	18	18.5
2012112	R28	10	3/8	32	22	21.5	18.5
2012113	R28	12	1/4	32	19	18	21
2012114	R28	12	3/8	34	22	21.5	21
2012115	R28	12	1/2	36	24	26	21

For the rods series D, see page **D2**.15

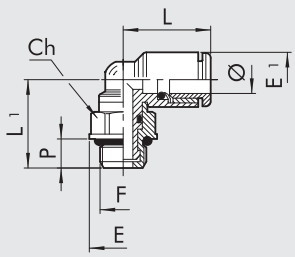
DUAL RING, TECHNOPOLYMER (R29)



Code	Ref.	Ø	Ø 1	L	L1	E	E1
2013102	R29	4	1/8	45	17	15	12.5
2013104	R29	5	1/8	46	17	15	13.5
2013106	R29	6	1/8	45	17	15	15
2013107	R29	6	1/4	48	19	18	15
2013108	R29	8	1/8	51	17	15	16.5
2013109	R29	8	1/4	54	19	18	16.5
2013110	R29	8	3/8	58	22	21.5	16.5
2013111	R29	10	1/4	64	19	18	18.5
2013112	R29	10	3/8	64	22	21.5	18.5
2013113	R29	12	1/4	64	19	18	21
2013114	R29	12	3/8	68	22	21.5	21
2013115	R29	12	1/2	72	24	26	21

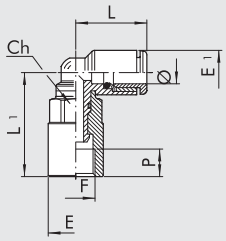
For the rods series D, see page **D2**.15

ROTARY ELBOW, MALE, TECHNOPOLYMER (R34)



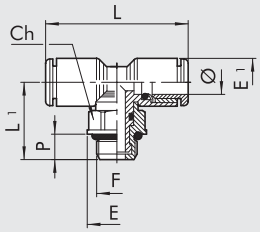
Code	Ref.	Ø	F	Ch	P	L	L1	E	E1
2L34001	RL34	4	M5	8	4	16.4	15.2	9	9.2
2L34020	RL34	4	M7	8	5	16.4	16.2	9.8	9.2
2L34002	RL34	4	1/8	12	6	16.4	17.2	14	9.2
2L34003	RL34	4	1/4	14	8	16.4	20.1	18	9.2
2L34006	RL34	6	M5	8	4	18	16.3	9	11.3
2L34021	RL34	6	M7	9	5	19	17.5	9.9	11.3
2L34007	RL34	6	1/8	12	6	19	18.3	14	11.3
2L34008	RL34	6	1/4	14	8	19	21.2	18	11.3
2L34009	RL34	8	1/8	12	6	20.2	19.5	14	13.8
2L34010	RL34	8	1/4	14	8	20.2	22.4	18	13.8
2L34011	RL34	8	3/8	17	9	20.2	24.4	22	13.8
2L34013	RL34	10	1/4	14	8	23.3	23.5	18	16
2L34014	RL34	10	3/8	17	9	23.3	25.6	22	16
2L34016	RL34	12	3/8	17	9	25.2	27.3	22	19.5
2L34017	RL34	12	1/2	19	11	25.2	30.3	26	19.5

ELBOW, FEMALE, ROTARY, TECHNOPOLYMER (R34/F)



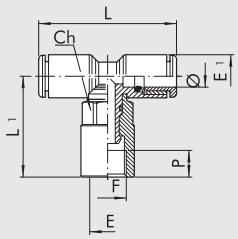
Code	Ref.	Ø	F	Ch	E	E1	L	L1	P
2L34F01	RL34/F	4	M5	8	9	9.2	16.4	15.3	4
2L34F05	RL34/F	4	1/8	12	14	9.2	16.4	20.9	7
2L34F06	RL34/F	6	M5	8	9	11.3	18	16.4	4
2L34F07	RL34/F	6	1/8	12	14	11.3	19	26.5	7
2L34F08	RL34/F	6	1/4	14	17	11.3	19	28.2	8
2L34F09	RL34/F	8	1/8	12	14	13.8	20.2	27.7	7
2L34F10	RL34/F	8	1/4	14	17	13.8	20.2	29.4	8
2L34F13	RL34/F	10	1/4	14	17	16	23.3	33	8
2L34F14	RL34/F	10	3/8	17	21	16	23.3	38	10
2L34F16	RL34/F	12	3/8	17	21	19.5	25.2	40.3	10
2L34F17	RL34/F	12	1/2	19	23.8	19.5	25.2	42.8	11

CENTRAL TEE, MALE, TECHNOPOLYMER (R35)



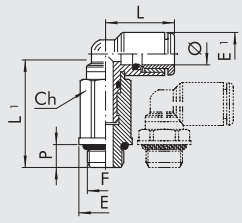
Code	Ref.	Ø	F	Ch	P	L	L1	E	E1
2L35001	RL35	4	M5	8	4	32.8	15.2	9	9.2
2L35020	RL35	4	M7	8	5	32.8	16.2	9.8	9.2
2L35002	RL35	4	1/8	12	6	32.8	17.2	14	9.2
2L35003	RL35	4	1/4	14	8	32.8	20.1	18	9.2
2L35006	RL35	6	M5	8	4	36	16.3	9	11.3
2L35007	RL35	6	1/8	12	6	38	18.3	14	11.3
2L35008	RL35	6	1/4	14	8	38	21.2	18	11.3
2L35009	RL35	8	1/8	12	6	40.4	19.5	14	13.8
2L35010	RL35	8	1/4	14	8	40.4	22.4	18	13.8
2L35011	RL35	8	3/8	17	9	40.4	24.4	22	13.8
2L35013	RL35	10	1/4	14	8	46.6	23.5	18	16
2L35014	RL35	10	3/8	17	9	46.6	25.6	22	16
2L35016	RL35	12	3/8	17	9	50.4	27.3	22	19.5
2L35017	RL35	12	1/2	19	11	50.4	30.3	26	19.5

CENTRAL TEE, FEMALE, ROTARY, TECHNOPOLYMER (R35/F)



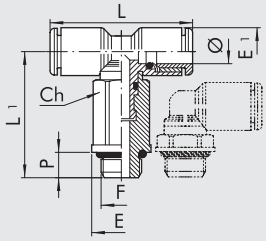
Code	Ref.	Ø	F	Ch	E	E1	L	L1	P
2L35F01	RL35/F	4	M5	8	9	9.2	32.8	15.3	4
2L35F06	RL35/F	6	M5	8	9	11.3	36	16.4	4
2L35F07	RL35/F	6	1/8	12	14	11.3	38	26.5	7
2L35F08	RL35/F	6	1/4	14	17	11.3	38	28.2	8
2L35F09	RL35/F	8	1/8	12	14	13.8	40.4	27.7	7
2L35F10	RL35/F	8	1/4	14	17	13.8	40.4	29.4	8
2L35F13	RL35/F	10	1/4	14	17	16	46.6	33	8
2L35F14	RL35/F	10	3/8	17	21	16	46.6	38	10
2L35F16	RL35/F	12	3/8	17	21	19.5	50.4	40.3	10
2L35F17	RL35/F	12	1/2	19	23.8	19.5	50.4	42.8	11

ROTARY ELBOW, MALE, EXTENDED, TECHNOPOLYMER (R36)



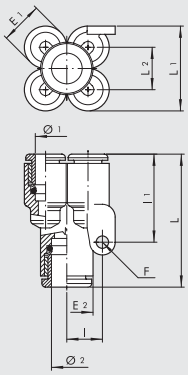
Code	Ref.	Ø	F	Ch	P	L	L1	E	E1
2L36001	RL36	4	M5	8	4	16.4	26.7	9	9.2
2L36020	RL36	4	M7	8	5	16.4	27.7	9.8	9.2
2L36002	RL36	4	1/8	12	6	16.4	25.3	14	9.2
2L36006	RL36	6	M5	8	4	18	27.8	9	11.3
2L36021	RL36	6	M7	9	5	18	29.3	9.9	11.3
2L36007	RL36	6	1/8	12	6	19	30.9	14	11.3
2L36008	RL36	6	1/4	14	8	19	33.2	18	11.3
2L36009	RL36	8	1/8	12	6	20.2	32.1	14	13.8
2L36010	RL36	8	1/4	14	8	20.2	34.4	18	13.8
2L36012	RL36	10	1/4	14	8	23.3	38	18	16

CENTRAL TEE, MALE, ROTARY, EXTENDED, TECHNOPOLYMER (R37)



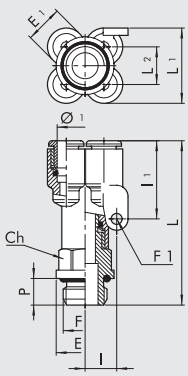
Code	Ref.	Ø	F	Ch	P	L	L1	E	E1
2L37001	RL37	4	M5	8	4	32.8	26.7	9	9.2
2L37020	RL37	4	M7	8	5	32.8	27.5	9.8	9.2
2L37002	RL37	4	1/8	12	6	32.8	25.3	14	9.2
2L37006	RL37	6	M5	8	4	36	27.8	9	11.3
2L37007	RL37	6	1/8	12	6	38	30.9	14	11.3
2L37008	RL37	6	1/4	14	8	38	33.2	18	11.3
2L37009	RL37	8	1/8	12	6	40.4	32.1	14	13.8
2L37010	RL37	8	1/4	14	8	40.4	34.4	18	13.8
2L37012	RL37	10	1/4	14	8	46.6	38	18	16

DUAL Y BRANCH TECHNOPOLYMER (R42)



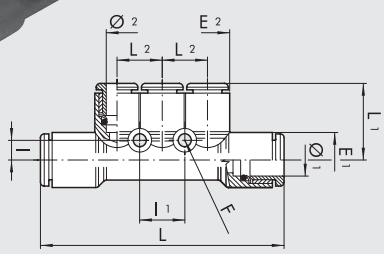
Code	Ref.	Ø1	Ø2	E1	E2	L	L1	L2	I	I1	F
2L42001	RL42	4	4	9.2	9.2	28.8	17.9	8.7	8	21.3	3.3
2L42002	RL42	4	6	9.2	11.3	31.3	17.9	8.7	8	21.3	3.3
2L42004	RL42	6	6	11.3	11.3	33.4	22.6	11.3	9.5	25.6	3.3
2L42005	RL42	6	8	11.3	14	34.8	22.6	11.3	9.5	25.6	3.3

DUAL Y BRANCH TECHNOPOLYMER, THREADED INPUT (R43)



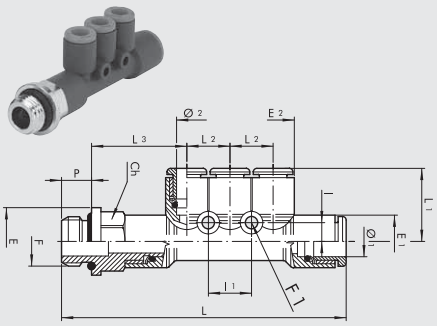
Code	Ref.	Ø1	F	E1	E	Ch	P	L	L1	L2	I	I1	F1
2L43001	RL43	4	M5	9.2	8	9	4	35.5	17.9	8.7	8	21.3	3.3
2L43002	RL43	4	1/8	9.2	14	12	6	41.6	17.9	8.7	8	21.3	3.3
2L43003	RL43	4	1/4	9.2	18	14	8	44.6	17.9	8.7	8	21.3	3.3
2L43008	RL43	6	1/8	11.3	14	12	6	43.7	22.6	11.3	9.5	25.6	3.3
2L43009	RL43	6	1/4	11.3	18	14	8	46.7	22.6	11.3	9.5	25.6	3.3

MULTIPLE MANIFOLD, TECHNOPOLYMER (R44)



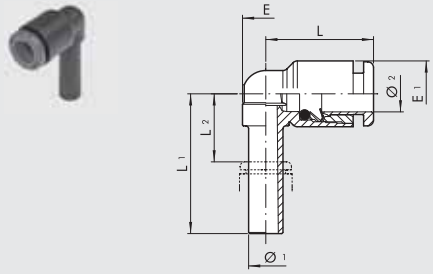
Code	Ref.	Ø1	Ø2	E1	E2	L	L1	L2	I	I1	F
2L44001	RL44	6	4	11.3	9.2	53.2	17.2	9.4	4.3	9.4	3.3
2L44003	RL44	8	6	14	11.3	61.4	19.6	11.5	5	11.5	3.3

MULTIPLE MANIFOLD, INPUT, THREADED, TECHNOPOLYMER (R45)



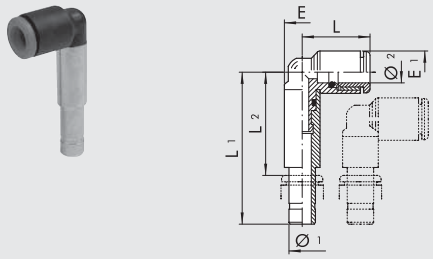
Code	Ref.	F	Ø1	Ø2	E1	E2	E	Ch	P	L	L1	L2	L3	I	I1	F1
2L45001	RL45	1/8	6	4	11.3	9.2	14	12	6	63.5	17.2	9.4	21.5	4.3	9.4	3.3
2L45002	RL45	1/4	6	4	11.3	9.2	18	14	8	66.5	17.2	9.4	22.5	4.3	9.4	3.3
2L45007	RL45	1/8	8	6	14	11.3	15	14	6	71.2	19.6	11.5	23	5	11.5	3.3
2L45008	RL45	1/4	8	6	14	11.3	18	14	8	75.6	19.6	11.5	25.4	5	11.5	3.3
2L45009	RL45	3/8	8	6	14	11.3	22	17	9	77.2	19.6	11.5	26	5	11.5	3.3

PLUG-IN ELBOWS (R46)



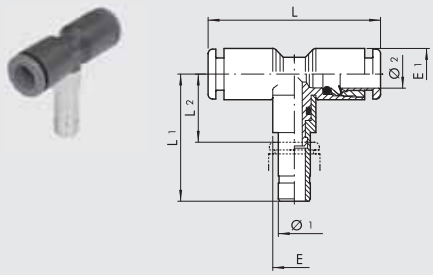
Code	Ref.	Ø1	Ø2	L	L1	L2	E	E1
2L46001	RL46	4	4	16	22.5	8.1	6.8	9.2
2L46002	RL46	6	6	18.5	24	8.4	8	11.3
2L46003	RL46	8	8	21.2	28.5	11.3	10	13.8
2L46004	RL46	10	10	23.3	32	13.3	12.5	16

EXTENDED PLUG-IN ELBOWS (R47)



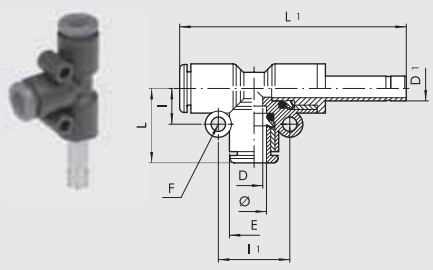
Code	Ref.	Ø1	Ø2	L	L1	L2	E	E1
2L47001	RL47	4	4	15.5	36.9	23.4	7.7	9.2
2L47002	RL47	6	6	18.1	40.6	25.9	9.3	11.3
2L47003	RL47	8	8	19.3	44.9	28.8	9.7	13.8

DOUBLE ELBOW (R48)



Code	Ref.	Ø1	Ø2	L	L1	L2	E	E1
2L48001	RL48	4	4	32	22.5	8.1	6.8	9.2
2L48002	RL48	6	6	37	37.5	16.4	9.7	11.3
2L48003	RL48	8	8	42.4	28.5	11.3	10	13.8
2L48004	RL48	10	10	46.6	46	27.7	14	16

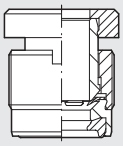
DOUBLE LATERAL ELBOW (R49)



Code	Ref.	Ø	L	L1	I	I1	E	D	D1	F
2L49001	RL49	4	16.7	47.4	7.2	14.4	9.2	2.5	4	3.3
2L49003	RL49	6	19	52.5	8.2	16.4	11.3	4.2	6	3.3
2L49004	RL49	8	21.4	58.4	9.6	19.2	13.8	6.2	8	3.3
2L49005	RL49	10	24.1	68.2	10.9	21.8	16	8.5	10	3.3
2L49006	RL49	12	25.8	74.1	12.5	25	19.5	10.5	12	3.3

CARTRIDGES AND ACCESSORIES

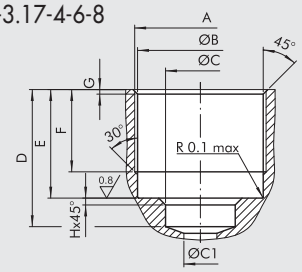
BRASS CARTRIDGE WITH THREAD (R26)



Code	Ref.	Ø	Brace of serration on centers in plastic material [Nm]	Brace of serration on metallic centers [Nm]
SERIES R				
2026A02	R26	3	0.6	0.8
2026A01	R26	3.17	0.6	0.8
2026001	R26	4	0.8	1
2026002	R26	5	0.8	1.5
2026003	R26	6	0.8	1.2
2026004	R26	8	1	1.8
2026005	R26	10	0.8	2
2026006	R26	12	0.8	2

CARTRIDGE SLOT R26

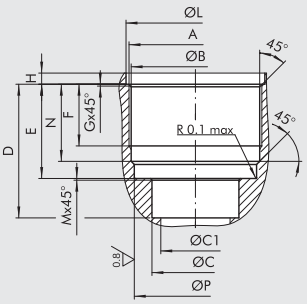
Ø 3-3.17-4-6-8



Ø	A	Ø B	Ø C	Ø C1	D	E	F
3-3.17	M7x0.75	$6.5^{\pm 01}$	$4.5^{+0.12}_{0}$	4 max	$10.5^{+0.3}_{0}$	$9.5^{+0.1}_{-0.3}$	$7^{\pm 0.20}$
4	M9.5x0.75	$9^{+0.10}_{0}$	$4.1^{+0.10}_{0}$	3 max	$12^{+0}_{-0.20}$	$9.5^{+0.15}_{-0.05}$	$7.5^{\pm 0.20}$
6	M11.5x0.75	$11^{+0.10}_{0}$	$6.1^{+0.10}_{0}$	5 max	$12^{\pm 01}$	$9.5^{\pm 01}$	$7.5^{\pm 0.20}$
8	M13.5x0.75	$13^{+0.10}_{0}$	$8.1^{+0.10}_{0}$	7 max	$15^{+0}_{-0.20}$	$10.5^{+0.15}_{-0.05}$	$8.5^{\pm 0.20}$

Ø	G	H
3-3.17	0.5	-
4	0.4	0.6
6	0.4	0.6
8	0.4	0.6

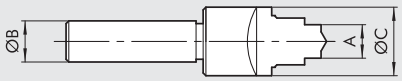
Ø 5-10-12



Ø	A	Ø B	Ø C	Ø C1	D	E	F
5	M10.5x0.75	$10^{+0.1}_{0}$	$5^{+0.15}_{0}$	4 max	$11.8^{\pm 01}$	$8.9^{+0.1}_{0}$	$5.8^{+0.3}_{-0}$
10	M15.5x0.75	$15^{+0.1}_{0}$	$10^{+0.15}_{0}$	9 max	$15.6^{\pm 01}$	$11^{\pm 0.05}$	$7.5^{+0.3}_{-0}$
12	M18x1	$17.5^{+0.05}_{0.1}$	$12^{+0.05}_{+0.15}$	11 max	$18^{\pm 01}$	$12^{\pm 0.05}$	$6.8^{+0.3}_{-0}$

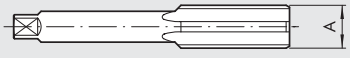
Ø	G	H	Ø L	M	N	Ø P
5	0.3	$0.9^{+0}_{-0.3}$	$11.2^{+0.12}_{+0.02}$	0.1	$7.8^{\pm 0.05}$	$9.7^{\pm 0.05}$
10	0.3	$1.3^{+0}_{-0.3}$	$16.2^{+0.1}_{-0.05}$	0.2	$9^{\pm 0.05}$	$14.9^{+0.10}_{-0}$
12	0.6	$1.3^{+0}_{-0.3}$	$18.8^{+0.1}_{-0}$	0.2	$9.75^{+0.1}_{-0.15}$	$17^{+0.1}_{-0}$

TOOL FOR SLOT R26



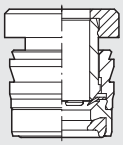
Code	Ref.	A	Ø B	Ø C
2025010	UT.SE. R26 3-3.17	4.5	10	10
2025011	UT.SE. R26 4	4.1	12	18
2025012	UT.SE. R26 5	5.1	15	20
2025013	UT.SE. R26 6	6.1	16	19
2025014	UT.SE. R26 8	8.1	16	21
2025015	UT.SE. R26 10	10.1	16	25
2025016	UT.SE. R26 12	12.1	15	28

MALE FOR CARTRIDGE SLOT R26



Code	Ref.	Ø	A
2025020	MA R26 3-3.17	3-3.17	M7x0.75
2025021	MA R26 4	4	M9.5x0.75
2025022	MA R26 5	5	M10.5x0.75
2025023	MA R26 6	6	M11.5x0.75
2025024	MA R26 8	8	M13.5x0.75
2025025	MA R26 10	10	M15.5x0.75
2025026	MA R26 12	12	M18x1

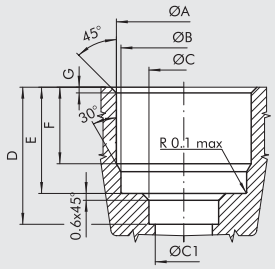
BRASS COMPRESSION CARTRIDGE (R27)



Code	Ref.	Ø
SERIES R		
2027001	R27	4
2027002	R27	5
2027003	R27	6
2027004	R27	8
2027005	R27	10
2027006	R27	12

CARTRIDGE SLOT R27

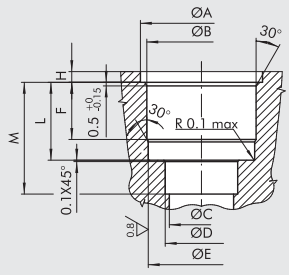
Ø 4-6-8



Ø	Ø A	Ø B	Ø C	Ø C1	D	E	F	G
FOR ALUMINIUM								
4	9.2 $^{+0}_{-0.10}$	9 $^{+0.10}_{-0}$	4.1 $^{+0.10}_{-0}$	3 MAX	12 $^{+0}_{-0.20}$	9.3 $^{+0}_{-0.10}$	6.7 $^{+0.10}_{-0}$	0.5
6	11.3 $^{+0}_{-0.08}$	11 $^{+0.10}_{-0}$	6.1 $^{+0.10}_{-0}$	5 MAX	12 $^{+0}_{-0.20}$	9.3 $^{+0}_{-0.10}$	6.7 $^{+0.10}_{-0}$	0.5
8	13.3 $^{+0}_{-0.08}$	13 $^{+0.10}_{-0}$	8.1 $^{+0.10}_{-0}$	7 MAX	15 $^{+0}_{-0.20}$	10.3 $^{+0}_{-0.10}$	7.7 $^{+0.10}_{-0}$	0.5
FOR TECHNOPOLYMER								
4	*9.2 $^{+0}_{-0.10}$	9 $^{+0.10}_{-0}$	4.1 $^{+0.10}_{-0}$	3 MAX	12 $^{+0}_{-0.20}$	9.3 $^{+0}_{-0.10}$	6.7 $^{+0.10}_{-0}$	0.5
6	*11.2 $^{+0}_{-0.10}$	11 $^{+0.10}_{-0}$	6.1 $^{+0.10}_{-0}$	5 MAX	12 $^{+0}_{-0.20}$	9.3 $^{+0}_{-0.10}$	6.7 $^{+0.10}_{-0}$	0.5
8	*13.2 $^{+0}_{-0.10}$	13 $^{+0.10}_{-0}$	8.1 $^{+0.10}_{-0}$	7 MAX	15 $^{+0}_{-0.20}$	10.3 $^{+0}_{-0.10}$	7.7 $^{+0.10}_{-0}$	0.5

*** N:B.: the diameter in interference is purely an indication and depends on the type of plastic material used and on its thickness. We suggest you should effect practical assembling tests.**

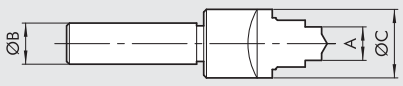
Ø 5-10-12



Ø	Ø A	Ø B	Ø C	Ø D	Ø E	F	H	L	M
FOR TECHNOPOLYMER									
5	12.1 $^{+0.15}_{-0}$	*10.2 $^{+0}_{-0.10}$	4 MAX	5.1 $^{+0.15}_{-0}$	9.7 ±0.05	6 $^{+0.2}_{-0}$	1.2 $^{-0}_{-0.2}$	8.75 $^{-0}_{-0.1}$	11.8 ±0.10
10	17.1 $^{+0.15}_{-0}$	*15.15 $^{+0}_{-0.08}$	9 MAX	10.15 $^{+0.1}_{-0}$	14.9 ±0.05	8 $^{+0.2}_{-0}$	1.5 $^{-0}_{-0.2}$	10.9 $^{-0}_{-0.1}$	15.6 ±0.10
12	19.7 $^{+0.15}_{-0}$	*17.55 $^{+0}_{-0.08}$	11 MAX	12.15 $^{+0.1}_{-0}$	17.1 ±0.05	9 $^{+0.2}_{-0}$	1.5 $^{-0}_{-0.2}$	11.85 $^{-0}_{-0.1}$	18 ±0.10
FOR ALUMINIUM									
5	12.1 $^{+0.15}_{-0}$	10.3 $^{+0}_{-0.08}$	4 MAX	5.1 $^{+0.15}_{-0}$	9.7 ±0.05	6 $^{+0.2}_{-0}$	1.2 $^{-0}_{-0.2}$	8.75 $^{-0}_{-0.1}$	11.8 ±0.10
10	17.1 $^{+0.15}_{-0}$	15.4 $^{+0}_{-0.08}$	9 MAX	10.15 $^{+0.1}_{-0}$	14.9 ±0.05	8 $^{+0.2}_{-0}$	1.5 $^{-0}_{-0.2}$	10.9 $^{-0}_{-0.1}$	15.6 ±0.10
12	19.7 $^{+0.15}_{-0}$	17.8 $^{+0}_{-0.08}$	11 MAX	12.15 $^{+0.1}_{-0}$	17.1 ±0.05	9 $^{+0.2}_{-0}$	1.5 $^{-0}_{-0.2}$	11.85 $^{-0}_{-0.1}$	18 ±0.10

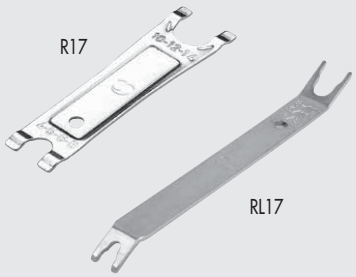
*** N:B.: the diameter in interference is purely an indication and depends on the type of plastic material used and on its thickness. We suggest you should effect practical assembling tests.**

TOOL FOR SLOT R27



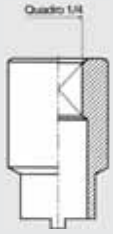
Code	Ref.	A	Ø B	Ø C
FOR ALUMINIUM				
2027021	UT.SE. R27 AL. 4	4.1	10	11.5
2027022	UT.SE. R27 AL. 5	5.1	12	16
2027023	UT.SE. R27 AL. 6	6.1	12	13.5
2027024	UT.SE. R27 AL. 8	8.1	12	15.5
2027025	UT.SE. R27 AL. 10	10.1	16	20
2027026	UT.SE. R27 AL. 12	12.1	16	22
FOR TECHNOPOLYMER				
2027011	UT.SE. R27 P. 4	4.1	10	11.5
2027012	UT.SE. R27 P. 5	5.1	12	16
2027013	UT.SE. R27 P. 6	6.1	12	13.5
2027014	UT.SE. R27 P. 8	8.1	12	15.5
2027015	UT.SE. R27 P. 10	10.1	16	20
2027016	UT.SE. R27 P. 12	12.1	16	22

R17 – DISASSEMBLY KEY



Code	Ref.	Lenght [mm]	Ø Tube
2L17001	RL17	140	from 3 to 10
2017001	R17	95.0	from 4 to 14

R41 – CARTRIDGE KEY R26



Code	Ref.	Ø
2041001	R41	4
2041002	R41	5
2041003	R41	6
2041004	R41	8
2041005	R41	10
2041006	R41	12

NOTES

SERIES F-E / SERIES F-NSF
PUSH-IN FITTINGS FOR USE IN THE FOOD INDUSTRY

These fittings are made of materials suitable for use in the food industry. They can also be used with hot and cold tap water.
All brass component parts undergo a clean-lead process, which consists of removing lead from the surface layer of the fitting; the gaskets are made of special FDA-approved Viton®. These fittings do not contain technopolymers, thereby avoiding problems of compatibility with detergents and other chemical agents. This choice of materials allows the fittings to be used up to 150°C, which makes them suitable for other high-temperature applications, in addition to the food industry.
The threads are cylindrical and under-head O-rings provide a pneumatic seal. This avoids the need for sealants (e.g. Teflon®), which could release solid fragments during screwing and unscrewing that would contaminate the environment or the fluid. Our fittings can be screwed and unscrewed any number of times and still remain clean and pneumatically sealed.
This choice of materials and treatments make these fittings suitable for use in the chemical, pharmaceutical, medical and electronics industry.
The fittings are available in two series:

- Series **F-E** fittings are made of brass that undergoes a surface clean-lead process, followed by a surface coating with inter-metal alloy compound; they comply with regulatory standards applicable in Europe and other world countries for use in contact with foodstuffs or drinking water.
- Series **F-NSF** fittings are made of brass with a low-lead content (≤ 0.2%) that undergoes a further surface clean-lead process in compliance with US standards, and are certified to NSF169 and NSF61 standards.

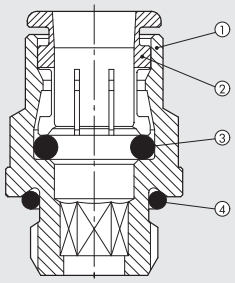
A standard range of fittings is available, but other designs can be developed on specific request.

SERIES F-NSF

SERIES F-E

TECHNICAL DATA		SERIES F-E	SERIES F-NSF
Threaded port		M5 - G1/8" - G1/4" - G3/8" - G1/2"	
Pipe diameter	mm	Ø 4 - Ø 6 - Ø 8 - Ø 10	
Temperature range	°C	– 20 to + 150	
	°F	– 4 to 302	
Pressure range		– 0.99 bar to 16 bar / – 0.099 MPa to 1.6 MPa	
Recommended pipe		Rilsan PA 11 - Nylon 6 - Polyamide 12 - Polypropylene - PTFE	PTFE

COMPONENTS



SERIES F-E
① Body: unleaded brass treated with environmentally-friendly intermetallic alloy
② Gripper: unleaded brass treated with environmentally-friendly intermetallic alloy
③ Seal: FDA-approved Viton®
④ Port seal: FDA-approved Viton®

SERIES F-NSF
① Body: low-lead brass (≤0.2%)
② Gripper: brass (not in contact with the fluid)
③ Seal: FDA-approved Viton®
④ Port seal: FDA-approved Viton®

ADVANTAGES / CERTIFICATIONS

SERIES F-E

ADVANTAGES

Under-head O-ring
Can be screwed and unscrewed any number of times; no fragments of Teflon® or sealant will contaminate the fluid.

Corrosion resistance
The intermetallic alloy deposited on the surface and Viton® are compatible with numerous substances.

No plastic parts
No risk of incompatibility.

CONFORMITY DECLARATIONS
- Regulation 1935/04 EU.*
- Regulation 2023/06 EU.

SERIES F-NSF

ADVANTAGES

Under-head O-ring
Can be screwed and unscrewed any number of times; no fragments of Teflon® or sealant will contaminate the fluid.

No plastic parts
No risk of incompatibility.

CERTIFICATIONS
- NSF/ANSI 169: products in contact with food.
- NSF/ANSI 61: products in contact with drinking water.

More specifically, they are certified according to section 4 in the "commercial hot 82C" category, which is the most restrictive and includes the following subcategories:
- Domestic cold temperature
- Domestic hot temperature
- Commercial hot temperature
- Environment pH5.

CONFORMITY DECLARATIONS
- DM 174
- Regulation 1935/04 EU.*
- Regulation 2023/06 EU.

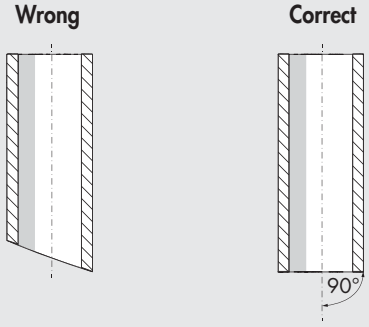
NSF/ANSI 61
NSF/ANSI 169

* Release tests performed at 20°C for a duration of 10 hours equal to 50°C for 30 minutes, with peaks of 5 minutes at 80°C (pasteurization) equal to peaks of 2/3 minutes at 120°C (sterilization).

INSTALLING THE PIPE

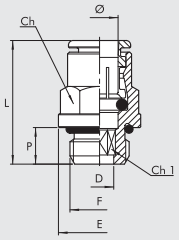
Compressed air pipes must be used in compliance with some basic criteria in order to ensure long life and proper operation of the fitting:
- check that the conditions for the installation and use (e.g. temperature and fluid used) comply with the characteristics stated by the pipe manufacturer;
- check the pipe size; oversized pipes could not fit properly, undersized ones could not ensure pipe retention and air tightness.

The cut should be as accurate as possible at a right angle with the pipe axis.



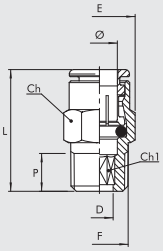
- the bending radius of the pipe installed must be as wide as possible. The fittings have been designed to ensure axial seal of the pipe; excessive curvature could considerably shorten the life of the pipe.
- the pipe must not be subjected to excessive axial stress and it must be of the right length for snugly fitting (not too long or too short).
- correct insertion of the pipe into the fitting is essential for air tightness and pipe retention. Make sure that the pipe is pushed right into the seat.
- check that the pipe does not encounter any obstacles or blockages along its way, which could cause tensile stress of the pipe in the fitting.

STRAIGHT, CYLINDRICAL, MALE R1 F



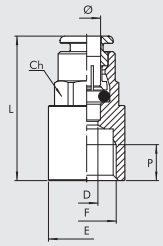
Series F-E		Series F-NSF									
Code	Ref.	Code	Ref.	Ø	F	Ch	Ch1	P	L	D	E
2F01001	R1 F-E	2F01051	R1 F-NSF	4	M5	Ø 9.9	2.5	4	21.5	2.6	9.9
2F01002	R1 F-E	2F01052	R1 F-NSF	4	1/8	11	3	6	20.5	3.1	15
2F01003	R1 F-E	2F01053	R1 F-NSF	4	1/4	12	3	8	22.5	3.1	18
2F01000	R1 F-E	2F01050	R1 F-NSF	6	M5	Ø 12.9	2.5	4	25	2.6	12.9
2F01007	R1 F-E	2F01057	R1 F-NSF	6	1/8	13	4	6	27.5	4.2	15
2F01008	R1 F-E	2F01058	R1 F-NSF	6	1/4	13	4	8	26.5	4.2	18
2F01009	R1 F-E	2F01059	R1 F-NSF	8	1/8	14	5	6	28.5	5.2	15.6
2F01010	R1 F-E	2F01060	R1 F-NSF	8	1/4	15	6	8	27	6.2	18
2F01011	R1 F-E	2F01061	R1 F-NSF	8	3/8	15	6	9	28	6.2	21
2F01012	R1 F-E	2F01062	R1 F-NSF	10	1/4	17	7	8	33.5	7.2	20
2F01013	R1 F-E	2F01063	R1 F-NSF	10	3/8	17	8	9	30.5	8.2	21
2F01022	R1 F-E	2F01072	R1 F-NSF	10	1/2	17	8	11	31.5	8.2	26

STRAIGHT, CONICAL, MALE R1C F



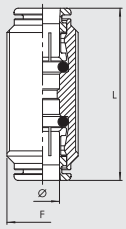
Series F-E		Series F-NSF									
Code	Ref.	Code	Ref.	Ø	F	Ch	Ch1	P	L	D	E
2F01C02	R1C F-E	2F01C52	R1C F-NSF	4	1/8	10	2.5	6.2	20.5	3.1	11.5
2F01C07	R1C F-E	2F01C57	R1C F-NSF	6	1/8	12	4	6.2	24	4.2	13.8
2F01C08	R1C F-E	2F01C58	R1C F-NSF	6	1/4	14	4	8.5	25.5	4.2	16
2F01C09	R1C F-E	2F01C59	R1C F-NSF	8	1/8	14	5	6.2	27.5	5.2	16
2F01C10	R1C F-E	2F01C60	R1C F-NSF	8	1/4	14	6	8.5	27.5	6.2	16
2F01C11	R1C F-E	2F01C61	R1C F-NSF	8	3/8	17	6	9	27	6.2	19.6
2F01C13	R1C F-E	2F01C63	R1C F-NSF	10	1/4	17	7	8.5	34.5	7.2	19.6
2F01C14	R1C F-E	2F01C64	R1C F-NSF	10	3/8	17	7	9	30.5	7.2	19.6

STRAIGHT, FEMALE R2 F



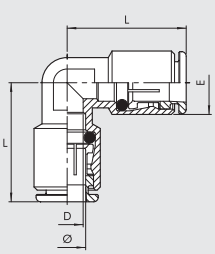
Series F-E		Series F-NSF								
Code	Ref.	Code	Ref.	Ø	F	Ch	P	L	D	E
2F02001	R2 F-E	2F02051	R2 F-NSF	4	1/8	10	7	27	3	14
2F02005	R2 F-E	2F02055	R2 F-NSF	6	1/8	13	7	30	5	15
2F02006	R2 F-E	2F02056	R2 F-NSF	6	1/4	13	8	32	5	17
2F02007	R2 F-E	2F02057	R2 F-NSF	8	1/8	14	7	30	7	17
2F02008	R2 F-E	2F02058	R2 F-NSF	8	1/4	14	8	32	7	17
2F02011	R2 F-E	2F02061	R2 F-NSF	10	1/4	17	8	35	9	20

STRAIGHT, INTERMEDIATE R3 F



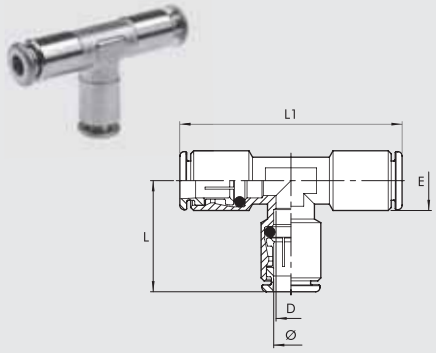
Series F-E		Series F-NSF				
Code	Ref.	Code	Ref.	Ø	F	L
2F03001	R3 F-E	2F03051	R3 F-NSF	4	M13X1	33
2F03003	R3 F-E	2F03053	R3 F-NSF	6	M15X1	40
2F03004	R3 F-E	2F03054	R3 F-NSF	8	M17X1	41
2F03005	R3 F-E	2F03055	R3 F-NSF	10	M20X1	47

ELBOW, INTERMEDIATE R4 F



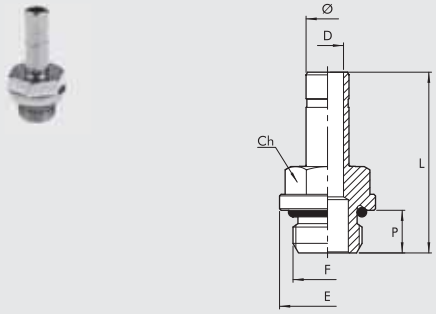
Series F-E		Series F-NSF					
Code	Ref.	Code	Ref.	Ø	D	E	L
2F04001	R4 F-E	2F04051	R4 F-NSF	4	2.5	9.5	18
2F04003	R4 F-E	2F04053	R4 F-NSF	6	4.5	13.5	22
2F04004	R4 F-E	2F04054	R4 F-NSF	8	7	14	26
2F04005	R4 F-E	2F04055	R4 F-NSF	10	9	17	30

TEE, INTERMEDIATE R5 F



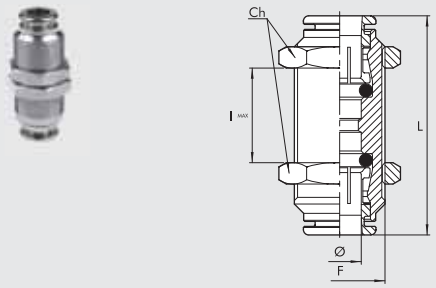
Series F-E		Series F-NSF						
Code	Ref.	Code	Ref.	Ø	L	L1	D	E
2F05001	R5 F-E	2F05051	R5 F-NSF	4	21	42	3.5	9.5
2F05003	R5 F-E	2F05053	R5 F-NSF	6	24	48	5	12.5
2F05004	R5 F-E	2F05054	R5 F-NSF	8	26	52	7	14
2F05005	R5 F-E	2F05055	R5 F-NSF	10	30	60	9	17

THREADED ADAPTER R6 F



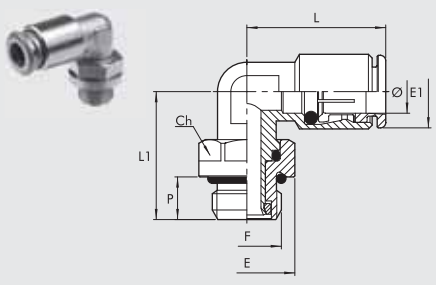
Series F-E		Series F-NSF								
Code	Ref.	Code	Ref.	Ø	F	Ch	P	L	D	E
2F06001	R6 F-E	2F06051	R6 F-NSF	4	M5	8	4	25.2	2.5	9
2F06002	R6 F-E	2F06052	R6 F-NSF	4	1/8	13	6	28.9	2.5	15
2F06003	R6 F-E	2F06053	R6 F-NSF	4	1/4	14	8	32.4	2.2	18
2F06000	R6 F-E	2F06050	R6 F-NSF	6	M5	9	4	25.7	2.7	10
2F06007	R6 F-E	2F06057	R6 F-NSF	6	1/8	13	6	29.4	4	15
2F06008	R6 F-E	2F06058	R6 F-NSF	6	1/4	14	8	32.9	4	18
2F06009	R6 F-E	2F06059	R6 F-NSF	8	1/8	13	6	30.6	5.5	15
2F06010	R6 F-E	2F06060	R6 F-NSF	8	1/4	14	8	34	6	18
2F06011	R6 F-E	2F06061	R6 F-NSF	8	3/8	17	9	35.4	6	22
2F06012	R6 F-E	2F06062	R6 F-NSF	10	1/4	14	8	35.6	7.8	18
2F06013	R6 F-E	2F06063	R6 F-NSF	10	3/8	17	9	37.1	8	22

STRAIGHT, INTERMEDIATE, BULKHEAD UNIONS R10 F



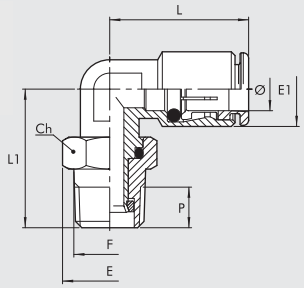
Series F-E		Series F-NSF						
Code	Ref.	Code	Ref.	Ø	F	Ch	L	I MAX
2F11001	R10 F-E	2F11051	R10 F-NSF	4	M13x1	16	33	11
2F11003	R10 F-E	2F11053	R10 F-NSF	6	M15x1	17	40	16
2F11004	R10 F-E	2F11054	R10 F-NSF	8	M17x1	20	41	19
2F11005	R10 F-E	2F11055	R10 F-NSF	10	M20x1	24	47	21

ROTARY ELBOW, MALE, CYLINDRICAL R31 F



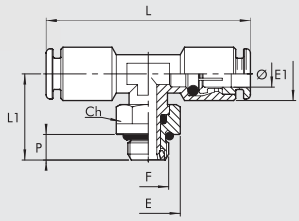
Series F-E		Series F-NSF									
Code	Ref.	Code	Ref.	Ø	F	Ch	E	E1	L	L1	P
2F31001	R31 F-E	2F31051	R31 F-NSF	4	M5	9	9	10	21	19	4
2F31002	R31 F-E	2F31052	R31 F-NSF	4	1/8	13	15	10	21	21	6
2F31003	R31 F-E	2F31053	R31 F-NSF	4	1/4	16	18	10	21	25	8
2F31007	R31 F-E	2F31057	R31 F-NSF	6	M5	9	8	11.8	24	17.5	4
2F31008	R31 F-E	2F31058	R31 F-NSF	6	1/8	13	15	12.5	24	21	6
2F31009	R31 F-E	2F31059	R31 F-NSF	6	1/4	16	18	12.5	25.5	25	8
2F31010	R31 F-E	2F31060	R31 F-NSF	8	1/8	13	15	14	26	22.5	6
2F31011	R31 F-E	2F31061	R31 F-NSF	8	1/4	16	18	14	26	25	8
2F31012	R31 F-E	2F31062	R31 F-NSF	8	3/8	19	22	14	27.5	30.5	9
2F31013	R31 F-E	2F31063	R31 F-NSF	10	1/4	16	18	16.5	30	27	8
2F31014	R31 F-E	2F31064	R31 F-NSF	10	3/8	19	22	16.5	30	30.5	9
2F31015	R31 F-E	2F31065	R31 F-NSF	10	1/2	22	26	16.5	31	32	11

ROTARY ELBOW, MALE, CONICAL R31C F



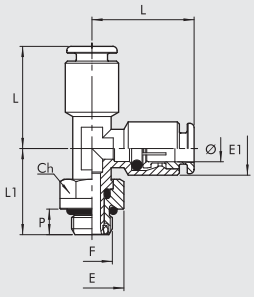
Series F-E		Series F-NSF									
Code	Ref.	Code	Ref.	Ø	F	Ch	E	E1	L	L1	P
2F31C02	R31C F-E	2F31C52	R31C F-NSF	4	1/8	12	13.3	10	21	22	6.2
2F31C03	R31C F-E	2F31C53	R31C F-NSF	4	1/4	16	17.7	10	21	27	8.5
2F31C08	R31C F-E	2F31C58	R31C F-NSF	6	1/8	12	13.3	11.8	24	22	6.2
2F31C09	R31C F-E	2F31C59	R31C F-NSF	6	1/4	16	17.7	12.5	25.5	27	8.5
2F31C10	R31C F-E	2F31C60	R31C F-NSF	8	1/8	12	13.3	14	26	23.5	6.2
2F31C11	R31C F-E	2F31C61	R31C F-NSF	8	1/4	16	17.7	14	26	27	8.5
2F31C12	R31C F-E	2F31C62	R31C F-NSF	8	3/8	19	22	14	27.5	31	9
2F31C13	R31C F-E	2F31C63	R31C F-NSF	10	1/4	16	17.7	16.5	30	29	8.5
2F31C14	R31C F-E	2F31C64	R31C F-NSF	10	3/8	19	22	16.5	30	31	9

CENTRAL TEE, MALE, CYLINDRICAL, ROTARY R32 F



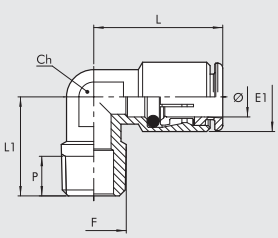
Series F-E		Series F-NSF									
Code	Ref.	Code	Ref.	Ø	F	Ch	E	E1	L	L1	P
2F32002	R32 F-E	2F32052	R32 F-NSF	4	1/8	13	15	10	41.5	21	6
2F32008	R32 F-E	2F32058	R32 F-NSF	6	1/8	13	15	12.5	47.5	21	6
2F32009	R32 F-E	2F32059	R32 F-NSF	6	1/4	16	18	12.5	50.5	25	8
2F32010	R32 F-E	2F32060	R32 F-NSF	8	1/8	13	15	14	52	22.5	6
2F32011	R32 F-E	2F32061	R32 F-NSF	8	1/4	16	18	14	52	25	8
2F32012	R32 F-E	2F32062	R32 F-NSF	8	3/8	19	22	14	56	30.5	9
2F32013	R32 F-E	2F32063	R32 F-NSF	10	1/4	16	18	16.5	60.5	27	8
2F32014	R32 F-E	2F32064	R32 F-NSF	10	3/8	19	22	16.5	60.5	30.5	9

LATERAL TEE, MALE, CYLINDRICAL, ROTARY R38 F



Series F-E		Series F-NSF									
Code	Ref.	Code	Ref.	Ø	F	Ch	E	E1	L	L1	P
2F38002	R38 F-E	2F38052	R38 F-NSF	4	1/8	13	15	9.5	22.5	21	6
2F38008	R38 F-E	2F38058	R38 F-NSF	6	1/8	13	15	12.5	24.5	21	6
2F38009	R38 F-E	2F38059	R38 F-NSF	6	1/4	16	18	12.5	26	25	8
2F38010	R38 F-E	2F38060	R38 F-NSF	8	1/8	13	15	14.5	27.5	22.5	6
2F38011	R38 F-E	2F38061	R38 F-NSF	8	1/4	16	18	14.5	27.5	25	8
2F38013	R38 F-E	2F38063	R38 F-NSF	10	1/4	16	18	17	31.5	27	8
2F38014	R38 F-E	2F38064	R38 F-NSF	10	3/8	19	22	17	31.5	30.5	9

ELBOW, MALE, CONICAL R39 F



Series F-E		Series F-NSF								
Code	Ref.	Code	Ref.	Ø	F	Ch	E1	L	L1	P
2F39C02	R39 F-E	2F39C52	R39 F-NSF	4	1/8	10	9.5	21	16	6.2
2F39C08	R39 F-E	2F39C58	R39 F-NSF	6	1/8	10	11.8	23.5	16	6.2
2F39C09	R39 F-E	2F39C59	R39 F-NSF	6	1/4	10	11.8	24	18.5	8.5
2F39C10	R39 F-E	2F39C60	R39 F-NSF	8	1/8	12	14	26	17	6.2
2F39C11	R39 F-E	2F39C61	R39 F-NSF	8	1/4	12	14	26	20	8.5
2F39C12	R39 F-E	2F39C62	R39 F-NSF	8	3/8	14	14	27.5	22.5	9
2F39C13	R39 F-E	2F39C63	R39 F-NSF	10	1/4	14	17	30.5	22	8.5

SUMMARY FITTING SERIES A, B, C, D

- **STANDARD FITTINGS SERIES A** D2.2

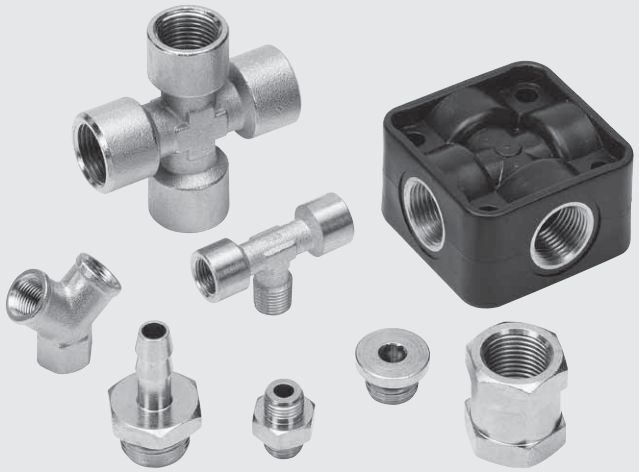
- **COMPRESSION FITTINGS SERIES B** D2.8

- **QUICK FITTINGS SERIES C** D2.11

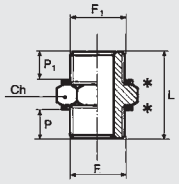
- **BANJO FITTINGS SERIES D** D2.15

STANDARD FITTINGS SERIES A

- Body: OT58 brass
- Maximum pressure 870 psi, 6000 KPa 60 bar



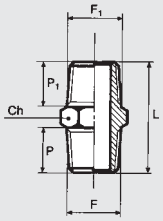
NIPPLE, PARALLEL (A1)



Code	Ref.	F	F1	Ch	P	P1	L
2101A00	A1	M5	M5	8	4.0	4.0	11.5
2101000	A1	M5	1/8	14	4.0	6.0	14.5
2101001	A1	1/8	1/8	14	6.0	6.0	17.0
2101002	A1	1/8	1/4	17	6.0	8.0	19.0
2101003	A1	1/8	3/8	20	6.0	9.0	20.0
2101004	A1	1/4	1/4	17	8.0	8.0	21.0
2101005	A1	1/4	3/8	20	8.0	9.0	22.0
2101006	A1	1/4	1/2	25	8.0	10.0	24.0
2101007	A1	3/8	3/8	20	9.0	9.0	24.0
2101008	A1	3/8	1/2	25	9.0	10.0	25.5
2101009	A1	1/2	1/2	25	10.0	10.0	26.5
2101010	A1	1/2	3/4	30	10.0	11.0	27.0
2101011	A1	3/4	3/4	30	11.0	11.0	28.0

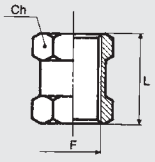
* Washer D11 can be used

NIPPLE, CONICAL (A2)



Code	Ref.	F	F1	Ch	P	P1	L
2102001	A2	1/8	1/8	12	8.0	8.0	21.0
2102002	A2	1/8	1/4	14	8.0	11.0	24.0
2102003	A2	1/8	3/8	17	8.0	11.5	25.0
2102004	A2	1/4	1/4	14	11.0	11.0	27.0
2102005	A2	1/4	3/8	17	11.0	11.5	28.0
2102006	A2	1/4	1/2	22	11.0	14.0	32.0
2102007	A2	3/8	3/8	17	11.5	11.5	29.0
2102008	A2	3/8	1/2	22	11.5	14.0	32.5
2102009	A2	1/2	1/2	22	14.0	14.0	35.0
2102010	A2	1/2	3/4	27	14.0	16.5	37.5
2102011	A2	3/4	3/4	27	16.5	16.5	40.0

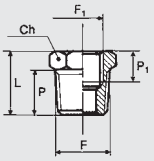
SLEEVE (A3)



Code	Ref.	F	Ch	L
2103000	A3	M5	8	11.0
2103001	A3	1/8	14	15.0
2103002	A3	1/4	17	22.0
2103003	A3	3/8	22	24.0
2103004	A3	1/2	27	30.0

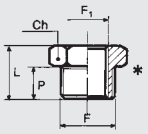
METAL WORK PNEUMATIC

REDUCER, CONICAL (A4)



Code	Ref.	F	F1	Ch	P	P1	L
2104001	A4	1/4	1/8	14	11.0	7.0	16.0
2104002	A4	3/8	1/8	17	11.5	7.0	17.0
2104003	A4	3/8	1/4	17	11.5	8.0	17.0
2104004	A4	1/2	1/4	22	14.0	8.0	20.0
2104005	A4	1/2	3/8	22	14.0	10.0	20.0
2104006	A4	3/4	1/2	27	16.5	11.0	23.5

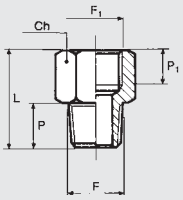
REDUCER, PARALLEL (A4/Z)



Code	Ref.	F	F1	Ch	P	L
2151000	A4/Z	1/8	M5	14	6.0	10.0
2151001	A4/Z	1/4	1/8	17	8.0	13.0
2151002	A4/Z	3/8	1/8	20	9.0	14.0
2151003	A4/Z	3/8	1/4	20	9.0	14.0
2151004	A4/Z	1/2	1/4	25	10.0	15.5
2151005	A4/Z	1/2	3/8	25	10.0	15.5

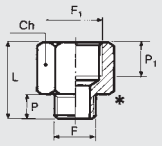
* Washer D11 can be used

REDUCER, CONICAL (A5)



Code	Ref.	F	F1	Ch	P	P1	L
2105001	A5	1/8	1/8	14	8.0	7.0	20.0
2105002	A5	1/8	1/4	17	8.0	8.0	22.5
2105003	A5	1/4	1/4	17	11.0	8.0	25.0
2105004	A5	1/4	3/8	22	11.0	10.0	28.5
2105005	A5	3/8	3/8	22	11.5	10.0	28.5
2105006	A5	3/8	1/2	24	11.5	11.0	32.0
2105007	A5	1/2	1/2	24	14.0	11.0	34.0

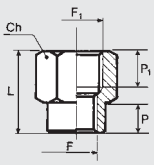
REDUCER, PARALLEL (A5/Z)



Code	Ref.	F	F1	Ch	P	P1	L
2152001	A5/Z	M5	1/8	12	4.0	7.0	17.0
2152002	A5/Z	1/8	1/8	14	6.0	7.0	18.5
2152003	A5/Z	1/8	1/4	17	6.0	8.0	21.5
2152004	A5/Z	1/4	1/4	17	8.0	8.0	22.5
2152005	A5/Z	1/4	3/8	22	8.0	10.0	26.0
2152006	A5/Z	3/8	3/8	22	9.0	10.0	26.5
2152007	A5/Z	3/8	1/2	24	9.0	11.0	29.5
2152008	A5/Z	1/2	1/2	25	10.0	11.0	29.5

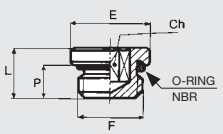
* Washer D11 can be used

REDUCER (A6)



Code	Ref.	F	F1	Ch	P	P1	L
2106001	A6	1/8	1/4	17	8.0	8.0	21.5
2106002	A6	1/8	3/8	22	7.0	10.0	23.5
2106003	A6	1/4	3/8	22	9.0	10.0	25.5
2106004	A6	1/4	1/2	24	9.0	11.0	28.5
2106005	A6	3/8	1/2	24	11.0	11.0	29.5

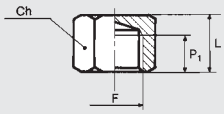
PLUG WITH EXAGON EMBEDEDDED (A7)



Code	Ref.	F	Ch	P	L	E	O ring
2107000	A7	M5	2.5	4.0	6.5	8	3.5x1.2
2107005	A7	M7	3	5.0	7.4	10	5x1.5
2107M01*	A7	1/8	4	5.2	7.2	13	2031
2107001	A7	1/8	3	7.0	9.5	15	2031
2107002	A7	1/4	6	8.0	11.0	18	2043
2107003	A7	3/8	8	9.0	12.5	21	2056
2107004	A7	1/2	10	11.0	14.5	26	3068

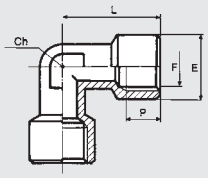
* Miniaturized version

NUB (A8)



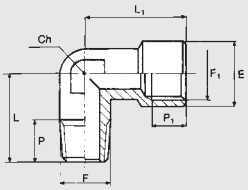
Code	Ref.	F	Ch	P1	L
2108001	A8	1/8	14	7.0	13.0
2108002	A8	1/4	17	8.0	15.0
2108003	A8	3/8	20	10.0	17.5
2108004	A8	1/2	24	11.0	20.0

ELBOW, FEMALE (A9)



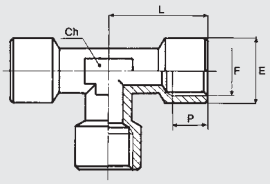
Code	Ref.	F	Ch	P	L	E
2109001	A9	1/8	10	7.0	20.5	13.5
2109002	A9	1/4	13	8.0	26.0	17.0
2109003	A9	3/8	15	10.0	30.0	20.5
2109004	A9	1/2	20	11.0	36.0	25.5

ELBOW, MALE-FEMALE (A10)



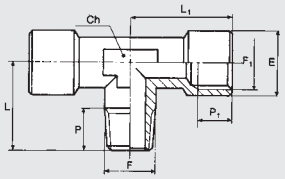
Code	Ref.	F	F1	Ch	P	P1	L	L1	E
2110001	A10	1/8	1/8	10	8.0	7.0	16.5	20.5	13.5
2110002	A10	1/4	1/4	13	10.5	8.0	24.5	26.0	17.0
2110003	A10	3/8	3/8	15	11.0	10.0	26.0	30.0	20.5
2110004	A10	1/2	1/2	20	13.0	11.0	30.0	36.0	25.5

TEE, FEMALE (A11)



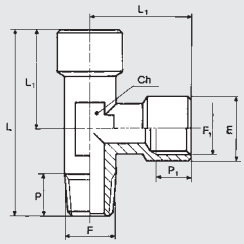
Code	Ref.	F	Ch	P	L	E
2111001	A11	1/8	10	7.0	20.5	13.5
2111002	A11	1/4	13	8.0	26.0	17.0
2111003	A11	3/8	15	10.0	30.0	20.5
2111004	A11	1/2	20	11.0	36.0	25.5

TEE, CENTRAL MALE (A12)



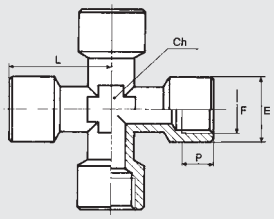
Code	Ref.	F	F1	Ch	P	P1	L	L1	E
2112001	A12	1/8	1/8	10	8.0	7.0	16.5	20.5	13.5
2112002	A12	1/4	1/4	13	10.5	8.0	24.5	26.0	17.0
2112003	A12	3/8	3/8	15	11.0	10.0	26.0	30.0	20.5
2112004	A12	1/2	1/2	20	13.0	11.0	30.0	36.0	25.5

TEE, LATERAL MALE (A13)



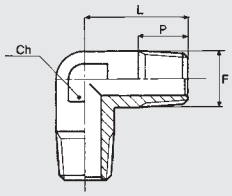
Code	Ref.	F	F1	Ch	P	P1	L	L1	E
2113001	A13	1/8	1/8	10	8.0	7.0	37.0	20.5	13.5
2113002	A13	1/4	1/4	13	10.5	8.0	50.5	26.0	17.0
2113003	A13	3/8	3/8	15	11.0	10.0	56.0	30.0	20.5
2113004	A13	1/2	1/2	20	13.0	11.0	66.0	36.0	25.5

EQUAL FEMALE CROSS (A14)



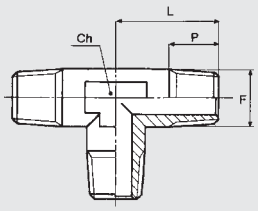
Code	Ref.	F	Ch	P	L	E
2114001	A14	1/8	10	7.0	20.5	13.5
2114002	A14	1/4	13	8.0	26.0	17.0
2114003	A14	3/8	15	10.0	28.0	20.5

ELBOW, MALE (A15)



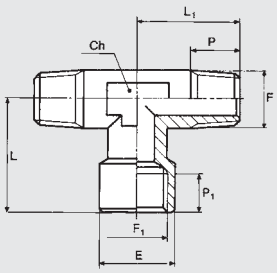
Code	Ref.	F	Ch	P	L
2115001	A15	1/8	10	8.0	16.5
2115002	A15	1/4	13	10.5	24.5
2115003	A15	3/8	15	11.0	26.0
2115004	A15	1/2	20	13.0	30.0

TEE, MALE (A16)



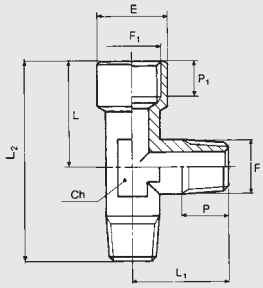
Code	Ref.	F	Ch	P	L
2116001	A16	1/8	10	8.0	16.5
2116002	A16	1/4	13	10.5	24.5
2116003	A16	3/8	15	11.0	26.0
2116004	A16	1/2	20	13.0	30.0

TEE, CENTRAL FEMALE (A17)



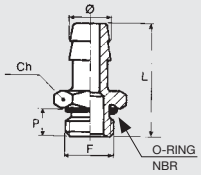
Code	Ref.	F	F1	Ch	P	P1	L	L1	E
2117001	A17	1/4	1/4	13	10.5	8.0	26.0	24.5	17.0
2117002	A17	1/8	1/8	10	8.0	7.0	20.5	16.5	13.5
2117003	A17	3/8	3/8	15	11.0	10.0	30.0	26.0	20.5
2117004	A17	1/2	1/2	20	13.0	11.0	36.0	30.0	25.5

TEE, LATERAL FEMALE (A18)



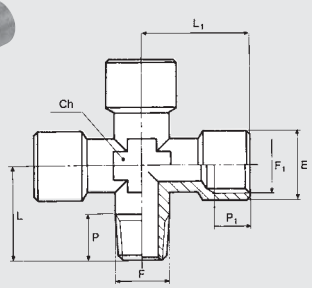
Code	Ref.	F	F1	Ch	P	P1	L	L1	E	L2
2118000	A18	1/8	1/8	10	8.0	7.0	20.5	16.5	13.5	37.0
2118001	A18	1/4	1/4	13	10.5	8.0	26.0	24.5	17.0	50.5
2118002	A18	3/8	3/8	15	11.0	10.0	30.0	26.0	20.5	56.0
2118003	A18	1/2	1/2	20	13.0	11.0	36.0	30.0	25.5	66.0

HOSE ADAPTER, PARALLEL (A19)



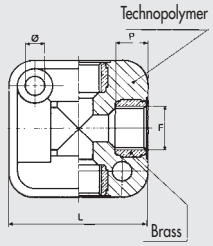
Code	Ref.	Ø	F	Ch	P	L	O ring
2119001	A19	7	1/8	15	6.0	31.0	2031
2119002	A19	7	1/4	18	8.0	33.0	2043
2119003	A19	8	1/8	15	6.0	31.0	2031
2119004	A19	9	1/8	15	6.0	31.0	2031
2119005	A19	9	1/4	18	8.0	33.0	2043
2119006	A19	9	3/8	21	9.0	34.0	2056
2119007	A19	12	1/4	18	8.0	33.0	2043
2119008	A19	12	3/8	21	9.0	34.0	2056
2119009	A19	12	1/2	26	11.0	36.0	3068
2119010	A19	17	3/8	21	9.0	34.0	2056
2119011	A19	17	1/2	26	11.0	36.0	3068

MALE-FEMALE EQUAL CROSS (A20)



Code	Ref.	F	F1	Ch	P	P1	L	L1	E
2120001	A20	1/8	1/8	10	8.0	7.0	16.5	20.5	13.5
2120002	A20	1/4	1/4	13	10.5	8.0	24.5	26.0	17.0

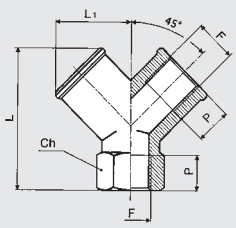
TEE CROSS (A21)



Code	Ref.	F	Ø	P	L	THICKNESS
2121001	A21	1/8	4.5	8.0	31.0	17.5
2121002	A21	1/4	5.5	9.0	40.0	24.0
2121003	A21	3/8	5.5	12.0	50.0	28.0
2121004	A21	1/2	5.5	12.0	50.0	34.0

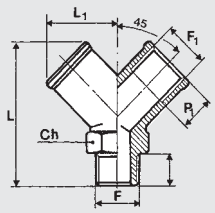
Maximum operating conditions for the A21s are different from other A-series fittings, namely max P13 bar, max T 50°C

Y, FEMALE 90° (A23)



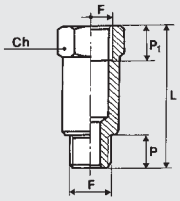
Code	Ref.	F	Ch	P	L	L1
2123001	A23	1/8	13	8	26.5	14.5
2123002	A23	1/4	17	11	32.0	18.0
2123003	A23	3/8	20	11.5	36.5	20.5
2123004	A23	1/2	25	14	44.5	26.5

Y, MALE 90° (A24)



Code	Ref.	F	F1	Ch	P	P1	L	L1
2124001	A24	1/8	1/8	13	8.0	8.0	32.0	14.5
2124002	A24	1/4	1/4	17	11.0	11.0	38.0	18.0
2124003	A24	3/8	3/8	20	11.5	11.5	42.0	20.5
2124004	A24	1/2	1/2	25	14.0	14.0	53.0	26.5

EXTENSION (A25)



Code	Rif.	F	Ch	P	L	P1
2150003	A25	1/8	14	6.0	22.0	8.0
2150004	A25	1/8	14	6.0	42.0	8.0
2150005	A25	1/8	14	6.0	51.0	8.0
2150006	A25	1/4	17	8.0	35.0	11.0
2150007	A25	1/4	17	8.0	51.0	11.0

TAPERED THREAD FITTINGS SERIES A WITH PTFE

Metal Work can supply fittings with a tapered thread coated in polytetrafluorethylene. This system provides the pneumatic seal between the fitting and the female thread. It is therefore not necessary to add other sealing systems during assembly, such as adhesives or Teflon tape. This significantly reduces assembly times. The physical and technical features of the material used ensure that the properties are maintained through time and in a wide range of operating temperatures.
This coating can be used with series A fittings types A2, A4, A5, A10, A12, A13, A15, A16, A17, A18 and A25 that have a 1/8" to 1/2" gas taper thread.

TECHNICAL DATA		
Temperature range for PTFE	°C	– 45 to + 80
	°F	– 49 to + 176

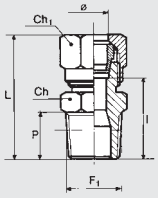
KEY TO CODES
Fittings with a PTFE thread have the same code as the standard fitting, with the addition of the suffix **T**.
For example A2 1/8 1/8 fitting has code **2102001**, so the PTFE version has code **2102001T**.

NOTES

COMPRESSION FITTINGS SERIES B

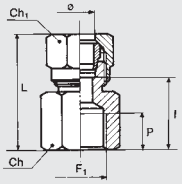
- Body: OT58 brass
- Maximum pressure 870 psi, 6000 kPa 60 bar
- For use with copper tubes

STRAIGHT, MALE CONICAL (B1)



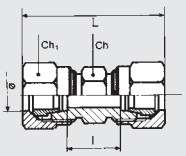
Code	Ref.	Ø	F1	Ch	Ch1	P	L	I
2201001	B1	4/2	1/8	10	10	8.0	27.5	16.0
2201002	B1	6/4	1/8	12	12	8.0	28.0	14.5
2201003	B1	6/4	1/4	14	12	11.0	31.0	17.5
2201004	B1	8/6	1/8	12	14	8.0	30.0	16.5
2201005	B1	8/ 6	1/4	14	14	11.0	33.0	19.5
2201006	B1	8/6	3/8	17	14	11.5	33.5	20.0
2201007	B1	10/8	1/4	17	19	11.0	38.5	20.0
2201008	B1	10/8	3/8	17	19	11.5	39.0	20.5
2201009	B1	10/8	1/2	22	19	14.0	42.5	24.0
2201010	B1	12/10	3/8	19	22	11.5	38.5	20.5
2201011	B1	12/10	1/2	22	22	14.0	42.0	24.0
2201012	B1	15/12	1/2	22	27	14.0	43.5	25.0

STRAIGHT, FEMALE (B2)



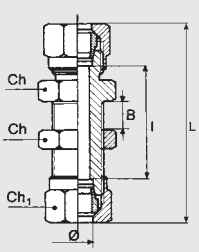
Code	Ref.	Ø	F1	Ch	Ch1	P	L	I
2202001	B2	6/4	1/8	14	12	7	28.5	15.0
2202002	B2	6/4	1/4	17	12	8	31.5	18.0
2202003	B2	8/6	1/8	14	14	7	29.5	16.0
2202004	B2	8/6	1/4	17	14	8	32.0	18.5
2202005	B2	8/6	3/8	22	14	10	36.0	22.5
2202006	B2	10/8	1/4	17	19	8	37.5	19.0
2202007	B2	10/8	3/8	22	19	10	41.0	22.5

STRAIGHT, CONNECTOR (B3)



Code	Ref.	Ø	Ch	Ch1	L	I
2203001	B3	4/2	10	10	35	12.0
2203002	B3	6/4	12	12	36	9.0
2203003	B3	8/6	14	14	39	12.0
2203004	B3	10/8	17	19	50	13.0
2203005	B3	12/10	19	22	50	14.0
2203006	B3	15/12	24	27	53	16.0

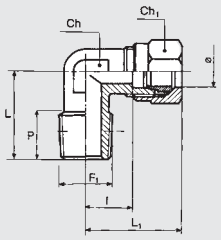
BULKHEAD CONNECTOR (B4)



Code	Ref.	Ø	Ch	Ch1	L	I
2204001	B4	6/4	14	12	53.0	26
2204002	B4	8/6	16	14	56.0	29
2204003	B4	10/8	19	19	66.5	29.5
2204004	B4	12/10	22	22	67.0	31
2204005	B4	15/12	25	27	73.5	36.5

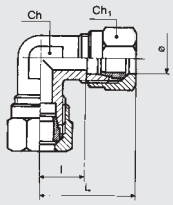
METAL WORK PNEUMATIC

ELBOW, MALE (B5)



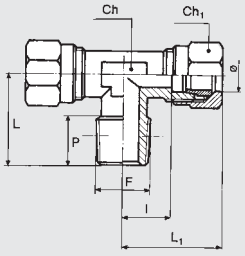
Code	Ref.	Ø	F1	Ch	Ch1	P	L	L1	l
2205001	B5	4/2	1/8	9	10	8.0	16.0	21.5	10.0
2205002	B5	6/4	1/8	9	12	8.0	16.0	22.0	8.5
2205003	B5	6/4	1/4	11	12	11.0	20.0	23.5	10.0
2205004	B5	8/6	1/8	11	14	8.0	17.0	24.0	10.5
2205005	B5	8/6	1/4	11	14	11.0	20.0	24.0	10.5
2205006	B5	8/6	3/8	13	14	12.0	23.5	27.0	13.5
2205007	B5	10/8	1/4	13	19	11.0	22.5	32.0	13.5
2205008	B5	10/8	3/8	13	19	12.0	23.5	32.0	13.5
2205009	B5	10/8	1/2	20	19	13.0	30.0	39.0	20.5
2205010	B5	12/10	3/8	15	22	11.5	24.0	33.5	15.5
2205011	B5	12/10	1/2	20	22	13.0	30.0	38.0	20.0
2205012	B5	15/12	1/2	20	27	13.0	30.0	38.5	20.0

ELBOW, FEMALE (B6)



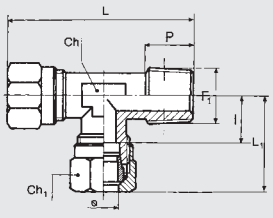
Code	Ref.	Ø	Ch	Ch1	L	l
2206001	B6	4/2	9	10	21.5	10.0
2206002	B6	6/4	9	12	22.0	8.5
2206003	B6	8/6	11	14	24.0	10.5
2206004	B6	10/8	13	19	32.0	13.5
2206005	B6	12/10	15	22	33.5	15.5
2206006	B6	15/12	20	27	38.5	20.0

TEE, CENTRAL MALE (B7)



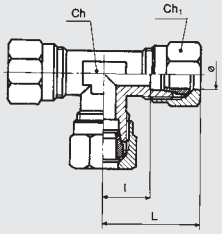
Code	Ref.	Ø	F	Ch	Ch1	P	L	L1	l
2207001	B7	4/2	1/8	9	10	8.0	16.0	21.5	10.0
2207002	B7	6/4	1/8	9	12	8.0	16.0	22.0	8.5
2207003	B7	6/4	1/4	11	12	11.0	20.0	23.5	10.0
2207004	B7	8/6	1/8	11	14	8.0	17.0	24.0	10.5
2207005	B7	8/6	1/4	11	14	11.0	20.0	24.0	10.5
2207006	B7	8/6	3/8	13	14	12.0	23.5	27.0	13.5
2207007	B7	10/8	1/4	13	19	11.0	22.5	32.0	13.5
2207008	B7	10/8	3/8	13	19	12.0	23.5	32.0	13.5
2207010	B7	12/10	3/8	15	22	11.5	24.0	33.5	15.5
2207011	B7	12/10	1/2	20	22	13.0	30.0	38.0	20.0
2207012	B7	15/12	1/2	20	27	13.0	30.0	38.5	20.0

TEE, LATERAL MALE (B8)



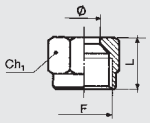
Code	Ref.	Ø	F1	Ch	Ch1	P	L	L1	l
2208000	B8	4/2	1/8	9	10	8.0	37.5	21.5	10.0
2208001	B8	6/4	1/8	9	12	8.0	38.5	22.0	8.5
2208002	B8	6/4	1/4	11	12	11.0	43.5	23.5	10.0
2208003	B8	8/6	1/8	11	14	8.0	41.0	24.0	10.5
2208004	B8	8/6	1/4	11	14	11.0	44.0	24.0	10.5
2208005	B8	8/6	3/8	13	14	12.0	50.5	27.0	13.5
2208006	B8	10/8	1/4	13	19	11.0	54.5	32.0	13.5
2208007	B8	10/8	3/8	13	19	12.0	55.5	32.0	13.5
2208009	B8	12/10	3/8	15	22	11.5	57.5	33.5	15.5
2208010	B8	12/10	1/2	20	22	13.0	68.0	38.0	20.0
2208011	B8	15/12	1/2	20	27	13.0	68.5	38.5	20.0

TEE, MALE (B9)



Code	Ref.	Ø	Ch	Ch1	L	I
2209001	B9	4/2	9	10	21.5	10.0
2209002	B9	6/4	9	12	22.0	8.5
2209003	B9	8/6	11	14	24.0	10.5
2209004	B9	10/8	13	19	32.0	13.5
2209005	B9	12/10	15	22	33.5	15.5
2209006	B9	15/12	20	27	38.5	20.0

NUT (B10)

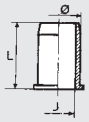


Code	Ref.	Ø	Ch1	L	F
2210001	B10	4/2	10	11.0	M8x1
2210002	B10	6/4	12	11.5	M10x1
2210003	B10	8/6	14	13.0	M12x1
2210004	B10	10/8	19	15.5	M16x1.5
2210005	B10	12/10	22	15.5	M18x1.5
2210006	B10	15/12	27	17.0	M22x1.5

OLIVE (B11)

Code	Ref.	Ø	L
2211001	B11	4/2	6
2211002	B11	6/4	7
2211003	B11	8/6	7
2211004	B11	10/8	10
2211005	B11	12/10	10
2211006	B11	15/12	10

INTERNAL BUSH (B12)



Code	Ref.	Ø	J	L
2212001	B12	6/4	3	12.0
2212002	B12	8/6	5	14.0
2212003	B12	10/8	7	15.0
2212004	B12	12/10	9	16.0
2212005	B12	15/12	11	17.0

TAPERED THREAD FITTINGS SERIES B WITH PTFE

Metal Work can supply fittings with a tapered thread coated in polytetrafluorethylene. This system provides the pneumatic seal between the fitting and the female thread. It is therefore not necessary to add other sealing systems during assembly, such as adhesives or Teflon tape. This significantly reduces assembly times. The physical and technical features of the material used ensure that the properties are maintained through time and in a wide range of operating temperatures.
This coating can be used with series B bicone fittings, types B1, B5, B7 and B8 that have a 1/8" to 1/2" gas taper thread.

TECHNICAL DATA		
Temperature range for PTFE	°C	– 45 to + 80
	°F	– 49 to + 176

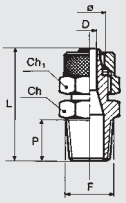
KEY TO CODES
Fittings with a PTFE thread have the same code as the standard fitting, with the addition of the suffix **T**.
For example B1 6/4 1/8 fitting has code **2201002**, so the PTFE version has code **2201002T**.

QUICK FITTINGS SERIES C

METAL WORK PNEUMATIC

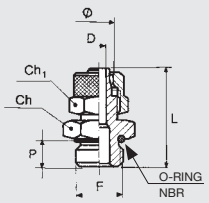
- Body: OT58 brass
- Maximum pressure 261 psi, 1800 kPa 18 bar

STRAIGHT, MALE CONICAL (C1)



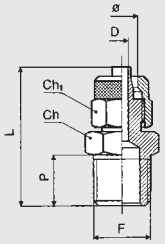
Code	Ref.	Ø	F	Ch	Ch1	P	L	D
2301017	C1	5/3	1/8	12	9	8.0	26.0	2.0
2301001	C1	6/4	1/8	12	12	8.0	26.5	3.0
2301002	C1	6/4	1/4	14	12	11.0	30.0	3.0
2301003	C1	8/6	1/8	12	14	8.0	26.5	5.0
2301004	C1	8/6	1/4	14	14	11.0	30.0	5.0
2301005	C1	8/6	3/8	17	14	11.5	31.0	5.0
2301020	C1	10/8	1/8	14	16	8.0	29.0	5.0
2301006	C1	10/8	1/4	14	16	11.0	32.0	6.8
2301007	C1	10/8	3/8	17	16	11.5	33.0	6.8
2301008	C1	10/8	1/2	22	16	14.0	36.0	6.8
2301009	C1	12/10	3/8	17	19	11.5	35.0	8.5
2301010	C1	12/10	1/2	22	19	14.0	38.0	8.5
2301015	C1	15/12.5	1/2	22	22	14.0	39.5	11.0

STRAIGHT, MALE PARALLEL WITH O-RING (C1/Z)



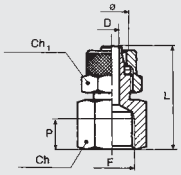
Code	Ref.	Ø	F	Ch	Ch1	P	L	D	O ring
2351001	C1/Z	4/2	M5	9	9	4.0	23.0	1.5	4x1.5
2351002	C1/Z	6/4	M5	9	9	4.0	23.0	2.3	4x1.5
2351003	C1/Z	6/4	1/8	13	12	6.0	25.0	3.0	2031
2351004	C1/Z	6/4	1/4	16	12	8.0	27.0	3.0	2043
2351005	C1/Z	8/6	1/8	14	14	6.0	25.0	5.0	2031
2351006	C1/Z	8/6	1/4	16	14	8.0	27.0	5.0	2043
2351007	C1/Z	8/6	3/8	19	14	9.0	29.0	5.0	2056
2351008	C1/Z	10/8	1/4	16	16	8.0	29.0	6.8	2043
2351009	C1/Z	10/8	3/8	19	16	9.0	31.0	6.8	2056
2351010	C1/Z	10/8	1/2	24	16	11.0	33.0	6.8	3068
2351011	C1/Z	12/10	3/8	19	19	9.0	33.0	8.5	2056
2351012	C1/Z	12/10	1/2	24	19	11.0	35.0	8.5	3068

STRAIGHT, MALE METRIC THREAD (C1/C)



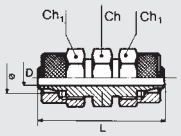
Code	Ref.	Ø	F	Ch	Ch1	P	L	D
2356001	C1/C	5/3	M5	9	9	4	23	2
2356002	C1/C	6/4	M6	9	9	5	24	3
2356003	C1/C	6/4	M12x1.5	17	12	8	27	3
2356004	C1/C	6/4	3/8	19	12	9	27	3
2356005	C1/C	8/6	M12x1.5	17	14	8	27	5

STRAIGHT, FEMALE (C2)



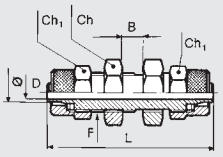
Code	Ref.	Ø	F	Ch	Ch1	P	L	D
2302001	C2	6/4	1/8	14	12	7.0	26.5	3.0
2302002	C2	6/4	1/4	17	12	8.0	29.5	3.0
2302012	C2	6/4	3/8	20	12	10.0	33.0	3.0
2302003	C2	8/6	1/8	14	14	7.0	26.5	5.0
2302004	C2	8/6	1/4	17	14	8.0	29.0	5.0
2302005	C2	8/6	3/8	20	14	10.0	33.0	5.0
2302006	C2	10/8	1/4	17	16	8.0	31.0	6.8
2302007	C2	10/8	3/8	20	16	10.0	35.0	6.8
2302008	C2	10/8	1/2	24	16	11.0	38.0	6.8

STRAIGHT, CONNECTOR (C3)



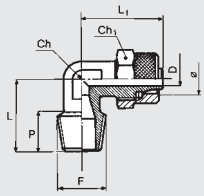
Code	Ref.	Ø	Ch	Ch1	L	D
2303001	C3	6/4	12	12	33.0	3.0
2303002	C3	8/6	12	14	33.0	5.0
2303003	C3	10/8	14	16	37.0	6.8
2303004	C3	12/10	17	19	42.0	8.5

BULKHEAD CONNECTOR (C4)



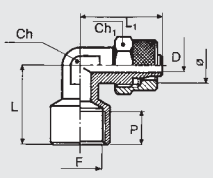
Code	Ref.	Ø	Ch	Ch1	L	D	B	F
2304001	C4	6/4	14	12	47.0	3.0	11.0	M10x1
2304002	C4	8/6	16	14	48.0	5.0	12.0	M12x1
2304003	C4	10/8	17	16	49.0	6.8	9.0	M14x1
2304004	C4	12/10	19	19	53.0	8.5	9.0	M16x1

ELBOW, MALE CONICAL (C5)



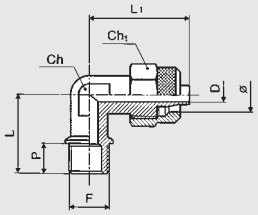
Code	Ref.	Ø	F	Ch	Ch1	P	L	L1	D
2305016	C5	5/3	1/8	8	9	8.0	17.0	22.0	2.0
2305001	C5	6/4	1/8	9	12	8.0	17.0	22.0	3.0
2305002	C5	6/4	1/4	9	12	11.0	20.0	22.0	3.0
2305003	C5	8/6	1/8	12	14	8.0	17.0	22.0	5.0
2305004	C5	8/6	1/4	12	14	11.0	20.0	22.0	5.0
2305005	C5	8/6	3/8	12	14	12.0	22.0	21.5	5.0
2305006	C5	10/8	1/4	12	16	11.0	20.5	25.0	6.8
2305007	C5	10/8	3/8	12	16	12.0	21.5	25.0	6.8
2305008	C5	10/8	1/2	17	16	14.0	26.0	28.5	6.8
2305009	C5	12/10	3/8	17	19	12.0	24.0	31.0	8.5
2305010	C5	12/10	1/2	17	19	14.0	26.0	31.0	8.5
2305017	C5	15/12.5	1/2	17	22	14.0	28.0	32.8	10.7

ELBOW FEMALE (C5/F)



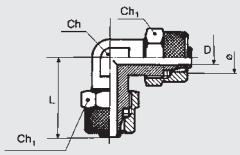
Code	Ref.	Ø	F	Ch	Ch1	L	L1	D	P
2352001	C5/F	6/4	1/8	9	12	21.0	22.0	3.0	7.0
2352002	C5/F	8/6	1/4	12	14	24.0	23.5	5.0	7.0

ELBOW, MALE METRIC THREAD (C5/C)



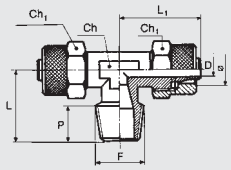
Code	Ref.	Ø	F	Ch	CH1	P	L	L1	D
2357001	C5/C	6/4	M12x1.5	10	12	9	22	22.5	3
2357002	C5/C	8/6	M12x1.5	10	14	9	22	22.5	5

ELBOW CONNECTOR (C6)



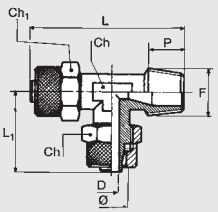
Code	Ref.	Ø	Ch	Ch1	L	D
2306001	C6	6/4	9	12	22.0	3.0
2306002	C6	8/6	12	14	22.0	5.0
2306003	C6	10/8	12	16	25.0	6.8
2306004	C6	12/10	17	19	31.0	8.5
2306006	C6	15/12.5	18	22	32.8	10.7

TEE, CENTRAL MALE (C7)



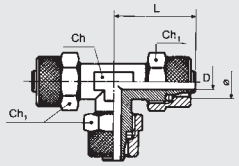
Code	Ref.	Ø	F	Ch	Ch1	P	L	L1	D
2307015	C7	5/3	1/8	9	9	8.0	17.0	22.0	2.0
2307001	C7	6/4	1/8	9	12	8.0	17.0	22.0	3.0
2307002	C7	6/4	1/4	9	12	11.0	20.0	22.0	3.0
2307003	C7	8/6	1/8	12	14	8.0	17.0	22.0	5.0
2307004	C7	8/6	1/4	12	14	11.0	20.0	22.0	5.0
2307005	C7	8/6	3/8	12	14	12.0	22.0	23.0	5.0
2307006	C7	10/8	1/4	12	16	11.0	21.0	25.0	6.8
2307007	C7	10/8	3/8	12	16	12.0	22.0	25.0	6.8
2307008	C7	10/8	1/2	17	16	14.0	26.0	28.5	6.8
2307009	C7	12/10	3/8	17	19	12.0	24.0	31.0	8.5
2307010	C7	12/10	1/2	17	19	14.0	26.0	31.0	8.5
2307016	C7	15/12.5	1/2	18	22	14.0	28.0	32.8	10.7

TEE, LATERAL MALE (C8)



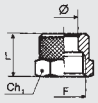
Code	Ref.	Ø	F	Ch	Ch1	P	L	L1	D
2308012	C8	5/3	1/8	9	9	8.0	39.0	22.0	2.0
2308001	C8	6/4	1/8	9	12	8.0	39.0	22.0	3.0
2308002	C8	6/4	1/4	9	12	11.0	42.0	22.0	3.0
2308003	C8	8/6	1/8	12	14	8.0	39.0	22.0	5.0
2308004	C8	8/6	1/4	12	14	11.0	42.0	22.0	5.0
2308005	C8	8/6	3/8	12	14	12.5	45.0	23.0	5.0
2308006	C8	10/8	1/4	12	16	11.5	46.0	25.0	6.8
2308007	C8	10/8	3/8	12	16	12.5	47.0	25.0	6.8
2308008	C8	10/8	1/2	17	16	13.5	54.5	28.5	6.8
2308009	C8	12/10	3/8	17	19	11.5	55.0	31.0	8.5
2308010	C8	12/10	1/2	17	19	13.5	57.0	31.0	8.5

TEE CONNECTOR (C9)



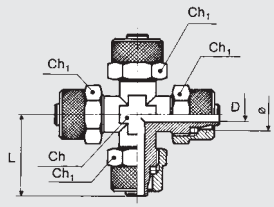
Code	Ref.	Ø	Ch	Ch1	L	D
2309001	C9	6/4	9	12	22.0	3.0
2309002	C9	8/6	12	14	22.0	5.0
2309003	C9	10/8	12	16	25.0	6.8
2309004	C9	12/10	17	19	31.0	8.5
2309007	C9	15/12.5	18	22	32.8	10.7

NUT (C10)



Code	Ref.	Ø	F	Ch1	L
2310001	C10	4/2	M7x0.5	9	9.0
2310009	C10	5/3	M7x0.5	9	9.0
2310002	C10	6/4- M5	M8x0.5	9	9.0
2310003	C10	6/4	M10x1	12	11.0
2310004	C10	8/6	M12x1	14	11.0
2310005	C10	10/8	M14x1	16	12.0
2310006	C10	12/10	M16x1	19	12.0
2310011	C10	15/12.5	M20x1	22	16.0

EQUAL CROSS CONNECTOR (C11)



Code	Ref.	Ø	Ch	Ch1	L	D
2311001	C11	6/4	10	12	21.5	3.0
2311002	C11	8/6	10	14	22.0	5.0
2311003	C11	10/8	12	16	24.5	6.8

TAPERED THREAD FITTINGS SERIES C WITH PTFE

Metal Work can supply fittings with a tapered thread coated in polytetrafluorethylene. This system provides the pneumatic seal between the fitting and the female thread. It is therefore not necessary to add other sealing systems during assembly, such as adhesives or Teflon tape. This significantly reduces assembly times. The physical and technical features of the material used ensure that the properties are maintained through time and in a wide range of operating temperatures.
This coating can be used with series C push-in fittings, types C1, C5, C7 and C8 that have a 1/8" to 1/2" gas taper thread.

TECHNICAL DATA		
Temperature range for PTFE	°C	– 45 to + 80
	°F	– 49 to + 176

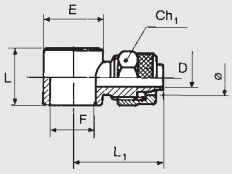
KEY TO CODES
Fittings with a PTFE thread have the same code as the standard fitting, with the addition of the suffix **T**.
For example C1 6/4 1/8 fitting has code **2301001**, so the PTFE version has code **2301001T**.

BANJO FITTINGS SERIES D

METAL WORK PNEUMATIC

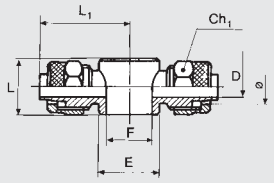
- Body: OT58 brass
- Maximum pressure 261 psi, 1800 kPa 18 bar

SINGLE BANJO BODY (D5)



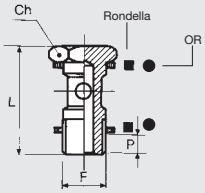
Code	Ref.	Ø	F	Ch1	L	L1	D	E
2405000	D5	4/2	M5	9	9.0	20.5	1.5	9.5
2405013	D5	5/3	1/8	9	15.0	24.3	2.0	14.0
2405018	D5	5/3	M5	9	9.0	20.7	2.0	9.5
2405001	D5	6/4	M5	9	9.0	20.5	3.0	9.5
2405002	D5	6/4	1/8	12	15.0	24.5	3.0	14.0
2405003	D5	6/4	1/4	12	17.0	26.5	3.0	18.0
2405005	D5	8/6	1/8	14	15.0	24.0	5.0	14.0
2405006	D5	8/6	1/4	14	17.0	26.0	5.0	18.0
2405007	D5	8/6	3/8	14	20.0	28.5	5.0	21.0
2405009	D5	10/8	1/4	16	17.0	28.0	6.8	18.0
2405010	D5	10/8	3/8	16	20.0	29.0	6.8	21.0
2405011	D5	10/8	1/2	16	24.0	30.5	6.8	26.0
2405012	D5	12/10	1/2	19	24.0	33.5	8.5	26.0
2405017	D5	12/10	3/8	19	20.0	31.0	8.5	21.0

DOUBLE BANJO BODY (D6)



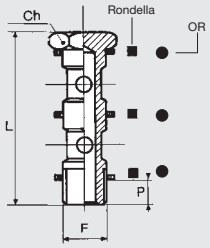
Code	Ref.	Ø	F	Ch1	L	L1	D	E
2406001	D6	6/4	1/8	12	15.0	24.5	3.0	14.0
2406002	D6	6/4	1/4	12	17.0	26.5	3.0	18.0
2406004	D6	8/6	1/8	14	15.0	24.0	5.0	14.0
2406005	D6	8/6	1/4	14	17.0	26.0	5.0	18.0
2406006	D6	8/6	3/8	14	20.0	28.5	5.0	21.0
2406008	D6	10/8	1/4	16	17.0	28.0	6.8	18.0
2406009	D6	10/8	3/8	16	20.0	29.0	6.8	21.0
2406010	D6	10/8	1/2	16	24.0	30.5	6.8	26.0
2406011	D6	12/10	1/2	19	24.0	33.5	8.5	26.0

BANJO STEM SINGLE (D7)



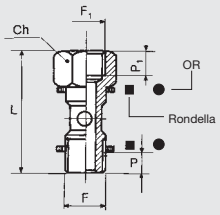
Code	Ref.	F	Ch	L	P
Version with washer D11 for models R13-R14-D12-D17-D5-D6					
2407001	D7	M5	8	18.0	3
2407002	D7	1/8	14	28.0	6
2407003	D7	1/4	17	33.0	8
2407004	D7	3/8	20	37.0	9
2407005	D7	1/2	27	42.0	10
2407006	D7	M12x1.5	17	33.0	8
Version with O-ring for models R28-R29					
2407102	D7 with OR	1/8	14	28.0	6
2407103	D7 with OR	1/4	17	33.0	8
2407104	D7 with OR	3/8	20	37.0	9

BANJO STEM DOUBLE (D8)



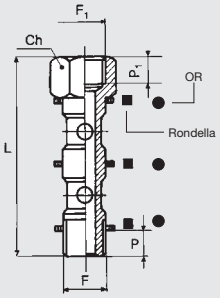
Code	Ref.	F	Ch	L	P
Version with washer D11 for models R13-R14-D5-D6-D12-D17					
2408001	D8	1/8	14	44.5	6
2408002	D8	1/4	17	51.5	8
2408003	D8	3/8	20	58.5	9
2408004	D8	1/2	27	67.5	10
Version with O-ring for models R28-R29					
2408102	D8 with OR	1/8	14	44.5	6
2408103	D8 with OR	1/4	17	51.5	8
2408104	D8 with OR	3/8	20	58.5	9

BANJO PASSING TROUGHT SINGLE (D9)



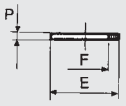
Code	Ref.	F	F1	Ch	L	P	P1
Version with washer D11 for models R13-R14-D5-D6-D12-D17							
2409001	D9	1/8	1/8	14	36.5	6	7
2409002	D9	1/4	1/4	17	42.5	8	8
2409003	D9	3/8	3/8	20	49.5	9	10
2409004	D9	1/2	1/2	27	56.5	10	11
Version with O-ring for models R28-R29							
2409102	D9	1/8	1/8	14	36.5	6	7
2409103	D9	1/4	1/4	17	42.5	8	8
2409104	D9	3/8	3/8	20	49.5	9	10

BANJO PASSING TROUGHT STEM DOUBLE (D10)



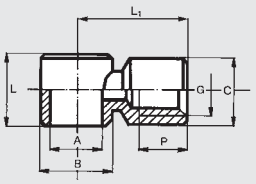
Code	Ref.	F	F1	Ch	L	P	P1
Version with washer D11 for models R13-R14-D5-D6-D12-D17							
2410001	D10	1/8	1/8	14	53.0	6	7
2410002	D10	1/4	1/4	17	61.0	8	8
2410003	D10	3/8	3/8	20	71.0	9	10
2410004	D10	1/2	1/2	27	82.0	10	11
Version with O-ring for models R28-R29							
2410102	D10 with OR	1/8	1/8	14	53.0	6	7
2410103	D10 with OR	1/4	1/4	17	61.0	8	8
2410104	D10 with OR	3/8	3/8	20	71.0	9	10

WASHER (D11)



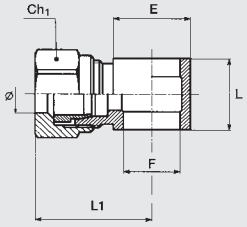
Code	Ref.	F	E	P
2411001	D11	M5	9	1.5 (nylon)
2411002	D11	1/8	13.8	1.5
2411003	D11	1/4	17.8	1.5
2411004	D11	3/8	21.0	1.5
2411005	D11	1/2	26.0	1.5

SINGLE BANJO PASSING TROUGHT BODY (D12)



Code	Ref.	A	G	B	C	L	L1	P
2412001	D12	1/8	1/8	14	13.5	15	21.5	7
2412002	D12	1/4	1/4	18	17.0	17	25.5	8
2412003	D12	3/8	3/8	21	20.5	20	31.0	10

SINGLE BANJO WITH "B" INTERFACE (D17)

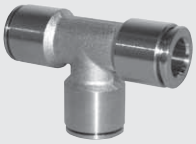


Code	Ref.	Ø	F	Ch1	L	L1	E
2417006	D17	4/2	1/8	10	15	24.5	14
2417002	D17	6/4	1/8	12	15	26.0	14
2417003	D17	6/4	1/4	12	17	28.0	18
2417004	D17	8/6	1/8	14	15	26.0	14
2417005	D17	8/6	1/4	14	17	28.0	18

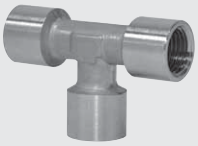
NOTES

NOTES

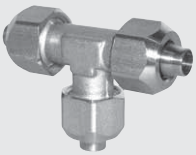
SUMMARY STAINLESS STEEL FITTINGS



● **PUSH-IN FITTINGS, STAINLESS STEEL** D3.2



● **STANDARD FITTINGS SERIES XA** D3.8



● **QUICK FITTINGS SERIES XC** D3.11

PUSH-IN FITTINGS, STAINLESS STEEL

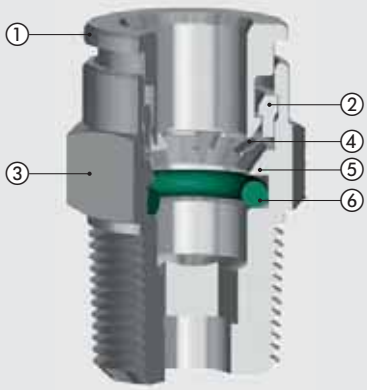
The push-in fittings in the XR can be reused thousands of times without affecting the pneumatic seal in any way.
They come in various configurations.
The XR fittings are made entirely of 316L stainless steel (EN 1.4404) and can be used to make connections in environments and conditions where the use of standard brass fittings would be incompatible.
The gasket are in FKM/FPM.

TECHNICAL DATA

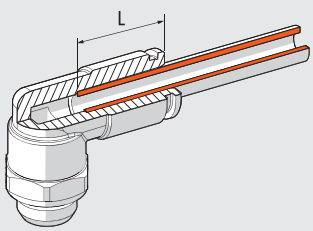
Threaded coupling		M5 - 1/8" - 1/4" - 3/8" - 1/2"
Diameter	mm	Ø4 - Ø6 - Ø8 - Ø10 - Ø12
Temperature range	°C	– 20 to +150
	°F	– 4 to +302
Pressure range		– 0.99 bar to 18 bar / – 0.099 MPa to 1.8 MPa
Recommended pipe		PTFE
Fluid		Vacuum - Compressed air

COMPONENTS

① RELEASE BUSHING: AISI 316L stainless steel
② LOCKING BUSHING: AISI 316L stainless steel
③ BODY: AISI 316L stainless steel
④ CLAMPING SPRING: AISI 301 stainless steel
⑤ SPRING SUPPORTING RING: AISI 316L stainless steel
⑥ SEAL: FKM/FPM

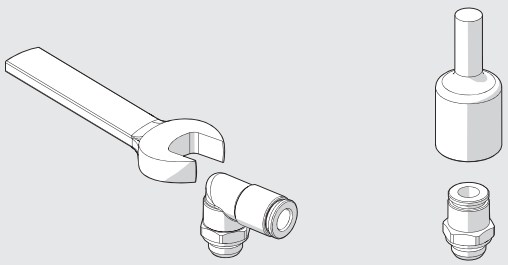


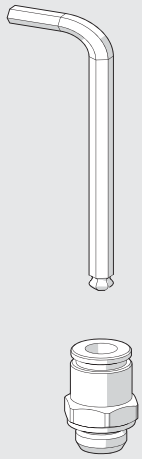
PIPE INSERTION DEPTH



Ø Pipe	L
4	13.2
6	16.1
8	16.2
10	18.3
12	19.5

SCREWING METHOD





Thread	Max. Torque [Nm]
M5	1.8
G 1/8"	6
G 1/4"	8
G 3/8"	10
G 1/2"	15

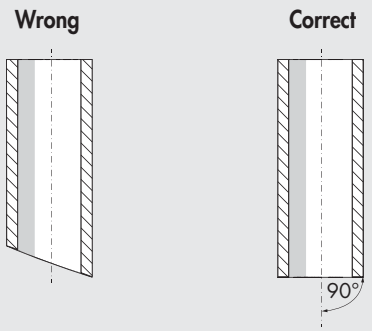
CH [mm]	Max. Torque [Nm]
3	2.5
4	5
6	8
8	18
10	15

N.B.: When using a socket spanner, the torque must not exceed that of the thread (e.g. fitting XR1 Ø 4 1/8", with a 3 mm thread, has a maximum torque of 6 Nm, highest value of the thread)

INSTALLING THE PIPE

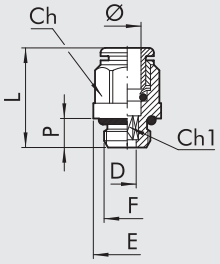
Compressed air pipes must be used in compliance with some basic criteria in order to ensure long life and proper operation of the fitting:
- check that the conditions for the installation and use (e.g. temperature and fluid used) comply with the characteristics stated by the pipe manufacturer;
- check the pipe size; oversized pipes could not fit properly, undersized ones could not ensure pipe retention and air tightness.

The cut should be as accurate as possible at a right angle with the pipe axis.



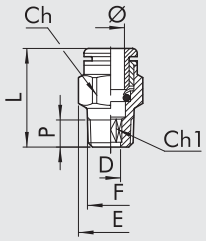
- the bending radius of the pipe installed must be as wide as possible. The fittings have been designed to ensure axial seal of the pipe; excessive curvature could considerably shorten the life of the pipe.
- the pipe must not be subjected to excessive axial stress and it must be of the right length for snugly fitting (not too long or too short).
- correct insertion of the pipe into the fitting is essential for air tightness and pipe retention. Make sure that the pipe is pushed right into the seat.
- check that the pipe does not encounter any obstacles or blockages along its way, which could cause tensile stress of the pipe in the fitting.

STRAIGHT, CYLINDRICAL, MALE (XR1)



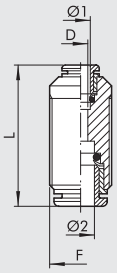
Code	Ref.	Ø	F	Ch	Ch1	P	L	D	E
2L01001X	XR1	4	M5	9	-	4	19	2.5	10.5
2L01002X	XR1	4	1/8	13	3	5	16	3.1	14.5
2L01000X	XR1	6	M5	12	-	4	22.5	2.5	13.5
2L01007X	XR1	6	1/8	13	4	5	19	4.2	14.5
2L01008X	XR1	6	1/4	16	4	6.5	18.5	4.2	18
2L01009X	XR1	8	1/8	14	6	5	22.5	6.2	15.5
2L01010X	XR1	8	1/4	16	6	6.5	21	6.2	18
2L01012X	XR1	10	1/4	16	8	6.5	27.5	8.4	18
2L01013X	XR1	10	3/8	17	8	7	25	8.4	20
2001014X	XR1	12	3/8	21	10	7	28.5	10.4	23.5
2001015X	XR1	12	1/2	22	10	8.5	26.5	10.4	25

STRAIGHT, CONICAL, MALE (XR1C)



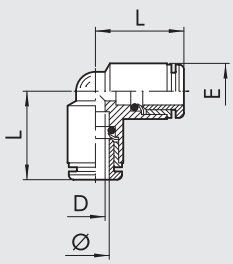
Code	Ref.	Ø	F	Ch	Ch1	P	L	D	E
2L01C02X	XR1C	4	1/8	10	3	7.5	15.5	3	11.5
2L01C03X	XR1C	4	1/4	14	3	11	20	3	16
2L01C07X	XR1C	6	1/8	12	4	7.4	20.5	4.2	14
2L01C08X	XR1C	6	1/4	14	4	11	20	4.2	16
2L01C09X	XR1C	8	1/8	14	6	7.1	24.5	6.2	16
2L01C10X	XR1C	8	1/4	14	6	11	23	6.2	16
2L01C13X	XR1C	10	1/4	16	8	11	30	8	18.5
2L01C14X	XR1C	10	3/8	17	8	11.5	23.5	8.4	20
2001C15X	XR1C	12	3/8	18	10	11.5	27	10.4	22
2001C16X	XR1C	12	1/2	22	10	14	27	10.4	25.5

STRAIGHT, INTERMEDIATE (XR3)



Code	Ref.	Ø 1	Ø 2	F	L	D
2L03001X	XR3	4	4	9	27	3
2L03301X	XR3	4	6	12	32.5	3
2L03003X	XR3	6	6	12	31	5
2L03303X	XR3	6	8	14	33	5
2L03004X	XR3	8	8	14	34	7
2L03005X	XR3	10	10	16	37.5	9
2003006X	XR3	12	12	19	39.5	11

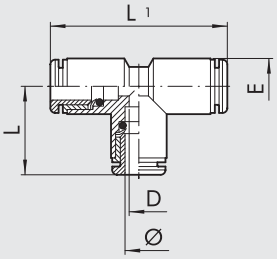
ELBOW, INTERMEDIATE (XR4)



Code	Ref.	Ø	L	D	E
2L04001X	XR4	4	17	3.5	9
2L04003X	XR4	6	20	5.5	12
2L04004X	XR4	8	21	7	14
2L04005X	XR4	10	25	8	16
2L04006X	XR4	12	27	10	19

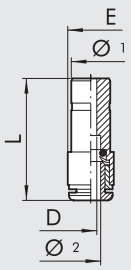
METAL WORK PNEUMATIC

TEE, INTERMEDIATE (XR5)



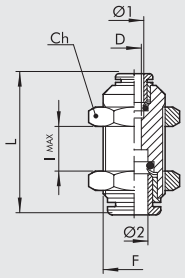
Code	Ref.	Ø	L	L1	D	E
2L05001X	XR5	4	17	34	3.5	9
2L05003X	XR5	6	20	40	5	12
2L05004X	XR5	8	21	42	6	14
2L05005X	XR5	10	25	50	8.5	16
2L05006X	XR5	12	27	54	10	19

REDUCER (XR8)



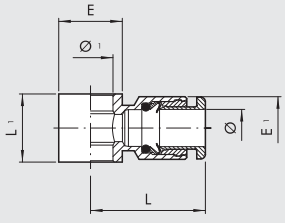
Code	Ref.	Ø 1	Ø 2	L	D	E
2L08002X	XR8	6	4	31	3	9
2L08006X	XR8	8	6	33	5	12
2L08008X	XR8	10	8	34.5	7	14

STRAIGHT, INTERMEDIATE, BULKMTAD (XR10)



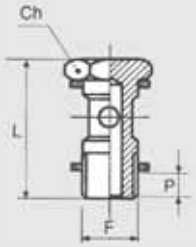
Code	Ref.	Ø 1	Ø 2	F	Ch	L	D	I max
2L11001X	XR10	4	4	M12x1	15	27	3	11
2L11003X	XR10	6	6	M14x1	17	32.5	5	16
2L11004X	XR10	8	8	M16x1	19	33	7	17
2L11005X	XR10	10	10	M18x1	21	37.5	9	19
2L11006X	XR10	12	12	M20x1	24	39.5	11	20

SINGLE RING (XR13)



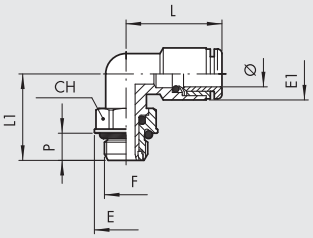
Code	Ref.	Ø	Ø 1	L	L1	E	E1
2012002X	XR13	4	1/8	19.5	15	14	9
2012005X	XR13	6	1/8	22	15	14	12
2012006X	XR13	6	1/4	23.5	17	18	12
2012007X	XR13	8	1/8	22.5	15	14	14
2012008X	XR13	8	1/4	24	17	18	14
2012010X	XR13	10	1/4	27	17	18	14
2012011X	XR13	10	3/8	29	20	22	16
2012012X	XR13	12	3/8	31	20	22	16
2012014X	XR13	12	1/2	33	24	26	19

BANJO STEM SINGLE (XD7)



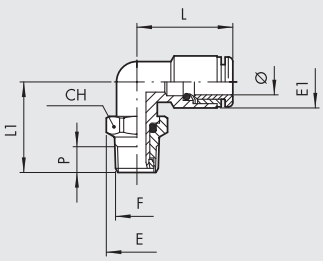
Code	Ref.	F	Ch	L	P
2407002X	XD7	1/8	14	29	6
2407003X	XD7	1/4	17	32.5	6.5
2407004X	XD7	3/8	21	36	7
2407005X	XD7	1/2	26	41.5	8.5

ROTARY ELBOW, MALE, CYLINDRICAL (XR31)



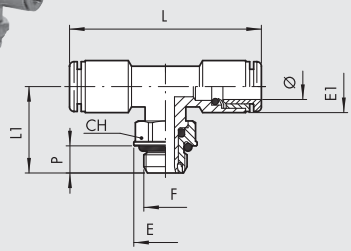
Code	Ref.	Ø	F	CH	E	E1	L	L1	P
2L31001X	XR31	4	M5	9	10	9	17	14	4
2L31002X	XR31	4	1/8	13	14.5	9	17	16	5
2L31007X	XR31	6	M5	9	10	12	20.5	15.5	4
2L31008X	XR31	6	1/8	13	14.5	12	21.5	18	5
2L31009X	XR31	6	1/4	16	18	12	21.5	20	6.5
2L31010X	XR31	8	1/8	13	14.5	14	22	18	5
2L31011X	XR31	8	1/4	16	18	14	22	20	6.5
2L31013X	XR31	10	1/4	16	18	16	25.5	22.5	6.5
2L31014X	XR31	10	3/8	21	23.5	16	25.5	24	7
2031017X	XR31	12	3/8	21	23.5	19	28	26.5	7
2031018X	XR31	12	1/2	22	25	19	28	31	8.5

ROTARY ELBOW, MALE, CONICAL (XR31C)



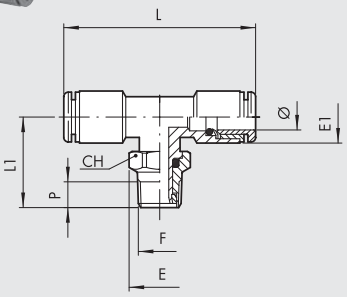
Code	Ref.	Ø	F	CH	E	E1	L	L1	P
2L31C02X	XR31C	4	1/8	10	11.2	9	17	17.5	7.5
2L31C08X	XR31C	6	1/8	13	14.5	12	21.5	20	7.5
2L31C09X	XR31C	6	1/4	14	14.5	12	21.5	24	11
2L31C10X	XR31C	8	1/8	13	14.5	14	22	20	7.5
2L31C11X	XR31C	8	1/4	14	15.5	14	22	24	11
2L31C13X	XR31C	10	1/4	16	18	16	25.5	26.5	11
2L31C14X	XR31C	10	3/8	17	19	16	25.5	27	11.5
2031C15X	XR31C	12	3/8	21	24.5	19	28	30.5	11.5
2031C16X	XR31C	12	1/2	22	24.5	19	28	33.5	14

CENTRAL TEE, MALE, CYLINDRICAL, ROTARY (XR32)



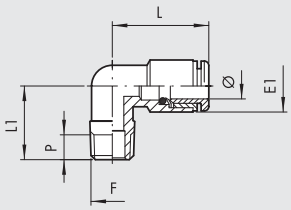
Code	Ref.	Ø	F	CH	E	E1	L	L1	P
2L32001X	XR32	4	M5	9	10	9	34	18	4
2L32002X	XR32	4	1/8	13	14.5	9	34	20	5
2L32008X	XR32	6	1/8	13	14.5	12	42	22.5	5
2L32009X	XR32	6	1/4	16	18	12	42	24.5	6.5
2L32010X	XR32	8	1/8	13	14.5	14	43	22.5	5
2L32011X	XR32	8	1/4	16	18	14	43	24.5	6.5
2L32013X	XR32	10	1/4	16	18	16	50	25.5	6.5
2L32014X	XR32	10	3/8	21	23.5	16	50	27	7

CENTRAL TEE, MALE, CONICAL, ROTARY (XR32C)



Code	Ref.	Ø	F	CH	E	E1	L	L1	P
2L32C02X	XR32C	4	1/8	10	11.2	9	34	21.5	7.5
2L32C08X	XR32C	6	1/8	13	14.5	12	42	24.5	7.5
2L32C09X	XR32C	6	1/4	14	15.5	12	42	28.5	11
2L32C10X	XR32C	8	1/8	13	14.5	14	43	24.5	7.5
2L32C11X	XR32C	8	1/4	14	15.5	14	43	28.5	11
2L32C13X	XR32C	10	1/4	16	18	16	50	32	11
2L32C14X	XR32C	10	3/8	17	19	16	50	32.5	1.5

ELBOW, MALE, CONICAL (XR39C)



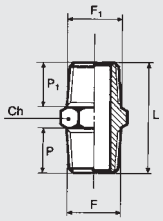
Code	Ref.	Ø	F	E1	L	L1	P
2L39C02X	XR39C	4	1/8	9	17	16	7.5
2L39C08X	XR39C	6	1/8	12	20	16	7.5
2L39C09X	XR39C	6	1/4	12	20	20	11
2L39C10X	XR39C	8	1/8	14	21	17	7.5
2L39C11X	XR39C	8	1/4	14	21	20	11
2L39C13X	XR39C	10	1/4	16	25.5	22.5	11

NOTES

STANDARD FITTINGS SERIES XA

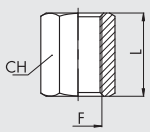
- Body made of AISI 316L (EN 1.4404) stainless steel
- Operating temperature for fittings with O-ring seals: -20 to 200 °C / -4 to 392 °F
- Maximum pressure 200 bar - 20000 KPa - 2900 psi

NIPPLE, CONICAL (XA2)



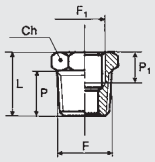
Code	Ref.	F	F1	Ch	P	P1	L
2102001X	XA2	1/8	1/8	12	7.5	7.5	20
2102002X	XA2	1/8	1/4	14	7.5	11	23.5
2102004X	XA2	1/4	1/4	14	11	11	27
2102005X	XA2	1/4	3/8	17	11	11.5	27.5
2102007X	XA2	3/8	3/8	17	11.5	11.5	28
2102008X	XA2	3/8	1/2	22	11.5	14	31.5
2102009X	XA2	1/2	1/2	22	14	14	34

SLEEVE (XA3)



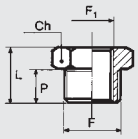
Code	Ref.	F	Ch	L
2103001X	XA3	1/8	14	15
2103002X	XA3	1/4	17	22
2103003X	XA3	3/8	22	24
2103004X	XA3	1/2	27	30

REDUCER, CONICAL (XA4)



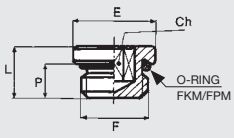
Code	Ref.	F	F1	Ch	P	P1	L
2104001X	XA4	1/4	1/8	14	11	8	16
2104002X	XA4	3/8	1/8	17	11.5	8	16.5
2104009X	XA4	1/2	1/8	22	14	8	19.5
2104003X	XA4	3/8	1/4	17	11.5	10	16.5
2104004X	XA4	1/2	1/4	22	14	10	19.5
2104005X	XA4	1/2	3/8	22	14	10	19.5

REDUCER, PARALLEL (XA4Z)



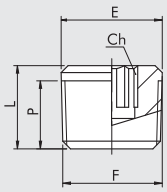
Code	Ref.	F	F1	Ch	P	L
2151000X	XA4Z	1/8	M5	14	6	10.5
2151001X	XA4Z	1/4	1/8	17	8	13
2151003X	XA4Z	3/8	1/4	19	9	14

PLUG WITH EXAGON EMBEDEDDED (XA7)



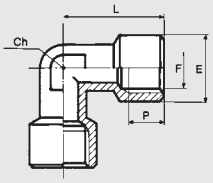
Code	Ref.	F	Ch	P	L	E
2107001X	XA7	1/8	5	5	7.5	13
2107002X	XA7	1/4	6	6.5	9.5	16
2107003X	XA7	3/8	8	7	10	20
2107004X	XA7	1/2	10	8.5	12	25

TAPER MALE PLUG (XA7C)



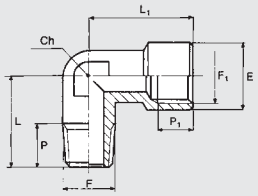
Code	Ref.	F	Ch	P	L	E
2107C01X	XA7C	1/8	5	5	7.5	13
2107C02X	XA7C	1/4	6	6.5	9.5	16
2107C03X	XA7C	3/8	8	7	10	20
2107C04X	XA7C	1/2	10	8.5	12	25

ELBOW, FEMALE (XA9)



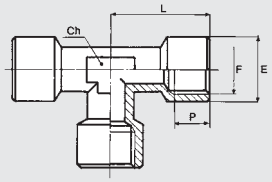
Code	Ref.	F	Ch	P	L	E
2109001X	XA9	1/8	10	8	22	13
2109002X	XA9	1/4	12	10	26	16.5
2109003X	XA9	3/8	17	10	28	20
2109004X	XA9	1/2	19	13	34	25

ELBOW, MALE-FEMALE (XA10)



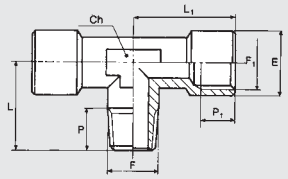
Code	Ref.	F	F1	Ch	P	P1	L	L1	E
2110001X	XA10	1/8	1/8	10	6	8	17	22	13
2110002X	XA10	1/4	1/4	12	9	10	21.5	26	16.5
2110003X	XA10	3/8	3/8	17	11	10	24.5	28	20
2110004X	XA10	1/2	1/2	19	13	13	30.5	34	25

TEE, FEMALE (XA11)



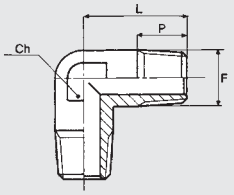
Code	Ref.	F	Ch	P	L	E
2111001X	XA11	1/8	10	8	22	13
2111002X	XA11	1/4	12	10	26	16.5
2111003X	XA11	3/8	17	10	28	20
2111004X	XA11	1/2	19	13	34	25

TEE, CENTRAL MALE (XA12)



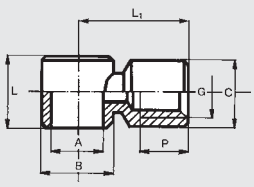
Code	Ref.	F	F1	Ch	P	P1	L	L1	E
2112001X	XA12	1/8	1/8	10	6	8	17	22	13
2112002X	XA12	1/4	1/4	12	9	10	21.5	26	16.5
2112003X	XA12	3/8	3/8	17	11	10	24.5	28	20
2112004X	XA12	1/2	1/2	19	13	13	30.5	34	25

ELBOW, MALE (XA15)



Code	Ref.	F	Ch	P	L
2115001X	XA15	1/8	10	6	17
2115002X	XA15	1/4	12	9	21.5
2115003X	XA15	3/8	17	11	24.5
2115004X	XA15	1/2	19	13	30.5

SINGLE BANJO PASSING TROUGHT BODY (XD12)



Code	Ref.	A	G	B	C	L	L1	P
2412001X	XD12	1/8	1/8	14	14	15	18.5	8
2412002X	XD12	1/4	1/4	17	17	17	24	10
2412003X	XD12	3/8	3/8	22	20	20	29	10
2412004X	XD12	1/2	1/2	25	26	24	34.5	14

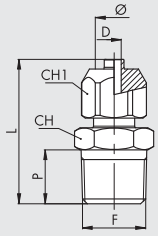
NOTES

QUICK FITTINGS SERIES XC

METAL WORK PNEUMATIC

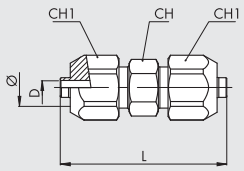
- Body made of AISI 316L (EN 1.4404) stainless steel
- Operating temperature according to the type of pipe used
- Maximum pressure 25 bar - 2500 KPa - 363 psi

STRAIGHT, MALE CONICAL (XC1)



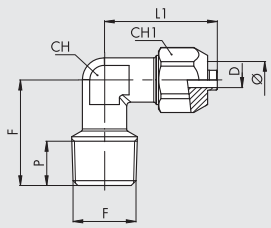
Code	Ref.	Ø	F	Ch	Ch1	P	L	D
2301001X	XC1	6/4	1/8	12	10	7.5	26	3
2301002X	XC1	6/4	1/4	12	14	11	29.5	3
2301003X	XC1	8/6	1/8	14	13	7.5	26.5	5
2301004X	XC1	8/6	1/4	14	14	11	30	5
2301006X	XC1	10/8	1/4	16	14	11	32.5	6.5
2301007X	XC1	10/8	3/8	16	17	11.5	33	6.5

STRAIGHT, CONNECTOR (XC3)



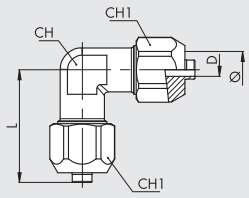
Code	Ref.	Ø	Ch	Ch1	L	D
2303001X	XC3	6/4	10	12	34	3
2303002X	XC3	8/6	12	14	35	5
2303003X	XC3	10/8	14	16	39	6.5

ELBOW, MALE CONICAL (XC5)



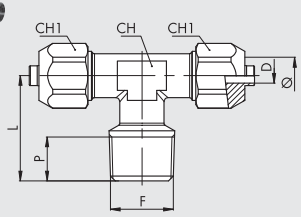
Code	Ref.	Ø	F	Ch	Ch1	P	L	L1	D
2305001X	XC5	6/4	1/8	10	12	7.5	17	23	3
2305002X	XC5	6/4	1/4	10	12	11	21.5	23	3
2305003X	XC5	8/6	1/8	10	14	7.5	17	23	5
2305004X	XC5	8/6	1/4	10	14	11	21.5	23	5
2305006X	XC5	10/8	1/4	10	16	11	21.5	25.5	6.5

ELBOW CONNECTOR (XC6)



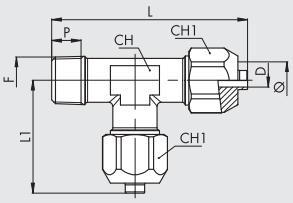
Code	Ref.	Ø	Ch	Ch1	L	D
2306001X	XC6	6/4	10	12	22.5	3
2306002X	XC6	8/6	10	14	23	5
2306003X	XC6	10/8	10	16	25.5	6.5

TEE, CENTRAL MALE (XC7)



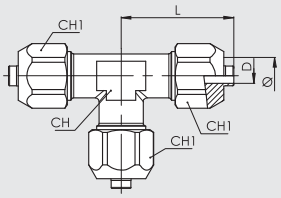
Code	Ref.	Ø	F	Ch	Ch1	P	L	L1	D
2307001X	XC7	6/4	1/8	10	12	8	17	23	3
2307002X	XC7	6/4	1/4	10	12	11	21.5	23	3
2307003X	XC7	8/6	1/8	10	14	8	17	23	5
2307004X	XC7	8/6	1/4	10	14	11	21.5	23	5
2307006X	XC7	10/8	1/4	10	16	11	21.5	25.5	6.5

TEE, LATERAL MALE (XC8)



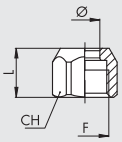
Code	Ref.	Ø	F	Ch	Ch1	P	L	L1	D
2308001X	XC8	6/4	1/8	10	12	8	40	23	3
2308002X	XC8	6/4	1/4	10	12	11	44.5	23	3
2308003X	XC8	8/6	1/8	10	14	8	40	23	5
2308004X	XC8	8/6	1/4	10	14	11	44.5	23	5
2308006X	XC8	10/8	1/4	10	16	11	47	25.5	6.5

TEE CONNECTOR (XC9)



Code	Ref.	Ø	Ch	Ch1	L	D
2309001X	XC9	6/4	10	12	22.5	3
2309002X	XC9	8/6	10	14	23	5
2309003X	XC9	10/8	10	16	25.5	6.5

NUT (XC10)



Code	Ref.	Ø	F	Ch1	L
2310002X	XC10	6/4	M10x1	12	10
2310004X	XC10	8/6	M12x1	14	10
2310005X	XC10	10/8	M14x1	16	11

NOTES

METAL WORK PNEUMATIC

ACCESSORIES

- LINE ON LINE E1
- COUPLINGS E2
- FLOW REGULATOR E3
- AUXILIARY VALVES E4
- VARIOUS ACCESSORIES E5
- STAINLESS STEEL ACCESSORIES E6

SUMMARY lineonline®

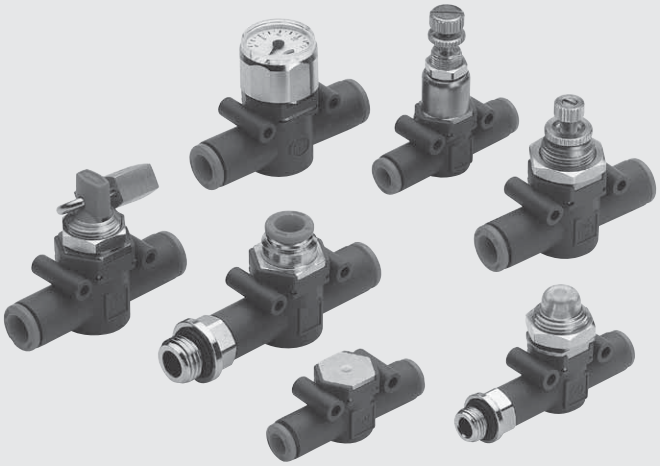
METAL WORK PNEUMATIC

	● INTRODUCTION LINE ON LINE®	E1.4
	● IN-LINE PNEUMATIC VALVE SERIES PNV L	E1.6
	● IN-LINE SOLENOID VALVE SERIES SOV L	E1.9
	● MINIATURE REDUCER/ECONOMIZER, SERIES RML, RMC AND RMS	E1.12
	● IN-LINE PRESSURE GAUGE SERIES MAN L	E1.16
	● IN-LINE PRESSURE INDICATOR SERIES LAM L	E1.18
	● IN-LINE SHUTOFF VALVE SERIES V2V L AND V3V L	E1.20
	● IN-LINE FLOW MICRO-REGULATOR SERIES RFL L	E1.23
	● IN-LINE FIXED-REGULATION FLOW REGULATOR SERIE RFF L	E1.26
	● IN-LINE QUICK-EXHAUST VALVES SERIES VSR L	E1.29
	● IN-LINE QUICK-EXHAUST VALVE WITH REGULATED EXHAUST SERIES VSRR L	E1.31
	● IN-LINE STOP VALVE SERIES STP L	E1.34
	● IN-LINE CHECK VALVE SERIES VNR L	E1.37
	● LINE ON LINE® ACCESSORIES	E1.39

lineonline®

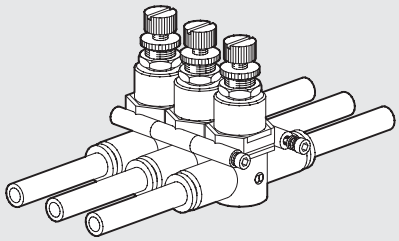
LINE OF PRODUCTS ON LINE

LINE ON LINE® is an exclusive range of products for mounting on pneumatic circuits. With these small, highly efficient components it is possible to perform all pneumatic functions at any point of the circuit.
LINE ON LINE® is ultra-modular - the components can be connected in parallel, in series or combined parallel/series.
All LINE ON LINE® products are available for pipe-pipe connection with two push-in fittings, or for thread-pipe connection with a brass nickel-plated male thread and a push-in fitting.
The body is made of technopolymer, giving a product that is extremely lightweight and compact.
One side of the body is marked with an indelible pneumatic symbol to facilitate identification and indicate the direction of flow.

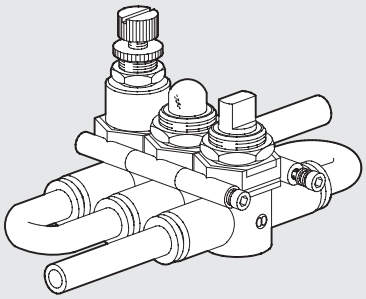


CONNECTION FREE

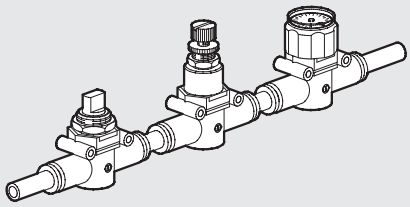
PARALLEL LINES



SERIAL LINE PARALLEL FITTING



SERIAL LINE IN-LINE FITTING



FIXING FREE

WALL FIXING

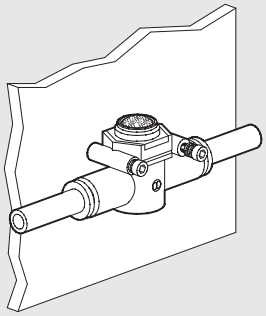
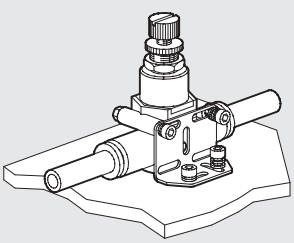
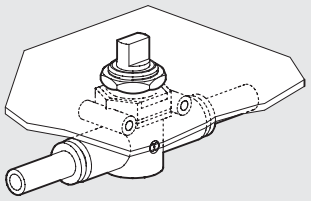


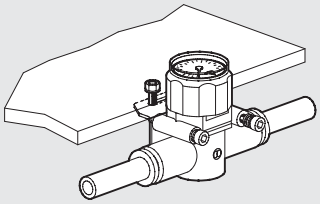
PLATE FIXING



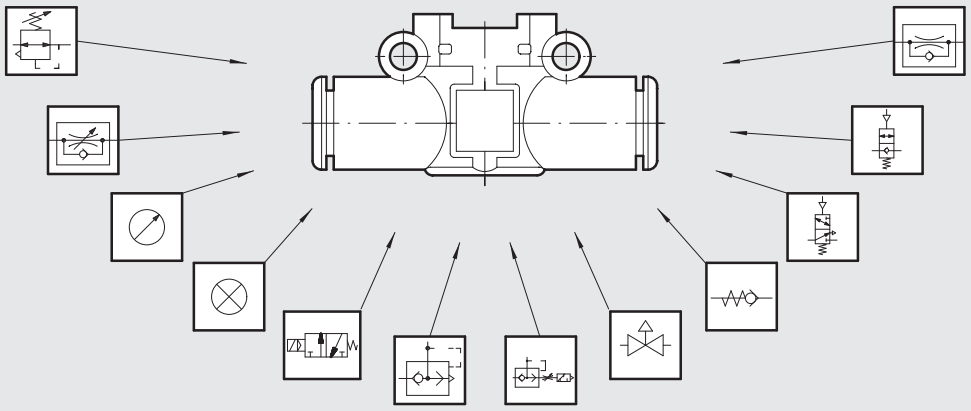
PANEL FIXING



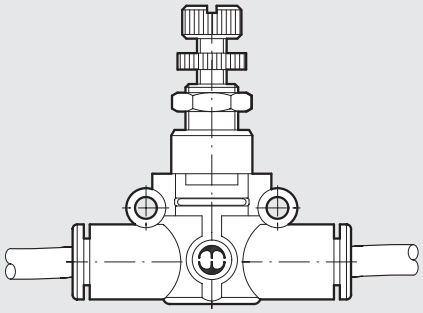
UNDER WALL FIXING



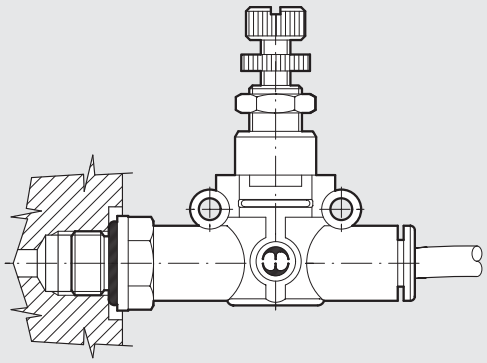
ALL THE PNEUMATIC FUNCTIONS WITH THE SAME EXTERNAL DIMENSIONS



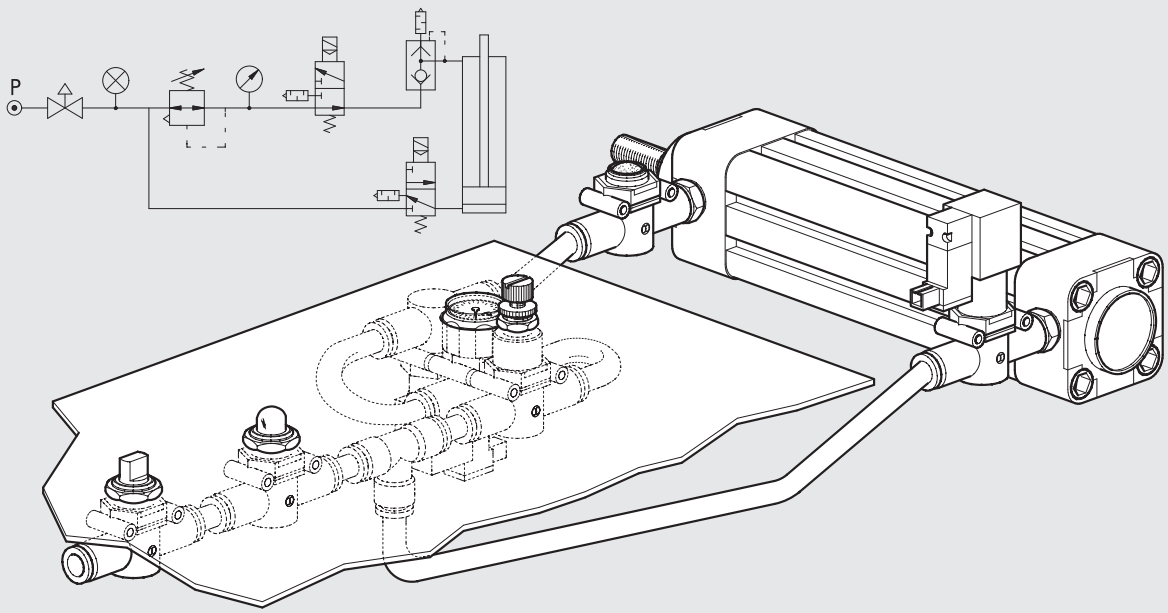
PIPE-PIPE



THREAD-PIPE

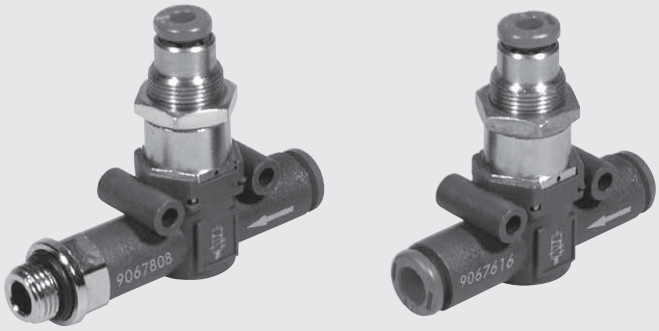


APPLICATION EXAMPLE



IN-LINE PNEUMATIC VALVE SERIES PNV L

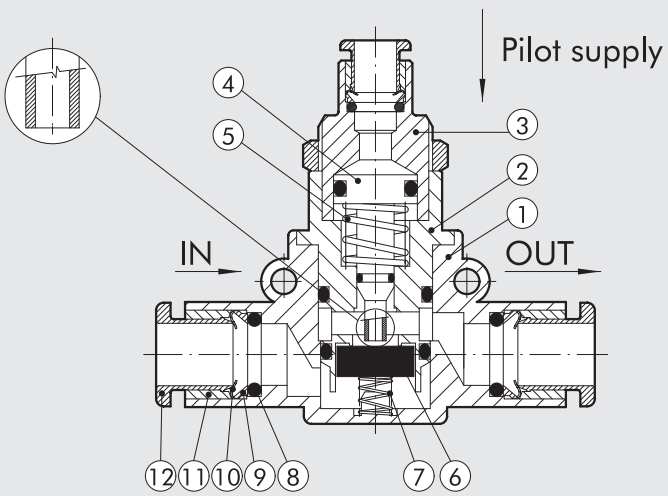
The PNV L in-line pneumatic valve belongs to the LINE ON LINE® family and can be connected in series or in parallel with the other products in the same family.
It is available in a version for pipe-pipe connection, which includes two push-in fittings, and a version for thread-pipe connection, which includes a nickel-plated brass male thread and a push-in fitting.
The compressed air port is a push-in fitting for Ø 4 pipe. The valve is the normally-closed 3/2 pipe. It is a unidirectional valve, meaning it only works properly if supplied from port 1.



TECHNICAL DATA		Ø 6	Ø 8
Max. operating pressure	MPa	1	
	bar	10	
	psi	145	
Temperature range	°C	– 20 to + 60	
	°F	– 4 to + 140	
Recommended pipe		Rilsan PA 11 - Nylon 6 - Polyamide 12 - Polypropylene	
Fluid		Lubricated or unlubricated filtered air	
Compatibility with oils		See **chapter Z1**	

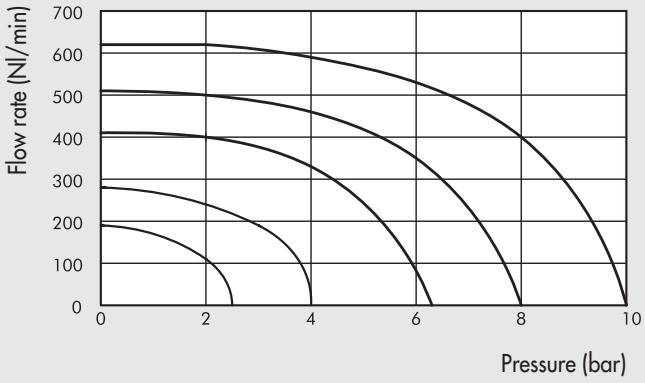
COMPONENTS

① Technopolymer body
② Nickel-plated brass insert
③ Nickel-plated brass pilot insert
④ Brass piston rod
⑤ Stainless steel clamping spring
⑥ NBR seal
⑦ Stainless steel poppet spring
⑧ NBR seal
⑨ Technopolymer spring ring
⑩ Stainless steel clamping spring
⑪ Technopolymer stop bushing
⑫ Technopolymer release bushing

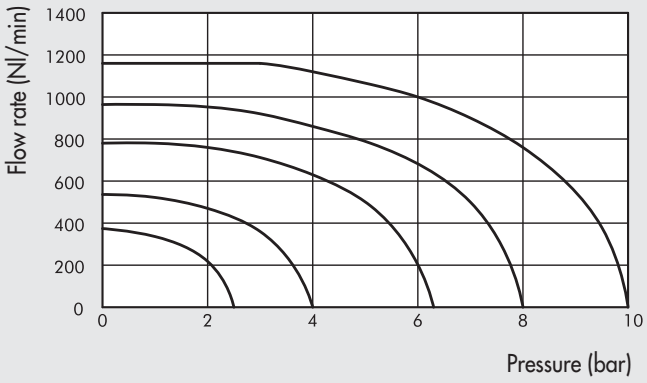


FLOW CHARTS

PNV L Ø 6

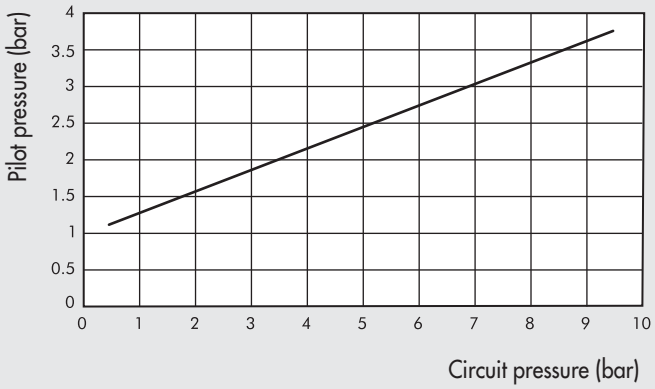


PNV L Ø 8

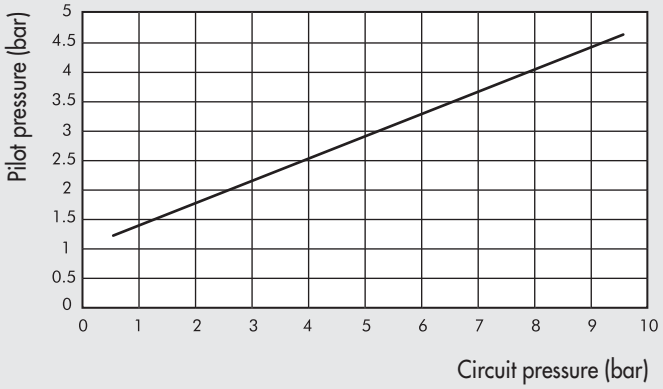


MINIMUM PILOT PRESSURE

PNV L Ø 6

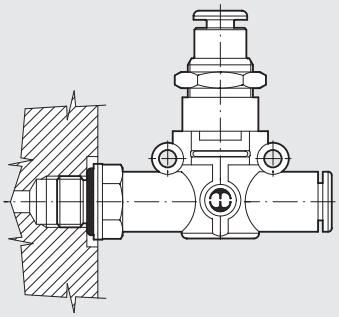


PNV L Ø 8



ASSEMBLY OPTIONS

Ⓐ



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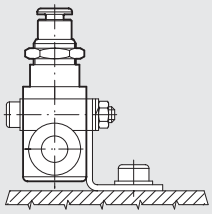

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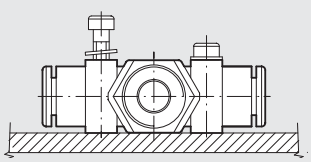

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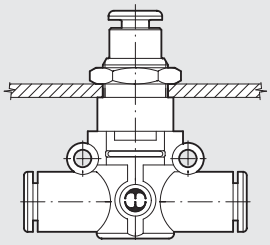
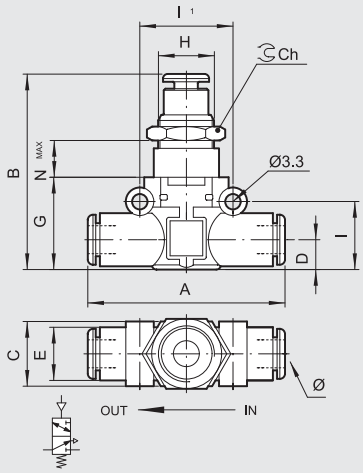


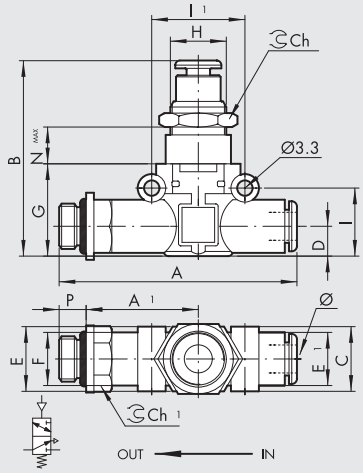
How to mount the PNV L:
- Fig. Ⓐ With the male threaded port it is possible to mount the PNV L straight onto the actuator or the control valve.
- Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
- Fig. Ⓒ There are two robust rings on the plastic body for fixing the PNV L straight onto the wall.
- Fig. Ⓓ The ring nut is screwed onto the threaded metal part of the PNV L body for panel mounting.

PNV L 3/2 NC PIPE - PIPE



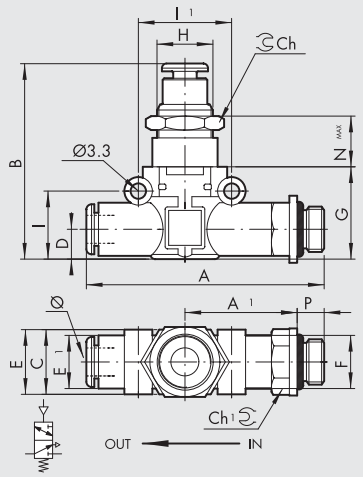
Code	Ref.	Ø	A	B	C	D	E	G	H	I	I1	Ch	Nmax
9067616	PNV L 3/2 NC Ø6 - Ø6	6	49.4	43.2	14.7	6.4	11.4	20	M12x0.75	14.6	20	15	4.7
9067624	PNV L 3/2 NC Ø8 - Ø8	8	57.3	49.7	18.7	9.1	13.8	26	M15x1	18.7	24	17	4

PNV L 3/2 NC PIPE - THREAD



Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Nmax
9067808	PNV L 3/2 NC Ø6 - 1/8	1/8	6	6	58.5	27.8	43.2	14.7	6.4	14	11.4	20	M12x0.75	14.6	20	15	4.7
9067809	PNV L 3/2 NC Ø6 - 1/4	1/4	6	8	61.5	28.8	43.2	14.7	6.4	18	11.4	20	M12x0.75	14.6	20	15	4.7
9067810	PNV L 3/2 NC Ø8 - 1/8	1/8	8	6	66.2	31.8	49.7	18.7	9.1	15	13.8	26	M15x1	18.7	24	17	4
9067811	PNV L 3/2 NC Ø8 - 1/4	1/4	8	8	70.6	34.2	49.7	18.7	9.1	18	13.8	26	M15x1	18.7	24	17	4
9067812	PNV L 3/2 NC Ø8 - 3/8	3/8	8	9	72.2	34.8	49.7	18.7	9.1	22	13.8	26	M15x1	18.7	24	17	4

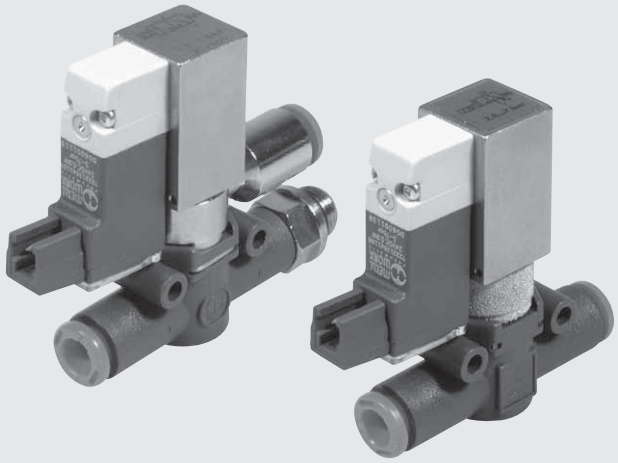
PNV L 3/2 NC THREAD - PIPE



Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Nmax
9067708	PNV L 3/2 NC 1/8 - Ø6	6	1/8	6	58.5	27.8	43.2	14.7	6.4	14	11.4	20	M12x0.75	14.6	20	15	4.7
9067709	PNV L 3/2 NC 1/4 - Ø6	6	1/4	8	61.5	28.8	43.2	14.7	6.4	18	11.4	20	M12x0.75	14.6	20	15	4.7
9067710	PNV L 3/2 NC 1/8 - Ø8	8	1/8	6	66.2	31.8	49.7	18.7	9.1	15	13.8	26	M15x1	18.7	24	17	4
9067711	PNV L 3/2 NC 1/4 - Ø8	8	1/4	8	70.6	34.2	49.7	18.7	9.1	18	13.8	26	M15x1	18.7	24	17	4
9067712	PNV L 3/2 NC 3/8 - Ø8	8	3/8	9	72.2	34.8	49.7	18.7	9.1	22	13.8	26	M15x1	18.7	24	17	4

IN-LINE SOLENOID VALVE SERIES SOV L

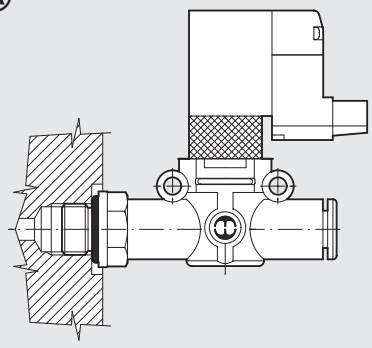
SOV L solenoid valves belong to the LINE ON LINE® family, which means they can be connected to all the other components in series or in parallel.
Available in the version for pipe-pipe connection with two push-in fittings, and in the version for thread-pipe connection with a brass nickel-plated male thread and a push-in fitting.
Though small in size, SOV L valves are solenoid-piloted and feature very high performance.
The spool distributor is fitted with special polyurethane gaskets to ensure a very long working life.
Each valve comes complete with a monostable manual control and LED.
Exhaust can be damped with an annular silencer or conveyed via a pipe fitting. The fitting for conveyed exhaust can be oriented freely.



TECHNICAL DATA		Ø 6	Ø 8
Operating pressure	MPa	0.25 - 0.7	
	bar	2.5 - 7	
	psi	36 - 101	
Temperature range	°C	–10 to +60	
	°F	+14 to +140	
Flow rate at 6.3 bar ΔP 0.5bar	Nl/min	270	500
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	380	700
Conductance C	Nl/min·bar	95.8	178.1
Coefficient b	bar/bar	0.145	0.129
Voltage	VDC	24	
Power	W	0.9	
Recommended pipe		Rilsan PA11 - Nylon 6 - Polyamide 12 - Polypropylene	
Fluid		Lubricated or unlubricated filtered compressed air	
Compatibility with oils		See **chapter Z1**	

ASSEMBLY OPTIONS

Ⓐ



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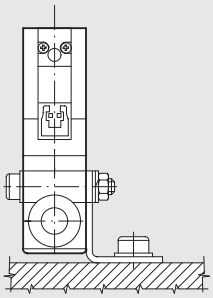

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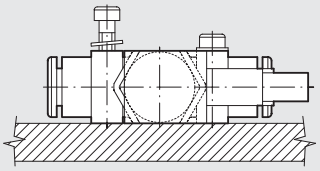
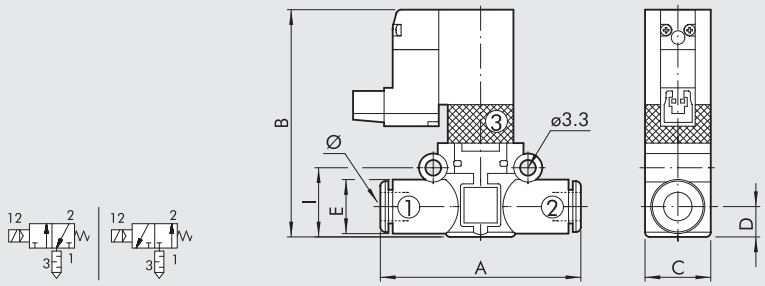


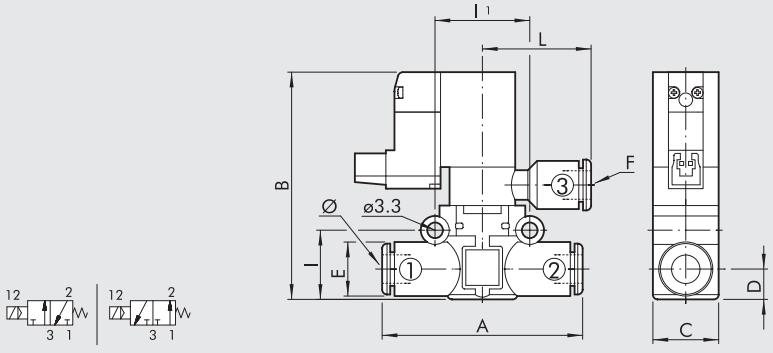
How to mount the SOV L:
- Fig. Ⓐ With the male threaded port it is possible to mount the SOV L straight onto the actuator.
- Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
- Fig. Ⓒ There are two robust rings on the plastic body for fixing the SOV L straight onto the wall.

SOV L 3/2 NC-NO PIPE-PIPE SILENCED EXHAUST



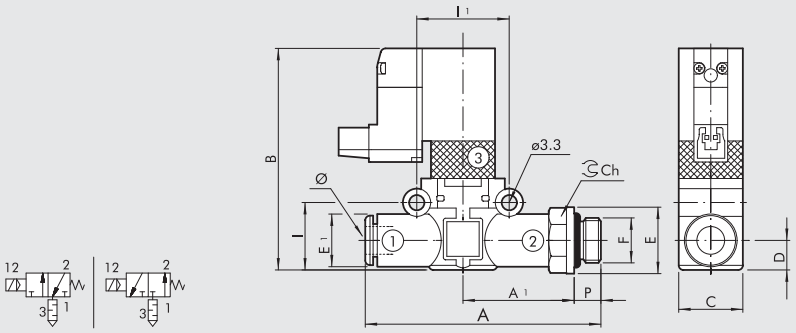
Code	Ref.	Ø	A	B	C	D	E	I	I1
9069016	SOV L 3/2 NC 6-6	6	49.4	57.5	14.7	6.4	11.4	14.6	20
9069116	SOV L 3/2 NO 6-6								
9069024	SOV L 3/2 NC 8-8	8	57.3	63.5	18.7	9.1	13.8	18.7	24
9069124	SOV L 3/2 NO 8-8								

SOV L 3/2 NC-NO PIPE-PIPE CONVEYED EXHAUST



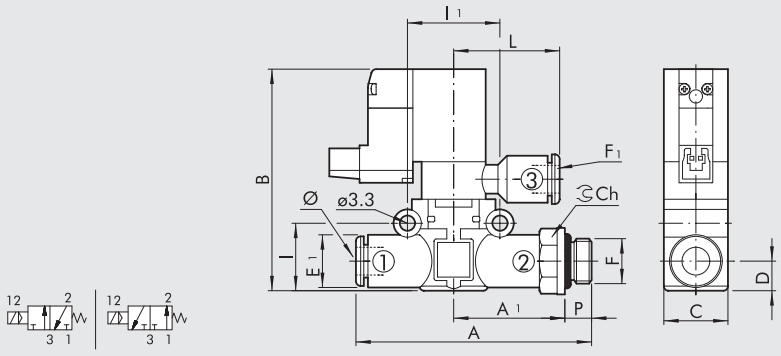
Code	Ref.	Ø	A	B	C	D	E	F	I	I1	L
9069216	SOV L 3/2 NC 6-6-6	6	49.4	57.5	14.7	6.4	11.4	Ø 6	14.6	20	28.3
9069316	SOV L 3/2 NO 6-6-6										
9069224	SOV L 3/2 NC 8-8-8	8	57.3	63.5	18.7	9.1	13.8	Ø 8	18.7	24	30
9069324	SOV L 3/2 NO 8-8-8										

SOV L 3/2 NC-NO PIPE-THREAD SILENCED EXHAUST



Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	I	I1	Ch
9069408	SOV L 3/2 NC 6-1/8	6	1/8	6	58.5	27.8	57.5	14.7	6.4	14	11.4	14.6	20	12
9069508	SOV L 3/2 NO 6-1/8													
9069409	SOV L 3/2 NC 6-1/4	6	1/4	8	61.5	28.8	57.5	14.7	6.4	18	11.4	14.6	20	14
9069509	SOV L 3/2 NO 6-1/4													
9069410	SOV L 3/2 NC 8-1/8	8	1/8	6	66.2	31.3	63.5	18.7	9.1	15	13.8	18.7	24	14
9069510	SOV L 3/2 NO 8-1/8													
9069411	SOV L 3/2 NC 8-1/4	8	1/4	8	70.6	34.2	63.5	18.7	9.1	18	13.8	18.7	24	14
9069511	SOV L 3/2 NO 8-1/4													
9069412	SOV L 3/2 NC 8-3/8	8	3/8	9	72.2	34.8	63.5	18.7	9.1	22	13.8	18.7	24	17
9069512	SOV L 3/2 NO 8-3/8													

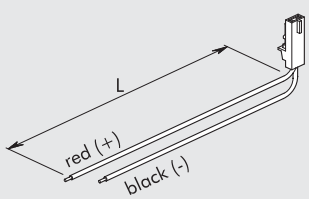
SOV L 3/2 NC-NO PIPE-THREAD CONVEYED EXHAUST



Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	F1	I	I1	L	Ch
9069608	SOV L 3/2 NC 6-1/8-6	6	1/8	6	58.5	27.8	57.5	14.7	6.4	14	11.4	Ø 6	14.6	20	28.3	12
9069708	SOV L 3/2 NO 6-1/8-6															
9069609	SOV L 3/2 NC 6-1/4-6	6	1/4	8	61.5	28.8	57.5	14.7	6.4	18	11.4	Ø 6	14.6	20	28.3	14
9069709	SOV L 3/2 NO 6-1/4-6															
9069610	SOV L 3/2 NC 8-1/8-8	8	1/8	6	66.2	31.8	63.5	18.7	9.1	15	13.8	Ø 8	18.7	24	30	14
9069710	SOV L 3/2 NO 8-1/8-8															
9069611	SOV L 3/2 NC 8-1/4-8	8	1/4	8	70.6	34.2	63.5	18.7	9.1	18	13.8	Ø 8	18.7	24	30	14
9069711	SOV L 3/2 NO 8-1/4-8															
9069612	SOV L 3/2 NC 8-3/8-8	8	3/8	9	72.2	34.8	63.5	18.7	9.1	22	13.8	Ø 8	18.7	24	30	17
9069712	SOV L 3/2 NO 8-3/8-8															

ACCESSORIES

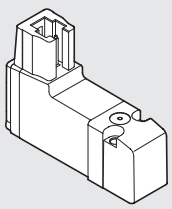
PLUG-IN CONNECTOR



Code	Description
W0970512000	Plug-in connector Mach 11 L = 300

SPARES

PLUG-IN PILOT



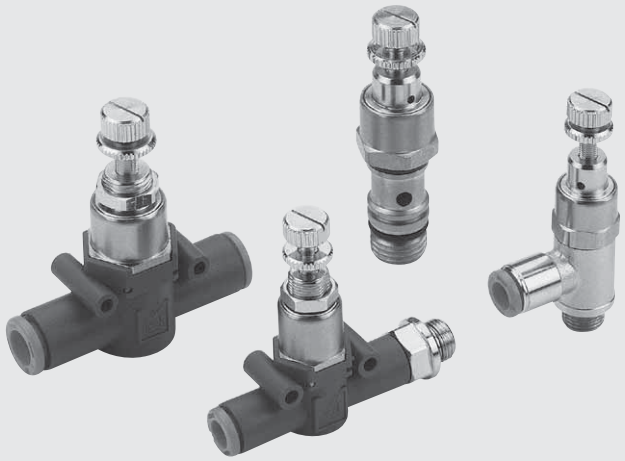
Code	Description
722213541100	PLT-10 722213541100

MINIATURE REDUCER/ECONOMIZER, SERIES RML, RMC AND RMS

The RML R miniature pressure regulator belongs to the LINE ON LINE® family and can be connected in series or in parallel with all the other products. The miniature pressure regulator is available in five different types:

- In-line with push-in input and output fitting
- In-line with threaded input port and push-in output fitting
- In-line with push-in input fitting and threaded output port
- At an angle with threaded input port and push-in output fitting
- Cartridge type for direct assembly in suitably worked slot. The miniature pressure regulator is fitted with a relief valve for over-pressure exhaust.
- Particularly suitable for use between the valve and actuator and as a pressure regulator in secondary branches of the pneumatic system.

The data in brackets refer to the angle version.

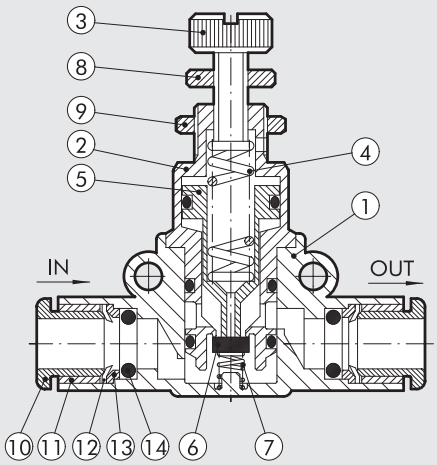


TECHNICAL DATA		RML Ø 6	RMC 1/8	RMS 1/8	RML Ø 8	RMC 1/4	RMS 1/4
Threaded ports		1/8"-1/4"	1/8"	1/8"	1/8"-1/4"-3/8"	1/4"	1/4"
Pipe coupling		Ø 6	Ø 4 - Ø 6 - Ø 8	–	Ø 8	Ø 6 - Ø 8 - Ø 10	–
Regulation range		1 to 8 bar - 0.1 to 0.8 MPa - 14.5 to 116 psi					
Inlet pressure	MPa	0.2 - 1					
	bar	2 - 10					
	psi	29 - 145					
Flow rate at 6.3 bar (0.63 MPa - 91 psi) ΔP 1 bar	Nl/min	150			260		
Flow rate on exhaust at 6.3 bar (0.63 MPa - 91 psi)		400			600		
Fluid		Lubricated or unlubricated filtered air					
Max. temperature at 1 MPa; 10 bar; 145 psi	°C	– 20 to + 60					
	°F	– 4 to + 140					
Assembly position		Available					
Notes		In the miniature regulator the pressure must always be set upwards					
Compatibility with oils		See **chapter Z1**					

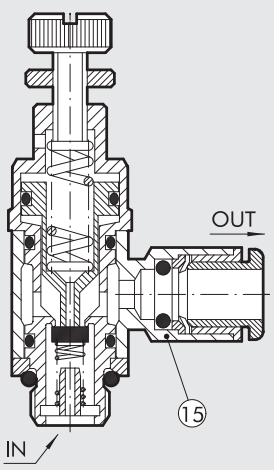
COMPONENTS

① Technopolymer body (brass for RMC)
② Nickel-plated brass insert
③ Nickel-plated brass adjusting screw
④ Steel adjusting spring
⑤ Brass piston rod
⑥ NBR shutter
⑦ Stainless steel shutter spring
⑧ Adjusting screw ring nut
⑨ Nickel-plated brass wall ring nut
⑩ Technopolymer release bushing
⑪ Technopolymer stop bushing (brass for RMC)
⑫ Stainless steel crimping spring
⑬ Technopolymer spring ring
⑭ NBR gasket
⑮ Nickel-plated brass rotating ring

RML



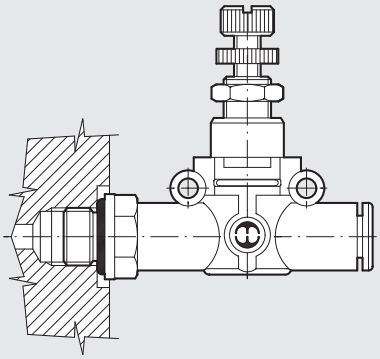
RMC



METAL WORK PNEUMATIC

ASSEMBLY OPTIONS

Ⓐ



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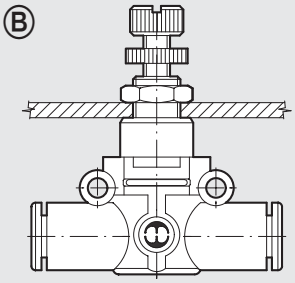

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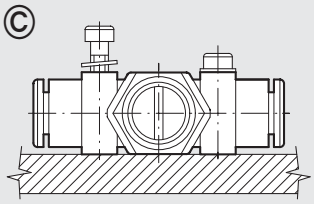

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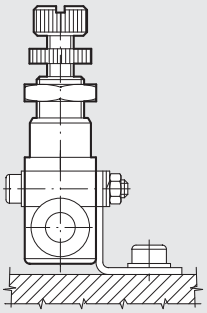
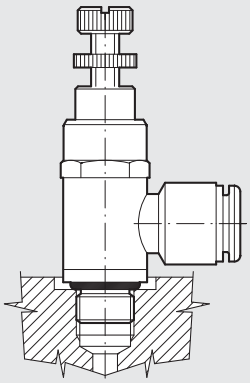


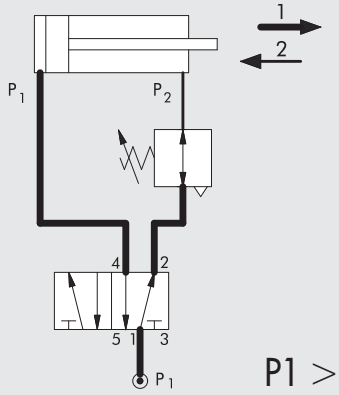
Ⓔ



How to assembly RML/RMC:
- Fig. Ⓐ Thanks to the male threaded part it's possible to assembly directly on the actuator or on the valve.
- Fig. Ⓑ By using the ring nut screwed on the threaded body it's possible the assembling on panels.
- Fig. Ⓒ On the plastic body there are two strong ring for the direct wall assembly.
- Fig. Ⓓ Fixing on plate trought the proper small square SQU L.
- Fig. Ⓔ For maintaining the tube the most parallel possible to the system , had been designed a specific version (RMC) with inlet and outlet at 90°.

POSSIBLE APPLICATIONS

ECONOMIZER

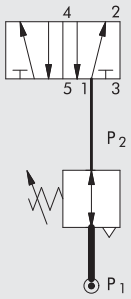


P1 > P2

If in a cylinder you require a thrust in one direction only, e.g. piston rod extension, and a lower thrust and pressure is sufficient in the oth er direction, you can save a lot of energy by mounting an economizer valve.

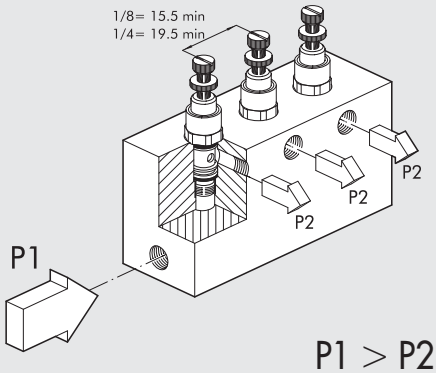
Example
Cylinder Ø 80 mm, stroke 200 mm, 6 bar, 12 cycles/min, 16 hours a day, 230 days a year. Consumption: 144 Nl/min => 3460 kWh/year => 880 litres of oil => 2428 kg of CO_2 => € 346/year. If you install an economizer that reduces the pressure from 6 to 2 bar, you SAVE: € 115/year.

REMOTE REDUCER



P1 > P2

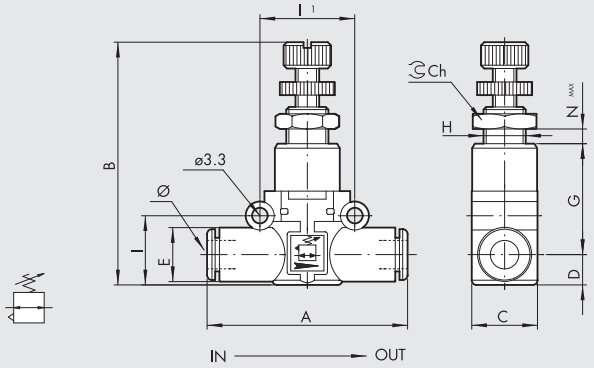
CARTRIDGE REDUCER, SERIE RMS



P1 > P2

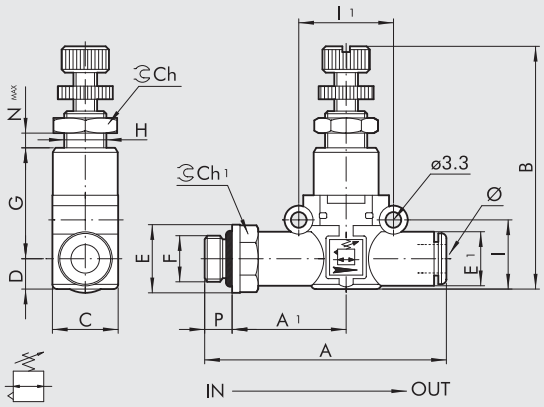
The cartridge regulator can be used:
- Fitted directly into the structure or along the air supply ducting.
- Package with common feed and separate regulated outlets.

LINE-MOUNTED MINIATURE REDUCER, SERIES RML



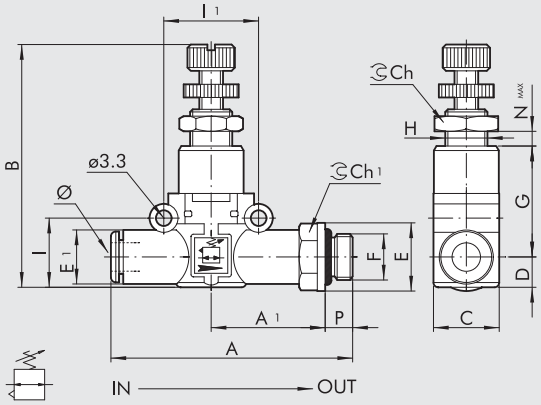
Code	Ref.	Ø	A	B	C	D	E	G	H	I	I1	Ch	Nmax
9061316	RML 6-6	6	49.4	46 - 52	14.7	6.4	11.4	24.8	M9x0.75	14.6	20	11	4.5
9061324	RML 8-8	8	57.3	52 - 58	18.7	9.1	13.8	27.4	M11x1	18.7	24	13	3.8

LINE-MOUNTED R/F MINIATURE REDUCER SERIES RML



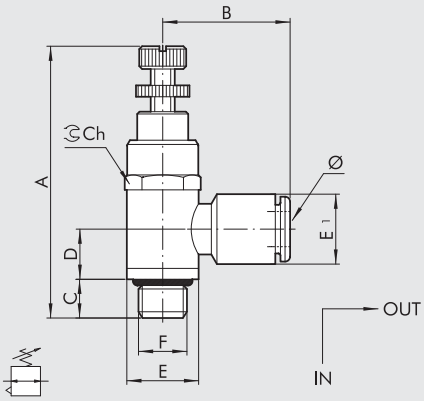
Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9061408	RML 1/8-6	1/8	6	6	58.5	27.8	46-52	14.7	6.4	14	11.4	24.8	M9x0.75	14.6	20	11	12	4.5
9061409	RML 1/4-6	1/4	6	8	61.5	28.8	46-52	14.7	6.4	18	11.4	24.8	M9x0.75	14.6	20	11	14	4.5
9061410	RML 1/8-8	1/8	8	6	66.2	31.8	52-58	18.7	9.1	15	13.8	27.4	M11x1	18.7	24	13	14	3.8
9061411	RML 1/4-8	1/4	8	8	70.6	34.2	52-58	18.7	9.1	18	13.8	27.4	M11x1	18.7	24	13	14	3.8
9061412	RML 3/8-8	3/8	8	9	72.2	34.8	52-58	18.7	9.1	22	13.8	27.4	M11x1	18.7	24	13	17	3.8

LINE-MOUNTED F/R MINIATURE REDUCER, SERIES RML



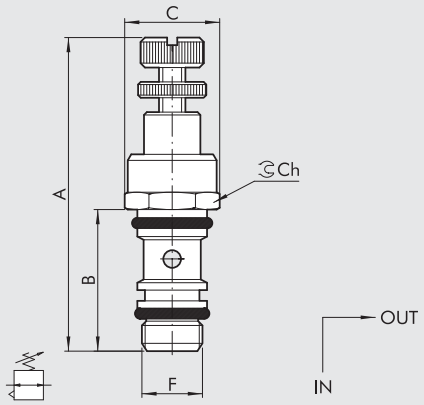
Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9061508	RML 6-1/8	6	1/8	6	58.5	27.8	46-52	14.7	6.4	14	11.4	24.8	M9x0.75	14.6	20	11	12	4.5
9061509	RML 6-1/4	6	1/4	8	61.5	28.8	46-52	14.7	6.4	18	11.4	24.8	M9x0.75	14.6	20	11	14	4.5
9061510	RML 8-1/8	8	1/8	6	66.2	31.8	52-58	18.7	9.1	15	13.8	27.4	M11x1	18.7	24	13	14	3.8
9061511	RML 8-1/4	8	1/4	8	70.6	34.2	52-58	18.7	9.1	18	13.8	27.4	M11x1	18.7	24	13	14	3.8
9061512	RML 8-3/8	8	3/8	9	72.2	34.8	52-58	18.7	9.1	22	13.8	27.4	M11x1	18.7	24	13	17	3.8

MINIATURE REDUCER, SERIES RMC



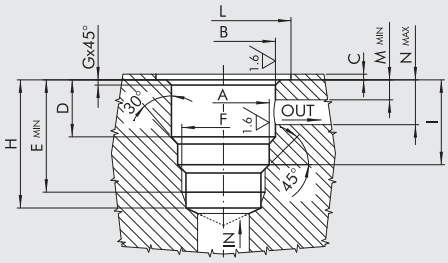
Code	Ref.	Ø	A	B	C	D	E	E1	Ch
9061102	RMC 1/8-4	4	51-57	20.4	7.1	12.7	14	9.5	14
9061108	RMC 1/8-6	6	51-57	23.7	7.1	12.7	14	11.3	14
9061110	RMC 1/8-8	8	51-57	25.6	7.1	12.7	14	13.8	14
9061109	RMC 1/4-6	6	57-63	25.1	9	11	18	11.3	17
9061111	RMC 1/4-8	8	57-63	27	9	11	18	13.8	17
9061112	RMC 1/4-10	10	57-63	32.2	9	11	18	16.5	17

CARTRIDGE REDUCER, SERIES RMS



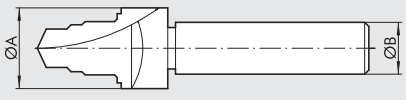
Code	Ref.	F	A	B	C	Ch
9061001	RMS 1/8	1/8	51-57	24.3	15	14
9061002	RMS 1/4	1/4	57-63	27.8	19	17

SEAT OF A MINIATURE CARTRIDGE REDUCER



	F	A	B	C	D	E	G	H	I	L	M	N
SE.RMS 1/8	1/8	9.8 $^{+0.1/-0}$	11.2 $^{\pm0.05}$	0.5 $^{\pm0.5}$	15.6 $^{\pm0.07}$	24.6	0.3	27	18.1 $^{\pm0.2}$	15.4	3.5	12
SE.RMS 1/4	1/4	13.5 $^{+0.1/-0}$	14.4 $^{\pm0.05}$	0.5 $^{\pm0.5}$	17.5 $^{\pm0.07}$	28	0.4	31.2	20.8 $^{\pm0.2}$	19.4	3.5	13.5

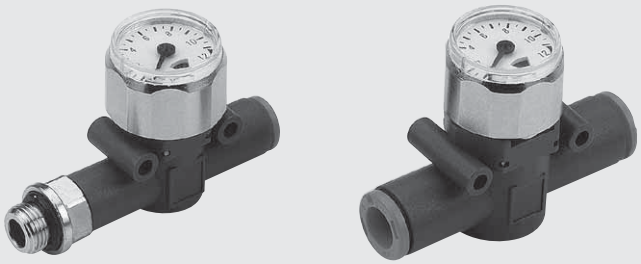
TOOL FOR RMS SEAT



Code	Ref.	Ø A	Ø B
9062001	UT.SE 1/8	16	12
9062002	UT.SE 1/4	20	15

IN-LINE PRESSURE GAUGE SERIES MAN L

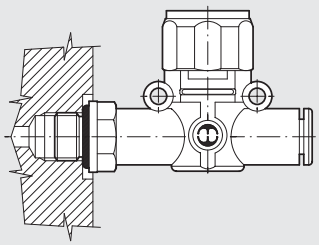
The MAN L pressure gauge belongs to the LINE ON LINE® family, which means it can be connected to all the other components in series or in parallel.
Available in the version for pipe-pipe connection with two push-in fittings, and in the version for thread-pipe connection with a brass nickel-plated male thread and a push-in fitting.
Though small in size, this pressure gauge, which is supplied in a metal casing, ensures accurate reading. It can be angled in any direction simply by rotating manually.



TECHNICAL DATA		Ø 4	Ø 6	Ø 8
Operating pressure	MPa	1.2		
	bar	12		
	psi	174		
Temperature range	°C	– 20 to + 60		
	°F	– 4 to + 140		
Precision		± 4% full scale		
Recommended pipe		Rilsan PA11 - Nylon 6 - Polyamide 12 - Polypropylene		
Fluid		Lubricated or unlubricated filtered compressed air		
Compatibility with oils		See **chapter Z1**		

ASSEMBLY OPTIONS

Ⓐ



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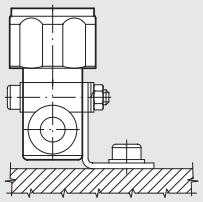

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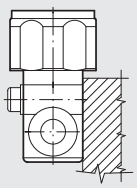

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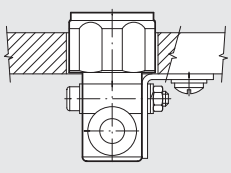
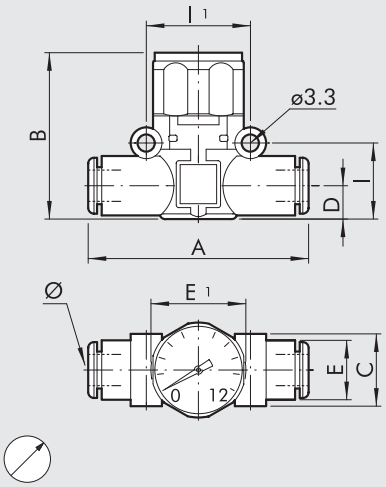


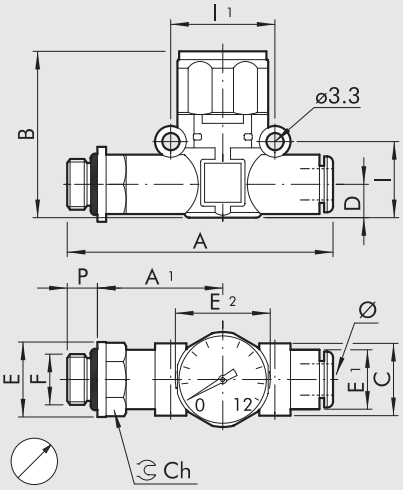
How to mount the MAN L:
- Fig. Ⓐ With the male threaded port it is possible to mount the MAN L straight onto the female thread.
- Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
- Fig. Ⓒ There are two robust rings on the plastic body for fixing the MAN L straight onto the wall.
- Fig. Ⓓ Use the SQL L bracket for panel mounting the MAN L.

MAN L PIPE-PIPE



Code	Ref.	Ø	A	B	C	D	E	E1	I	I1
9067001	MAN L 4-4	4	41.8	36.1	10.7	5.6	10	23	12.8	16
9067016	MAN L 6-6	6	49.4	35	14.7	6.4	11.4	23	14.6	20
9067024	MAN L 8-8	8	57.3	41	18.7	9.1	13.8	23	18.7	24

MAN L THREAD-PIPE

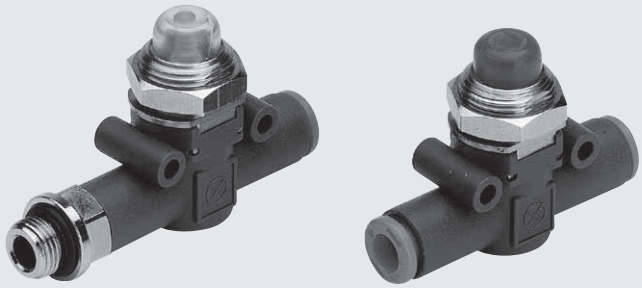


Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	E2	I	I1	Ch
9067101	MAN L M5-4	M5	4	4	47.7	26.7	36.1	10.7	5.6	9.9	10	23	12.8	16	9
9067102	MAN L 1/8-4	1/8	4	6	51.5	30.6	36.1	10.7	5.6	14	10	23	12.8	16	12
9067108	MAN L 1/8-6	1/8	6	6	58.5	27.8	35	14.7	6.4	14	11.4	23	14.6	20	12
9067109	MAN L 1/4-6	1/4	6	8	61.5	28.8	35	14.7	6.4	18	11.4	23	14.6	20	14
9067110	MAN L 1/8-8	1/8	8	6	66.2	31.8	41	18.7	9.1	15	13.8	23	18.7	24	14
9067111	MAN L 1/4-8	1/4	8	8	70.6	34.2	41	18.7	9.1	18	13.8	23	18.7	24	14
9067112	MAN L 3/8-8	3/8	8	9	72.2	34.8	41	18.7	9.1	22	13.8	23	18.7	24	17

NOTES

IN-LINE PRESSURE INDICATOR SERIES LAM L

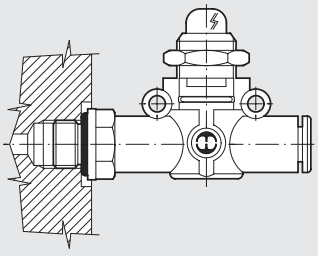
The LAM L pneumatic light indicator belongs to the LINE ON LINE® family, which means it can be connected to all the other components in series or in parallel.
Available in the version for pipe-pipe connection with two FOX push-in fittings, and in the version for thread-pipe connection with a brass nickel-plated male thread and a push-in fitting.
When there is no pressure, the clear technopolymer bell looks empty.
When there is pressure, a red signal appears.
The clear bell can be cleaned using normal detergents or ethyl alcohol, as the technopolymer used is fully compatible.



TECHNICAL DATA		Ø 6	Ø 8
Operating pressure	MPa	0.2 - 1	
	bar	2 - 10	
	psi	29 - 145	
Temperature range	°C	– 20 to + 60	
	°F	– 4 to + 140	
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	420	800
Colour with pressure		Orange - Green	
Recommended pipe		Rilsan PA11 - Nylon 6 - Polyamide 12 - Polypropylene	
Fluid		Lubricated or unlubricated filtered compressed air; if used, must be continuous	
Compatibility with oils		See **chapter Z1**	

ASSEMBLY OPTIONS

Ⓐ



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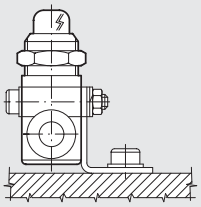

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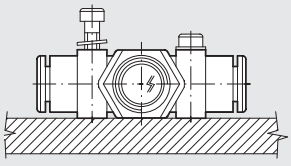

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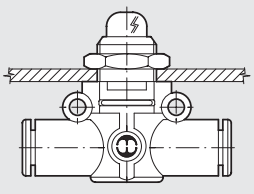
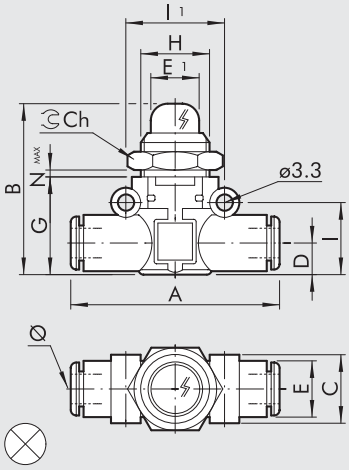


How to mount the LAM L:
- Fig. Ⓐ With the male threaded port it is possible to mount the LAM L straight onto the female thread.
- Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
- Fig. Ⓒ There are two robust rings on the plastic body for fixing the LAM L straight onto the wall.
- Fig. Ⓓ The ring nut is screwed onto the threaded metal part of the LAM L body for panel mounting.

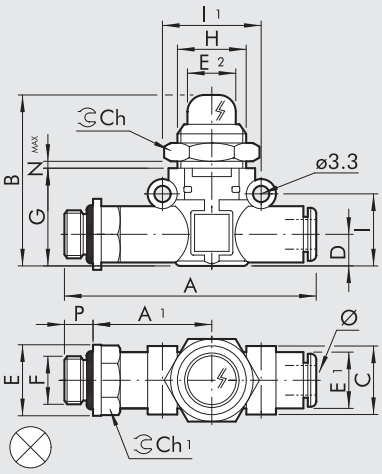
LAM L PIPE-PIPE



Code	Ref.	Ø	A	B	C	D	E	E1	G	H	I	I1	Ch	Nmax
9068016	LAM L 6-6-A	6	49.4	37	14.7	6.4	11.4	10.6	21	M15x1	14.6	20	17	4.5
9068216	LAM L 6-6-V													
9068024	LAM L 8-8-A	8	57.3	41	18.7	9.1	13.8	10.6	26	M15x1	18.7	24	17	4.5
9068224	LAM L 8-8-V													

A = Orange
V = Green

LAM L THREAD-PIPE

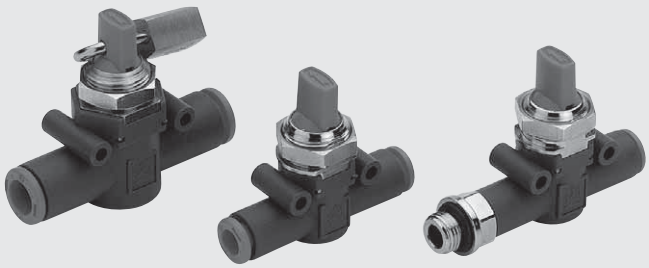


Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	E2	G	H	I	I1	Ch	Ch1	Nmax
9068108	LAM L 1/8-6-A	1/8	6	6	58.5	27.8	37	14.7	6.4	14	11.4	10.6	21	M15x1	14.6	20	17	12	4.5
9068308	LAM L 1/8-6-V																		
9068109	LAM L 1/4-6-A	1/4	6	8	61.5	28.8	37	14.7	6.4	18	11.4	10.6	21	M15x1	14.6	20	17	14	4.5
9068309	LAM L 1/4-6-V																		
9068110	LAM L 1/8-8-A	1/8	8	6	66.2	31.8	41	18.7	9.1	15	13.8	10.6	26	M15x1	18.7	24	17	14	4.5
9068310	LAM L 1/8-8-V																		
9068111	LAM L 1/4-8-A	1/4	8	8	70.6	34.2	41	18.7	9.1	18	13.8	10.6	26	M15x1	18.7	24	17	14	4.5
9068311	LAM L 1/4-8-V																		
9068112	LAM L 3/8-8-A	3/8	8	9	72.2	34.8	41	18.7	9.1	22	13.8	10.6	26	M15x1	18.7	24	17	17	4.5
9068312	LAM L 3/8-8-V																		

A = Orange
V = Green

IN-LINE SHUTOFF VALVE SERIES V2V L AND V3V L

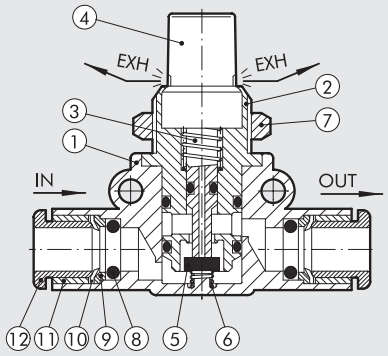
V2V L and V3V L shutoff valves belong to the LINE ON LINE® family which means they can be connected to all the other components in series or in parallel. Available in the version for pipe-pipe connection with two push-in fittings, and in the version for thread-pipe connection with a brass nickel-plated male thread and a push-in fitting.
V2V is a two-way unidirectional valve, while V3V is a three-way valve with free discharge in the area around the control knob.
The locked version is probably the smallest available on the market.
A lock is provided to ensure the valve is kept in the closed position during machine maintenance. The valve is supplied complete with a lock and two keys.



TECHNICAL DATA		Ø 6	Ø 8
Operating pressure	MPa	1	
	bar	10	
	psi	145	
Temperature range	°C	– 20 to + 60	
	°F	– 4 to + 140	
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	280	470
Exhaust flow rate at 6.3 bar	Nl/min	110	110
Recommended pipe		Rilsan PA11 - Nylon 6 - Polyamide 12 - Polypropylene	
Fluid		Lubricated or unlubricated filtered compressed air; if used, must be continuous	
Compatibility with oils		See **chapter Z1**	

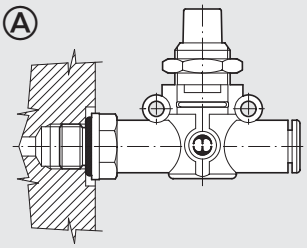
COMPONENTS

① Technopolymer body
② Nickel-plated brass insert
③ Brass rod
④ Technopolymer knob
⑤ NBR valve
⑥ Stainless steel valve compression spring
⑦ Nickel-plated brass wall-mount ring nut
⑧ NBR gasket
⑨ Technopolymer spring ring
⑩ Stainless steel folding spring
⑪ Technopolymer locking bushing
⑫ Technopolymer release bushing



ASSEMBLY OPTIONS

Ⓐ



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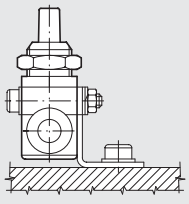

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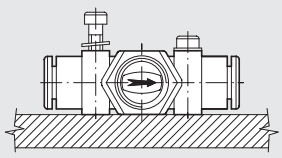

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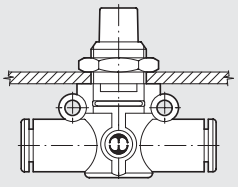
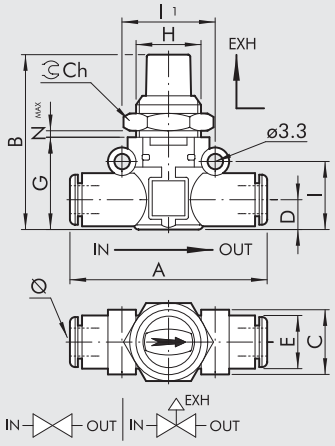


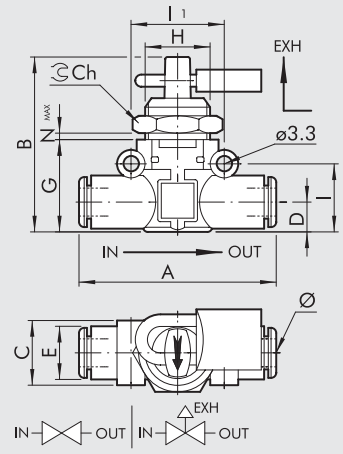
How to mount the V2V/V3V L:
- Fig. Ⓐ With the male threaded port it is possible to mount the V2V/V3V L straight onto the female thread.
- Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
- Fig. Ⓒ There are two robust rings on the plastic body for fixing the V2V/V3V L straight onto the wall.
- Fig. Ⓓ The rig nut is screwed onto the threaded metal part of the V2V/V3V L body for panel mounting.

V2V/V3V L PIPE-PIPE



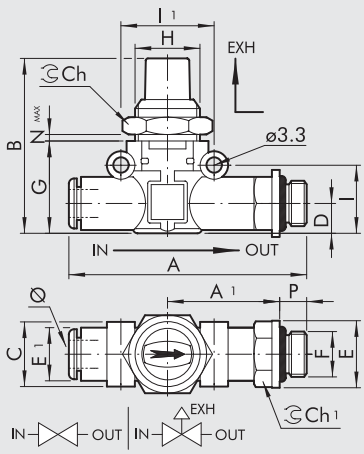
Code	Ref.	Ø	A	B	C	D	E	G	H	I	I1	Ch	Nmax
9065016	V2V L 6-6	6	49.4	41	14.7	6.4	11.4	21	M15x1	14.6	20	17	5.5
9066016	V3V L 6-6												
9065024	V2V L 8-8	8	57.3	46	18.7	9.1	13.8	26	M15x1	18.7	24	17	5.5
9066024	V3V L 8-8												

V2V/V3V L PIPE-PIPE PADLOCKED



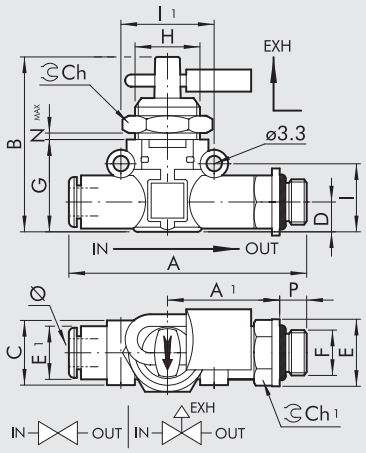
Code	Ref.	Ø	A	B	C	D	E	G	H	I	I1	Ch	Nmax
9065116	V2V L 6-6 KEY	6	49.4	41	14.7	6.4	11.4	21	M15x1	14.6	20	17	5.5
9066116	V3V L 6-6 KEY												
9065124	V2V L 8-8 KEY	8	57.3	46	18.7	9.1	13.8	26	M15x1	18.7	24	17	5.5
9066124	V3V L 8-8 KEY												

V2V/V3V L PIPE-THREAD



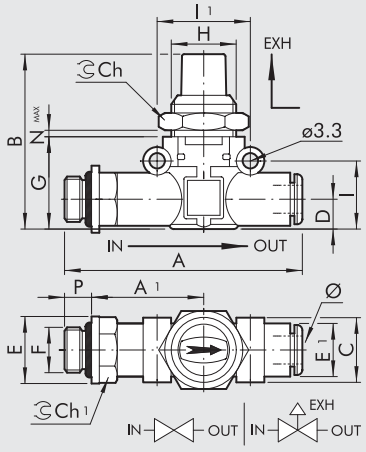
Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9065208	V2V L 6-1/8	6	1/8	6	58.5	27.8	41	14.7	6.4	14	11.4	21	M15x1	14.6	20	17	12	5.5
9066208	V3V L 6-1/8																	
9065209	V2V L 6-1/4	6	1/4	8	61.5	28.8	41	14.7	6.4	18	11.4	21	M15x1	14.6	20	17	14	5.5
9066209	V3V L 6-1/4																	
9065210	V2V L 8-1/8	8	1/8	6	66.2	31.8	46	18.7	9.1	15	13.8	26	M15x1	18.7	24	17	14	5.5
9066210	V3V L 8-1/8																	
9065211	V2V L 8-1/4	8	1/4	8	70.6	34.2	46	18.7	9.1	18	13.8	26	M15x1	18.7	24	17	14	5.5
9066211	V3V L 8-1/4																	
9065212	V2V L 8-3/8	8	3/8	9	72.2	34.8	46	18.7	9.1	22	13.8	26	M15x1	18.7	24	17	17	5.5
9066212	V3V L 8-3/8																	

V2V/V3V L PIPE-THREAD PADLOCKED



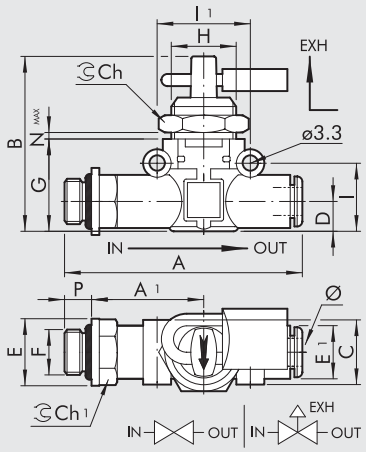
Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9065308	V2V L 6-1/8 KEY	6	1/8	6	58.5	27.8	41	14.7	6.4	14	11.4	21	M15x1	14.6	20	17	12	5.5
9066308	V3V L 6-1/8 KEY																	
9065309	V2V L 6-1/4 KEY	6	1/4	8	61.5	28.8	41	14.7	6.4	18	11.4	21	M15x1	14.6	20	17	14	5.5
9066309	V3V L 6-1/4 KEY																	
9065310	V2V L 8-1/8 KEY	8	1/8	6	66.2	31.8	46	18.7	9.1	15	13.8	26	M15x1	18.7	24	17	14	5.5
9066310	V3V L 8-1/8 KEY																	
9065311	V2V L 8-1/4 KEY	8	1/4	8	70.6	34.2	46	18.7	9.1	18	13.8	26	M15x1	18.7	24	17	14	5.5
9066311	V3V L 8-1/4 KEY																	
9065312	V2V L 8-3/8 KEY	8	3/8	9	72.2	34.8	46	18.7	9.1	22	13.8	26	M15x1	18.7	24	17	17	5.5
9066312	V3V L 8-3/8 KEY																	

V2V/V3V L THREAD-PIPE



Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9065408	V2V L 1/8-6	1/8	6	6	58.5	27.8	41	14.7	6.4	14	11.4	21	M15x1	14.6	20	17	12	5.5
9066408	V3V L 1/8-6																	
9065409	V2V L 1/4-6	1/4	6	8	61.5	28.8	41	14.7	6.4	18	11.4	21	M15x1	14.6	20	17	14	5.5
9066409	V3V L 1/4-6																	
9065410	V2V L 1/8-8	1/8	8	6	66.2	31.8	46	18.7	9.1	15	13.8	26	M15x1	18.7	24	17	14	5.5
9066410	V3V L 1/8-8																	
9065411	V2V L 1/4-8	1/4	8	8	70.6	34.2	46	18.7	9.1	18	13.8	26	M15x1	18.7	24	17	14	5.5
9066411	V3V L 1/4-8																	
9065412	V2V L 3/8-8	3/8	8	9	72.2	34.8	46	18.7	9.1	22	13.8	26	M15x1	18.7	24	17	17	5.5
9066412	V3V L 3/8-8																	

V2V/V3V L THREAD-PIPE PADLOCKED



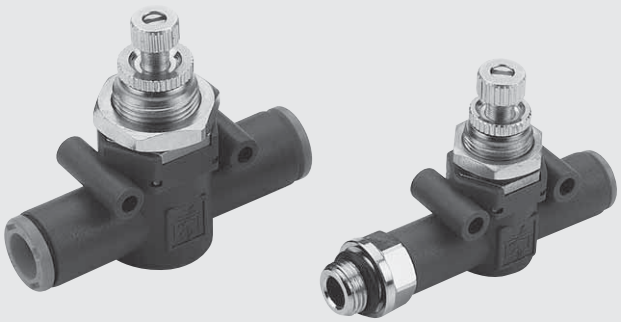
Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9065508	V2V L 1/8-6 KEY	1/8	6	6	58.5	27.8	41	14.7	6.4	14	11.4	21	M15x1	14.6	20	17	12	5.5
9066508	V3V L 1/8-6 KEY																	
9065509	V2V L 1/4-6 KEY	1/4	6	8	61.5	28.8	41	14.7	6.4	18	11.4	21	M15x1	14.6	20	17	14	5.5
9066509	V3V L 1/4-6 KEY																	
9065510	V2V L 1/8-8 KEY	1/8	8	6	66.2	31.8	46	18.7	9.1	15	13.8	26	M15x1	18.7	24	17	14	5.5
9066510	V3V L 1/8-8 KEY																	
9065511	V2V L 1/4-8 KEY	1/4	8	8	70.6	34.2	46	18.7	9.1	18	13.8	26	M15x1	18.7	24	17	14	5.5
9066511	V3V L 1/4-8 KEY																	
9065512	V2V L 3/8-8 KEY	3/8	8	9	72.2	34.8	46	18.7	9.1	22	13.8	26	M15x1	18.7	24	17	17	5.5
9066512	V3V L 3/8-8 KEY																	

IN-LINE FLOW MICRO-REGULATOR SERIES RFL L

The RLF L flow micro-regulator belongs to the LINE ON LINE® family and can be connected in series or in parallel with all the other products.
The RFL L regulates the air input and thus the speed in pneumatic actuators.
Two versions are available:
Type U (unidirectional) regulates the flow only in one of the two directions of air flow. The following types of fitting can be mounted:
- Push-in input and output fitting
- Push-in input fitting and threaded port on the exhaust (cylinder type)
- Input threaded port and push-in fitting on the exhaust (valve type)

Type B (bidirectional) regulates the flow in both directions of air flow.
The following types of fitting can be mounted:
- Push-in input and output fitting
- Threaded port and push-in fitting

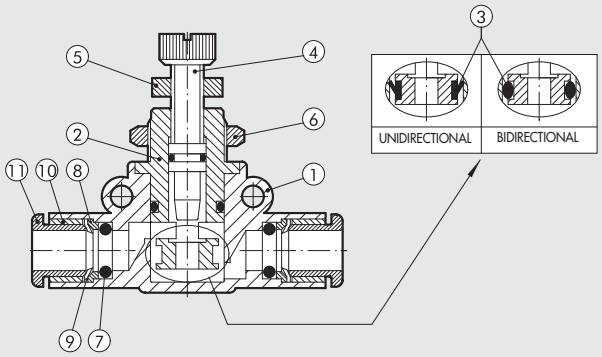
There are four possible types of assembly (see example below).



TECHNICAL DATA		Ø 4	Ø 6	Ø 8
Max. operating pressure	MPa		1	
	bar		10	
	psi		145	
Temperature range	°C		– 20 to + 60	
	°F		– 4 to + 140	
Max flow rate on regulation at 6.3 bar	Nl/min	155	450	850
Flow rate on exhaust at 6.3 bar	Nl/min	160	550	950
Adjustment			Manual or using a screwdriver	
Internal system			Tapered needle	
Recommended pipe			Rilsan PA 11 - Nylon 6 - Polyamide 12 - Polypropylene	
Fluid			Lubricated or unlubricated filtered air	
Compatibility with oils			See **chapter Z1**	

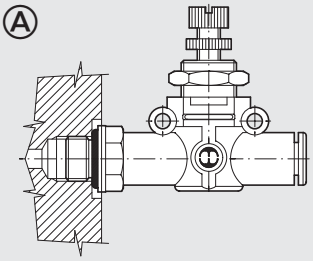
COMPONENTS

① Technopolymer body
② Nickel-plated brass seal support
③ NBR gasket
④ Brass adjusting needle
⑤ Nickel-plated brass needle ring nut
⑥ Wall fixing ring nut
⑦ NBR seal
⑧ Technopolymer spring ring
⑨ Stainless steel clip-on spring
⑩ Technopolymer stop bushing
⑪ Technopolymer release bushing



ASSEMBLY OPTIONS

Ⓐ



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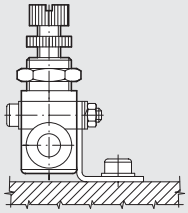

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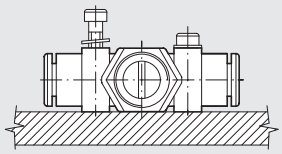

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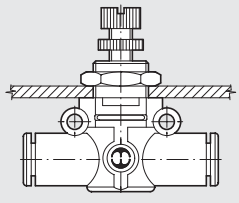
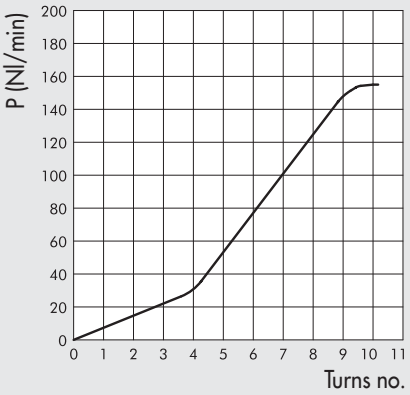


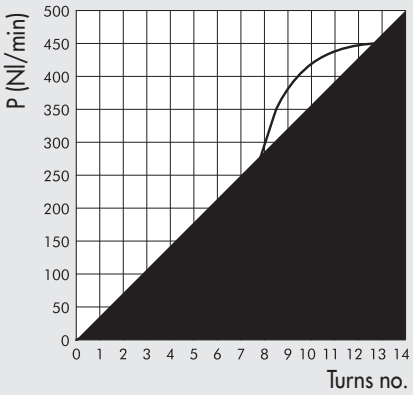
How to mount the RFL L:
- Fig. Ⓐ With the male threaded port it is possible to mount the RFL L straight onto the actuator or the control valve.
- Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
- Fig. Ⓒ There are two robust rings on the plastic body for fixing the RFL L straight onto the wall.
- Fig. Ⓓ The ring nut is screwed onto the threaded metal part of the RFL L body for panel mounting.

FLOW RATE CHARTS AT 6.3 bar DEPENDING ON THE TURNS EFFECTED BY THE REGULATION SCREW

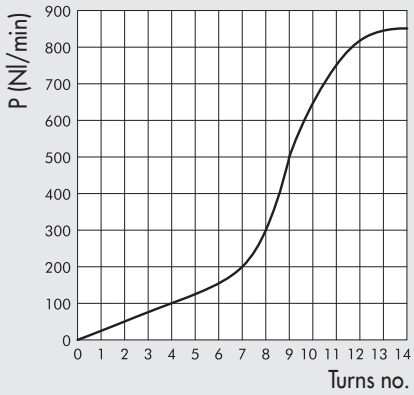
RFL L Ø 4



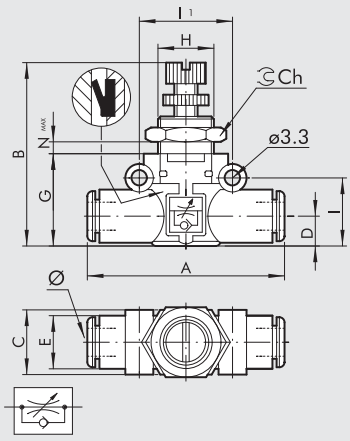
RFL L Ø 6



RFL L Ø 8

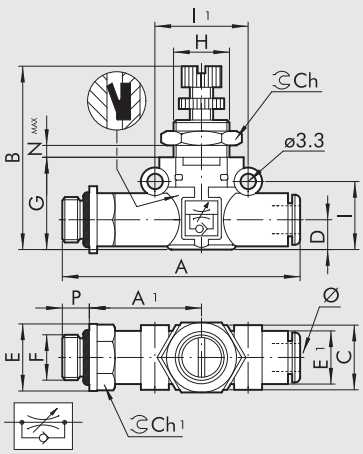


RFL L PIPE-PIPE UNIDIRECTIONAL



Code	Ref.	Ø	A	B	C	D	E	G	H	I	I1	Ch	Nmax
9041301	RFL L U 4-4	4	42	33.5-36.5	10.7	5.6	10	17.5	M9x0.75	12.8	16	11	4
9041316	RFL L U 6-6	6	49.4	36-41	14.7	6.4	11.4	20	M12x0.75	14.6	20	15	4
9041324	RFL L U 8-8	8	57.3	44-49	18.7	9.1	13.8	26	M15x1	18.7	24	20	4.5

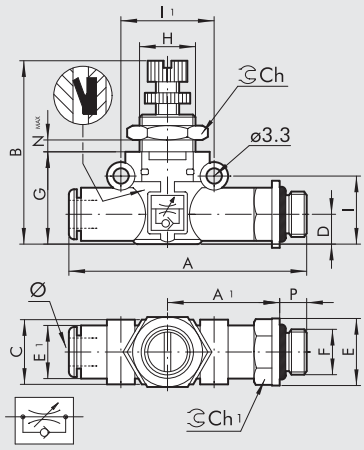
RFL L THREAD-PIPE UNIDIRECTIONAL CYLINDER VERSION



Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9041401	RFL L U M5-4	M5	4	4	47.7	22.7	33.5-36.5	10.7	5.6	9.9	10	17.5	M9x0.75	12.8	16	11	9	4
9041402	RFL L U 1/8-4	1/8	4	6	51.6	24.6	33.5-36.5	10.7	5.6	14	10	17.5	M9x0.75	12.8	16	11	12	4
9041408	RLF L U 1/8-6	1/8	6	6	58.5	27.8	36-41	14.7	6.4	14	11.4	20	M12x0.75	14.6	20	15	12	4
9041409	RFL L U 1/4-6	1/4	6	8	61.5	28.8	36-41	14.7	6.4	18	11.4	20	M12x0.75	14.6	20	15	14	4
9041410	RFL L U 1/8-8	1/8	8	6	66.2	31.8	44-49	18.7	9.1	15	13.8	26	M15x1	18.7	24	20	14	4.5
9041411	RFL L U 1/4-8	1/4	8	8	70.6	34.2	44-49	18.7	9.1	18	13.8	26	M15x1	18.7	24	20	14	4.5
9041412	RFL L U 3/8-8	3/8	8	9	72.2	34.8	44-49	18.7	9.1	22	13.8	26	M15x1	18.7	24	20	17	4.5

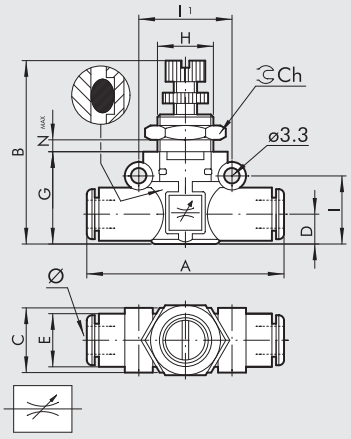
METAL WORK PNEUMATIC

RFL L PIPE-THREAD UNIDIRECTIONAL VALVE VERSION



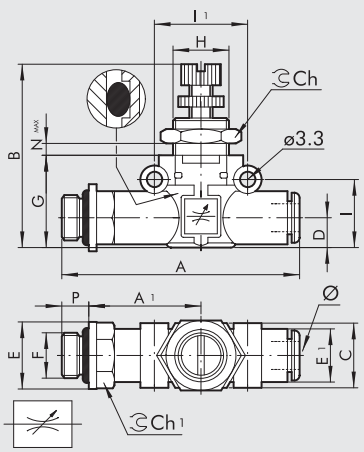
Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9041501	RFL L U 4-M5	4	M5	4	47.7	22.7	33.5-36.5	10.7	5.6	9.9	10	17.5	M9x0.75	12.8	16	11	9	4
9041502	RFL L U 4-1/8	4	1/8	6	51.6	24.6	33.5-36.5	10.7	5.6	14	10	17.5	M9x0.75	12.8	16	11	12	4
9041508	RFL L U 6-1/8	6	1/8	6	58.5	27.8	36-41	14.7	6.4	14	11.4	20	M12x0.75	14.6	20	15	12	4
9041509	RFL L U 6-1/4	6	1/4	8	61.5	28.8	36-41	14.7	6.4	18	11.4	20	M12x0.75	14.6	20	15	14	4
9041510	RFL L U 8-1/8	8	1/8	6	66.2	31.8	44-49	18.7	9.1	15	13.8	26	M15x1	18.7	24	20	14	4.5
9041511	RFL L U 8-1/4	8	1/4	8	70.6	34.2	44-49	18.7	9.1	18	13.8	26	M15x1	18.7	24	20	14	4.5
9041512	RFL L U 8-3/8	8	3/8	9	72.2	34.8	44-49	18.7	9.1	22	13.8	26	M15x1	18.7	24	20	17	4.5

RFL L PIPE-PIPE BIDIRECTIONAL



Code	Ref.	Ø	A	B	C	D	E	G	H	I	I1	Ch	Nmax
9041601	RFL L B 4-4	4	42	33.5-36.5	10.7	5.6	10	17.5	M9x0.75	12.8	16	11	4
9041616	RFL L B 6-6	6	49.4	36-41	14.7	6.4	11.4	20	M12x0.75	14.6	20	15	4
9041624	RFL L B 8-8	8	57.3	44-49	18.7	9.1	13.8	26	M15x1	18.7	24	20	4.5

RFL L THREAD-PIPE BIDIRECTIONAL



Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9041701	RFL L B M5-4	M5	4	4	47.7	22.7	33.5-36.5	10.7	5.6	9.9	10	17.5	M9x0.75	12.8	16	11	9	4
9041702	RFL L B 1/8-4	1/8	4	6	51.6	24.6	33.5-36.5	10.7	5.6	14	10	17.5	M9x0.75	12.8	16	11	12	4
9041708	RFL L B 1/8-6	1/8	6	6	58.5	27.8	36-41	14.7	6.4	14	11.4	20	M12x0.75	14.6	20	15	12	4
9041709	RFL L B 1/4-6	1/4	6	8	61.5	28.8	36-41	14.7	6.4	18	11.4	20	M12x0.75	14.6	20	15	14	4
9041710	RFL L B 1/8-8	1/8	8	6	66.2	31.8	44-49	18.7	9.1	15	13.8	26	M15x1	18.7	24	20	14	4.5
9041711	RFL L B 1/4-8	1/4	8	8	70.6	34.2	44-49	18.7	9.1	18	13.8	26	M15x1	18.7	24	20	14	4.5
9041712	RFL L B 3/8-8	3/8	8	9	72.2	34.8	44-49	18.7	9.1	22	13.8	26	M15x1	18.7	24	20	17	4.5

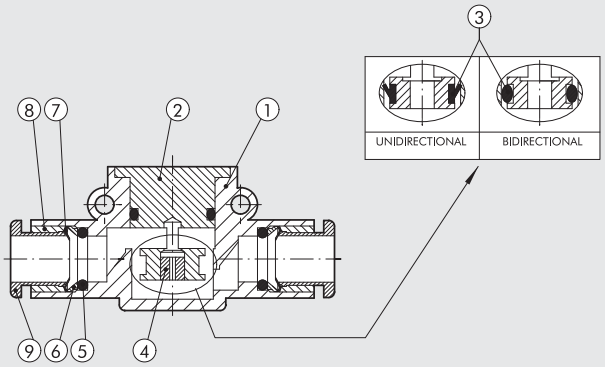
IN-LINE FIXED-REGULATION FLOW REGULATOR SERIES RFF L

The in-line fixed regulation flow regulator belongs to the LINE ON LINE® family and can be connected in series or in parallel with the other products in the same family. The RFF L regulates the flow of air, and hence the rate of operation of pneumatic actuators. Air flow is regulated by means of a choke with a calibrated diameter. A full range of diameters is available. The advantage of the RFF L over other adjustable versions is that there is no need for regulation during machine installation. Subsequent adjustments are not required either. Two versions are available. Version U (unidirectional) regulates the flow in one direction only. Version B (bidirectional) regulates the air flow in both directions. The flow regulator can be mounted in three different ways (see example below).

TECHNICAL DATA		Ø 4	Ø 6	Ø 8
Max. operating pressure	MPa		1	
	bar		10	
	psi		145	
Temperature range	°C		– 20 to + 60	
	°F		– 4 to + 140	
Choke flow rate	Nl/min		See table below	
Recommended pipe			Rilsan PA 11 - Nylon 6 - Polyamide 12 - Polypropylene	
Fluid			Lubricated or unlubricated filtered air	
Compatibility with oils			See **chapter Z1**	

COMPONENTS

① Technopolymer body
② Nickel-plated brass gasket holding insert
③ NBR gasket
④ Brass choke cartridge
⑤ NBR seal
⑥ Technopolymer spring ring
⑦ Stainless steel clip-on spring
⑧ Technopolymer stop bushing
⑨ Technopolymer release bushing



EXHAUST FLOW RATE AT 6.3 bar FOR VERSIONS C-U-V (Nl/min)

Choke (mm)	Ø 4	Ø 6	Ø 8
Ø 0.2	142	552	912
Ø 0.3	144	554	914
Ø 0.4	147	557	917
Ø 0.5	153	563	923
Ø 0.6	155	565	925
Ø 0.8	172	582	942
Ø 1.0	190	600	960
Ø 1.3	225	635	995
Ø 1.5	250	660	1020

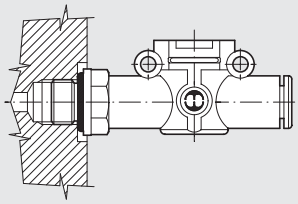
CHOKE FLOW-RATE AT 6 bar WITH RELIEF VALVE OPEN

Choke (mm)	Flow rate (Nl/min)
Ø 0.2	2
Ø 0.3	4
Ø 0.4	7
Ø 0.5	13
Ø 0.6	15
Ø 0.8	32
Ø 1.0	50
Ø 1.3	85
Ø 1.5	110

METAL WORK PNEUMATIC

ASSEMBLY OPTIONS

Ⓐ



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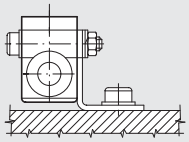

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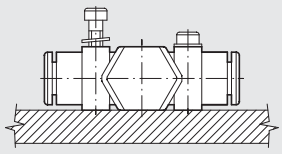
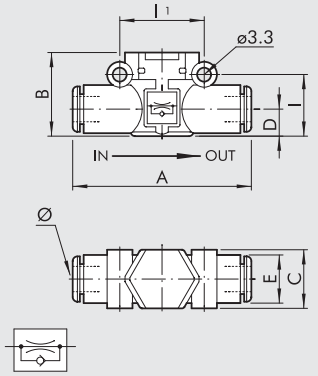


How to mount the RFF L:
- Fig. Ⓐ With the male threaded port it is possible to mount the RFF L straight onto the actuator or the control valve.
- Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
- Fig. Ⓒ There are two robust rings on the plastic body for fixing the RFF L straight onto the wall.

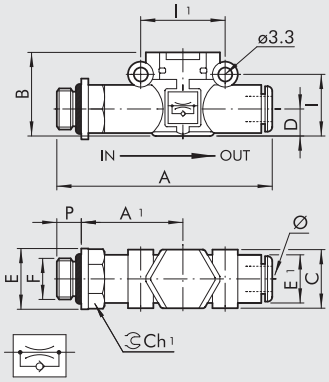
RFF L PIPE - PIPE UNIDIRECTIONAL



Code	Ref.	Ø	A	B	C	D	E	I	I1
9070U11_ _*	RFF-U L 4-4	4	42	17.5	10.7	5.6	10	12.8	16
9070U22_ _*	RFF-U L 6-6	6	49.4	20	14.7	6.4	11.4	14.6	20
9070U33_ _*	RFF-U L 8-8	8	57.3	25.5	18.7	9.1	13.8	18.7	24

* The last two digits indicate the narrowing Ø. To complete the code please look at the key to codes.

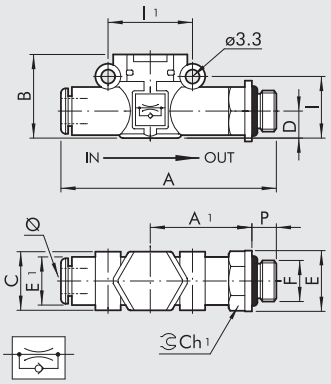
RFF L THREAD - PIPE UNIDIRECTIONAL CYLINDER VERSION



Code	Ref.	F	Ø	P	A	A1	B	C	E	E1	I	I1	Ch1
9070C51_ _*	RFF-C L M5 - Ø4	M5	4	4	47.7	22.7	17.5	10.7	9.9	10	12.8	16	9
9070C61_ _*	RFF-C L 1/8" - Ø4	1/8	4	6	51.6	24.6	17.5	10.7	14	10	12.8	16	12
9070C62_ _*	RFF-C L 1/8" - Ø6	1/8	6	6	58.5	27.8	20	14.7	14	11.4	14.6	20	12
9070C72_ _*	RFF-C L 1/4" - Ø6	1/4	6	8	61.5	28.8	20	14.7	18	11.4	14.6	20	14
9070C63_ _*	RFF-C L 1/8" - Ø8	1/8	8	6	66.2	31.8	25.5	18.7	15	13.8	18.7	24	14
9070C73_ _*	RFF-C L 1/4" - Ø8	1/4	8	8	70.6	34.2	25.5	18.7	18	13.8	18.7	24	14
9070C83_ _*	RFF-C L 3/8" - Ø8	3/8	8	9	72.2	34.8	25.5	18.7	22	13.8	18.7	24	17

* The last two digits indicate the narrowing Ø. To complete the code please look at the key to codes.

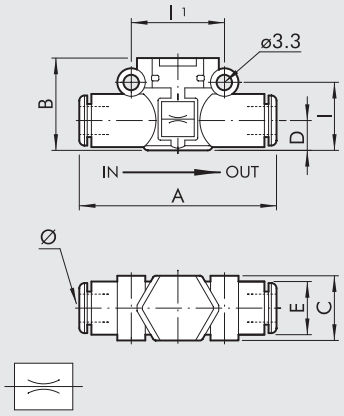
RFF L PIPE - THREAD UNIDIRECTIONAL VALVE VERSION



Code	Ref.	Ø	F	P	A	A1	B	C	E	E1	I	I1	Ch1
9070V15_ _*	RFF-V L Ø4 - M5	4	M5	4	47.7	22.7	17.5	10.7	9.9	10	12.8	16	9
9070V16_ _*	RFF-V L Ø4 - 1/8"	4	1/8	6	51.6	24.6	17.5	10.7	14	10	12.8	16	12
9070V26_ _*	RFF-V L Ø6 - 1/8"	6	1/8	6	58.5	27.8	20	14.7	14	11.4	14.6	20	12
9070V27_ _*	RFF-V L Ø6 - 1/4"	6	1/4	8	61.5	28.8	20	14.7	18	11.4	14.6	20	14
9070V36_ _*	RFF-V L Ø8 - 1/8"	8	1/8	6	66.2	31.8	25.5	18.7	15	13.8	18.7	24	14
9070V37_ _*	RFF-V L Ø8 - 1/4"	8	1/4	8	70.6	34.2	25.5	18.7	18	13.8	18.7	24	14
9070V38_ _*	RFF-V L Ø8 - 3/8"	8	3/8	9	72.2	34.8	25.5	18.7	22	13.8	18.7	24	17

* The last two digits indicate the narrowing Ø. To complete the code please look at the key to codes.

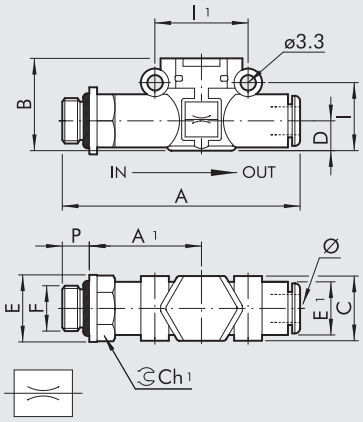
RFF L PIPE - PIPE BIDIRECTIONAL



Code	Ref.	Ø	A	B	C	D	E	I	I1
9070B11_ _*	RFF-B L 4-4	4	42	17.5	10.7	5.6	10	12.8	16
9070B22_ _*	RFF-B L 6-6	6	49.4	20	14.7	6.4	11.4	14.6	20
9070B33_ _*	RFF-B L 8-8	8	57.3	25.5	18.7	9.1	13.8	18.7	24

* The last two digits indicate the narrowing Ø. To complete the code please look at the key to codes.

RFF L THREAD - PIPE BIDIRECTIONAL



Code	Ref.	F	Ø	P	A	A1	B	C	E	E1	I	I1	Ch1
9070B51_ _*	RFF-B L M5 - Ø 4	M5	4	4	47.7	22.7	17.5	10.7	9.9	10	12.8	16	9
9070B61_ _*	RFF-B L 1/8" - Ø 4	1/8	4	6	51.6	24.6	17.5	10.7	14	10	12.8	16	12
9070B62_ _*	RFF-B L 1/8" - Ø 6	1/8	6	6	58.5	27.8	20	14.7	14	11.4	14.6	20	12
9070B72_ _*	RFF-B L 1/4" - Ø 6	1/4	6	8	61.5	28.8	20	14.7	18	11.4	14.6	20	14
9070B63_ _*	RFF-B L 1/8" - Ø 8	1/8	8	6	66.2	31.8	25.5	18.7	15	13.8	18.7	24	14
9070B73_ _*	RFF-B L 1/4" - Ø 8	1/4	8	8	70.6	34.2	25.5	18.7	18	13.8	18.7	24	14
9070B83_ _*	RFF-B L 3/8" - Ø 8	3/8	8	9	72.2	34.8	25.5	18.7	22	13.8	18.7	24	17

* The last two digits indicate the narrowing Ø. To complete the code please look at the key to codes.

KEY TO CODES

9070	B	11	02
TYPE	**FUNCTION**	**Ø IN - Ø OUT**	**Ø CHOKE**
9070 RFF L	**B** Bidirectional	■ **11** = Ø 4 - Ø 4	**02** = Ø 0.2
	C For cylinder	✱ **15** = Ø 4 - M5	**03** = Ø 0.3
	U Unidirectional	✱ **16** = Ø 4 - 1/8"	**04** = Ø 0.4
	V For valve	■ **22** = Ø 6 - Ø 6	**05** = Ø 0.5
		✱ **26** = Ø 6 - 1/8"	**06** = Ø 0.6
		✱ **27** = Ø 6 - 1/4"	**08** = Ø 0.8
		■ **33** = Ø 8 - Ø 8	**10** = Ø 1.0
		✱ **36** = Ø 8 - 1/8"	**13** = Ø 1.3
		✱ **37** = Ø 8 - 1/4"	**15** = Ø 1.5
		✱ **38** = Ø 8 - 3/8"	
		● **51** = M5 - Ø 4	
		● **61** = 1/8" - Ø 4	
		● **62** = 1/8" - Ø 6	
		● **63** = 1/8" - Ø 8	
		● **72** = 1/4" - Ø 6	
		● **73** = 1/4" - Ø 8	
		● **83** = 3/8" - Ø 8	

■ Only for **B** (bidirectional) and **U** (unidirectional) versions
✱ Only for **V** (valve) versions
● Only for **C** (cylinder) and **B** (bidirectional) versions

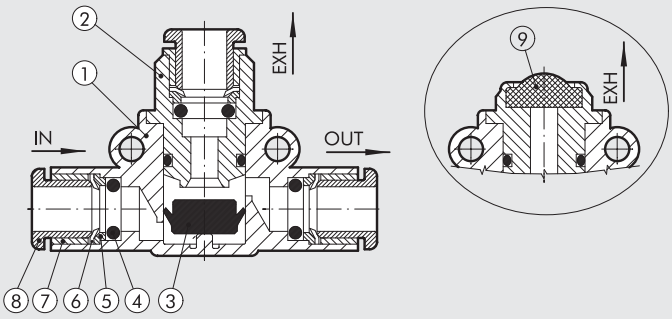
IN-LINE QUICK-EXHAUST VALVES SERIES VSR L

The VSR L quick-exhaust valve belongs to the LINE ON LINE® family, which means it can be connected to all the other components in series or in parallel.
Available in the version for pipe-pipe connection with two push-in fittings, and in the version for thread-pipe connection with a brass nickel-plated male thread and a push-in fitting.
Exhaust can be silenced using a STAINLESS steel wire silencer, or conveyed using a push-in fitting.

TECHNICAL DATA		Ø 4	Ø 6	Ø 8
Inlet pressure	MPa		0.1 - 1	
	bar		1 - 10	
	psi		14.5 - 145	
Temperature range	°C		–20 to +60	
	°F		–4 to +140	
Inlet flow rate at 6.3 bar ΔP 1 bar	Nl/min	50	270	400
Exhaust flow rate at 6.3 bar	Nl/min	100	700	1000
Recommended pipe		Rilsan PA 11 - Nylon 6 - Polyamide 12 - Polypropylene		
Fluid		Lubricated or unlubricated filtered compressed air; if used, must be continuous		
Compatibility with oils		See **chapter Z1**		

COMPONENTS

① Technopolymer body
② Nickel-plated brass insert
③ NBR valve
④ NBR gasket
⑤ Technopolymer spring ring
⑥ Stainless steel folding spring
⑦ Brass or technopolymer locking bushing
⑧ Technopolymer release bushing
⑨ Stainless steel wire silencer



ASSEMBLY OPTIONS

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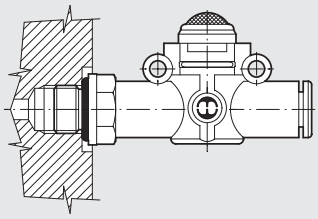

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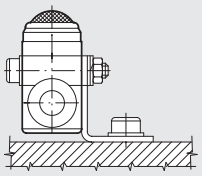

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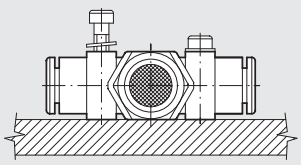
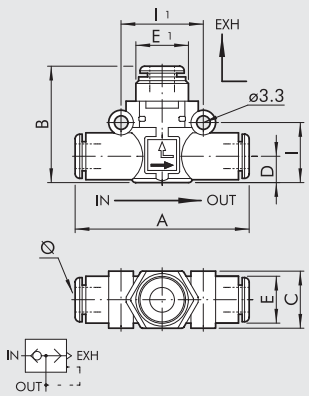


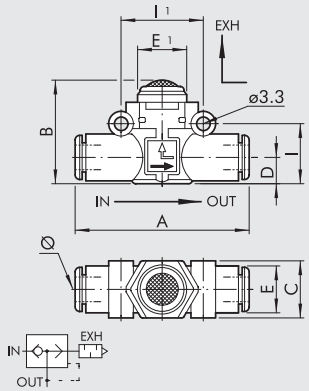
How to mount the VSR L:
• Fig. Ⓐ With the male threaded port it is possible to mount the VSR L straight onto the actuator.
• Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
• Fig. Ⓒ There are two robust rings on the plastic body for fixing the VSR L straight onto the wall.

VSR L PIPE-PIPE, CONVEYED EXHAUST



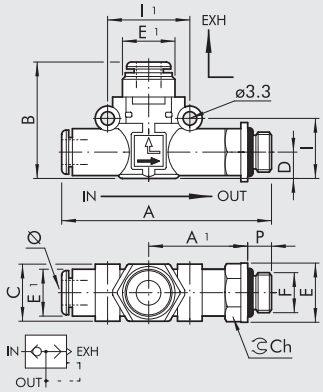
Code	Ref.	Ø	A	B	C	D	E	E1	I	I1
9063001	VSR L 4-4-4	4	41.8	25.8	10.7	5.6	10	9.7	12.8	16
9063016	VSR L 6-6-6	6	49.4	30.2	14.7	6.4	11.4	13	14.6	20
9063024	VSR L 8-8-8	8	57.3	35.9	18.7	9.1	13.8	15	18.7	24

VSR L PIPE-PIPE, SILENCED EXHAUST



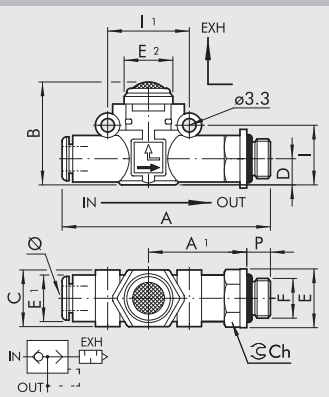
Code	Ref.	Ø	A	B	C	D	E	E1	I	I1
9063101	VSR L 4-4-SIL	4	41.8	19.8	10.7	5.6	10	10	12.8	16
9063116	VSR L 6-6-SIL	6	49.4	25.5	14.7	6.4	11.4	14	14.6	20
9063124	VSR L 8-8-SIL	8	57.3	31.5	18.7	9.1	13.8	18	18.7	24

VSR L PIPE-THREAD, CONVEYED EXHAUST



Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	E2	I	I1	Ch
9063201	VSR L 4-M5-4	4	M5	4	47.7	22.7	25.8	10.7	5.6	9.9	10	9.7	12.8	16	9
9063202	VSR L 4-1/8-4	4	1/8	6	50.6	24.6	25.8	10.7	5.6	14	10	9.7	12.8	16	12
9063208	VSR L 6-1/8-6	6	1/8	6	58.5	27.8	30.2	14.7	6.4	14	11.4	13	14.6	20	12
9063209	VSR L 6-1/4-6	6	1/4	8	61.5	28.8	30.2	14.7	6.4	18	11.4	13	14.6	20	14
9063210	VSR L 8-1/8-8	8	1/8	6	66.2	31.8	35.9	18.7	9.1	15	13.8	15	18.7	24	14
9063211	VSR L 8-1/4-8	8	1/4	8	70.6	34.2	35.9	18.7	9.1	18	13.8	15	18.7	24	14
9063212	VSR L 8-3/8-8	8	3/8	9	72.2	34.8	35.9	18.7	9.1	22	13.8	15	18.7	24	17

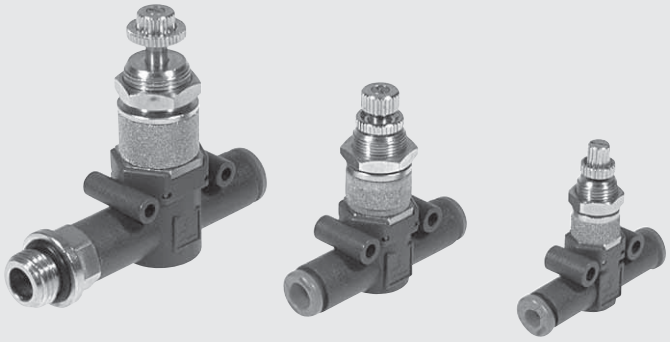
VSR L PIPE-THREAD, SILENCED EXHAUST



Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	E2	I	I1	Ch
9063301	VSR L 4-M5-SIL	4	M5	4	46.7	22.7	19.8	10.7	5.6	9.9	10	10	12.8	16	9
9063302	VSR L 4-1/8-SIL	4	1/8	6	50.6	24.6	19.8	10.7	5.6	14	10	10	12.8	16	12
9063308	VSR L 6-1/8-SIL	6	1/8	6	58.5	27.8	25.5	14.7	6.4	14	11.4	14	14.6	20	12
9063309	VSR L 6-1/4-SIL	6	1/4	8	61.5	28.8	25.5	14.7	6.4	18	11.4	14	14.6	20	14
9063310	VSR L 8-1/8-SIL	8	1/8	6	66.2	31.8	31.5	18.7	9.1	15	13.8	18	18.7	24	14
9063311	VSR L 8-1/4-SIL	8	1/4	8	70.6	34.2	31.5	18.7	9.1	18	13.8	18	18.7	24	14
9063312	VSR L 8-3/8-SIL	8	3/8	9	72.2	34.8	31.5	18.7	9.1	22	13.8	18	18.7	24	17

IN-LINE QUICK-EXHAUST VALVE WITH REGULATED EXHAUST SERIES VSRR L

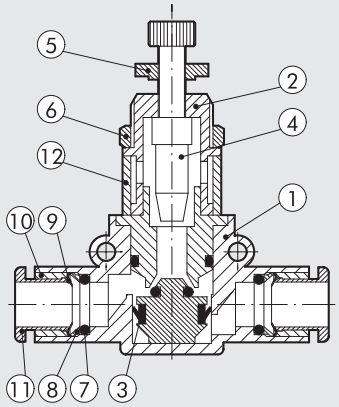
The VSRR L quick-exhaust valve with regulated exhaust belongs to the LINE ON LINE® family of products and can be linked in series or in parallel to all the other products.
It comes in a version for pipe-pipe connection, which includes two push-in fittings, and a version for thread-pipe connection, which includes a nickel-plated brass taper thread and push-in fitting.
The main feature of these valves is that the discharge flow can be adjusted via a pin regulator. This allows you to control the speed of the actuator connected to the valve, giving a higher speed than with an MRF regulator.



TECHNICAL DATA		Ø 4	Ø 6	Ø 8
Max. operating pressure	MPa		1	
	bar		10	
	psi		145	
Temperature range	°C		–20 to +60	
	°F		–4 to +140	
Max flow rate on regulation at 6.3 bar ΔP 1 bar	Nl/min	50	270	400
Flow rate on exhaust at 6.3 bar	Nl/min	170	460	960
Adjustment			Manual or using a screwdriver	
Internal system			Tapered needle	
Recommended pipe			Rilsan PA 11 - Nylon 6 - Polyamide 12 - Polypropylene	
Fluid			Lubricated or unlubricated filtered air	
Compatibility with oils			See **chapter Z1**	

COMPONENTS

① Technopolymer body
② Nickel-plated brass seal support
③ NBR gasket
④ Brass adjusting needle
⑤ Nickel-plated brass needle ring nut
⑥ Nickel-plated brass wall fixing ring nut
⑦ NBR seal
⑧ Technopolymer spring ring
⑨ Stainless steel clip-on spring
⑩ Technopolymer stop bushing
⑪ Technopolymer release bushing
⑫ Sintered bronze silencer



ASSEMBLY OPTIONS

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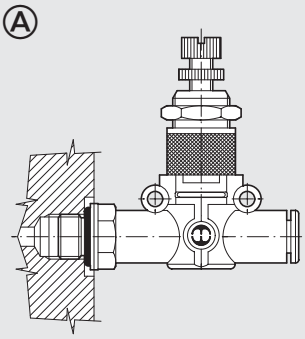

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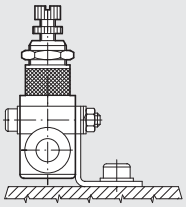

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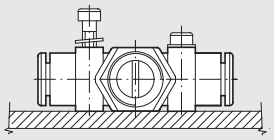

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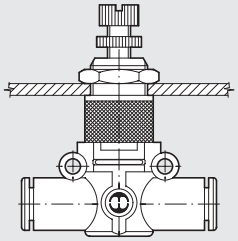
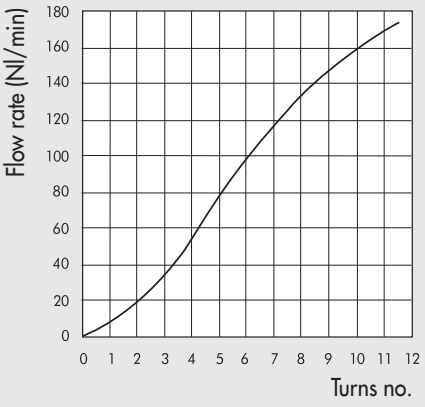


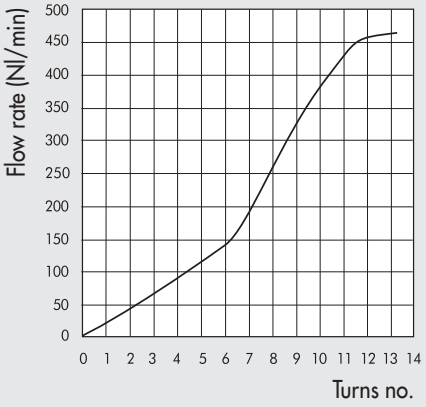
How to mount the VSRR L:
- Fig. Ⓐ With the male threaded port it is possible to mount the VSRR L straight onto the actuator or the control valve.
- Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
- Fig. Ⓒ There are two robust rings on the plastic body for fixing the VSRR L straight onto the wall.
- Fig. Ⓓ The ring nut is screwed onto the threaded metal part of the VSRR L body for panel mounting.

EXHAUST FLOW CHARTS VSRR L

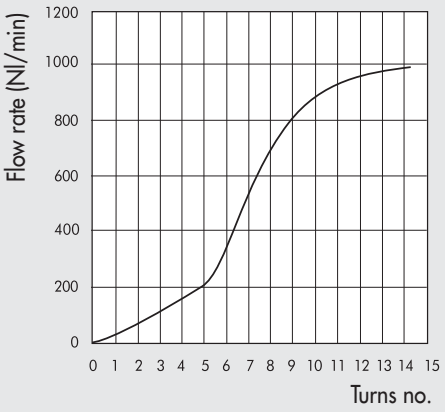
VSRR L Ø 4



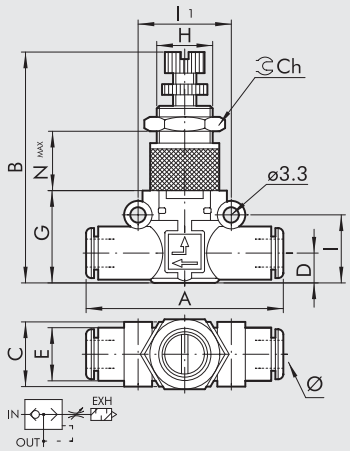
VSRR L Ø 6



VSRR L Ø 8

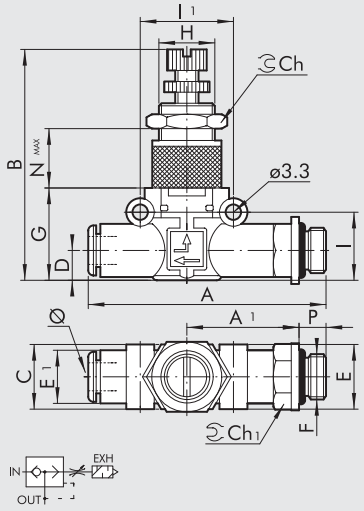


VSRR L PIPE-PIPE



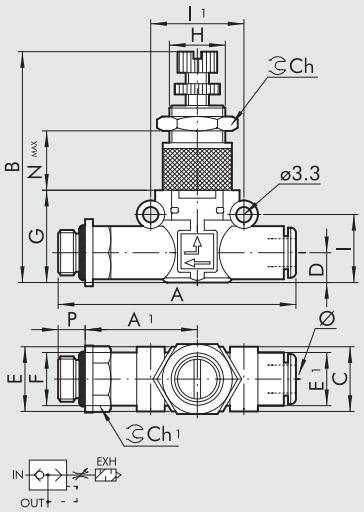
Code	Ref.	Ø	A	B	C	D	E	G	H	I	I1	Ch	Nmax
9063501	VSRR L 4-4	4	42	39.5-43.5	10.7	5.6	10	17.5	M9x0.75	12.8	16	11	11.5
9063516	VSRR L 6-6	6	49.4	47-52	14.7	6.4	11.4	20	M12x0.75	14.6	20	15	15.5
9063524	VSRR L 8-8	8	57.3	56-61.2	18.7	9.1	13.8	26	M15x1	18.7	24	17	18.5

VSRR L THREAD-PIPE



Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9063601	VSRR L M5-4	M5	4	4	47.7	22.7	39.5-43.5	10.7	5.6	9.9	10	17.5	M9x0.75	12.8	16	11	9	11.5
9063602	VSRR L 1/8-4	1/8	4	6	51.6	24.6	39.5-43.5	10.7	5.6	14	10	17.5	M9x0.75	12.8	16	11	12	11.5
9063608	VSRR L 1/8-6	1/8	6	6	58.5	27.8	47-52	14.7	6.4	14	11.4	20	M12x0.75	14.6	20	15	12	15.5
9063609	VSRR L 1/4-6	1/4	6	8	61.5	28.8	47-52	14.7	6.4	18	11.4	20	M12x0.75	14.6	20	15	14	15.5
9063610	VSRR L 1/8-8	1/8	8	6	66.2	31.8	56-61.2	18.7	9.1	15	13.8	26	M15x1	18.7	26	17	14	18.5
9063611	VSRR L 1/4-8	1/4	8	8	70.6	34.2	56-61.2	18.7	9.1	18	13.8	26	M15x1	18.7	26	17	14	18.5
9063612	VSRR L 3/8-8	3/8	8	9	72.2	34.8	56-61.2	18.7	9.1	22	13.8	26	M15x1	18.7	26	17	17	18.5

VSRR L PIPE-THREAD

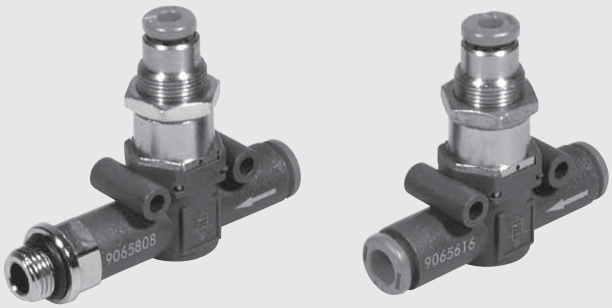


Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9063701	VSRR L 4-M5	4	M5	4	47.7	22.7	39.5-43.5	10.7	5.6	9.9	10	17.5	M9x0.75	12.8	16	11	9	11.5
9063702	VSRR L 4-1/8	4	1/8	6	51.6	24.6	39.5-43.5	10.7	5.6	14	10	17.5	M9x0.75	12.8	16	11	12	11.5
9063708	VSRR L 6-1/8	6	1/8	6	58.5	27.8	47-52	14.7	6.4	14	11.4	20	M12x0.75	14.6	20	15	12	15.5
9063709	VSRR L 6-1/4	6	1/4	8	61.5	28.8	47-52	14.7	6.4	18	11.4	20	M12x0.75	14.6	20	15	14	15.5
9063710	VSRR L 8-1/8	8	1/8	6	66.2	31.8	56-61.2	18.7	9.1	15	13.8	26	M15x1	18.7	26	17	14	18.5
9063711	VSRR L 8-1/4	8	1/4	8	70.6	34.2	56-61.2	18.7	9.1	18	13.8	26	M15x1	18.7	26	17	14	18.5
9063712	VSRR L 8-3/8	8	3/8	9	72.2	34.8	56-61.2	18.7	9.1	22	13.8	26	M15x1	18.7	26	17	17	18.5

NOTES

IN-LINE STOP VALVE SERIES STP L

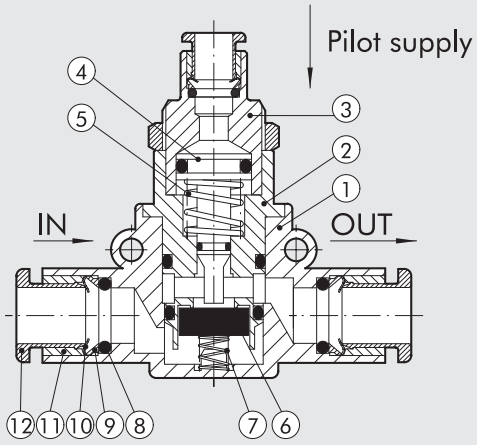
The STP L stop valve belongs to the LINE ON LINE® family and can be connected in series or in parallel with the other products in the same family. It is available in a version for pipe-pipe connection, which includes two push-in fittings, and a version for thread-pipe connection, which includes a nickel-plated brass male thread and a push-in fitting. The stop valve is normally mounted on the inlet port of cylinders and allows the flow of air only in the presence of a pneumatic pilot.
Cylinder movement ceases if there is a drop in pneumatic pilot pressure. The compressed air port is a push-in fitting for Ø 4 pipe. This stop valve is available in a unidirectional version, so the flow can be interrupted in one direction, but remains free in the other direction.
This valve can also be used as a unidirectional normally-closed 2/2 pneumatic control valve.



TECHNICAL DATA		Ø 6	Ø 8
Max. operating pressure	MPa	1	
	bar	10	
	psi	145	
Temperature range	°C	–20 to +60	
	°F	–4 to +140	
Recommended pipe		Rilsan PA 11 - Nylon 6 - Polyamide 12 - Polypropylene	
Fluid		Lubricated or unlubricated filtered air	
Compatibility with oils		See **chapter Z1**	

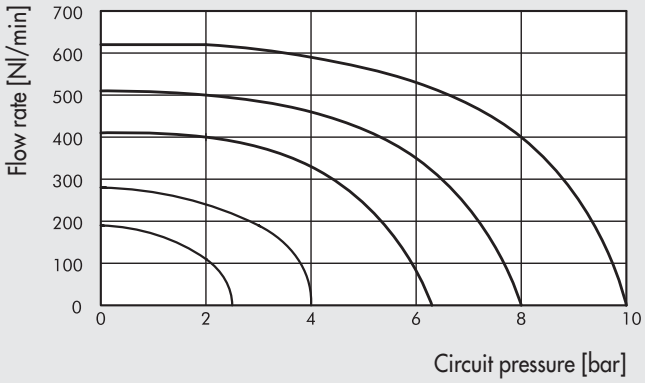
COMPONENTS

① Technopolymer body
② Nickel-plated brass insert
③ Nickel-plated brass pilot insert
④ Brass piston rod
⑤ Stainless steel clamping spring
⑥ NBR seal
⑦ Stainless steel poppet spring
⑧ NBR seal
⑨ Technopolymer spring ring
⑩ Stainless steel clip-on spring
⑪ Technopolymer stop bushing
⑫ Technopolymer release bushing

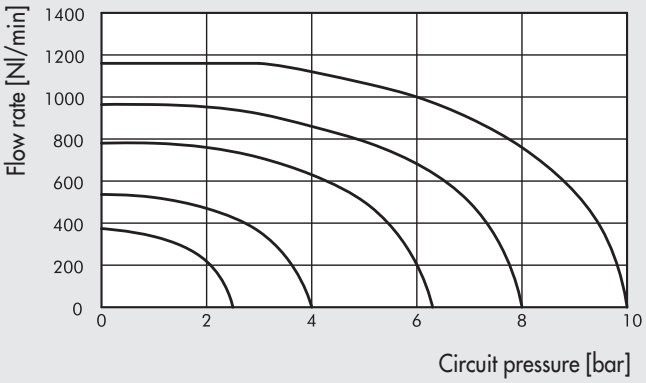


FLOW CHARTS

STP L Ø 6

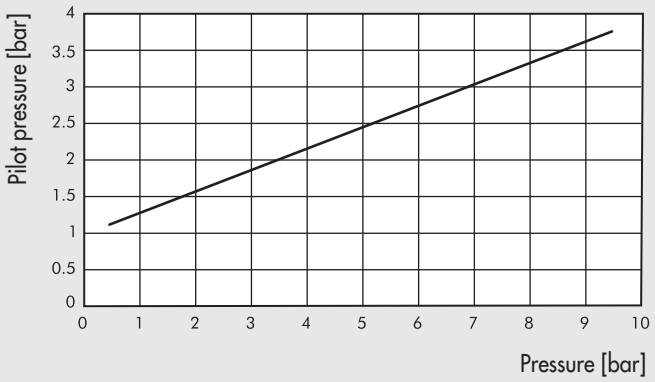


STP L Ø 8

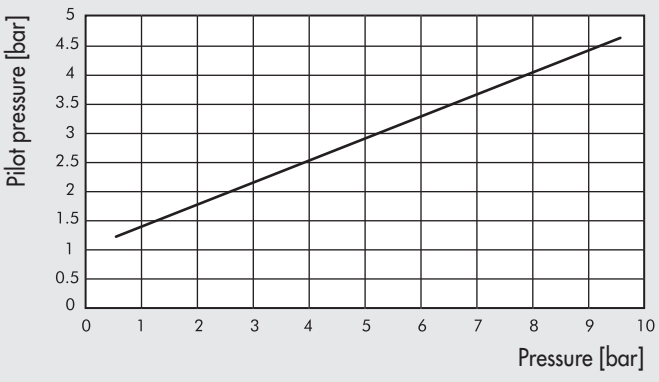


MINIMUM PILOT PRESSURE

STP L Ø 6



STP L Ø 8



ASSEMBLY OPTIONS

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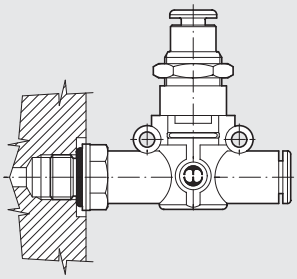

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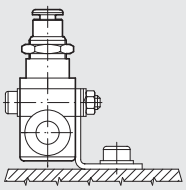

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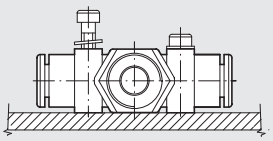

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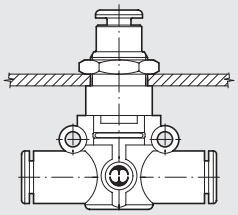
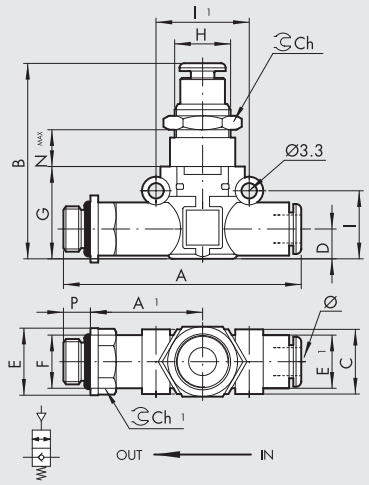


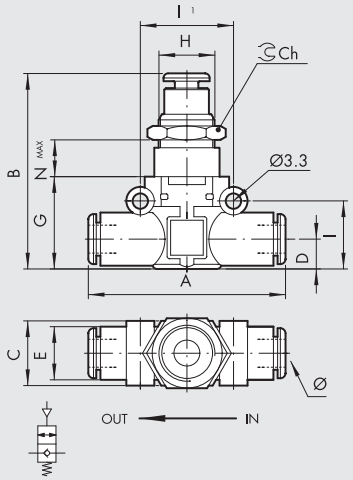
How to mount the STP L:
- Fig. Ⓐ With the male threaded port it is possible to mount the STP L straight onto the actuator or the control valve.
- Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
- Fig. Ⓒ There are two robust rings on the plastic body for fixing the STP L straight onto the wall.
- Fig. Ⓓ The ring nut is screwed onto the threaded metal part of the STP L body for panel mounting.

STP L 2/2 PIPE - PIPE



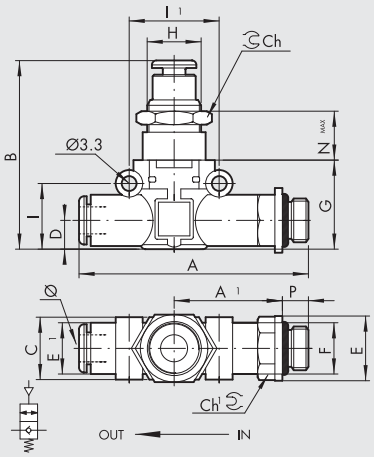
Code	Ref.	Ø	A	B	C	D	E	G	H	I	I1	Ch	Nmax
9065616	STP L 2/2 Ø6 - Ø6	6	49.4	43.2	14.7	6.4	11.4	20	M12x0.75	14.6	20	15	4.7
9065624	STP L 2/2 Ø8 - Ø8	8	57.3	49.7	18.7	9.1	13.8	26	M15x1	18.7	24	17	4

STP L 2/2 PIPE - THREAD



Code	Ref.	Ø	F	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9065808	STP L 2/2 Ø6 - 1/8	6	1/8	6	58.5	27.8	43.2	14.7	6.4	14	11.4	20	M12x0.75	14.6	20	15	12	4.7
9065809	STP L 2/2 Ø6 - 1/4	6	1/4	8	61.5	28.8	43.2	14.7	6.4	18	11.4	20	M12x0.75	14.6	20	15	14	4.7
9065810	STP L 2/2 Ø8 - 1/8	8	1/8	6	66.2	31.8	49.7	18.7	9.1	15	13.8	26	M15x1	18.7	24	17	14	4
9065811	STP L 2/2 Ø8 - 1/4	8	1/4	8	70.6	34.2	49.7	18.7	9.1	18	13.8	26	M15x1	18.7	24	17	14	4
9065812	STP L 2/2 Ø8 - 3/8	8	3/8	9	72.2	34.8	49.7	18.7	9.1	22	13.8	26	M15x1	18.7	24	17	17	4

STP L 2/2 THREAD - PIPE



Code	Ref.	F	Ø	P	A	A1	B	C	D	E	E1	G	H	I	I1	Ch	Ch1	Nmax
9065708	STP L 2/2 1/8 - Ø6	1/8	6	6	58.5	27.8	43.2	14.7	6.4	14	11.4	20	M12x0.75	14.6	20	15	12	4.7
9065709	STP L 2/2 1/4 - Ø6	1/4	6	8	61.5	28.8	43.2	14.7	6.4	18	11.4	20	M12x0.75	14.6	20	15	14	4.7
9065710	STP L 2/2 1/8 - Ø8	1/8	8	6	66.2	31.8	49.7	18.7	9.1	15	13.8	26	M15x1	18.7	24	17	14	4
9065711	STP L 2/2 1/4 - Ø8	1/4	8	8	70.6	34.2	49.7	18.7	9.1	18	13.8	26	M15x1	18.7	24	17	14	4
9065712	STP L 2/2 3/8 - Ø8	3/8	8	9	72.2	34.8	49.7	18.7	9.1	22	13.8	26	M15x1	18.7	24	17	17	4

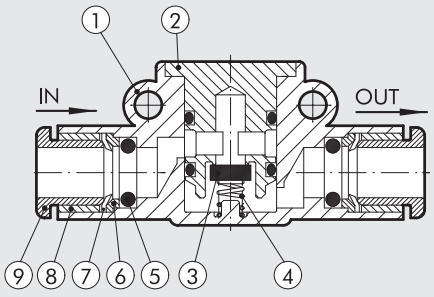
IN-LINE CHECK VALVE SERIES VNR L

The VNR L check valve belongs to the LINE ON LINE® family, which means it can be connected to all the other components in series or in parallel.
Available in the version for pipe-pipe connection with two push-in fittings, and in the version for thread-pipe connection with a brass nickel-plated male thread and a push-in fitting.
It is still the only check valve with holes for wall mounting.

TECHNICAL DATA		Ø 4	Ø 6	Ø 8
Operating pressure	MPa	0.05 - 1.2		
	bar	0.5 - 12		
	psi	7.2 - 174		
Temperature range	°C	–20 to +60		
	°F	–4 to +140		
Flow rate at 6.3 bar ΔP 1 bar	Nl/min	80	320	480
Recommended pipe		Rilsan PA11 - Nylon 6 - Polyamide 12 - Polypropylene		
Fluid		Lubricated or unlubricated filtered compressed air		

COMPONENTS

① Technopolymer body
② Nickel-plated brass insert
③ NBR valve
④ Stainless steel valve compression spring
⑤ NBR gasket
⑥ Technopolymer spring ring
⑦ Stainless steel folding spring
⑧ Technopolymer locking bushing
⑨ Technopolymer release bushing



ASSEMBLY OPTIONS

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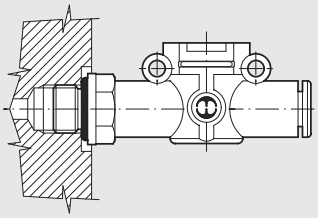

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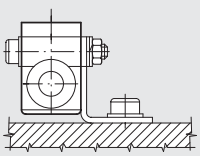

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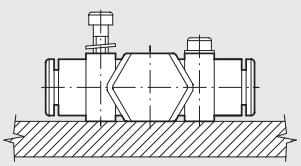
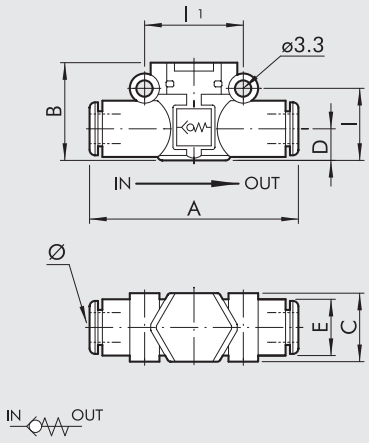


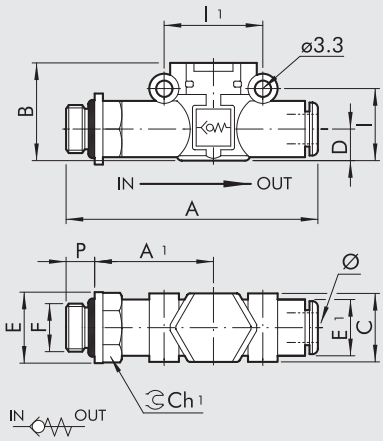
How to mount the VNR L:
• Fig. Ⓐ With the male threaded port it is possible to mount the VNR L straight onto the female thread.
• Fig. Ⓑ Fixing to the plate with the special SQU L bracket.
• Fig. Ⓒ There are two robust rings on the plastic body for fixing the VNR L straight onto the wall.

VNR L PIPE-PIPE



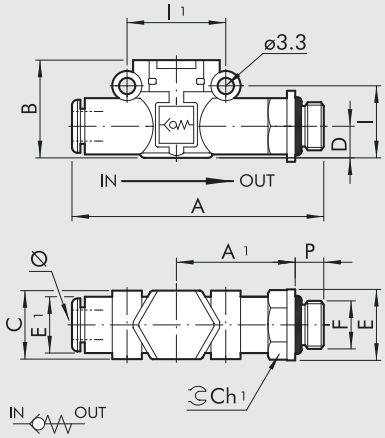
Code	Ref.	Ø	A	B	C	D	E	I	I1
9064001	VNR L 4-4	4	41.8	17.5	10.7	5.6	10	12.8	16
9064016	VNR L 6-6	6	49.4	20	14.7	6.4	11.4	14.6	20
9064024	VNR L 8-8	8	57.3	25.5	18.7	9.1	13.8	18.7	24

VNR L THREAD-PIPE



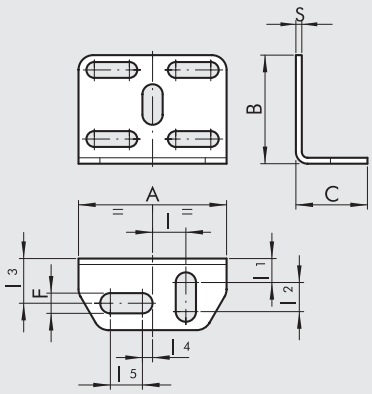
Code	Ref.	F	Ø	P	A	A1	B	C	E	E1	I	I1	Ch1
9064101	VNR L M5-4	M5	4	4	47.7	22.7	17.5	10.7	9.9	10	12.8	16	9
9064102	VNR L 1/8-4	1/8	4	6	50.6	24.6	17.5	10.7	14	10	12.8	16	12
9064108	VNR L 1/8-6	1/8	6	6	58.5	27.8	20	14.7	14	11.4	14.6	20	12
9064109	VNR L 1/4-6	1/4	6	8	61.5	28.8	20	14.7	18	11.4	14.6	20	14
9064110	VNR L 1/8-8	1/8	8	6	66.2	31.8	25.5	18.7	15	13.8	18.7	24	14
9064111	VNR L 1/4-8	1/4	8	8	70.6	34.2	25.5	18.7	18	13.8	18.7	24	14
9064112	VNR L 3/8-8	3/8	8	9	72.2	34.8	25.5	18.7	22	13.8	18.7	24	17

VNR L PIPE-THREAD



Code	Ref.	Ø	F	P	A	A1	B	C	E	E1	I	I1	Ch1
9064201	VNR L 4-M5	4	M5	4	47.7	22.7	17.5	10.7	9.9	10	12.8	16	9
9064202	VNR L 4-1/8	4	1/8	6	50.6	24.6	17.5	10.7	14	10	12.8	16	12
9064208	VNR L 6-1/8	6	1/8	6	58.5	27.8	20	14.7	14	11.4	14.6	20	12
9064209	VNR L 6-1/4	6	1/4	8	61.5	28.8	20	14.7	18	11.4	14.6	20	14
9064210	VNR L 8-1/8	8	1/8	6	66.2	31.8	25.5	18.7	15	13.8	18.7	24	14
9064211	VNR L 8-1/4	8	1/4	8	70.6	34.2	25.5	18.7	18	13.8	18.7	24	14
9064212	VNR L 8-3/8	8	3/8	9	72.2	34.8	25.5	18.7	22	13.8	18.7	24	17

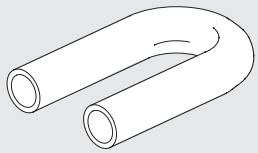
FIXING SQUARE KIT



Code	Description	A	B	C	F	I	I1	I2	I3	I4	I5	S
9062110	SQU L	30	22	14.5	4.2	6.8	4.8	5.9	9.1	2	6.5	1.2

NOTE: comes with two m3x16 screws (for L.O.L. Ø 6 - 8), two m3 hexagonal nuts, 2 groovers, 4 washers.

U-BOLT



Code	Description
9062216	TUB L 6-6
9062224	TUB L 8-8

NOTES

NOTES

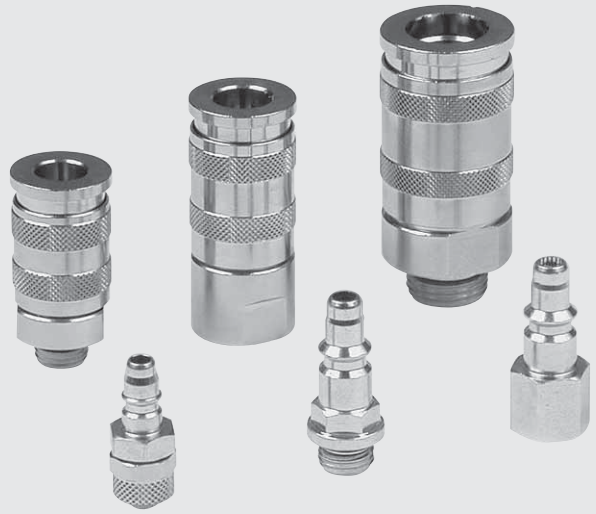
SUMMARY COUPLINGS

- **COMPRESSED AIR QUICK-FIT COUPLING SERIES IAC** E2.2

- **QUICK-FIT COUPLING FOR MOULD CONDITIONING SERIES ICS** E2.6

COMPRESSED AIR QUICK-FIT COUPLING SERIES IAC

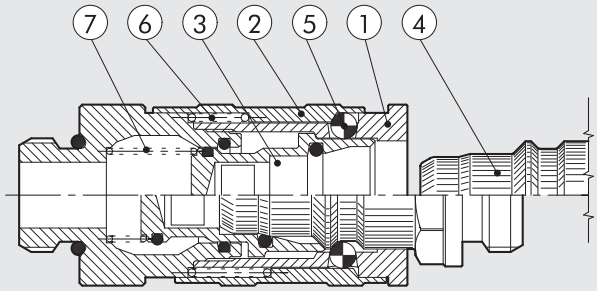
The compressed air quick-fit coupling by Metal Work allows quick replacement of pneumatic equipment (drills, milling machines, screwers and actuators in general) without having to set the line pressure to zero each time. Rapid tool changeover can be easily obtained by fitting a female body on the branch under pressure and the male coupling on the actuator. The presence of a female coupling with a safety valve on the branch under pressure prevents air dispersion during disconnection.



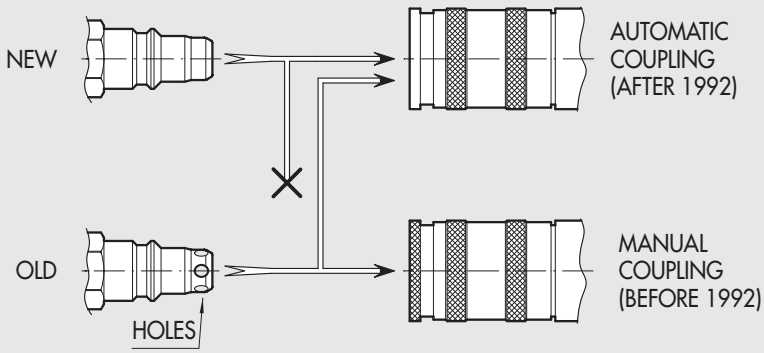
TECHNICAL DATA		MINI		100	200	300
Threaded coupling		1/8″	1/4″	1/4″	3/8″	1/2″
Maximum inlet pressure	MPa	3			3	
	bar	30			30	
	psi	435			435	
Flow rate at 6 bar (0.6 MPa - 87 psi) ΔP 1 bar (0.1 MPa - 14 psi)	Nl/min	480		750	1450	1750
Maximum temperature	°C	80			80	
	°F	176			176	

COMPONENTS

① Body: nickel-plated brass
② Ring nut: nickel-plated brass
③ Valve: nickel-plated brass
④ Coupling: carbonitrured and zinc-plated steel
⑤ Ball: stainless steel
⑥ Ring nut spring: AISI 302
⑦ Valve spring: AISI 302

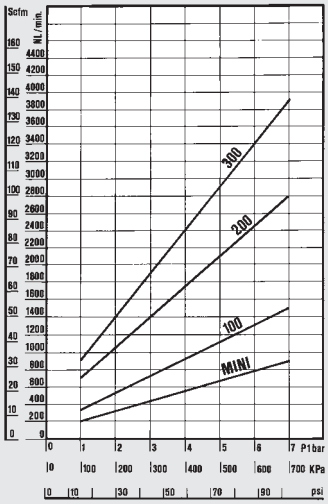


The actual male couplings don't have lateral holes. They cannot be coupled with the manual ports old production.

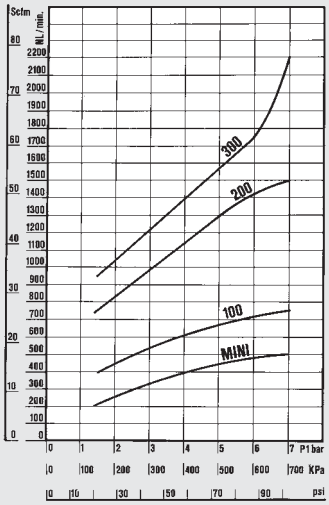


FLOW CHARTS

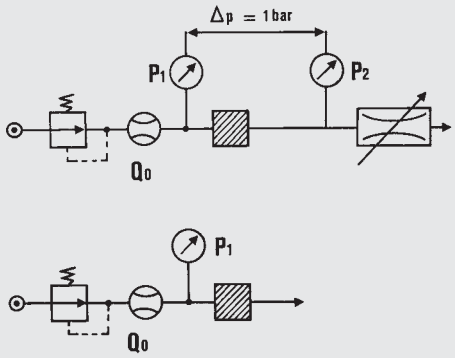
CURVE WITH ΔP = 1 bar



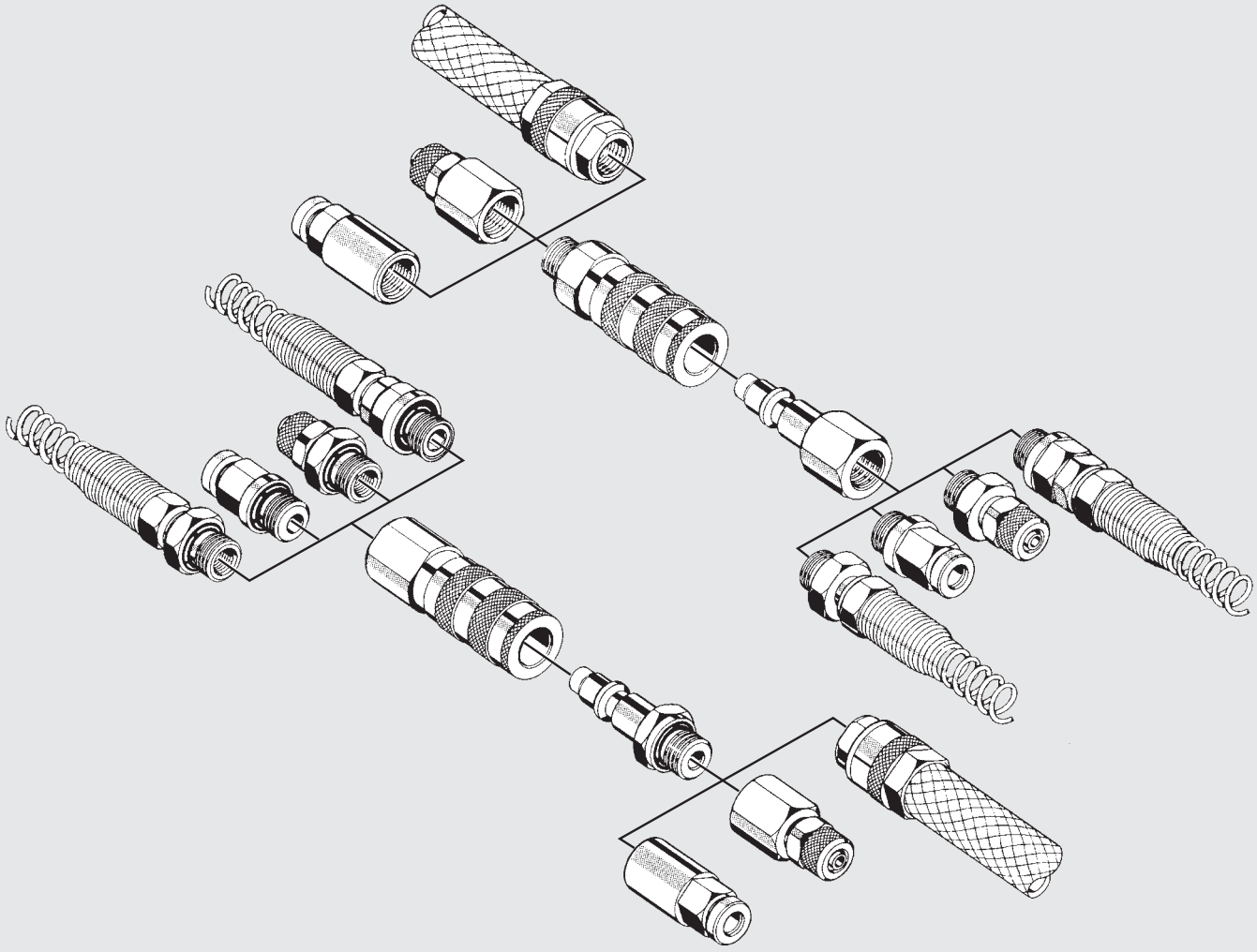
CURVE WITH FREE EXHAUST



FLOW TEST DIAGRAMS

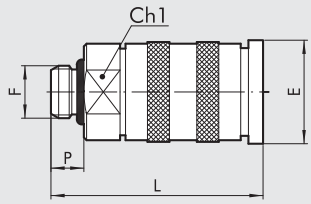


TYPICAL ASSEMBLIES



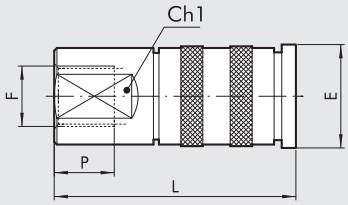
OVERALL DIMENSIONS AND ORDERING CODES

QUICK-FIT PORT, MALE



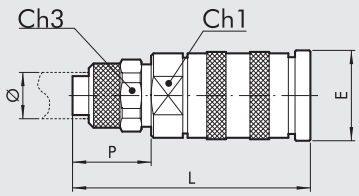
Code	Ref.	Mod.	F	Ch1	P	L	E	O-ring
0101001	01	mini	1/8	16	6.0	38.0	18.8	2031
0101002	02	mini	1/4	16	8.0	40.0	18.8	2043
0201101	101	100	1/4	21	8.0	50.0	24.4	2043
0301201	201	200	3/8	23	9.0	57.6	26.4	2056
0300202	201/A	200	1/4	23	8.0	56.6	26.4	2043
0401301	301	300	1/2	30	11.0	70.8	33.0	3068

QUICK-FIT PORT, FEMALE



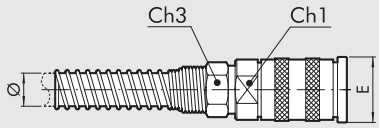
Code	Ref.	Mod.	F	Ch1	P	L	E
0101003	03	mini	1/8	16	7.0	40.5	18.8
0101004	04	mini	1/4	16	8.0	42.0	18.8
0201102	102	100	1/4	21	8.0	52.0	24.4
0301202	202	200	3/8	23	10.0	60.7	26.4
0401302	302	300	1/2	30	11.0	73.8	33.0

QUICK-FIT PORT, NYLON PIPE



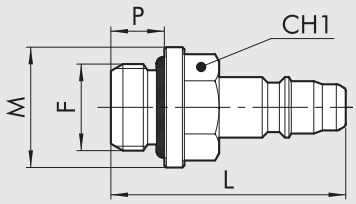
Code	Ref.	Mod.	Ø	Ch1	Ch3	P	L	E
0101005	05	mini	6/4	16	12	14.0	46.0	18.8
0101006	06	mini	8/6	16	14	14.0	46.0	18.8

QUICK-FIT PORT, NYLON PIPE WITH SPRING



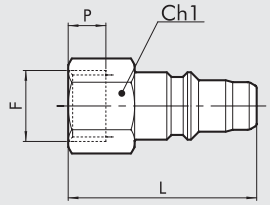
Code	Ref.	Mod.	Ø	Ch1	Ch3	E
0101007	07	mini	6/4	16	12	18.8
0101008	08	mini	8/6	16	14	18.8

QUICK-FIT COUPLING, MALE



Code	Ref.	Mod.	F	Ch1	P	L	M	O-ring
0102011	11	mini	1/8	13	6.0	29.3	15	2031
0102012	12	mini	1/4	14	8.0	32.7	18	2043
0202111	111	100	1/4	14	8.0	42.2	18	2043
0302211	211	200	3/8	17	9.0	45.8	20	2056
0303205	211/A	200	1/4	16	8.0	46.2	18	2043
0402311	311	300	1/2	22	11.0	55.2	26	3068

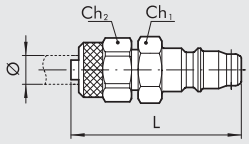
QUICK-FIT COUPLING, FEMALE



Code	Ref.	Mod.	F	Ch1	P	L
0102013	13	mini	1/8	14	7.0	29.5
0102014	14	mini	1/4	17	8.0	30.5
0202112	112	100	1/4	17	8.0	42.0
0302212	212	200	3/8	20	10.0	48.0
0402312	312	300	1/2	24	11.0	55.0

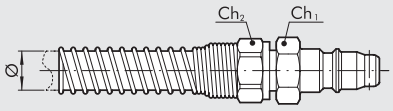
METAL WORK PNEUMATIC

QUICK-FIT COUPLING, NYLON PIPE



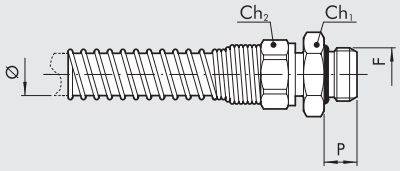
Code	Ref.	Mod.	Ø	Ch1	Ch2	L
0102015	15	mini	6/4	12	12	35.5
0102016	16	mini	8/6	14	14	35.5

QUICK-FIT COUPLING, NYLON PIPE WITH SPRING



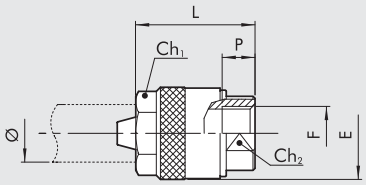
Code	Ref.	Mod.	Ø	Ch1	Ch2
0102017	17	mini	6/4	12	12
0102018	18	mini	8/6	14	14

NYLON PIPE FITTING WITH SPRING



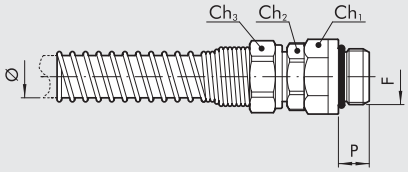
Code	Ref.	F	Ø	Ch1	Ch2	P
0010001	C1/Z	1/4	8/6	18	14	8
0010002	C1/Z	3/8	8/6	21	14	9
0010003	C1/Z	1/4	10/8	18	17	8
0010004	C1/Z	3/8	10/8	21	17	9
0010005	C1/Z	3/8	12/8	21	19	9

HOSE FITTING



Code	Ref.	F	Ø	Ch1	Ch2	P	L	E
2601001	40	1/4	6x14	18	16	8.0	29.0	23.0
2601002	41	1/4	8x17	21	16	8.0	31.0	25.0
2601003	42	1/4	10x19	23	17	8.0	31.0	27.0
2601004	43	1/2	13x23	27	24	11.0	35.5	31.0

SWIVEL NYLON PIPE FITTING WITH SPRING



Code	Ref.	F	Ø	Ch1	Ch2	Ch3	P	O-ring
2501010	50	1/4	6/4	16	14	12	8.0	2043
2501011	51	1/4	8/6	16	14	14	8.0	2043
2501012	52	3/8	10/8	19	17	17	9.0	2056
2501013	53	3/8	12/10	19	17	19	9.0	2056

NOTES

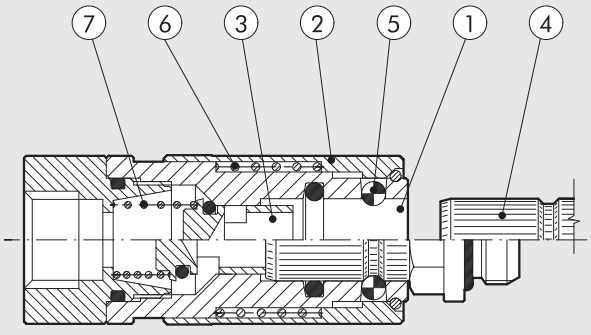
QUICK-FIT COUPLING FOR MOULD CONDITIONING SERIES ICS

The mould conditioning coupling was specifically designed to speed up and facilitate the replacement of moulds in injection moulding machines. Rapid mould changeover can be easily obtained by fitting a female body at the end of the pipes conveying the thermoregulating fluid and a male coupling to the moulds. With this configuration, each mould can be connected and disconnected from the thermoregulation circuit rapidly. The presence of a female coupling with a safety valve on the pipework prevents the outflow of fluid when coupling with or releasing from the mould.

TECHNICAL DATA		501 V with valve	401 V with valve	503 V without valve	403 V without valve
Threaded coupling		1/8″	1/4″	1/8″	1/4″
Maximum temperature at: 1.8 MPa; 18 bar; 261 psi	°F	+248			
	°C	+120			
Minimum temperature at: 1.8 MPa; 18 bar; 261 psi	°F	–68			
	°C	–20			
Maximum pressure	MPa	1.8			
	bar	18			
	psi	261			
Type of gasket		FKM/FPM			

COMPONENTS

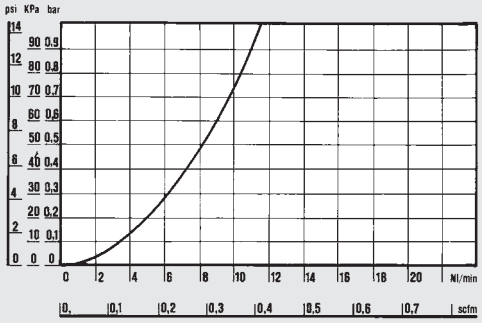
① Body: nickel-plated brass
② Ring nut: nickel-plated brass
③ Valve: nickel-plated brass
④ Coupling: nickel-plated brass
⑤ Ball: stainless steel
⑥ Ring nut spring: AISI 302
⑦ Valve spring: AISI 302



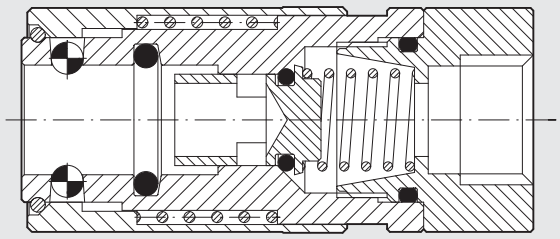
ICS WATER FLOW CHARTS WITH SAFETY VALVE

ICS/500 1/8"

ΔP - Pressure

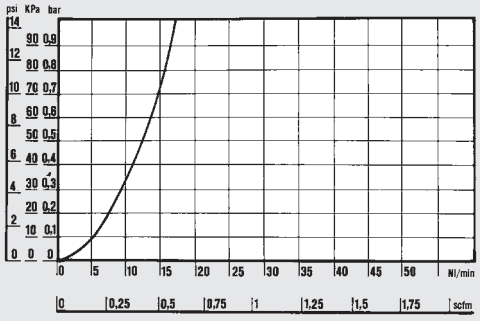


Flow rate



ICS/400 1/4"

ΔP - Pressure



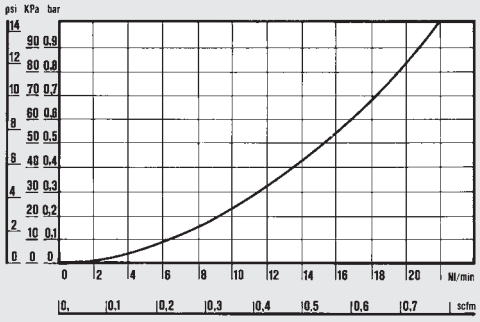
Flow rate

WITH SAFETY VALVE
The female body with safety valve prevents the outflow of thermoregulator fluid when coupling with or releasing from the mould.

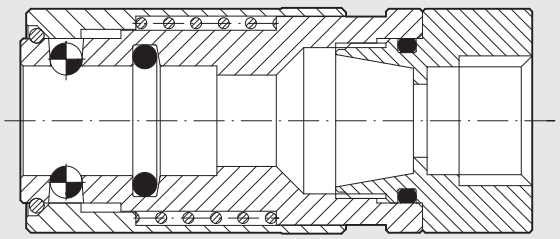
ICS WATER FLOW CHARTS WITHOUT SAFETY VALVE

ICS/500 1/8"

ΔP - Pressure

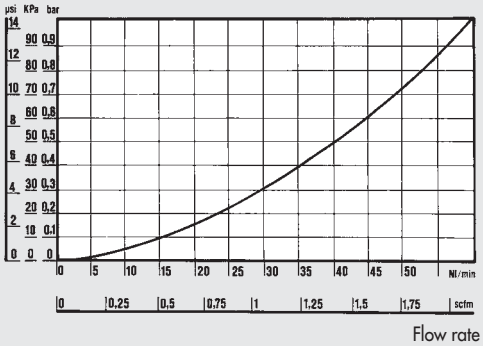


Flow rate



ICS/400 1/4"

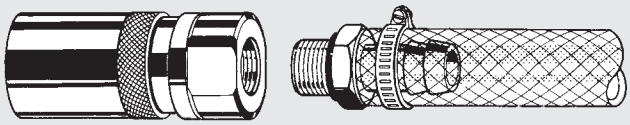
ΔP - Pressure



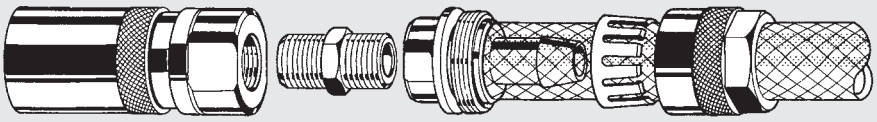
Flow rate

WITHOUT SAFETY VALVE
A version having a female body without a safety valve is available for when a high flow rate is required. This version allows a greater thermoregulator fluid flow rate but does not act as a fluid check valve when coupling with or releasing from the mould.

GENERAL FEATURES



Female body plus conventional hose fitting (pipe locked with metal circlip).



Female body plus self-locking hose fitting patented by Metal Work. When the outer ring nut is tightened, the gripper locks on the pipe.

FIG. A

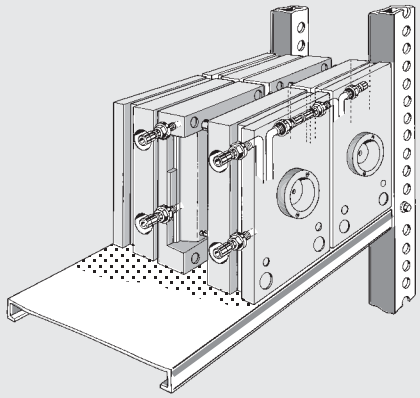


FIG. 1

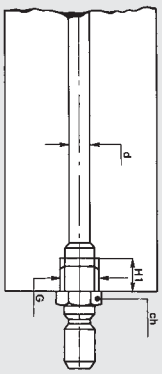
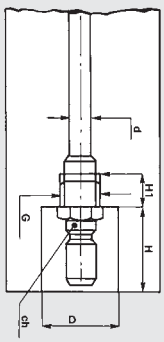


FIG. 2



The male fitting should be coupled with the mould so that it remains embedded (Fig. 2-4). This saves space and protects the coupling. The mould has no projecting parts, which would occupy more space on the storage shelving (Fig. A).

d	G	H1	Ch	D	H
4/6	1/8	7	13	20	23
7/9	1/4	9	14	26	30

FIG. B

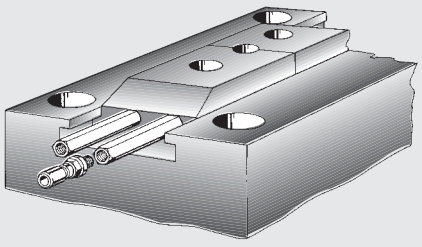


FIG. 3

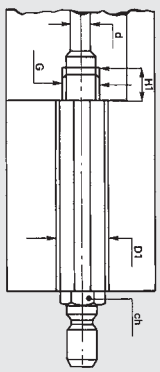
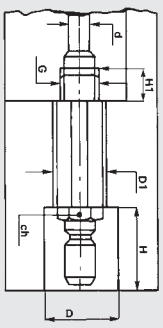


FIG. 4

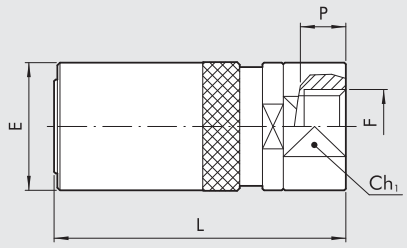


The Extension (see A25 fittings) is available as an accessory. It is extremely useful when parts inside the moulds need to be thermoregulated or when the presence of trucks makes it impossible to connect the moulds to the rubber pipe. (Fig. B).

d	G	H1	Ch	D	H	D1
4/6	1/8	7	13	20	23	17
7/9	1/4	9	14	26	30	21

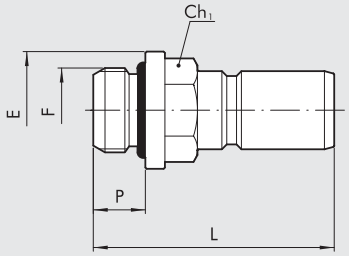
OVERALL DIMENSIONS AND ORDERING CODES

FEMALE PORT



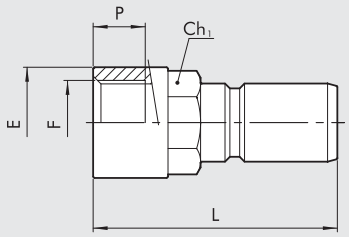
Code	Ref.	F	Safety valve	Ch1	P	L	E
0601040	501V	1/8	yes	16	7.0	45.0	19.0
0501040	401V	1/4	yes	21	8.0	56.0	25.0
0600040	503V	1/8	no	16	7.0	45.0	19.0
0500040	403V	1/4	no	21	8.0	56.0	25.0

MALE COUPLING



Code	Ref.	F	Ch1	P	L	E	O-ring FKM/FPM
0602001	511	1/8	13	6.0	28.5	15.0	2031
0502001	411	1/4	14	8.0	37.0	18.0	2043

FEMALE COUPLING



Code	Ref.	F	Ch1	P	L	E
0602002	512	1/8	12	7.0	28.0	14
0502002	412	1/4	14	8.0	37.5	17

NOTES

NOTES

SUMMARY FLOW REGULATOR

- **INTRODUCTION FLOW MICRO-REGULATOR** E3.2

- **FLOW MICRO-REGULATOR SERIES COMPACT N and COMPACT O** E3.4

- **FLOW MICRO-REGULATOR SERIES MRF HIGH-FLOW** E3.13

- **FLOW MICRO-REGULATOR SERIES MRF PUSH-LOCK** E3.15

- **IN-LINE FLOW MICRO-REGULATOR SERIES RFL L** E1.23

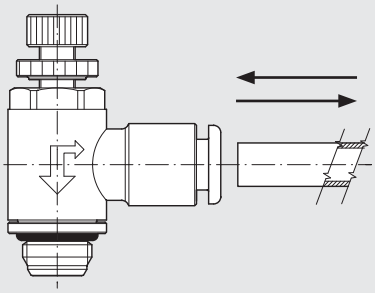
- **IN-LINE FLOW REGULATOR SERIES RFL** E3.17

INTRODUCTION FLOW MICRO-REGULATOR

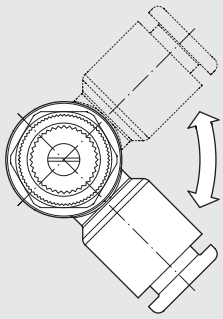
The job of flow microregulators is to regulate speed in the pneumatic cylinders. The configuration of both type C (to be mounted on the cylinder inlet) and type V (to be mounted on the valve port) is such as to ensure full flow on feed and regulated flow on discharge. Type B (bidirectional) can be used to regulate the flow both on feed and discharge. Flow microregulators are divided into 4 series:

- **MRF COMPACT O**: can be adjusted using a screwdriver; the regulation pin is lubrified with a particular antivivration grease; it has reduced dimensions and fine adjustment in the first turns; adjustgment can be prevented by assembling a disposable cap (supplied separately) that can be removed using a tool.
- **MRF COMPACT N**: can be adjusted using the knob and/or screwdriver; adjustment can be prevented by tightening the ring nut; it has the same regulation curve as those in series O.
- **MRF HIGH-FLOW**: can be adjusted using the knob and/or screwdriver; adjustment can be prevented by tightening the ring nut; it is ideal for use in installations requiring high flow rates both on regulation and discharge. Available in 1/8" and 1/4" and with a technopolymer ring.
- **MRF PUSH-LOCK**: it is the only one in the MRF series with a PUSH-LOCK knob, that can be replaced by an anti-tampering knob (supplied separately). Available in 1/8" and 1/4" and with a technopolymer ring.

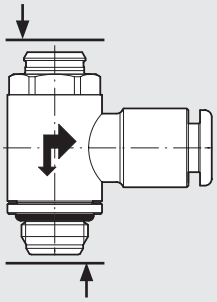
All the MRF with a pipe engage-release system of the latest generation that facilitates detachment of the pipe even under difficult operating conditions.



The rings can be rotated even with the MRF installed, which means that they can be mounted with the pipe facing towards any direction.

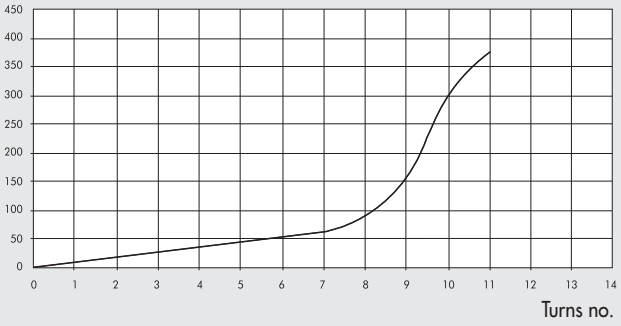


Special focus has been placed on miniaturisation of the components (mainly for COMPACT MRF series O), which saves considerable space.



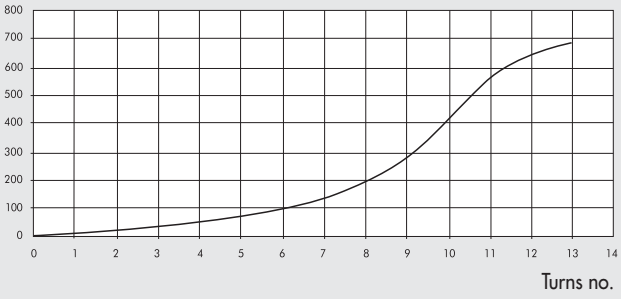
FLOW CHARTS

Flow rate (Nl/min)

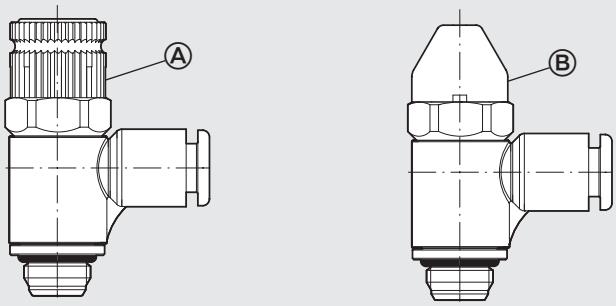


The regulation curve in the MRF series COMPACT N, COMPACT O and PUSH-LOCK takes place in two sections: in the first half of the flash pin stroke for very fine regulation and relatively low flow rates; in the second half, the flash pin quickly opens the passage so as to reach the maximum flow rate quickly.

Flow rate (Nl/min)



The regulation curve in the MRF series HIGH-FLOW is divided into 3 sections: regulation is particularly accurate along the entire flash pin stroke and the maximum flow rate is reached at a good steady rate; in this way, the user can choose the solution which best fits the specific application.



A major innovative aspect of the new MRF is the possibility of using the PUSH-LOCK series that can be mounted with either a push-lock (A) or an anti-tampering knob (B). The push-lock knob prevents decalibration of the MRF due to vibration or incorrect torque. With the anti-tampering knob there is no way to change the position unless you remove the knob using a special tool.

All the new MRF can be fixed from the top using a universal wrench, a pipe wrench or an automatic screwer.

Thread	Maximum torque [Nm]*
M5	max 1.8
G 1/8"	max 6
G 1/4"	max 8
G 3/8"	max 10
G 1/2"	max 15

* measured on a metal female thread

FLOW MICROREGULATOR SERIES COMPACT N and COMPACT O

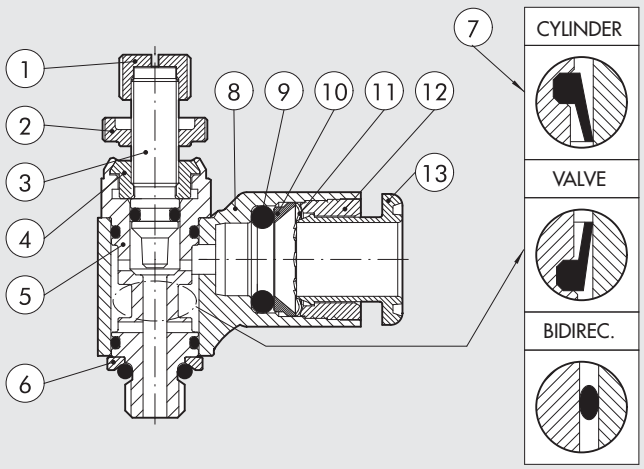
Main features:
- reduced dimensions
- excellent regulation
- regulation with a screwdriver and disposable anti-tampering cap (COMPACT O)
- regulation with either a screwdriver and/or a knob, can be fixed with a ring nut (COMPACT N)
- available in all sizes (from M5 to 1/2") with a brass or a technopolymer ring
- can be mounted with an automatic screwdriver
- comes with a ring that can rotate even with the MRF mounted in position.

TECHNICAL DATA		M5			1/8"				1/4"				3/8"			1/2"
Pipe		Ø 4	Ø 5*	Ø 6	Ø 4	Ø 5*	Ø 6	Ø 8	Ø 6	Ø 8	Ø 10	Ø 12	Ø 8	Ø 10	Ø 12	Ø 12
Max input pressure	MPa	1														
	bar	10														
	psi	145														
Temperature range: Technopolymer ring	°C	– 10 to + 50														
	°F	+ 14 to + 122														
Brass ring	°C	– 10 to + 70														
	°F	+ 14 to +158														
Max flow rate on regulation at 6.3 bar	Nl/min	150	155	155	350	360	380	400	750	850	950	1000	1250	1300	1400	2000
Max flow rate on exhaust at 6.3 bar with closed needle	Nl/min	140	145	150	300	320	350	390	450	500	500	550	1030	1050	1250	1750
Max flow rate on exhaust at 6.3 bar with open needle	Nl/min	240	245	245	450	510	600	650	850	1050	1150	1250	1700	1700	2100	2700
Regulation		Manual (COMPACT N only) or using a screwdriver														
Internal system		Tapered needle														
Fluid		Filtered, lubricated or unlubricated compressed air														

* Pipe Ø 5 is only available with a brass ring

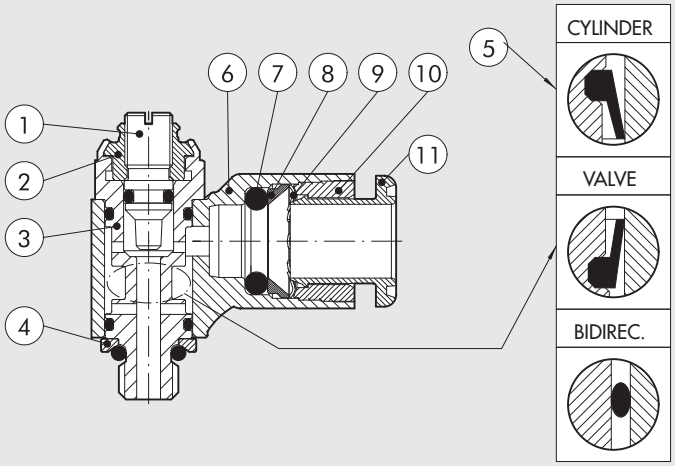
TYPE N COMPONENTS - M5 THREAD

① Nichel-plated brass knob
② Nickel-plated brass securing ring nut
③ Brass needle
④ Nickel-plated brass bush
⑤ Nickel-plated brass body
⑥ Nickel-plated brass retaining ring
⑦ NBR gasket
⑧ Nickel-plated or technopolymer brass revolving ring
⑨ NBR gasket
⑩ Technopolymer spring supporting ring
⑪ Stainless steel grabbing spring
⑫ Technopolymer retaining bush
⑬ Technopolymer release bush



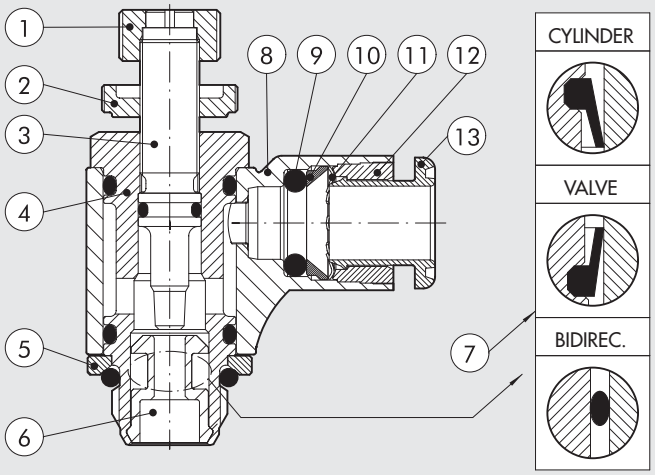
TYPE O COMPONENTS - M5 THREAD

① Brass needle
② Nickel-plated brass bush
③ Nickel-plated brass body
④ Nickel-plated brass retaining ring
⑤ NBR gasket
⑥ Nickel-plated or technopolymer brass revolving ring
⑦ NBR gasket
⑧ Technopolymer spring supporting ring
⑨ Stainless steel grabbing spring
⑩ Technopolymer retaining bush
⑪ Technopolymer release bush



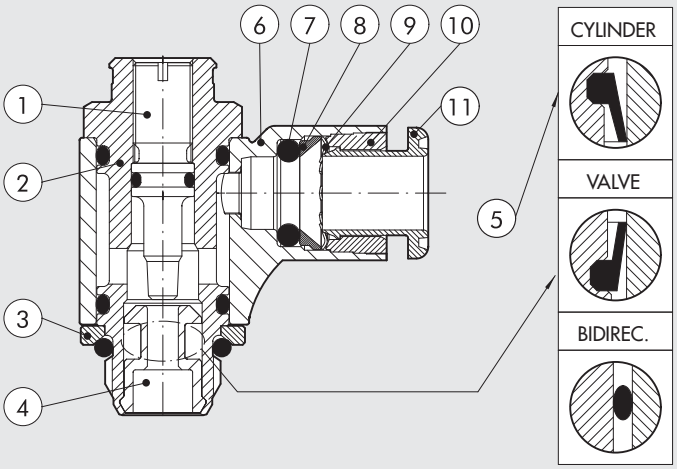
TYPE N COMPONENTS - THREAD 1/8" TO 1/2"

① Nickel-plated brass knob
② Nickel-plated brass securing ring nut
③ Brass needle
④ Nickel-plated brass body
⑤ Nickel-plated brass retaining ring
⑥ Brass gasket holding insert
⑦ NBR gasket
⑧ Nickel-plated or technopolymer brass revolving ring
⑨ NBR gasket
⑩ Technopolymer spring supporting ring
⑪ Stainless steel grabbing spring
⑫ Technopolymer retaining bush
⑬ Technopolymer release bush



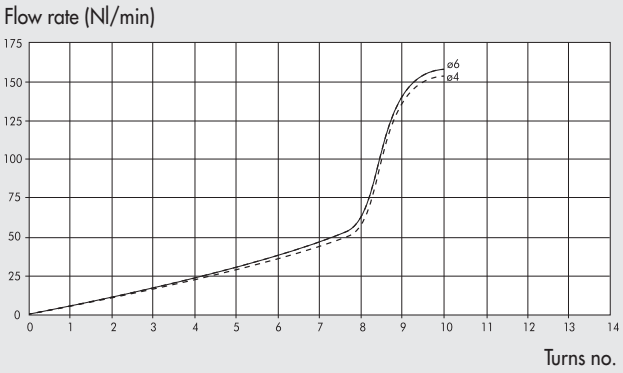
TYPE O COMPONENTS - THREAD FROM 1/8" TO 1/2"

① Brass needle
② Nickel-plated brass body
③ Nickel-plated brass retaining ring
④ Brass gasket holding insert
⑤ NBR gasket
⑥ Nickel-plated or technopolymer brass revolving ring
⑦ NBR gasket
⑧ Technopolymer spring supporting ring
⑨ Stainless steel grabbing spring
⑩ Technopolymer retaining bush
⑪ Technopolymer release bush

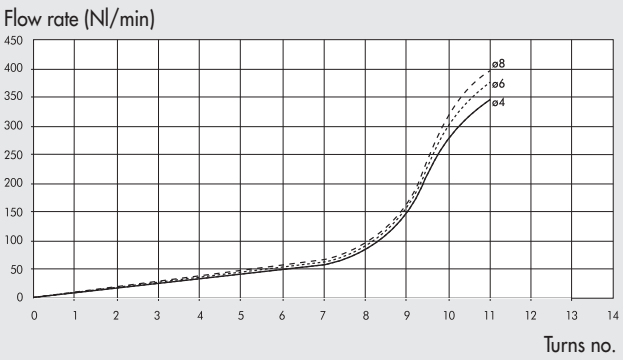


FLOW CHARTS

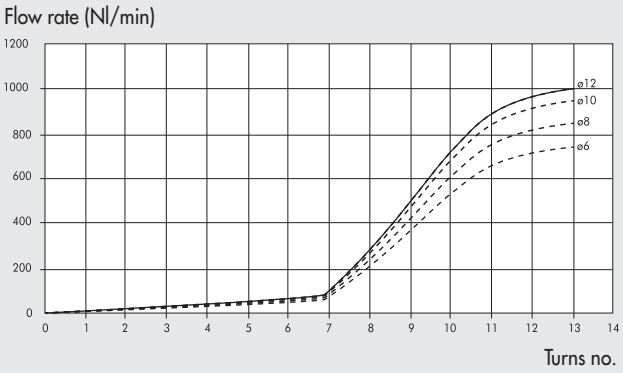
MRF M5 - PIPE Ø 4 - Ø 6



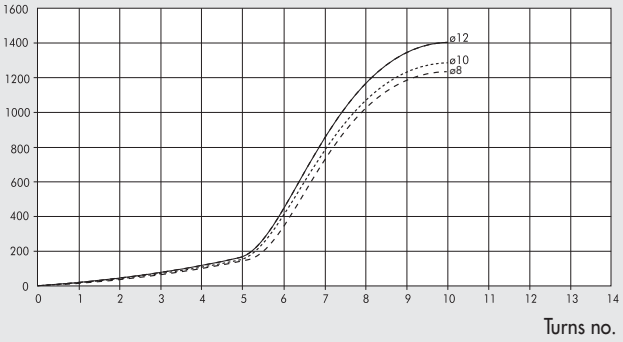
MRF 1/8" - PIPE Ø 4 - Ø 6 - Ø 8



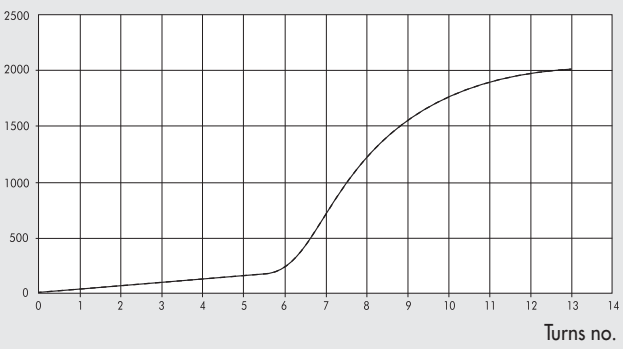
MRF 1/4" - PIPE Ø 6 - Ø 8 - Ø 10 - Ø 12



MRF 3/8" - PIPE Ø 8 - Ø 10 - Ø 12



MRF 1/2" - PIPE Ø 12

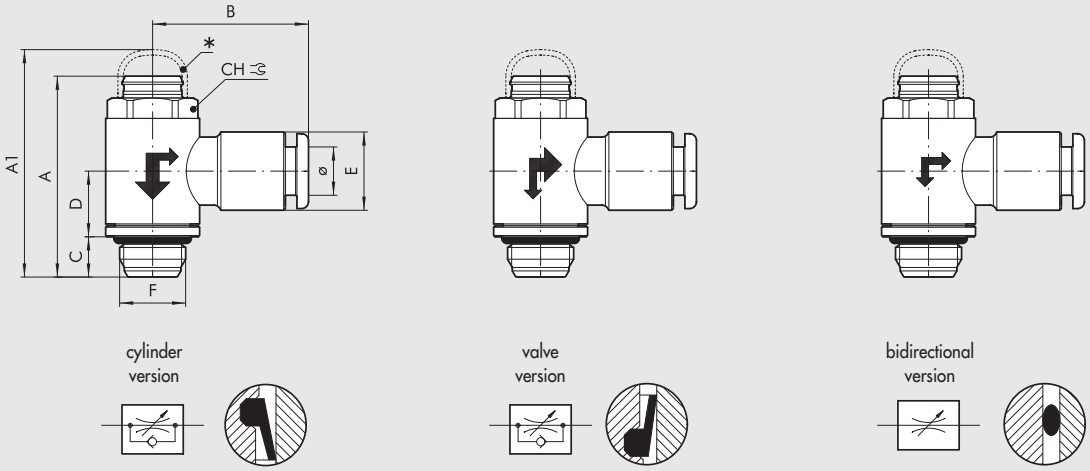


SYNOPTIC, SIZES AND VERSIONS

M R F	N	M	C	4	M5
FAMILY	**TYPE**	**RING**	**FUNCTION**	**Ø PIPE**	**Ø THREAD**
Flow microregulator	**N** With knob and ring nut **O** Flash needle	**M** Nickel-plated brass with push-in fitting **T** Technopolymer with push-in fitting **F** Nickel-plated brass with female thread	**C** For cylinder **V** For valve **B** Bidirectional	**4:** Ø 4 **5:** Ø 5 **6:** Ø 6 **8:** Ø 8 **10:** Ø 10 **12:** Ø 12 **1/8:** G 1/8" F **1/4:** G 1/4" F **3/8:** G 3/8" F	**M5:** M5 **1/8:** G 1/8" **1/4:** G 1/4" **3/8:** G 3/8" **1/2:** G 1/2"

METAL WORK PNEUMATIC

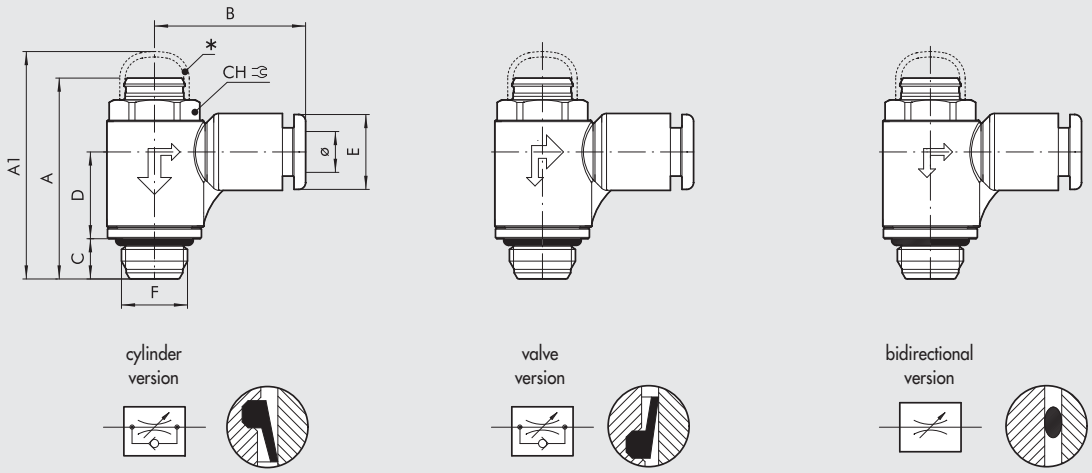
MRF COMPACT "O" BRASS RING



* OPTIONAL ANTI-TAMPERING CAP

Code	Description	F	Ø	CH	A min	A max	A1	B	C	D	E
9001001C	MRF O M C 4 M5	M5	4	9	23.9	25	26.5	20.2	4	9.2	9.5
9001110V	MRF O M V 4 M5	M5	4	9	23.9	25	26.5	20.2	4	9.2	9.5
9001601B	MRF O M B 4 M5	M5	4	9	23.9	25	26.5	20.2	4	9.2	9.5
9001002C	MRF O M C 5 M5	M5	5	9	23.9	25	26.5	23.8	4	9.2	12
9001113V	MRF O M V 5 M5	M5	5	9	23.9	25	26.5	23.8	4	9.2	12
9001603B	MRF O M B 5 M5	M5	5	9	23.9	25	26.5	23.8	4	9.2	12
9001007C	MRF O M C 6 M5	M5	6	9	23.9	25	26.5	23.5	4	9.2	11.3
9001105V	MRF O M V 6 M5	M5	6	9	23.9	25	26.5	23.5	4	9.2	11.3
9001612B	MRF O M B 6 M5	M5	6	9	23.9	25	26.5	23.5	4	9.2	11.3
9001011C	MRF O M C 4 1/8	1/8	4	12	29.8	30.9	34	21.3	6	9.8	9.5
9001111V	MRF O M V 4 1/8	1/8	4	12	29.8	30.9	34	21.3	6	9.8	9.5
9001602B	MRF O M B 4 1/8	1/8	4	12	29.8	30.9	34	21.3	6	9.8	9.5
9001012C	MRF O M C 5 1/8	1/8	5	12	29.8	30.9	34	24.8	6	9.8	12
9001112V	MRF O M V 5 1/8	1/8	5	12	29.8	30.9	34	24.8	6	9.8	12
9001604B	MRF O M B 5 1/8	1/8	5	12	29.8	30.9	34	24.8	6	9.8	12
9001003C	MRF O M C 6 1/8	1/8	6	12	29.8	30.9	34	23	6	9.8	11.5
9001101V	MRF O M V 6 1/8	1/8	6	12	29.8	30.9	34	23	6	9.8	11.5
9001605B	MRF O M B 6 1/8	1/8	6	12	29.8	30.9	34	23	6	9.8	11.5
9001005C	MRF O M C 8 1/8	1/8	8	12	29.8	30.9	34	24.8	6	9.8	13.8
9001103V	MRF O M V 8 1/8	1/8	8	12	29.8	30.9	34	24.8	6	9.8	13.8
9001607B	MRF O M B 8 1/8	1/8	8	12	29.8	30.9	34	24.8	6	9.8	13.8
9001004C	MRF O M C 6 1/4	1/4	6	15	35.4	37	38.9	24.5	8	11.1	11.5
9001102V	MRF O M V 6 1/4	1/4	6	15	35.4	37	38.9	24.5	8	11.1	11.5
9001606B	MRF O M B 6 1/4	1/4	6	15	35.4	37	38.9	24.5	8	11.1	11.5
9001006C	MRF O M C 8 1/4	1/4	8	15	35.4	37	38.9	26.5	8	11.1	13.8
9001104V	MRF O M V 8 1/4	1/4	8	15	35.4	37	38.9	26.5	8	11.1	13.8
9001608B	MRF O M B 8 1/4	1/4	8	15	35.4	37	38.9	26.5	8	11.1	13.8
9001010C	MRF O M C 8 3/8	3/8	8	19	42.7	42.7	49.5	28.5	9	13.4	13.8
9001115V	MRF O M V 8 3/8	3/8	8	19	42.7	42.7	49.5	28.5	9	13.4	13.8
9001611B	MRF O M B 8 3/8	3/8	8	19	42.7	42.7	49.5	28.5	9	13.4	13.8
9001008C	MRF O M C 10 1/4	1/4	10	15	35.4	37	38.9	31.4	8	11.1	16.5
9001106V	MRF O M V 10 1/4	1/4	10	15	35.4	37	38.9	31.4	8	11.1	16.5
9001609B	MRF O M B 10 1/4	1/4	10	15	35.4	37	38.9	31.4	8	11.1	16.5
9001014C	MRF O M C 12 1/4	1/4	12	15	35.4	37	38.9	33	8	11.1	19.5
9001123V	MRF O M V 12 1/4	1/4	12	15	35.4	37	38.9	33	8	11.1	19.5
9001623B	MRF O M B 12 1/4	1/4	12	15	35.4	37	38.9	33	8	11.1	19.5
9001009C	MRF O M C 10 3/8	3/8	10	19	42.7	42.7	49.5	32.8	9	13.4	16
9001114V	MRF O M V 10 3/8	3/8	10	19	42.7	42.7	49.5	32.8	9	13.4	16
9001610B	MRF O M B 10 3/8	3/8	10	19	42.7	42.7	49.5	32.8	9	13.4	16
9001015C	MRF O M C 12 3/8	3/8	12	19	42.7	42.7	49.5	35.3	9	13.4	19.5
9001124V	MRF O M V 12 3/8	3/8	12	19	42.7	42.7	49.5	35.3	9	13.4	19.5
9001624B	MRF O M B 12 3/8	3/8	12	19	42.7	42.7	49.5	35.3	9	13.4	19.5
9001016C	MRF O M C 12 1/2	1/2	12	22	50.6	51.4	55.3	37	11	15.9	19.5
9001125V	MRF O M V 12 1/2	1/2	12	22	50.6	51.4	55.3	37	11	15.9	19.5
9001625B	MRF O M B 12 1/2	1/2	12	22	50.6	51.4	55.3	37	11	15.9	19.5

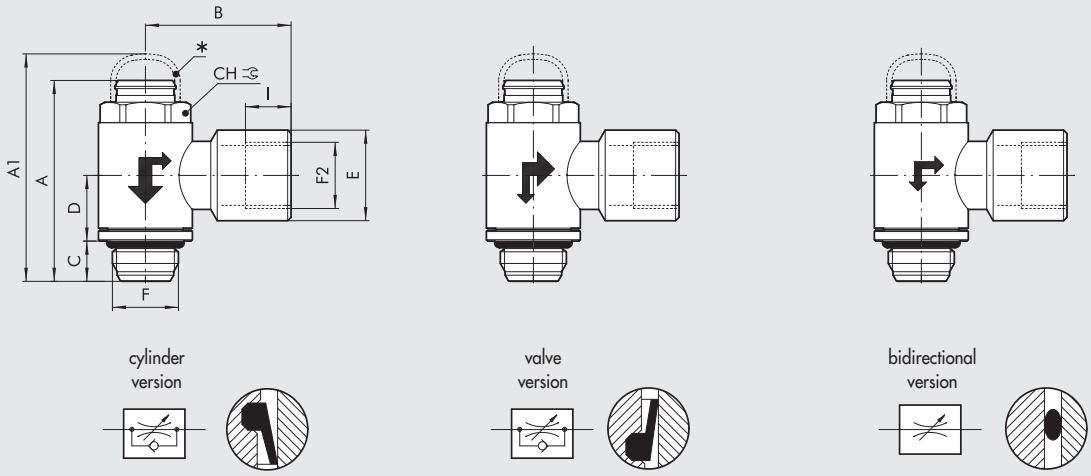
MRF COMPACT "O" TECHNOPOLYMER RING



* OPTIONAL ANTI-TAMPERING CAP

Code	Description	F	Ø	CH	A min	A max	A1	B	C	D	E
9011001C	MRF O T C 4 M5	M5	4	9	23.9	25	26.5	19.1	4	9.5	9.2
9011110V	MRF O T V 4 M5	M5	4	9	23.9	25	26.5	19.1	4	9.5	9.2
9011601B	MRF O T B 4 M5	M5	4	9	23.9	25	26.5	19.1	4	9.5	9.2
9011007C	MRF O T C 6 M5	M5	6	9	23.9	25	26.5	20.8	4	9.5	11.3
9011105V	MRF O T V 6 M5	M5	6	9	23.9	25	26.5	20.8	4	9.5	11.3
9011612B	MRF O T B 6 M5	M5	6	9	23.9	25	26.5	20.8	4	9.5	11.3
9011011C	MRF O T C 4 1/8	1/8	4	12	29.8	30.9	34	21	6	12.9	9.2
9011111V	MRF O T V 4 1/8	1/8	4	12	29.8	30.9	34	21	6	12.9	9.2
9011602B	MRF O T B 4 1/8	1/8	4	12	29.8	30.9	34	21	6	12.9	9.2
9011003C	MRF O T C 6 1/8	1/8	6	12	29.8	30.9	34	22.3	6	12.9	11.3
9011101V	MRF O T V 6 1/8	1/8	6	12	29.8	30.9	34	22.3	6	12.9	11.3
9011605B	MRF O T B 6 1/8	1/8	6	12	29.8	30.9	34	22.3	6	12.9	11.3
9011005C	MRF O T C 8 1/8	1/8	8	12	29.8	30.9	34	25.6	6	12.9	13.8
9011103V	MRF O T V 8 1/8	1/8	8	12	29.8	30.9	34	25.6	6	12.9	13.8
9011607B	MRF O T B 8 1/8	1/8	8	12	29.8	30.9	34	25.6	6	12.9	13.8
9011004C	MRF O T C 6 1/4	1/4	6	15	35.4	37	38.9	24.3	8	15	11.3
9011102V	MRF O T V 6 1/4	1/4	6	15	35.4	37	38.9	24.3	8	15	11.3
9011606B	MRF O T B 6 1/4	1/4	6	15	35.4	37	38.9	24.3	8	15	11.3
9011006C	MRF O T C 8 1/4	1/4	8	15	35.4	37	38.9	27.2	8	15	13.8
9011104V	MRF O T V 8 1/4	1/4	8	15	35.4	37	38.9	27.2	8	15	13.8
9011608B	MRF O T B 8 1/4	1/4	8	15	35.4	37	38.9	27.2	8	15	13.8
9011008C	MRF O T C 10 1/4	1/4	10	15	35.4	37	38.9	28.6	8	15	16
9011106V	MRF O T V 10 1/4	1/4	10	15	35.4	37	38.9	28.6	8	15	16
9011609B	MRF O T B 10 1/4	1/4	10	15	35.4	37	38.9	28.6	8	15	16
9011014C	MRF O T C 12 1/4	1/4	12	15	35.4	37	38.9	31	8	15	19.5
9011123V	MRF O T V 12 1/4	1/4	12	15	35.4	37	38.9	31	8	15	19.5
9011623B	MRF O T B 12 1/4	1/4	12	15	35.4	37	38.9	31	8	15	19.5
9011009C	MRF O T C 10 3/8	3/8	10	19	42.7	42.7	49.5	30.3	9	17.9	16
9011114V	MRF O T V 10 3/8	3/8	10	19	42.7	42.7	49.5	30.3	9	17.9	16
9011610B	MRF O T B 10 3/8	3/8	10	19	42.7	42.7	49.5	30.3	9	17.9	16
9011015C	MRF O T C 12 3/8	3/8	12	19	42.7	42.7	49.5	32.4	9	17.9	19.5
9011124V	MRF O T V 12 3/8	3/8	12	19	42.7	42.7	49.5	32.4	9	17.9	19.5
9011624B	MRF O T B 12 3/8	3/8	12	19	42.7	42.7	49.5	32.4	9	17.9	19.5
9011016C	MRF O T C 12 1/2	1/2	12	22	50.6	51.4	55.3	34	11	20.1	19.5
9011125V	MRF O T V 12 1/2	1/2	12	22	50.6	51.4	55.3	34	11	20.1	19.5
9011625B	MRF O T B 12 1/2	1/2	12	22	50.6	51.4	55.3	34	11	20.1	19.5

MRF COMPACT "O" THREADED BRASS RING

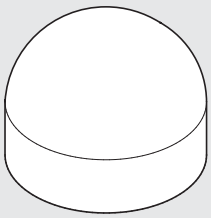


* OPTIONAL ANTI-TAMPERING CAP

Code	Description	F	F2	CH	A min	A max	A1	B	C	D	E	I
9001020C	MRF O F C 1/8 1/8	1/8	1/8	12	29.8	30.9	34	21.4	6	9.8	13.3	6.7
9001120V	MRF O F V 1/8 1/8	1/8	1/8	12	29.8	30.9	34	21.4	6	9.8	13.3	6.7
9001620B	MRF O F B 1/8 1/8	1/8	1/8	12	29.8	30.9	34	21.4	6	9.8	13.3	6.7
9001021C	MRF O F C 1/4 1/4	1/4	1/4	15	35.4	37	38.9	25.5	8	11.1	16.7	8
9001121V	MRF O F V 1/4 1/4	1/4	1/4	15	35.4	37	38.9	25.5	8	11.1	16.7	8
9001621B	MRF O F B 1/4 1/4	1/4	1/4	15	35.4	37	38.9	25.5	8	11.1	16.7	8
9001022C	MRF O F C 3/8 3/8	3/8	3/8	19	42.7	42.7	49.5	31.5	9	13.4	20.2	10
9001122V	MRF O F V 3/8 3/8	3/8	3/8	19	42.7	42.7	49.5	31.5	9	13.4	20.2	10
9001622B	MRF O F B 3/8 3/8	3/8	3/8	19	42.7	42.7	49.5	31.5	9	13.4	20.2	10

ACCESSORIES MRF COMPACT "O"

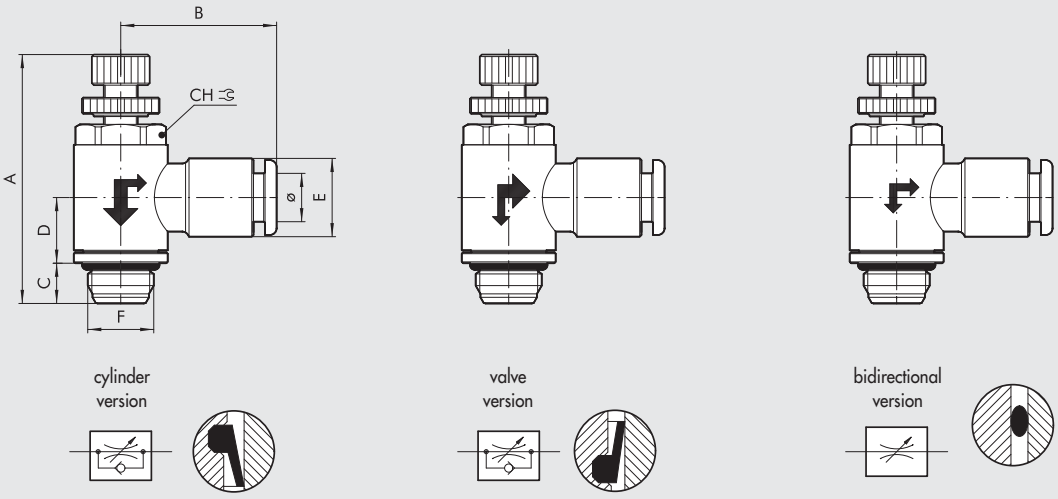
ANTI-TAMPERING CAP



Code	Description
9090001	Cap MRF O M5
9090002	Cap MRF O 1/8-1/4
9090003	Cap MRF O 3/8-1/2

NOTE: Adjust the flow rate via the regulating pin.
Apply the anti-tampering cap and press on firmly to prevent access to the regulation pin.
If the MRF needs to be recalibrated, remove the cap using the grippers provided.
IMPORTANT: The cap cannot be re-used after it has been removed.

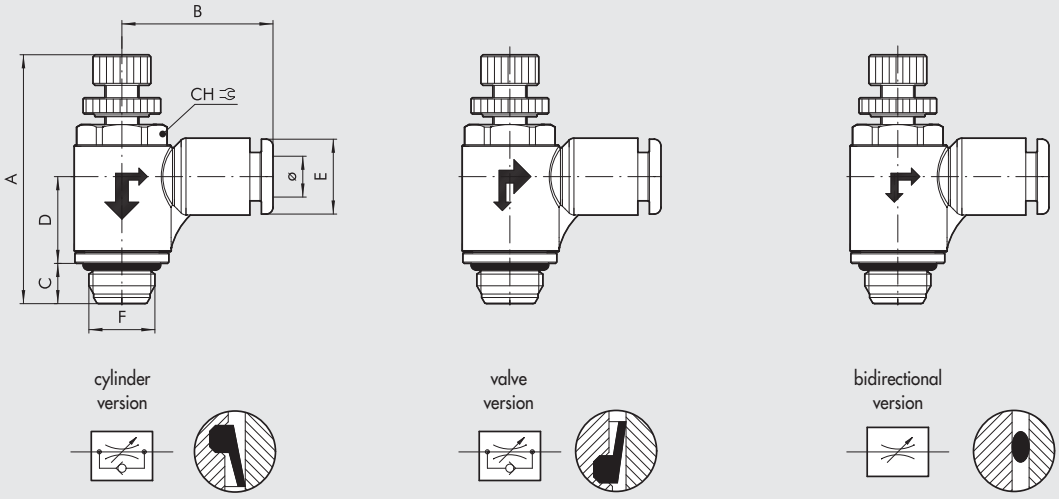
MRF COMPACT "N" BRASS RING



Code	Description	F	Ø	CH	A min	A max	B	C	D	E
9031001C	MRF N M C 4 M5	M5	4	9	27.7	31	20.2	4	9.2	9.5
9031101V	MRF N M V 4 M5	M5	4	9	27.7	31	20.2	4	9.2	9.5
9031201B	MRF N M B 4 M5	M5	4	9	27.7	31	20.2	4	9.2	9.5
9031003C	MRF N M C 5 M5	M5	5	9	27.7	31	23.8	4	9.2	12
9031103V	MRF N M V 5 M5	M5	5	9	27.7	31	23.8	4	9.2	12
9031203B	MRF N M B 5 M5	M5	5	9	27.7	31	23.8	4	9.2	12
9031005C	MRF N M C 6 M5	M5	6	9	27.7	31	23.5	4	9.2	11.3
9031105V	MRF N M V 6 M5	M5	6	9	27.7	31	23.5	4	9.2	11.3
9031205B	MRF N M B 6 M5	M5	6	9	27.7	31	23.5	4	9.2	11.3
9031002C	MRF N M C 4 1/8	1/8	4	12	33.5	37.6	21.3	6	9.8	9.5
9031102V	MRF N M V 4 1/8	1/8	4	12	33.5	37.6	21.3	6	9.8	9.5
9031202B	MRF N M B 4 1/8	1/8	4	12	33.5	37.6	21.3	6	9.8	9.5
9031004C	MRF N M C 5 1/8	1/8	5	12	33.5	37.6	24.8	6	9.8	12
9031104V	MRF N M V 5 1/8	1/8	5	12	33.5	37.6	24.8	6	9.8	12
9031204B	MRF N M B 5 1/8	1/8	5	12	33.5	37.6	24.8	6	9.8	12
9031006C	MRF N M C 6 1/8	1/8	6	12	33.5	37.6	23	6	9.8	11.5
9031106V	MRF N M V 6 1/8	1/8	6	12	33.5	37.6	23	6	9.8	11.5
9031206B	MRF N M B 6 1/8	1/8	6	12	33.5	37.6	23	6	9.8	11.5
9031008C	MRF N M C 8 1/8	1/8	8	12	33.5	37.6	24.8	6	9.8	13.8
9031108V	MRF N M V 8 1/8	1/8	8	12	33.5	37.6	24.8	6	9.8	13.8
9031208B	MRF N M B 8 1/8	1/8	8	12	33.5	37.6	24.8	6	9.8	13.8
9031007C	MRF N M C 6 1/4	1/4	6	15	38.8	43.7	24.5	8	11.1	11.5
9031107V	MRF N M V 6 1/4	1/4	6	15	38.8	43.7	24.5	8	11.1	11.5
9031207B	MRF N M B 6 1/4	1/4	6	15	38.8	43.7	24.5	8	11.1	11.5
9031009C	MRF N M C 8 1/4	1/4	8	15	38.8	43.7	26.5	8	11.1	13.8
9031109V	MRF N M V 8 1/4	1/4	8	15	38.8	43.7	26.5	8	11.1	13.8
9031209B	MRF N M B 8 1/4	1/4	8	15	38.8	43.7	26.5	8	11.1	13.8
9031010C	MRF N M C 8 3/8	3/8	8	19	47.2	52	28.5	9	13.4	13.8
9031110V	MRF N M V 8 3/8	3/8	8	19	47.2	52	28.5	9	13.4	13.8
9031210B	MRF N M B 8 3/8	3/8	8	19	47.2	52	28.5	9	13.4	13.8
9031011C	MRF N M C 10 1/4	1/4	10	15	38.8	43.7	31.4	8	11.1	16.5
9031111V	MRF N M V 10 1/4	1/4	10	15	38.8	43.7	31.4	8	11.1	16.5
9031211B	MRF N M B 10 1/4	1/4	10	15	38.8	43.7	31.4	8	11.1	16.5
9031014C	MRF N M C 12 1/4	1/4	12	15	38.8	43.7	33	8	11.1	19.5
9031114V	MRF N M V 12 1/4	1/4	12	15	38.8	43.7	33	8	11.1	19.5
9031214B	MRF N M B 12 1/4	1/4	12	15	38.8	43.7	33	8	11.1	19.5
9031012C	MRF N M C 10 3/8	3/8	10	19	47.2	52	32.8	9	13.4	16
9031112V	MRF N M V 10 3/8	3/8	10	19	47.2	52	32.8	9	13.4	16
9031212B	MRF N M B 10 3/8	3/8	10	19	47.2	52	32.8	9	13.4	16
9031015C	MRF N M C 12 3/8	3/8	12	19	47.2	52	35.3	9	13.4	19.5
9031115V	MRF N M V 12 3/8	3/8	12	19	47.2	52	35.3	9	13.4	19.5
9031215B	MRF N M B 12 3/8	3/8	12	19	47.2	52	35.3	9	13.4	19.5
9031016C	MRF N M C 12 1/2	1/2	12	22	53	59.8	37	11	15.9	19.5
9031116V	MRF N M V 12 1/2	1/2	12	22	53	59.8	37	11	15.9	19.5
9031216B	MRF N M B 12 1/2	1/2	12	22	53	59.8	37	11	15.9	19.5

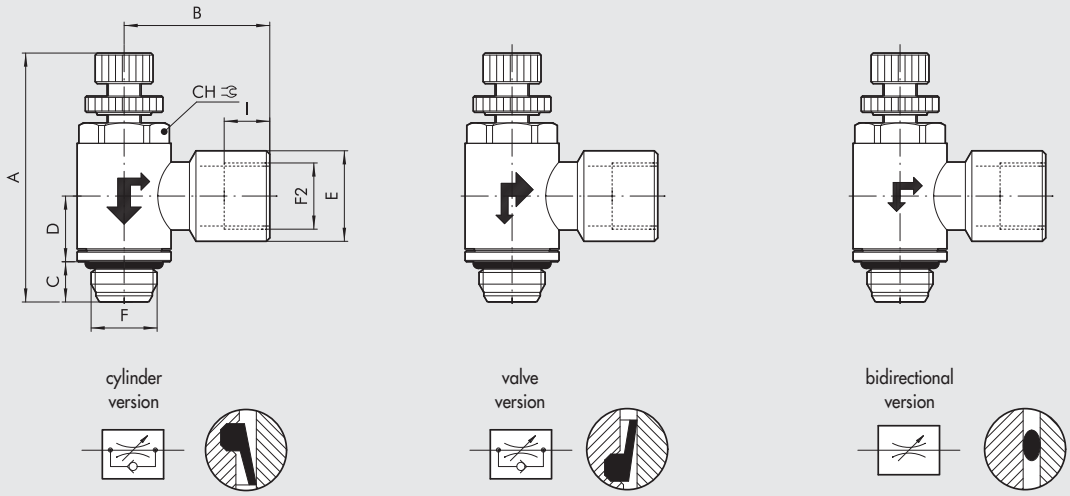
METAL WORK PNEUMATIC

MRF COMPACT "N" TECHNOPOLYMER RING



Code	Description	F	Ø	CH	A min	A max	B	C	D	E
9021001C	MRF N T C 4 M5	M5	4	9	27.7	31	19.1	4	9.5	9.2
9021101V	MRF N T V 4 M5	M5	4	9	27.7	31	19.1	4	9.5	9.2
9021201B	MRF N T B 4 M5	M5	4	9	27.7	31	19.1	4	9.5	9.2
9021005C	MRF N T C 6 M5	M5	6	9	27.7	31	20.8	4	9.5	11.3
9021105V	MRF N T V 6 M5	M5	6	9	27.7	31	20.8	4	9.5	11.3
9021205B	MRF N T B 6 M5	M5	6	9	27.7	31	20.8	4	9.5	11.3
9021002C	MRF N T C 4 1/8	1/8	4	12	33.5	37.6	21	6	12.9	9.2
9021102V	MRF N T V 4 1/8	1/8	4	12	33.5	37.6	21	6	12.9	9.2
9021202B	MRF N T B 4 1/8	1/8	4	12	33.5	37.6	21	6	12.9	9.2
9021006C	MRF N T C 6 1/8	1/8	6	12	33.5	37.6	22.3	6	12.9	11.3
9021106V	MRF N T V 6 1/8	1/8	6	12	33.5	37.6	22.3	6	12.9	11.3
9021206B	MRF N T B 6 1/8	1/8	6	12	33.5	37.6	22.3	6	12.9	11.3
9021008C	MRF N T C 8 1/8	1/8	8	12	33.5	37.6	25.6	6	12.9	13.8
9021108V	MRF N T V 8 1/8	1/8	8	12	33.5	37.6	25.6	6	12.9	13.8
9021208B	MRF N T B 8 1/8	1/8	8	12	33.5	37.6	25.6	6	12.9	13.8
9021007C	MRF N T C 6 1/4	1/4	6	15	38.8	43.7	24.3	8	15	11.3
9021107V	MRF N T V 6 1/4	1/4	6	15	38.8	43.7	24.3	8	15	11.3
9021207B	MRF N T B 6 1/4	1/4	6	15	38.8	43.7	24.3	8	15	11.3
9021009C	MRF N T C 8 1/4	1/4	8	15	38.8	43.7	27.2	8	15	13.8
9021109V	MRF N T V 8 1/4	1/4	8	15	38.8	43.7	27.2	8	15	13.8
9021209B	MRF N T B 8 1/4	1/4	8	15	38.8	43.7	27.2	8	15	13.8
9021011C	MRF N T C 10 1/4	1/4	10	15	38.8	43.7	28.6	8	15	16
9021111V	MRF N T V 10 1/4	1/4	10	15	38.8	43.7	28.6	8	15	16
9021211B	MRF N T B 10 1/4	1/4	10	15	38.8	43.7	28.6	8	15	16
9021014C	MRF N T C 12 1/4	1/4	12	15	38.8	43.7	31	8	15	19.5
9021114V	MRF N T V 12 1/4	1/4	12	15	38.8	43.7	31	8	15	19.5
9021214B	MRF N T B 12 1/4	1/4	12	15	38.8	43.7	31	8	15	19.5
9021012C	MRF N T C 10 3/8	3/8	10	19	47.2	52	30.3	9	17.9	16
9021112V	MRF N T V 10 3/8	3/8	10	19	47.2	52	30.3	9	17.9	16
9021212B	MRF N T B 10 3/8	3/8	10	19	47.2	52	30.3	9	17.9	16
9021015C	MRF N T C 12 3/8	3/8	12	19	47.2	52	32.4	9	17.9	19.5
9021115V	MRF N T V 12 3/8	3/8	12	19	47.2	52	32.4	9	17.9	19.5
9021215B	MRF N T B 12 3/8	3/8	12	19	47.2	52	32.4	9	17.9	19.5
9021016C	MRF N T C 12 1/2	1/2	12	22	53	59.8	34	11	20.1	19.5
9021116V	MRF N T V 12 1/2	1/2	12	22	53	59.8	34	11	20.1	19.5
9021216B	MRF N T B 12 1/2	1/2	12	22	53	59.8	34	11	20.1	19.5

MRF COMPACT "N" THREADED BRASS RING



Code	Description	F	F2	CH	A min	A max	B	C	D	E	I
9031301C	MRF N F C 1/8 1/8	1/8	1/8	12	33.5	37.6	21.4	6	9.8	13.3	6.7
9031401V	MRF N F V 1/8 1/8	1/8	1/8	12	33.5	37.6	21.4	6	9.8	13.3	6.7
9031501B	MRF N F B 1/8 1/8	1/8	1/8	12	33.5	37.6	21.4	6	9.8	13.3	6.7
9031302C	MRF N F C 1/4 1/4	1/4	1/4	15	38.8	43.7	25.5	8	11.1	16.7	8
9031402V	MRF N F V 1/4 1/4	1/4	1/4	15	38.8	43.7	25.5	8	11.1	16.7	8
9031502B	MRF N F B 1/4 1/4	1/4	1/4	15	38.8	43.7	25.5	8	11.1	16.7	8
9031303C	MRF N F C 3/8 3/8	3/8	3/8	19	47.2	52	31.5	9	13.4	20.2	10
9031403V	MRF N F V 3/8 3/8	3/8	3/8	19	47.2	52	31.5	9	13.4	20.2	10
9031503B	MRF N F B 3/8 3/8	3/8	3/8	19	47.2	52	31.5	9	13.4	20.2	10

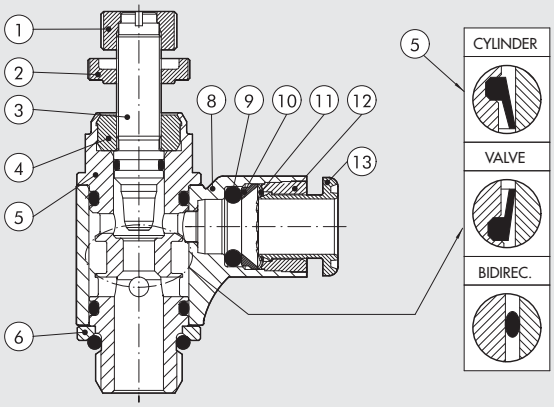
FLOW MICRO-REGULATOR SERIES MRF HIGH-FLOW

Main features:
- high flow rate during regulation and discharge
- excellent regulation features
- regulation using a screwdriver and/or a knob and fixing using a ring nut
- available in sizes 1/8" and 1/4" only with a technopolymer ring
- can be mounted with an automatic screwdriver
- fitted with a swivel ring with the MRF mounted in position.

TECHNICAL DATA		1/8"			1/4"			
Pipe		Ø 4	Ø 6	Ø 8	Ø 6	Ø 8	Ø 10	Ø 12
Max input pressure	MPa	1						
	bar	10						
	psi	145						
Temperature range: technopolymer ring	°C	– 10 to + 50						
	°F	+ 14 to + 122						
Max flow rate on regulation at 6.3 bar	Nl/min	500	600	650	850	900	1150	1200
Max flow rate on exhaust at 6.3 bar with closed needle	Nl/min	400	500	600	700	850	875	950
Max flow rate on exhaust at 6.3 bar with open needle	Nl/min	500	750	900	1000	1250	1350	1450
Regulation		Manual or via screwdriver						
Internal system		Tapered needle						
Fluid		Filtered, lubricated or unlubricated compressed air						

COMPONENTS

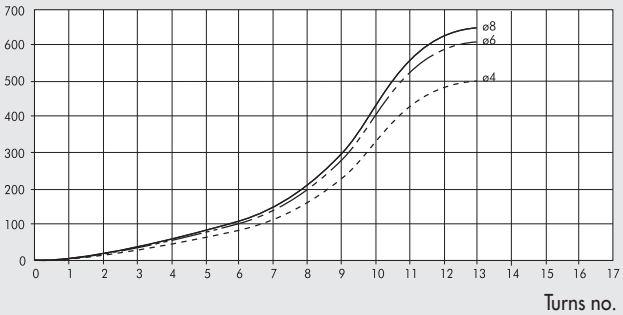
① Nickel-plated brass knob
② Nickel-plated brass securing ring nut
③ Brass needle
④ Nickel-plated brass bush
⑤ Nickel-plated brass body
⑥ Nickel-plated brass retaining ring
⑦ NBR gasket
⑧ Technopolymer swivel ring
⑨ NBR gasket
⑩ Technopolymer spring supporting ring
⑪ Stainless steel grabbing spring
⑫ Technopolymer retaining bush
⑬ Technopolymer release bush



FLOW CHARTS

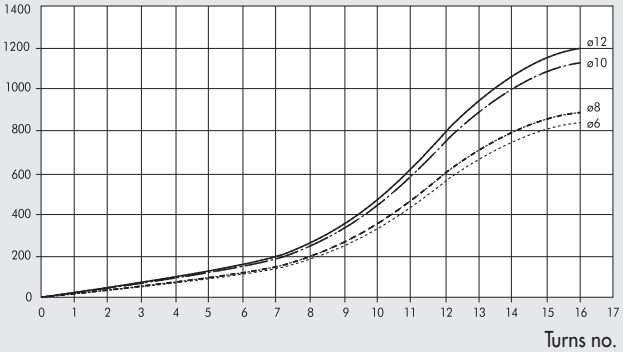
MRF 1/8"- PIPE Ø 4 - Ø 6 - Ø 8

Flow rate (Nl/min)

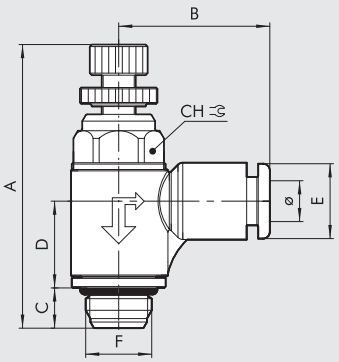


MRF 1/4"- PIPE Ø 6 - Ø 8 - Ø 10 - Ø 12

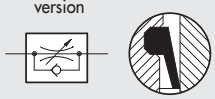
Flow rate (Nl/min)

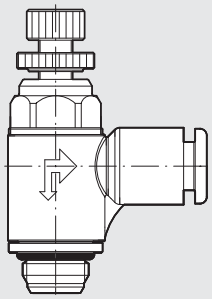


MRF HIGH-FLOW

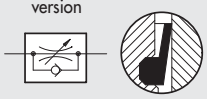


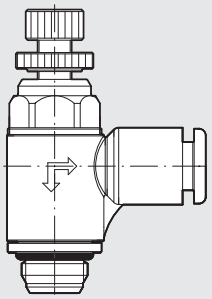
cylinder version



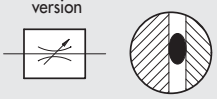


valve version





bidirectional version



Code	Description	F	Ø	CH	A min	A max	B	C	D	E
9025002C	MRF H T C 4 1/8	1/8	4	12	38.5	43.3	21	6	12.9	9.2
9025102V	MRF H T V 4 1/8	1/8	4	12	38.5	43.3	21	6	12.9	9.2
9025602B	MRF H T B 4 1/8	1/8	4	12	38.5	43.3	21	6	12.9	9.2
9025006C	MRF H T C 6 1/8	1/8	6	12	38.5	43.3	22.3	6	12.9	11.3
9025106V	MRF H T V 6 1/8	1/8	6	12	38.5	43.3	22.3	6	12.9	11.3
9025606B	MRF H T B 6 1/8	1/8	6	12	38.5	43.3	22.3	6	12.9	11.3
9025008C	MRF H T C 8 1/8	1/8	8	12	38.5	43.3	25.6	6	12.9	13.8
9025108V	MRF H T V 8 1/8	1/8	8	12	38.5	43.3	25.6	6	12.9	13.8
9025608B	MRF H T B 8 1/8	1/8	8	12	38.5	43.3	25.6	6	12.9	13.8
9025007C	MRF H T C 6 1/4	1/4	6	15	44.3	49.8	24.3	8	15	11.3
9025107V	MRF H T V 6 1/4	1/4	6	15	44.3	49.8	24.3	8	15	11.3
9025607B	MRF H T B 6 1/4	1/4	6	15	44.3	49.8	24.3	8	15	11.3
9025009C	MRF H T C 8 1/4	1/4	8	15	44.3	49.8	27.2	8	15	13.8
9025109V	MRF H T V 8 1/4	1/4	8	15	44.3	49.8	27.2	8	15	13.8
9025609B	MRF H T B 8 1/4	1/4	8	15	44.3	49.8	27.2	8	15	13.8
9025011C	MRF H T C 10 1/4	1/4	10	15	44.3	49.8	28.6	8	15	16
9025111V	MRF H T V 10 1/4	1/4	10	15	44.3	49.8	28.6	8	15	16
9025611B	MRF H T B 10 1/4	1/4	10	15	44.3	49.8	28.6	8	15	16
9025014C	MRF H T C 12 1/4	1/4	12	15	44.3	49.8	31	8	15	19.5
9025114V	MRF H T V 12 1/4	1/4	12	15	44.3	49.8	31	8	15	19.5
9025614B	MRF H T B 12 1/4	1/4	12	15	44.3	49.8	31	8	15	19.5

SYNOPTIC, SIZES AND VERSIONS

M R F	H	T	C	4	M5
FAMILY	**TYPE**	**RING**	**FUNCTION**	**Ø PIPE**	**Ø THREAD**
Flow microregulator	**H** High flow	**T** Technopolymer with push-in fitting	**C** For cylinder **V** For valve **B** Bidirectional	**4:** Ø 4 **6:** Ø 6 **8:** Ø 8 **10:** Ø 10 **12:** Ø 12	**1/8:** G 1/8" **1/4:** G 1/4"

FLOW MICRO-REGULATOR SERIES MRF PUSH-LOCK

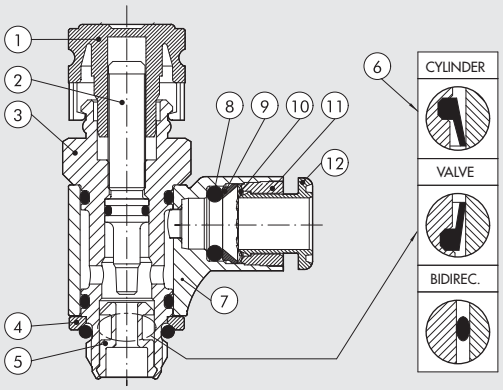
METAL WORK PNEUMATIC

Main features:
- excellent regulation
- regulation with a push-lock knob: when the desired position has been reached, the knob can moved to the lock position to maintain the set regulation
- possibility of purchasing the anti-tampering cap that, when pushed into the lock position, prevents the MRF from being operated and any undesired regulation
- available in the sizes 1-8" and 1/4" only with a technopolymer ring
- can be fitted with an automatic screwdriver
- come with a swivel ring with the MRF mounted in position.

TECHNICAL DATA		1/8"			1/4"			
Pipe		Ø 4	Ø 6	Ø 8	Ø 6	Ø 8	Ø 10	Ø 12
Max. input pressure	MPa	1						
	bar	10						
	psi	145						
Temperature range: technopolymer ring	°C	– 10 to + 50						
	°F	+ 14 to + 122						
Max. flow rate on regulation at 6.3 bar	Nl/min	350	380	400	750	850	950	1000
Max. flow rate on exhaust at 6.3 with closed needle	Nl/min	300	350	390	450	475	500	550
Max. flow rate on exhaust at 6.3 with open needle	Nl/min	450	600	650	850	1050	1150	1250
Regulation		Manual with Push-Lock knob						
Internal system		Tapered needle						
Fluid		Filtered, lubricated or unlubricated compressed air						

COMPONENTS

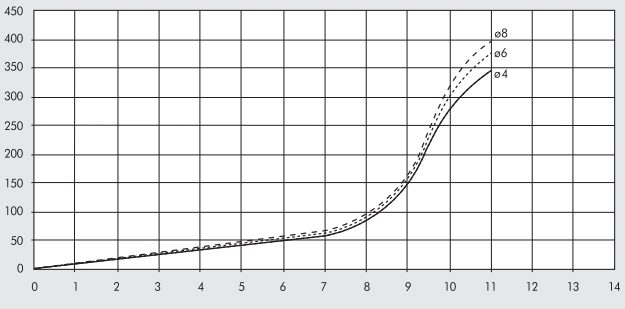
① Technopolymer knob
② Brass needle
③ Nickel-plated brass body
④ Nickel-plated brass retaining ring
⑤ Brass gasket holder insert
⑥ NBR gasket
⑦ Technopolymer revolving ring
⑧ NBR gasket
⑨ Technopolymer spring supporting ring
⑩ Stainless steel grabbing spring
⑪ Technopolymer retaining bush
⑫ Technopolymer release bush



FLOW CHARTS

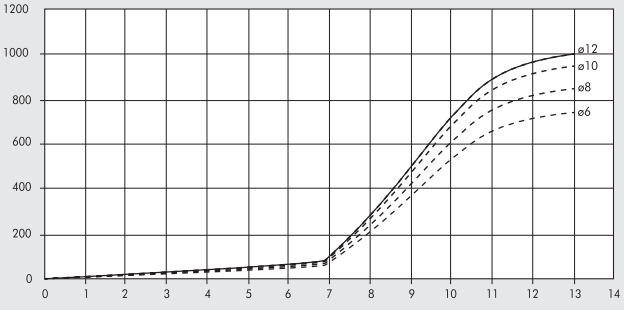
MRF 1/8"- PIPE Ø 4 - Ø 6 - Ø 8

Flow rate (Nl/min)

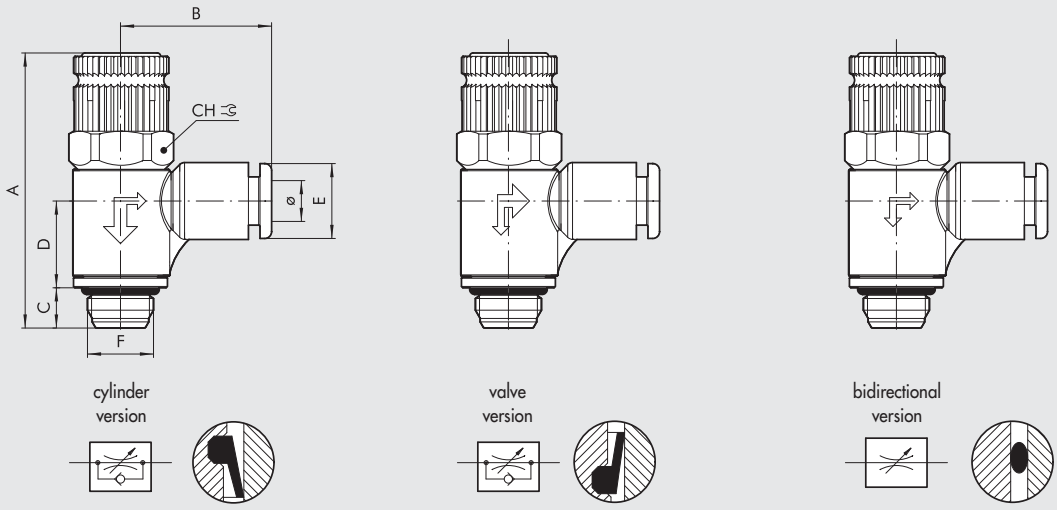


MRF 1/4"- PIPE Ø 6 - Ø 8 - Ø 10 - Ø 12

Flow rate (Nl/min)



MRF PUSH-LOCK



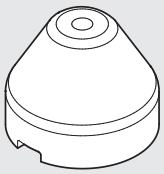
Code	Description	F	Ø	CH	A min	A max	B	C	D	E
9026002C	MRF P T C 4 1/8	1/8	4	14	41.2	43.4	21	6	12.9	9.2
9026102V	MRF P T V 4 1/8	1/8	4	14	41.2	43.4	21	6	12.9	9.2
9026602B	MRF P T B 4 1/8	1/8	4	14	41.2	43.4	21	6	12.9	9.2
9026006C	MRF P T C 6 1/8	1/8	6	14	41.2	43.4	22.3	6	12.9	11.3
9026106V	MRF P T V 6 1/8	1/8	6	14	41.2	43.4	22.3	6	12.9	11.3
9026606B	MRF P T B 6 1/8	1/8	6	14	41.2	43.4	22.3	6	12.9	11.3
9026008C	MRF P T C 8 1/8	1/8	8	14	41.2	43.4	25.6	6	12.9	13.8
9026108V	MRF P T V 8 1/8	1/8	8	14	41.2	43.4	25.6	6	12.9	13.8
9026608B	MRF P T B 8 1/8	1/8	8	14	41.2	43.4	25.6	6	12.9	13.8
9026007C	MRF P T C 6 1/4	1/4	6	15	46.6	48.8	24.3	8	15	11.3
9026107V	MRF P T V 6 1/4	1/4	6	15	46.6	48.8	24.3	8	15	11.3
9026607B	MRF P T B 6 1/4	1/4	6	15	46.6	48.8	24.3	8	15	11.3
9026009C	MRF P T C 8 1/4	1/4	8	15	46.6	48.8	27.2	8	15	13.8
9026109V	MRF P T V 8 1/4	1/4	8	15	46.6	48.8	27.2	8	15	13.8
9026609B	MRF P T B 8 1/4	1/4	8	15	46.6	48.8	27.2	8	15	13.8
9026011C	MRF P T C 10 1/4	1/4	10	15	46.6	48.8	28.6	8	15	16
9026111V	MRF P T V 10 1/4	1/4	10	15	46.6	48.8	28.6	8	15	16
9026611B	MRF P T B 10 1/4	1/4	10	15	46.6	48.8	28.6	8	15	16
9026014C	MRF P T C 12 1/4	1/4	12	15	46.6	48.8	31	8	15	19.5
9026114V	MRF P T V 12 1/4	1/4	12	15	46.6	48.8	31	8	15	19.5
9026614B	MRF P T B 12 1/4	1/4	12	15	46.6	48.8	31	8	15	19.5

SYNOPTIC, SIZES AND VERSIONS

M R F	P	T	C	4	1/8
FAMILY	**TYPE**	**RING**	**RING**	**Ø PIPE**	**Ø THREAD**
Flow microregulator	**P** Push-look	**T** Technopolymer with push-in fitting	**C** For cylinder **V** For valve **B** Bidirectional	**4:** Ø 4 **6:** Ø 6 **8:** Ø 8 **10:** Ø 10 **12:** Ø 12	**1/8:** G 1/8" **1/4:** G 1/4"

ACCESSORIES MRF PUSH-LOCK

ANTI-TAMPERING KNOB



Code	Description
9200703	Anti-tampering knob

NOTE: Remove the knob on the Push-Lock MRF by pulling outwards. Fit on the anti-tampering knob and make the necessary settings.
When the MRF has been set, press the knob firmly until it locks in position. If the MRF needs to be recalibrated, remove the anti-tampering knob and push laterally using a screwdriver.

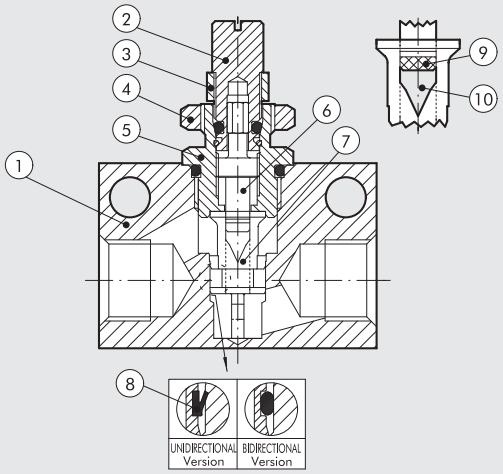
IN-LINE FLOW REGULATOR SERIES RFL

The in-line flow regulator regulates the speed of the piston rod in the pneumatic cylinders.
Two versions are available:
- type U (unidirectional) regulates the flow only in one of the two directions of air flow.
- type B (bidirectional) regulates the flow in both directions of air flow.

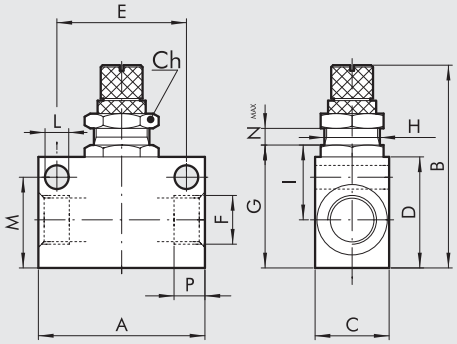
Regulation: manual or with a screwdriver.
Max. temperature 70°C (158°F)
Max. pressure: 10 bar (1MPa-145 psi)

COMPONENTS

① Aluminium block
② Brass adjusting knob
③ Brass knob locking ring nut
④ Brass wall locking ring nut
⑤ Brass nipple
⑥ Brass regulation needle
⑦ Technopolymer gasket insert
⑧ NBR gasket
⑨ Part of needle
⑩ Flow window



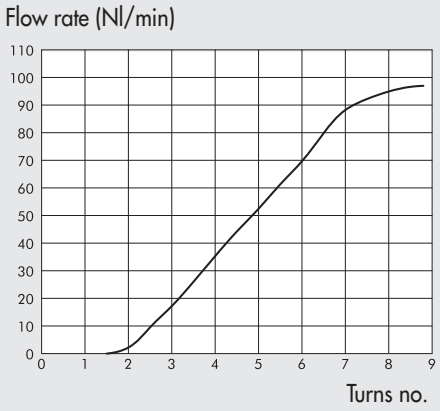
DIMENSIONS



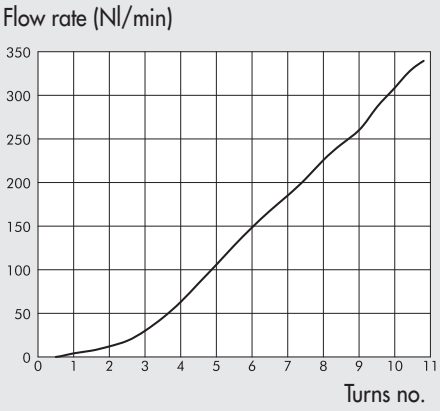
THREAD F	M5	1/8	1/4	3/8	1/2
P	4.2	7	8	10	11
E	15	25	35	35	44
H	M10x0.75	M12x1	M12x1	M15x1	M15x1
Nmax	3.3	5.5	5	7.5	7.5
A	21	31	45	50	59
B	37	48	53.5	59	67
C	14	16	20	25	30
G	18	25	33	34	43.5
I	11.6	15	22	22	24
D	16	22	30	30	40
M	12.5	18.2	24.5	25.5	35
Ch	12	16	16	20	20
L	4.2	4.2	6.5	6.5	6.5

FLOW CHARTS Pm = 6 bar

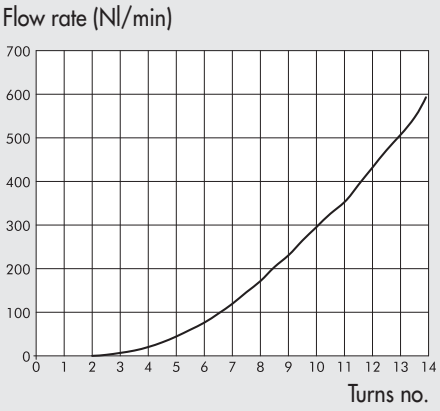
RFL M5



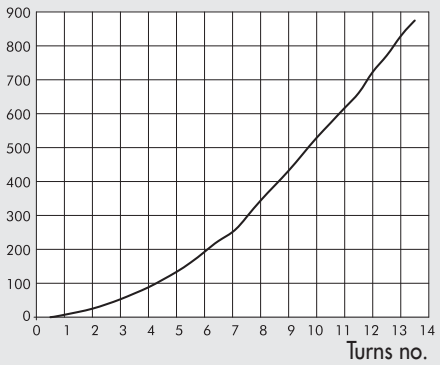
RFL G 1/8"



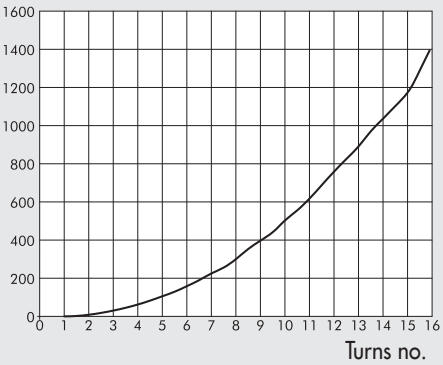
RFL G 1/4"



RFL G 3/8"

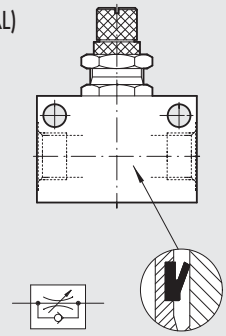


RFL G 1/2"



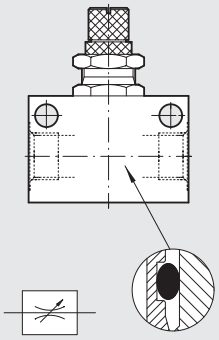
ORDERING CODES

RFL U (UNIDIRECTIONAL)



Code	Ref.
9041001	RFL U M5
9041002	RFL U 1/8
9041003	RFL U 1/4
9041004	RFL U 3/8
9041005	RFL U 1/2

RFL B (BIDIRECTIONAL)



Code	Ref.
9041201	RFL B M5
9041202	RFL B 1/8
9041203	RFL B 1/4
9041204	RFL B 3/8
9041205	RFL B 1/2

SUMMARY AUXILIARY VALVES

- **QUICK EXHAUST VALVE SERIES VSR** E4.2

- **STOP VALVE SERIES STP** E4.3

- **SLIDE VALVE SERIES VCS** E4.6

- **CIRCUIT SELECTOR VALVE SERIES VOR** E4.7

- **CHECK VALVE SERIES VNR** E4.8

- **PNEUMATIC LOGIC** E4.9
- **TIMER** E4.11

QUICK EXHAUST VALVE SERIES VSR

New, more compact and lighter version.
Used to evacuate air in the cylinder quickly, which increases cylinder speed.

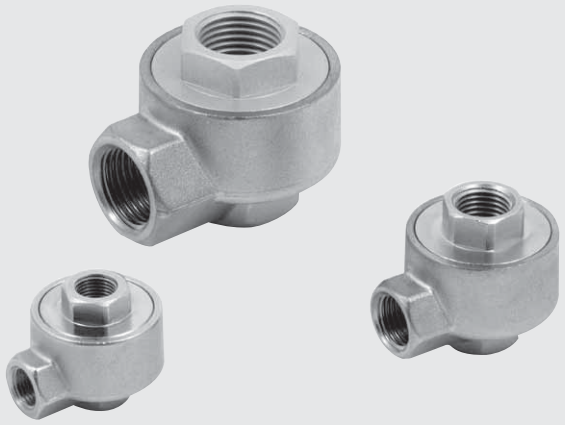
- Temperature 0-80°C (32°-176°F)
- Max. pressure 12 bar (1200 KPa)
- Min. pressure 0.5 bar (50 KPa)

Nominal flow rate (P → A) ΔP = 1 bar [Nl/min]:

Pm [bar]	1/8	1/4	1/2
2.5	550	800	2400
4	700	1200	2800
6.3	900	1400	3600

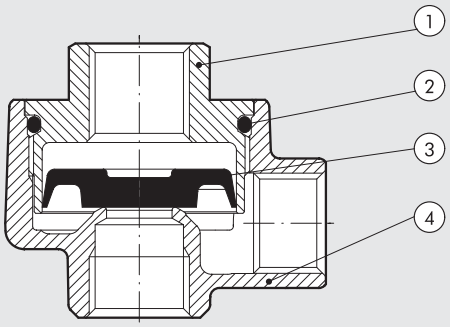
Empty flow rate (A → R) [Nl/min]:

Pm [bar]	1/8	1/4	1/2
2.5	800	1500	4400
4	1200	2450	6300
6.3	1800	3500	8000

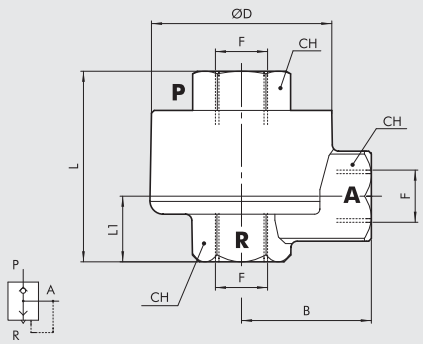


COMPONENTS

① Cap: nickel-plated brass for 1/8-1/4
anodised aluminium for 1/2
② O-ring: NBR
③ Lip-seal: Polyurethane
④ Body: nickel-plated brass

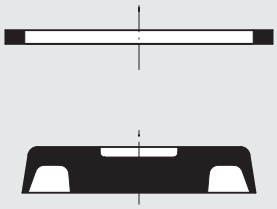


OVERALL DIMENSIONS AND ORDERING CODES



Code	Ref.	F	B	D	CH	L	L1	Weight [g]
9101201	VSR 1/8	1/8	18.5	29.5	14	32.5	13.4	80
9201201	VSR 1/4	1/4	23.3	34	17	40.5	16.9	115
9401201	VSR 1/2	1/2	35	47	27	45.7	16.2	230

SPARE GASKETS



Code	Ref.
9151501	Spare gaskets VSR 1/8
9251501	Spare gaskets VSR 1/4
9451501	Spare gaskets VSR 1/2

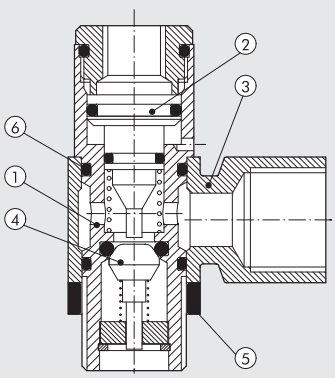
STOP VALVE SERIES STP

Stop valves mounted on the cylinder inlets allow a flow of air only in the presence of an pneumatic pilot. Unidirectional and bidirectional versions are available.This item is mainly used as a safety valve. When pressure drops in the pneumatic pilot, all cylinder movement is halted.

TECHNICAL DATA		UNIDIRECTIONAL				BIDIRECTIONAL				
		1/8"	1/4"	3/8"	1/2"	1/8"	1/4"	3/8"	1/2"	3/4"
Operating pressure	bar	0.5 to 10								
	MPa	0.05 to 1								
Operating temperature	°C	–10 to 60								
	°F	14 to 148								
Fluid		Lubricated or unlubricated filtered air								
Flow rate (6 bar)	Nl/min	250	350	950	1450	320	700	1200	2100	7000
Connection type		Female threaded - R automatic cartridge								Female threaded
Installation		In any position								

UNIDIRECTIONAL STOP VALVE COMPONENTS

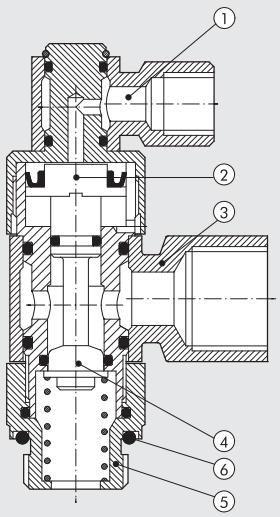
① Body: nickel-plated brass
② Piston rod: steel
③ Rotary ring: nickel-plated brass
④ Valve: steel
⑤ Gasket: technopolymer
⑥ Gasket O-Ring: NBR



BIDIRECTIONAL STOP VALVE COMPONENTS

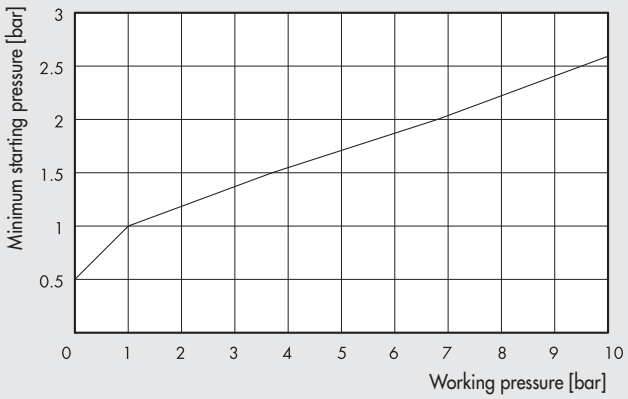
1/8" - 1/4" - 3/8" - 1/2"
① Pilot ring: nickel-plated brass
② Piston rod: nickel-plated brass
③ Rotary ring: nickel-plated brass
④ Stem with valve: brass
⑤ Body: nickel-plated brass
⑥ Gasket O-Ring: NBR

3/4"
① Pilot ring: nickel-plated brass
② Piston rod: anodised aluminium
③ Rotary ring: anodised aluminium
④ Stem with valve: anodised aluminium
⑤ Body: anodised aluminium
⑥ Gasket O-Ring: NBR

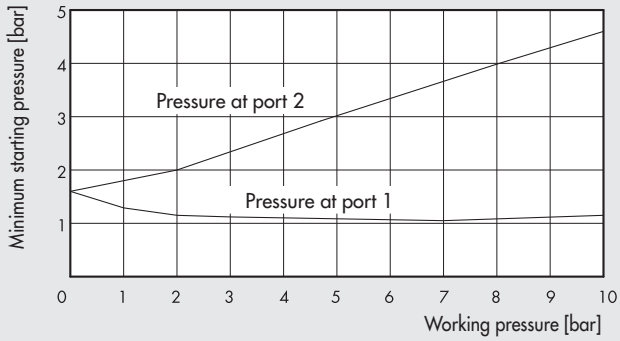


STARTING PRESSURE

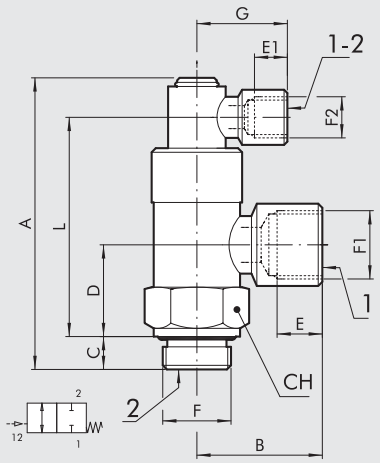
UNIDIRECTIONAL VALVE



BIDIRECTIONAL VALVE

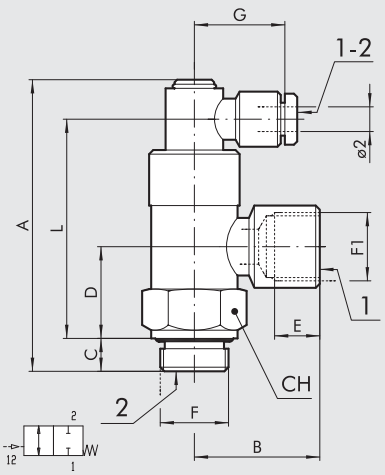


BIDIRECTIONAL THREADED STOP VALVE



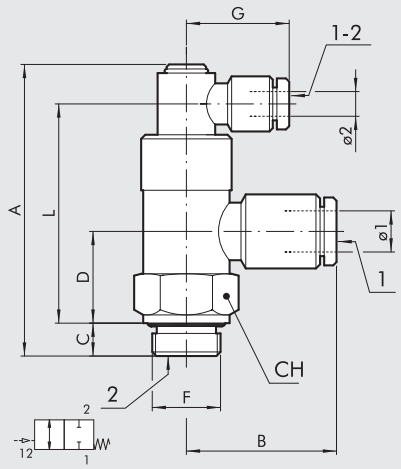
Code	Description	F	F1	F2	A	B	C	D	E	E1	G	L	CH
W6001101001	STP-B 1/8 108	G 1/8	G 1/8	G 1/8	57.5	21.5	6.9	16	7	7	21.5	41.9	14
W6001111011	STP-B 1/4 104	G 1/4	G 1/4	G 1/8	65.7	25.5	8	19.5	8	7	21.5	48.1	17
W6001121021	STP-B 3/8 138	G 3/8	G 3/8	G 1/8	70.9	31	8	22.3	10	7	21.5	53.3	22
W6001131031	STP-B 1/2 112	G1/2	G1/2	G1/8	83.5	40	12	27	14	7	21	61.5	27
W6001141041	STP-B 3/4 134	G3/4	G3/4	G1/8	93.5	39	12	32.5	16	7	21	74	32

THREAD + PIPE BIDIRECTIONAL STOP VALVE



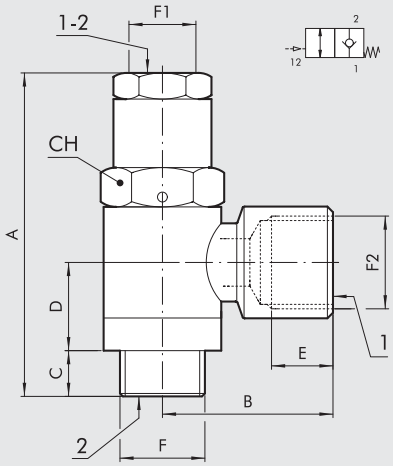
Code	Description	F	F1	Ø 2	A	B	C	D	E	G	L	CH
W6001101002	STP-BX 1/8-1/8 04	G 1/8	G 1/8	4	57.5	21.5	6.9	16	7	25	41.9	14
W6001111012	STP-BX 1/4-1/4 04	G 1/4	G 1/4	4	65.7	25.5	8	19.5	8	25	48.1	17
W6001121022	STP-BX 3/8-3/8 04	G 3/8	G 3/8	4	70.9	31	8	22.3	10	25	53.3	22

PIPE BIDIRECTIONAL STOP VALVE



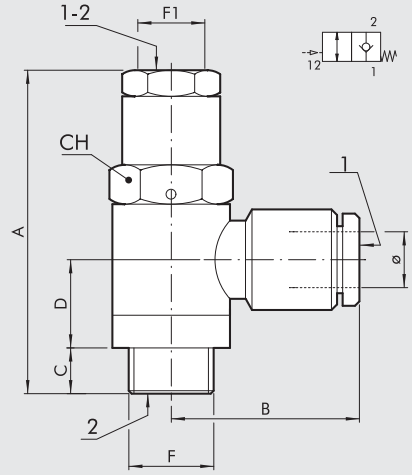
Code	Description	F	Ø 1	Ø 2	A	B	C	D	G	L	CH
W6001101106	STP-B 1/8 006	G 1/8	6	4	57.5	25	6.9	16	25	41.9	14
W6001111106	STP-B 1/4 006	G 1/4	6	4	65.7	27.5	8	19.5	25	48.1	17
W6001111108	STP-B 1/4 008	G 1/4	8	4	65.7	32	8	19.5	25	48.1	17
W6001121108	STP-B 3/8 008	G 3/8	8	4	70.9	31.5	8	22.3	25	53.3	22
W6001121110	STP-B 3/8 010	G 3/8	10	4	70.9	36.5	8	22.3	25	53.3	22
W6001131112	STP-B 1/2 012	G 1/2	12	4	83.5	41.5	12	27	25	71.5	27

UNIDIRECTIONAL THREADED STOP VALVE



Code	Description	F	F2	A	B	C	D	E	F1	CH
W6001001001	STP-U 1/8 108	G 1/8	G 1/8	43.5	21.5	6	13	7	M5	14
W6001011011	STP-U 1/4 114	G 1/4	G 1/4	49.5	25.5	7	13.5	8	G 1/8	17
W6001021021	STP-U 3/8 138	G 3/8	G 3/8	54.9	31	9	15	10	G 1/8	19

UNIDIRECTIONAL PIPE STOP VALVE



Code	Description	F	Ø	A	B	C	D	F1	CH
W6001001106	STP-U 1/8 006	G 1/8	6	43.5	25	6	13	M5	14
W6001011106	STP-U 1/4 006	G 1/4	6	49.5	27.5	7	13.5	G 1/8	17
W6001011108	STP-U 1/4 008	G 1/4	8	49.5	32	7	13.5	G 1/8	17
W6001021108	STP-U 3/8 008	G 3/8	8	54.9	31.5	9	15	G 1/8	19
W6001021110	STP-U 3/8 010	G 3/8	10	54.9	36.5	9	15	G 1/8	19
W6001031112	STP-U 1/2 012	G 1/2	12	61.4	41.5	10	17	G 1/8	24

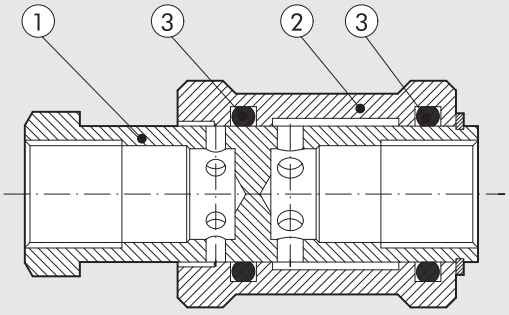
SLIDE VALVE SERIES VCS

The 3/2 slide valve is normally used as a circuit on-off valve. When the ring nut is moved back, the system downstream is relieved; when the ring nut is moved forward, the system is supplied with compressed air.

TECHNICAL DATA		1/8″	1/4″	3/8″	1/2″
Operating pressure		0 - 10 bar (0 - 1 MPa)			
Operating temperature range	°C	–10 to + 80			
Fluid		Lubricated or unlubricated filtered air			
Flow rate at 6.3 bar (0.63 MPa - 91 psi) ΔP 0.5 bar	Nl/min	430	680	1400	2200
Flow rate at 6.3 bar (0.63 MPa - 91 psi) ΔP 1bar	Nl/min	630	1040	2070	3330
Conductance C	Nl/min · bar	170	247	537	833
Critical ratio b	bar/bar	0.2	0.3	0.1	0.2

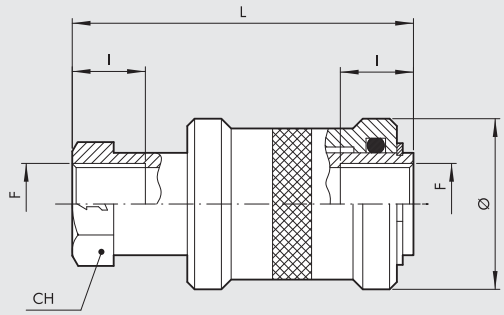
COMPONENTS

① Body: chromium-plated brass
② Ring nut: anodized aluminium
③ Seals: NBR



DIMENSIONS AND ORDERING CODES

Code	Description	F	Ø	I	L	CH
W0970050001	Slide valves 3/2	1/8″	25	10	48	11
W0970050002	Slide valves 3/2	1/4″	30	12	58	19
W0970050003	Slide valves 3/2	3/8″	35	12	68	22
W0970050004	Slide valves 3/2	1/2″	40	15	80	27



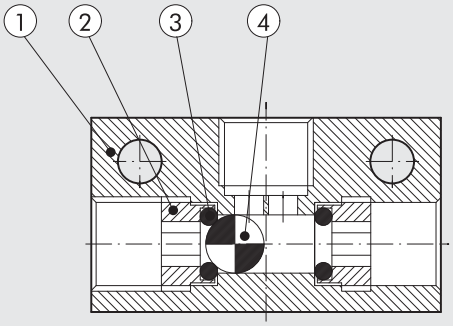
CIRCUIT SELECTOR VALVE SERIES VOR

Circuit selector valves select two separate input signal without creating reciprocal interference, giving a single output signal.

TECHNICAL DATA		1/8"	1/4"
Nominal flow rate at 6.3 bar ΔP 1 bar	Nl/min	500	1300
Operating temperature range	°C	−10 to + 80	
	°F	14 to 176	
Operating pressure	bar	2 - 10	
	MPa	0.2 - 1	
Fluid		Lubricated or unlubricated filtered air	

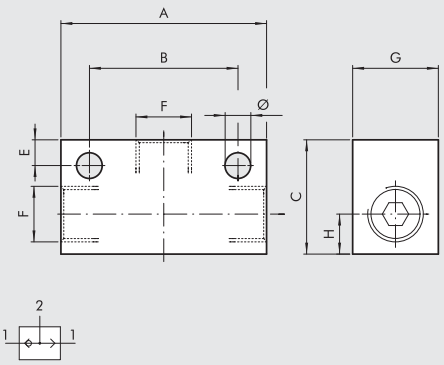
COMPONENTS

① Body: passivated aluminium
② Insert: brass
③ Seal: NBR
④ Ball: stainless steel



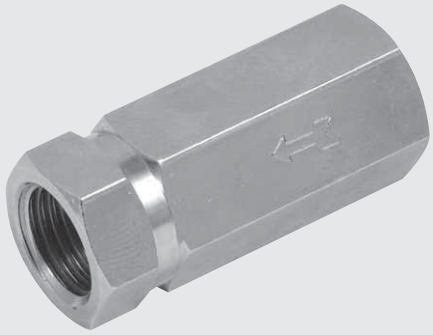
DIMENSIONS AND ORDERING CODES

Code	Description	A	C	G	H	E	B	F	Ø
W3603000001	VOR 1/8	36	20	15	7.5	4	25	G 1/8	4.5
W3603000002	VOR 1/4	43	25	20	8.5	6.5	25	G 1/4	4.5



CHECK VALVE SERIES VNR

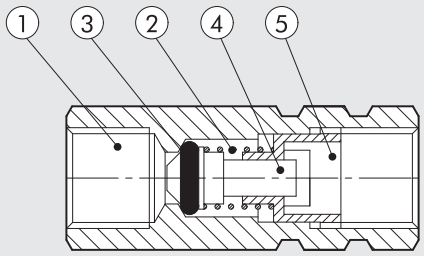
This allow air flow in only one of the two directions.



TECHNICAL DATA		1/8"	1/4"
Ports		G 1/8"	G 1/4"
Nominal diameter	mm	5.2	7
Nominal flow rate	Nl/min	900	1100
Operating temperature range	°C	–10 to + 70	
	°F	14 to 158	
Operating pressure	bar	2 - 10	
	MPa	0.2 - 1	
Opening pressure	bar	0.05 (5 KPa)	
Fluid		Lubricated or unlubricated filtered air	

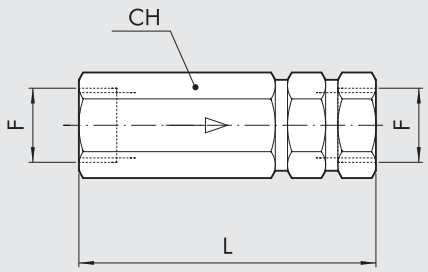
COMPONENTS

① Body: OT58 brass
② Valve spring: steel
③ Seal: NBR
④ Stem with OT58 brass valve
⑤ Stem insert: OT58 brass



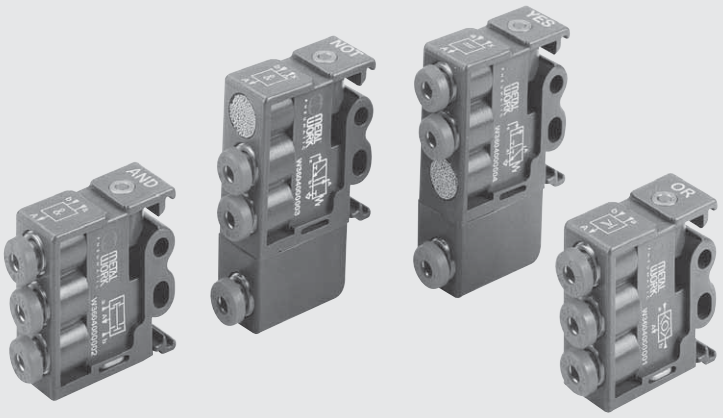
DIMENSIONS AND ORDERING CODES

Code	Description	F	L	CH
W3601000001	VNR 1/8	1/8	35	13
W3601000002	VNR 1/4	1/4	41	17



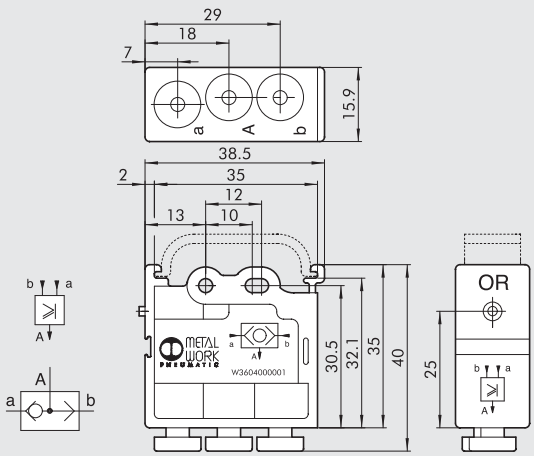
PNEUMATIC LOGIC

Metal Work logic elements are available with 5 different functions:
OR, AND, NOT, YES, MEMORY.
Main features common to all elements:
- Adaptor for Ω bar (DIN EN 50022) integral with the body.
- Built-in pressure indicator.
- Pipe locking system using Ø 4 built-in fittings.



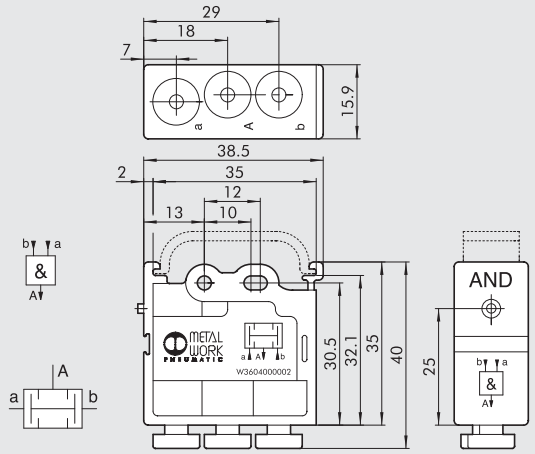
TECHNICAL DATA		
Operating temperature	°C	– 10 to + 60
Valve fitting		Push-in fitting for Ø 4 pipe
Pressure range	bar	OR - AND: from 1.5 to 8 bar
		YES-NOT -MEMORY: from 0 to 8 bar, pilot pressure from 1.5 to 8 bar
		NOT: 6 bar switching thereshold = 0.4
Nominal diameter	mm	2.7
Flow rate at 6 bar (0.6 MPa-87 psi) ΔP 1 bar (0.1 Mpa-14.5 psi)	Nl/min	100
Fluid		Lubricated or unlubricated filtered compressed air; must be uninterrupted when lubricated
Recommended lubricant		ISO and UNI FD22
Actionament		Via compressed air
Reset		AND-OR: via compressed air
		YES-NOT via mechanical spring
		MEMORY: via compressed air
Installation		In any position
Mounted		On Omega bar (DIN EN 50022) size 35 x 7 or 35 x 15
		Wall-mounted with Ø 4.2 holes
MATERIALS		
Body		Technopolymer
Spool		Aluminium
Seal		NBR

LOGIC ELEMENT: OR



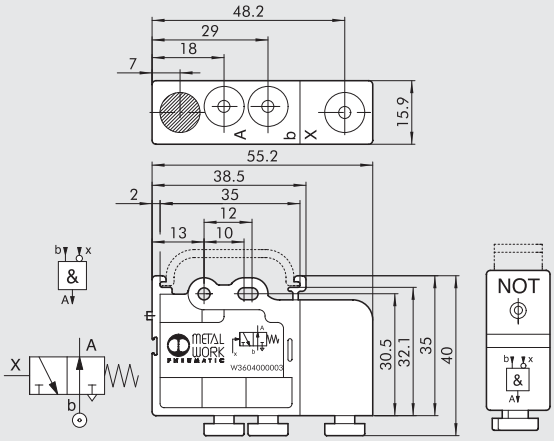
Code	Description
W3604000001	OR - logic product

LOGIC ELEMENT: AND



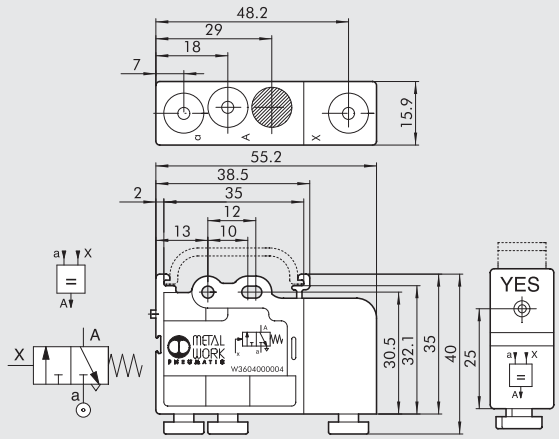
Code	Description
W3604000002	AND - logic sum

LOGIC ELEMENT: NOT



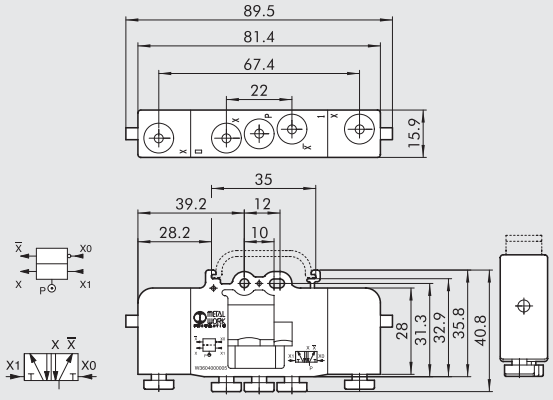
Code	Description
W3604000003	NOT - Negation

LOGIC ELEMENT: YES



Code	Description
W3604000004	YES - Affirmation

LOGIC ELEMENT: MEMORY



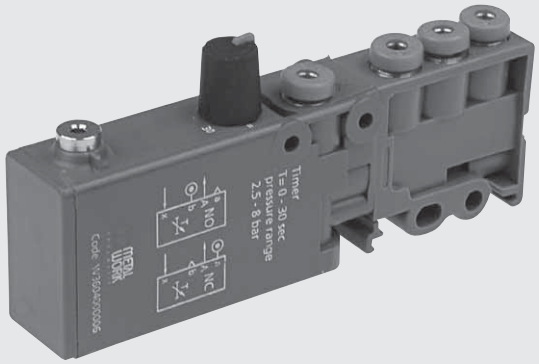
Code	Description
W3604000005	Memory

NOTES

TIMER

The Timer is part of Metal Work range of logic elements, which also includes OR, AND, NOT, YES, MEMORY.
The value of the signal output delay is set by rotating a knob. It can work both as 3/2 NC and 3/2 NO, depending on whether feeding is through port "a" or port "b".
The maximum delay time can be increased by unscrewing a plug and connecting the port to an external auxiliary tank.

- Adaptor for Ω bar (DIN EN 50022) integrated in the body.
- Pressure indicator via an orange pin
- Pipe clamping system using Ø 4 built-in push-on fittings.

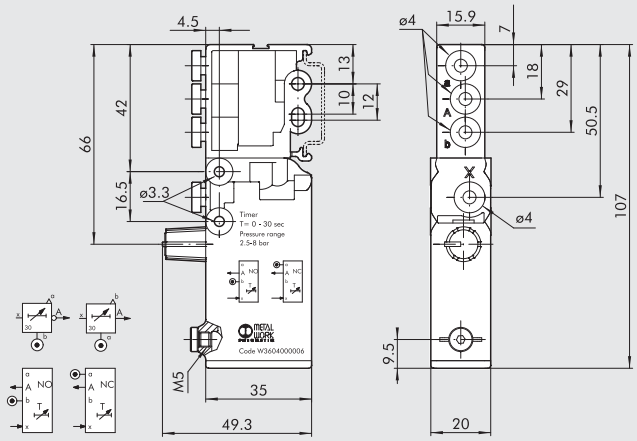


TECHNICAL DATA

Temperature range	°C	– 10 to + 60
Valve coupling	mm	Push-in fitting for Ø 4 pipe
Pressure range	bar	From 2.5 to 8
Nominal diameter	mm	2.7
Flow rate at 6 bar (0.6 Mpa, 87 psi) ΔP 1 bar (0.1 Mpa, 14.5 psi)	Nl/min	100
Delay setting range	s	From 0 to 30, at 6 bar
Signal shutoff time	s	< 0.1
Repeatability	s	± 0.4
Fluid		Filtered, lubricated or unlubricated compressed air. If used, must be continuous
Operating		By compressed air
Repositioning		By mechanical spring
Installation		In any direction
Assembly		On Ω bar (DIN EN 50022) size 35 x 7 o 35 x 15 - Wall mounting using Ø 4.2 holes
MATERIALS		
Body		Anodised aluminium / Technopolymer
Internal parts		Brass / Technopolymer
Gaskets		NBR
Spring		Spring steel

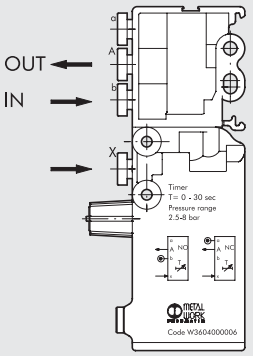
DIMENSIONS AND ORDERING CODES

Code	Description
W3604000006	Timer

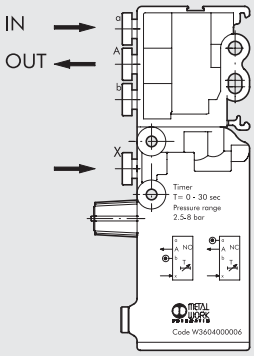


NORMALLY OPEN AND NORMALLY CLOSED OPERATION

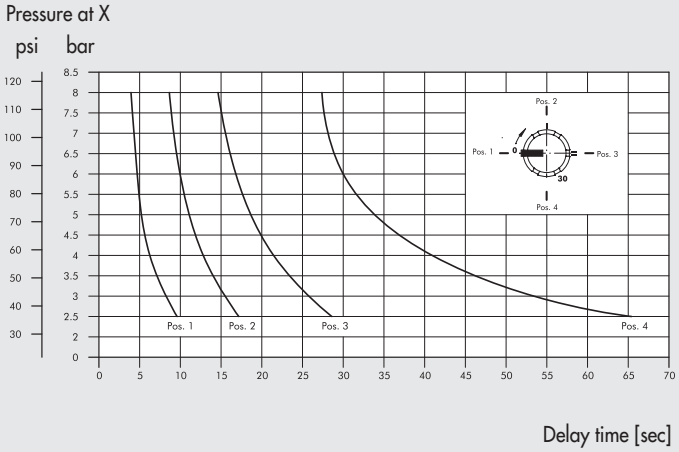
NO



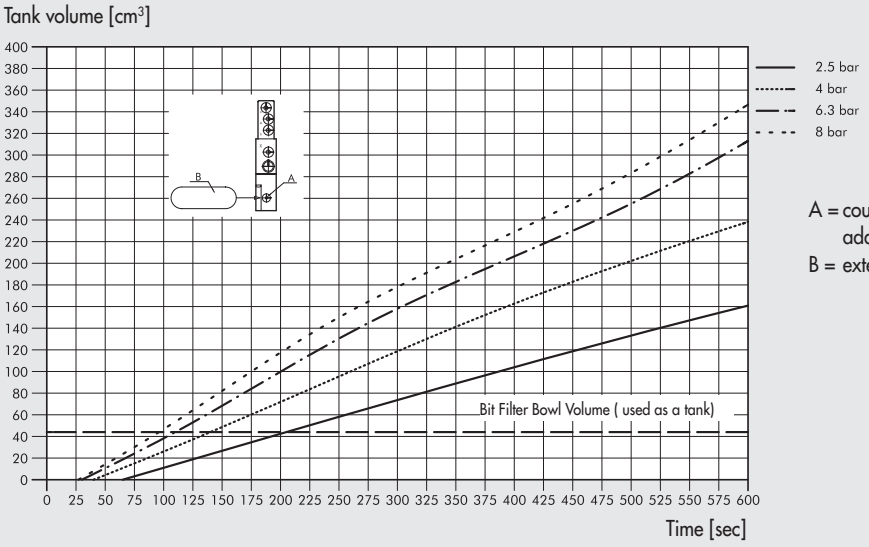
NC



CHANGE IN THE DELAY WITH CHANGE IN PRESSURE AND KNOB POSITION



HOW TO INCREASE THE DELAY



A = coupling (plugged) for external additional tanks
B = external tank

NOTES

SUMMARY VARIOUS ACCESSORIES

- **AIR-AIR PRESSURE MULTIPLIER (BOOSTER)** **E5**.2

- **IN-LINE PROGRESSIVE STARTER VAP 1/4" AND 1/2"** **E5**.9

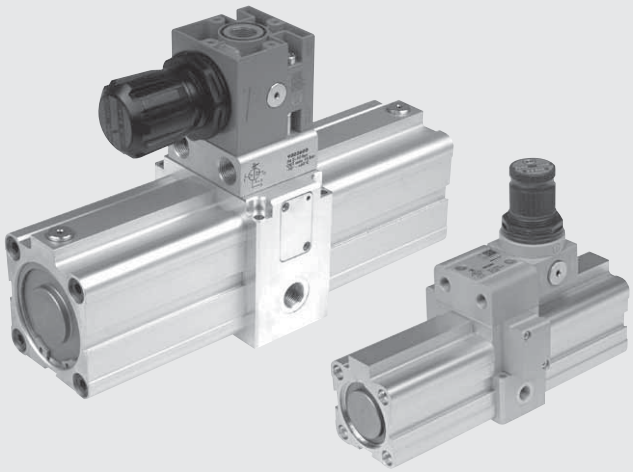
- **ROTARY JOINTS AND DISTRIBUTION FRAMES** **E5**.11

- **SILENCERS AND EXHAUST REGULATOR** **E5**.15

- **PNEUMO-POWER** **E5**.20

AIR-AIR PRESSURE MULTIPLIER (BOOSTER)

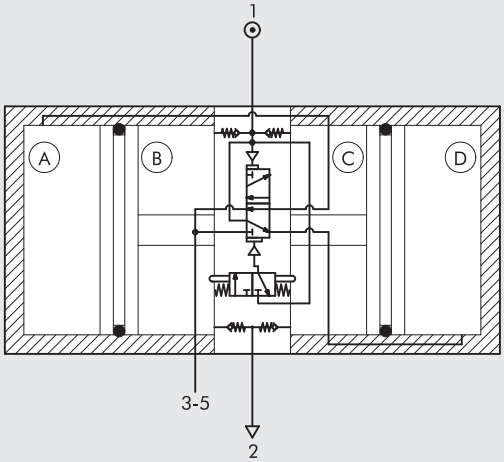
The air-air pressure multiplier, or booster, is an automatic device that compresses air to give an outlet pressure that is double the inlet pressure. It is normally used to locally intensify the input pressure of one or more actuators. As it is entirely pneumatic it can be used when electric devices are not recommended. The booster can be supplied with or without a pressure regulator. It is fitted with check valves that maintain the outlet pressure even when the supply of compressed air is switched off.
This means it is necessary to interrupt the supply and relieve the circuit before intervening on the device in any way.
It is advisable to install a tank after the booster to prevent fluctuations in outlet pressure.



TECHNICAL DATA		Booster Ø 40	Booster Ø 40 with regulator	Booster Ø 63	Booster Ø 63 with regulator
Bore		Ø 40		Ø 63	
Fluid		Filtered unlubricated compressed air, Lubrication, if used, must be continuous.			
Threaded port		1/8"		3/8"	
Inlet pressure	MPa	0.2 - 1			
	bar	2 - 10			
	psi	29 - 145			
Outlet pressure	MPa	max 2	max 1.6 (regulated)	max 2	max 1.6 (regulated)
	bar	max 20	max 16 (regulated)	max 20	max 16 (regulated)
	psi	max 290	max 232 (regulated)	max 290	max 232 (regulated)
Operating temperature	°C	-10 to +60	-10 to +60	-10 to +60	-10 to +50
	°F	14 to 140	14 to 122	14 to 140	14 to 122
Weight	g	1.380	1.600	4.240	5.350
Mounting		Wall or panel			
Installation		In any position			

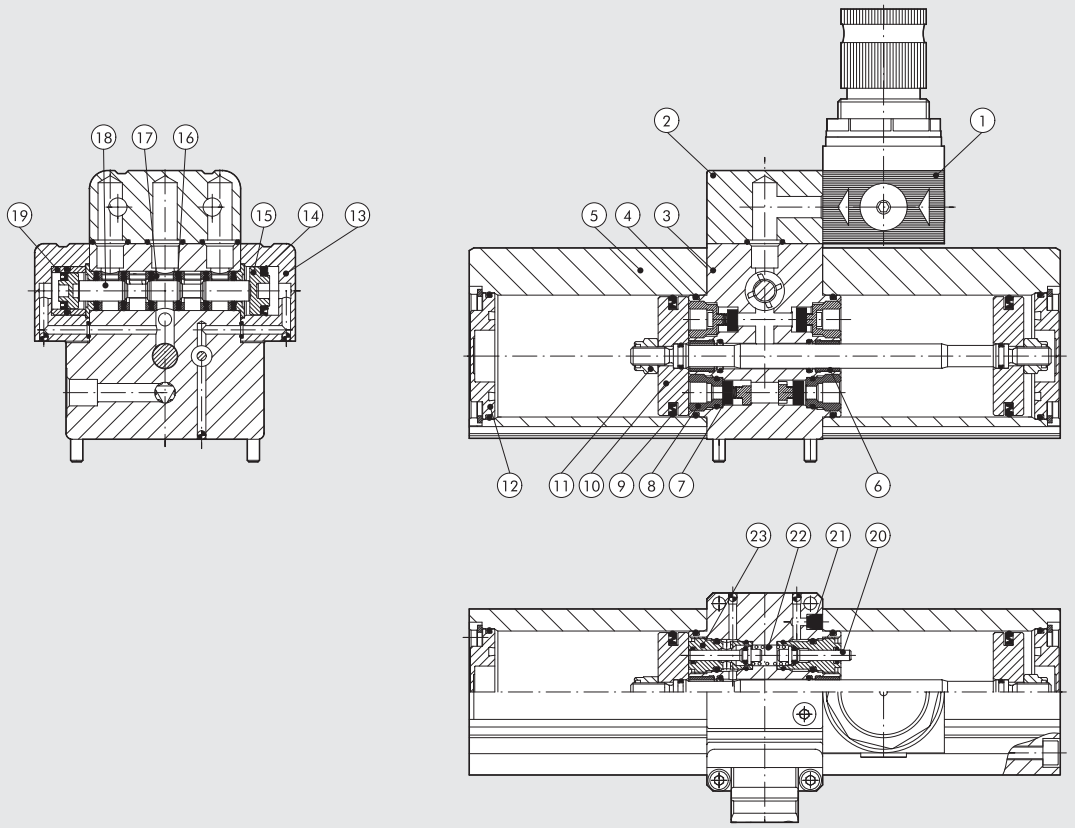
OPERATING LAYOUT

The pressure booster is comprised of a central body (with one 3-2 valve, one 5-2 valve and four check valves), two side liners and a through rod on which two pistons are mounted.
The supply air is compressed alternately by the two pistons in one of the two central chambers (B and C); the other central chamber and one of the two side chambers (A and D) operate the pistons; the external chamber, which is not involved in compression, is relieved.
Air compressed at a ratio of 2:1 passes through a check valve that maintains the output pressure even when compressed air is no longer supplied.
The valves in the central body, which are operated by mechanical pusher pistons, switch the function of the two pairs of chambers (A and D, B and C) at each piston stroke.



METAL WORK PNEUMATIC

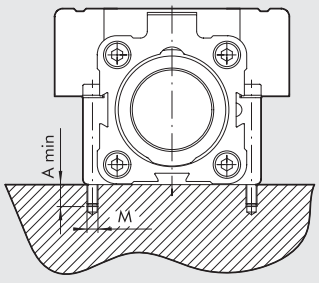
COMPONENTS



① PRESSURE REGULATOR (for 9002200 - 9002600 only)
② INTERFACE BLOCK (for 9002200 - 9002600 only): anodized aluminium
③ CENTRAL BODY: anodized aluminium
④ OR SEAL: NBR rubber
⑤ BARREL: anodized aluminium alloy section
⑥ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑦ POPPET: NBR rubber
⑧ CHECK VALVE: brass
⑨ PISTON GASKET: NBR rubber
⑩ PISTON: aluminium
⑪ SELF-LOCKING NUT: stainless steel
⑫ CYLINDER BASE: anodized aluminium
⑬ VALVE CONTROL: anodized aluminium
⑭ VALVE CONTROL GASKET: NBR rubber
⑮ VALVE PISTON: technopolymer
⑯ GASKET: NBR rubber
⑰ SPACER: technopolymer
⑱ SPOOL: nickel-plated aluminium
⑲ DIFFERENTIAL BUSHING: brass
⑳ PUSHER: stainless steel
㉑ SILENCER: technopolymer
㉒ SPRING: stainless steel
㉓ GUIDE BUSHING: brass

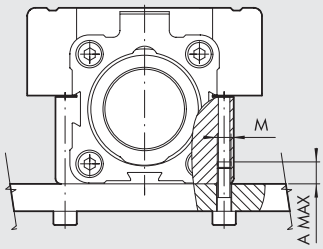
MOUNTING

On a wall using the M4 x 40 - M6 x 10 screws provided with the Booster.



	Ø 40	Ø 63
A	8	12
M	M4	M6

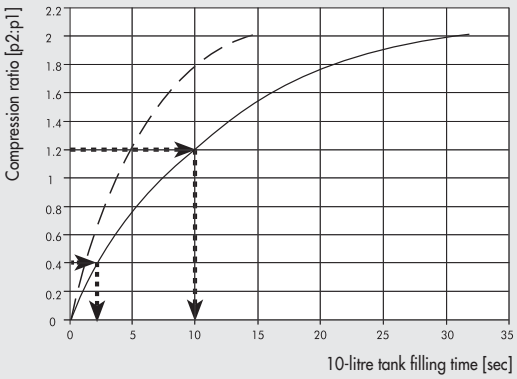
On a panel using M5 - M8 screws.



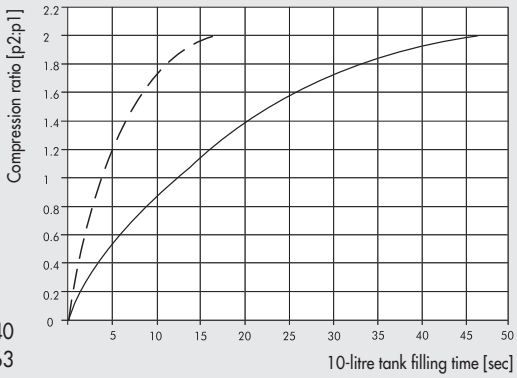
	Ø 40	Ø 63
A	8	10
M	M5	M8

TANK FILLING CURVES

WITHOUT REGULATOR



WITH REGULATOR



——— Ø 40
— — — Ø 63

The graphs refer to the filling of a 10-litre tank and show the ratio of outlet to inlet pressure (= p2:p1) as a function of time (sec).
The graphs are valid for any inlet pressure between 2 and 10 bar.
The following formula can be used to calculate the time t (sec) required to switch from pressure ratio 1 to pressure ratio 2 in a tank of volume V (litres):

$$t = \frac{V\,(t2 - t1)}{10}$$

where t1 and t2 are the times shown on the x-axis, corresponding to ratios 1 and 2.

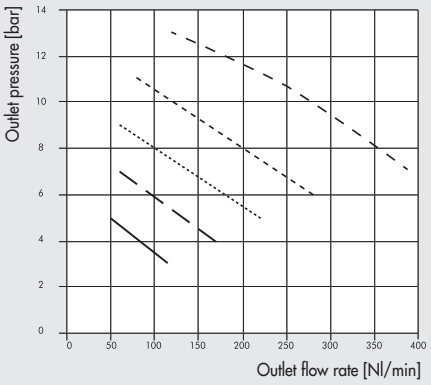
E.g.
1 = 0.4 => t1 = 2.5 sec
2 = 1.2 => t2 = 10 sec

The time required to switch from 1 to 2 with a 25-litre tank is:

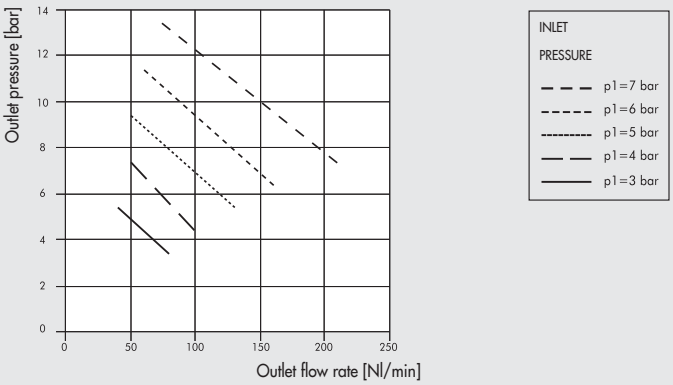
$$t = \frac{25\,(10 - 2.5)}{10}\ \text{sec} = 18.75\ \text{sec}$$

FLOW CHARTS

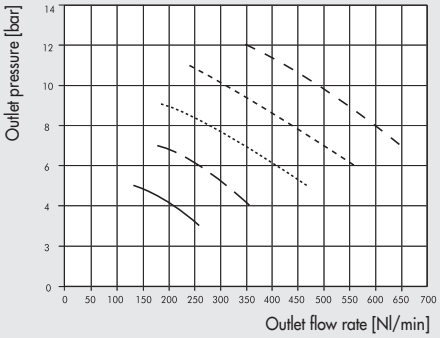
WITHOUT REGULATOR Ø 40



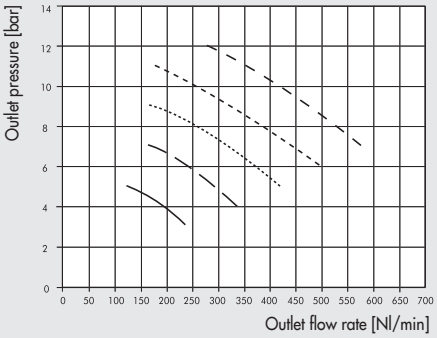
WITH REGULATOR Ø 40



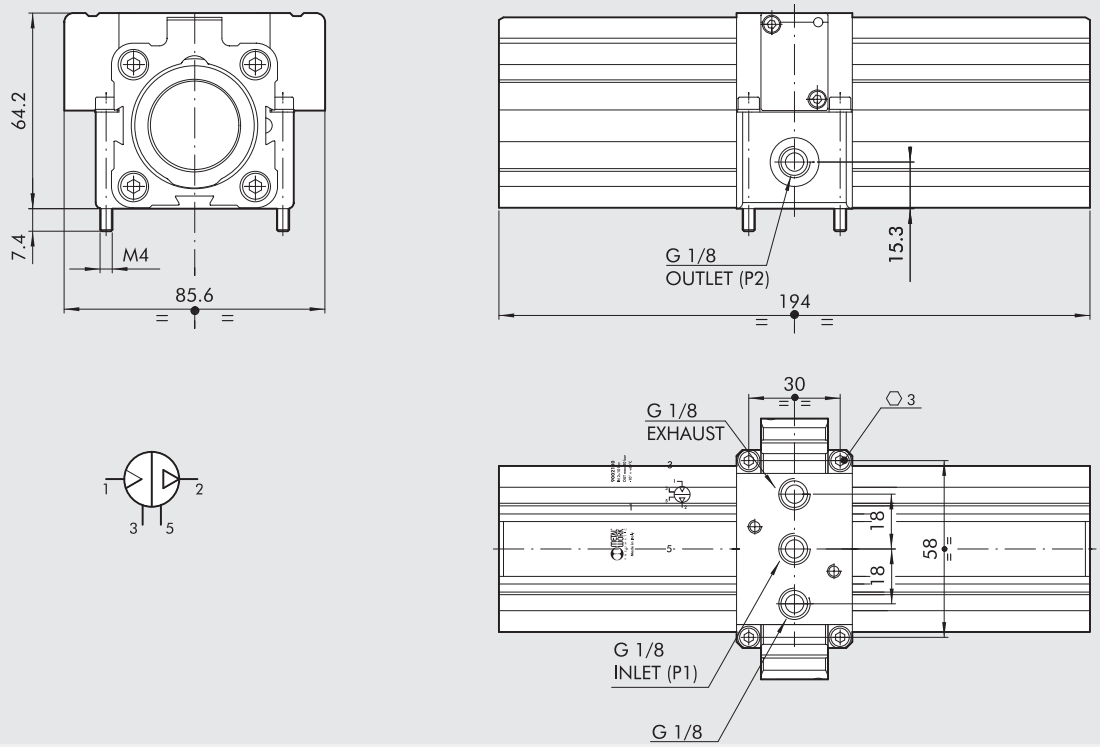
WITHOUT REGULATOR Ø 63



WITH REGULATOR Ø 63

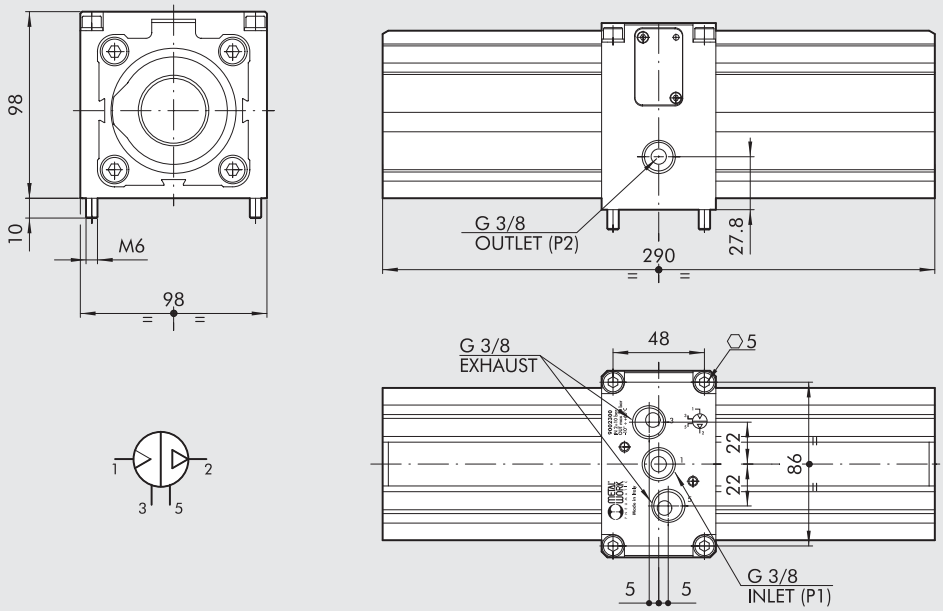


PRESSURE MULTIPLIER (BOOSTER Ø 40)



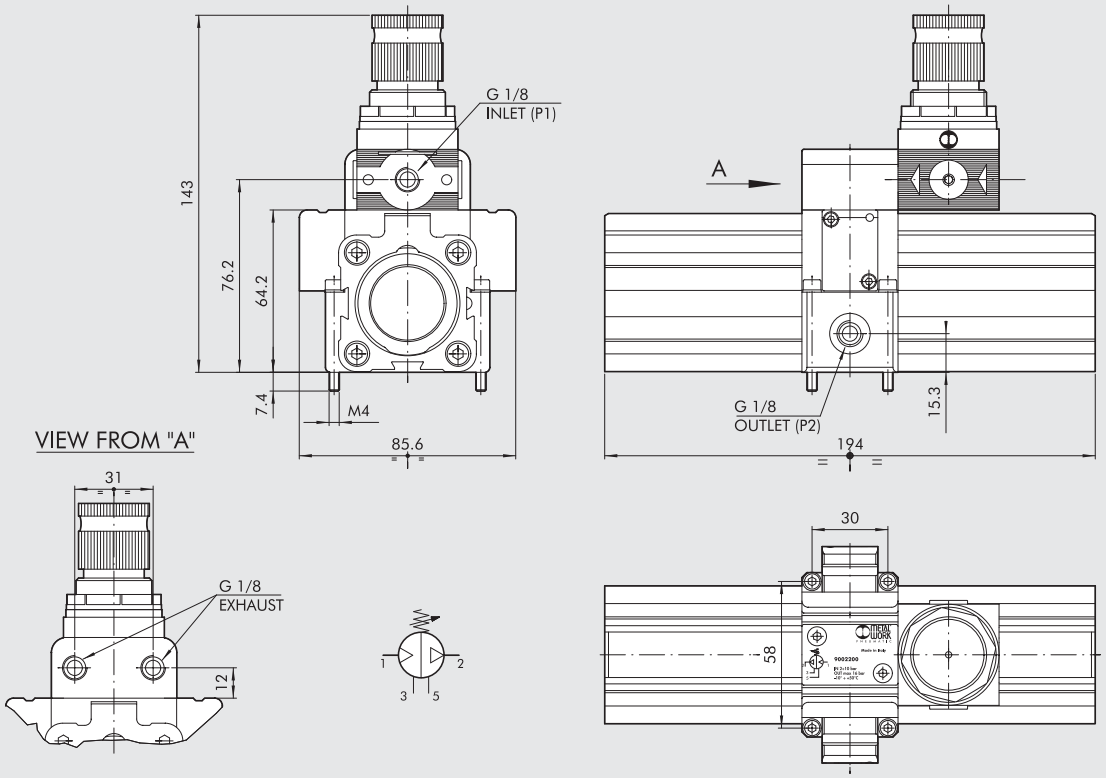
Code	Description
9002100	Booster Ø 40

PRESSURE MULTIPLIER (BOOSTER Ø 63)



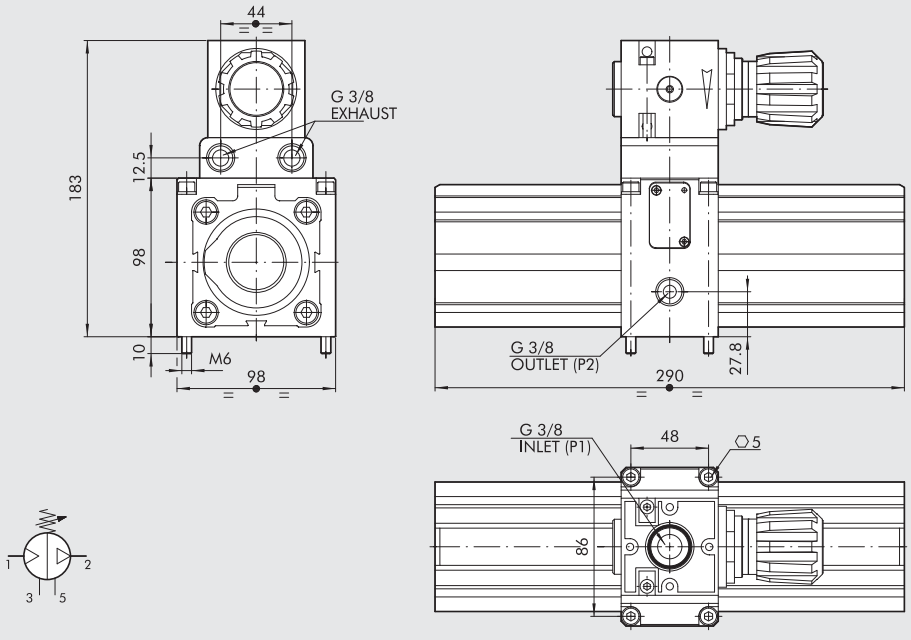
Code	Description
9002300	Booster Ø 63

PRESSURE MULTIPLIER (Ø 40 BOOSTER WITH REGULATOR)



Code	Description
9002200	Booster Ø 40 with regulator

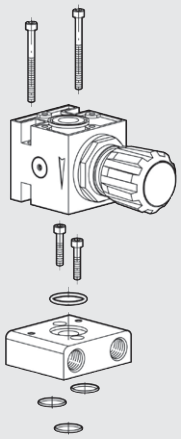
PRESSURE MULTIPLIER (Ø 63 BOOSTER WITH REGULATOR)



Code	Description
9002600	Booster Ø 63 with regulator

ACCESSORIES

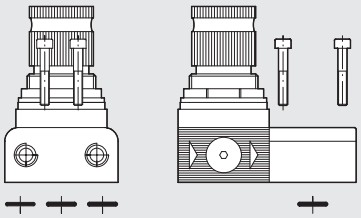
Ø 63 REGULATOR UNIT



Code	Description
9002380	Ø 63 regulator unit

Note: supplied with 4 screws, 4 o-ring

Ø 40 REGULATOR UNIT



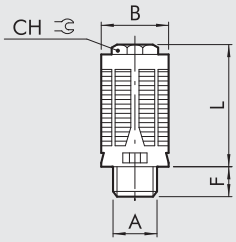
Code	Description
9002180	Ø 40 regulator unit

Note: Supplied with 2 screws, 3 O-ring

PRESSURE GAUGE

Code	Description
9700101	M 40 1/8 012
9700110	M 40x40 1/8 012

MW SPL-F SILENCER FOR BOOSTER Ø 40

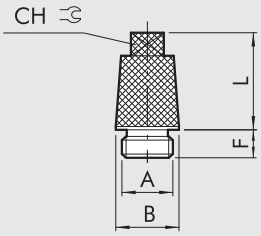


Code	A	B +0.2	F +0.5	L +3%	CH
W0970530072	G1/8	16.3	85.5	29	10

Materials:
Black acetal resin
Felt

Features:
Pmax: 12 bar
Temp.: -10°C to +60°C

MW SCQ SILENCER FOR BOOSTER Ø 63



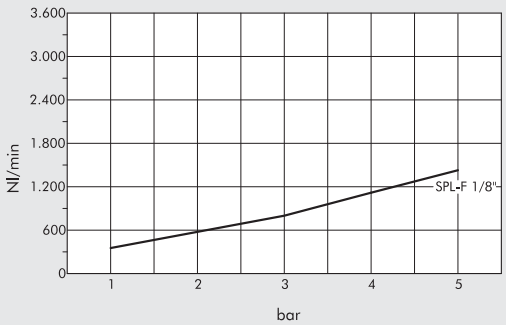
Code	A	B +0.2	F +0.5	L +3%	CH
W0970530014	G3/8	19	8.5	29.2	10

Materials:
Nickel-plated brass
Sintered nickel-plated bronze

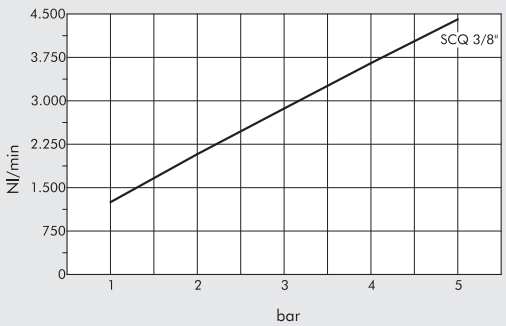
Features:
Pmax: 12 bar
Temp.: −10°C to +80°C

SILENCER FLOW GRAPH

MW SPL-F



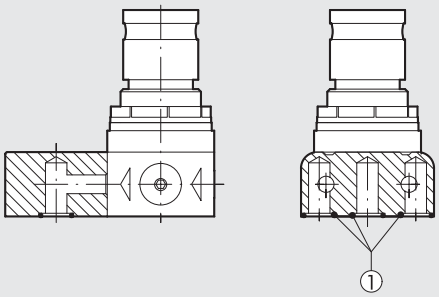
MW SCQ



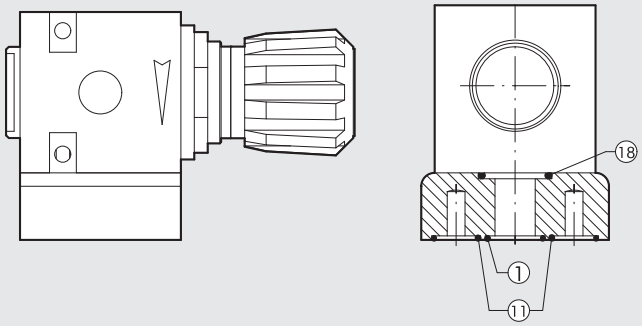
SPARE PARTS

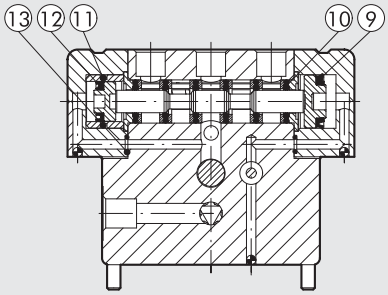
SET OF GASKETS

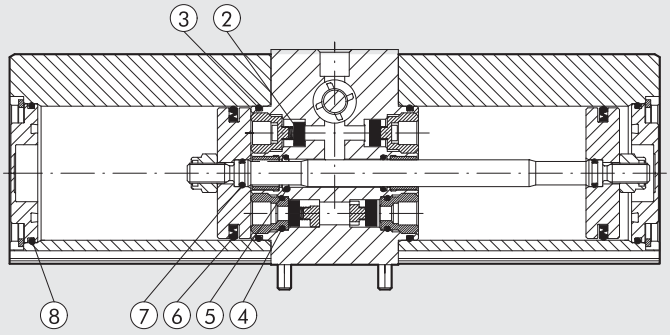
Ø 40

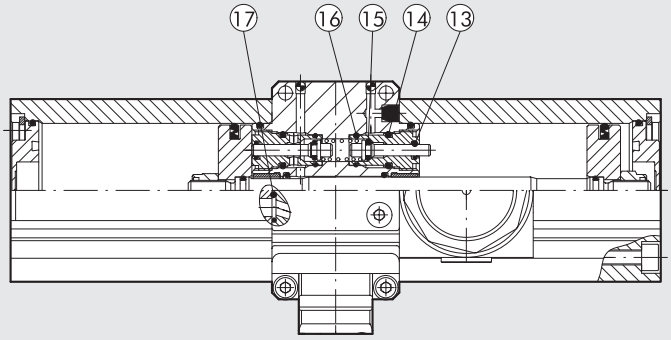


Ø 63









Code	Description
9002190	Set of gaskets for Ø 40 Booster (includes all gaskets numbered 1 to 17)
9002390	Set of gaskets for Ø 63 Booster (includes all gaskets numbered 1 to 18)

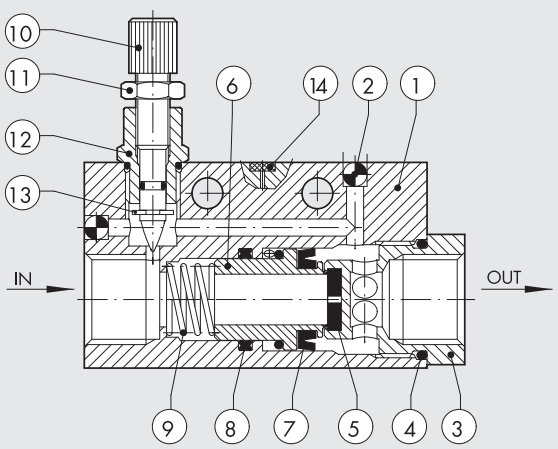
IN-LINE PROGRESSIVE STARTER VAP 1/4" AND 1/2"

The in-line progressive starter is a valve that regulates the flow of air until the outlet pressure reaches a certain value, at which the valve opens and allows air to flow at full rate.
This valve can be used to control a group of valves or a single valve, or it can be mounted between another valve and an actuator.
The air that enters inlet 1 passes through a choke that has a knob adjustment to control the flow. The valve opens completely when the outlet pressure reaches about 60% of the inlet pressure.
If the air supply is switched off, the valve discharges air from outlet 2 to inlet 1.

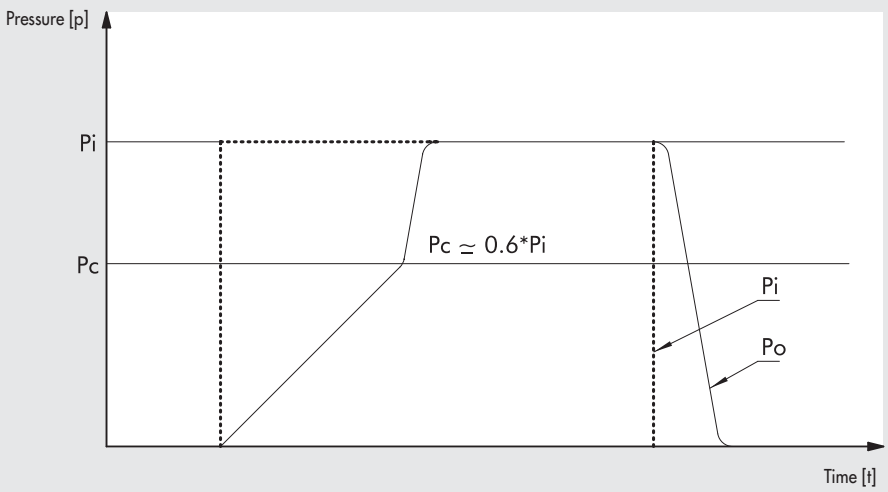
TECHNICAL DATA		VAP 1/4	VAP 1/2
Threaded ports		1/4"	1/2"
Type of valve		2/2 NC	
Minimum operating pressure	bar	2	
	psi	29	
	MPa	0.2	
Maximum operating pressure	bar	10	
	psi	145	
	MPa	1	
Switching pressure		About 60% of inlet pressure	
Operating frequency	Hz	max 5	
Flow rate at 6.3 bar, ΔP=0.5 bar:	Nl/min	1050	2350
	scfm	37	83
Flow rate at 6.3 bar, ΔP=1 bar:	Nl/min	1500	3100
	scfm	53	110
Maximum flow rate through flow regulator at 6.3 bar:	Nl/min	200	300
	scfm	7	11
Operating temperature	°C	from -10 to 70	
	°F	from 14 to 158	
Fluid		Filtered, lubricated or unlubricated, compressed air. Lubrication, if used, must be continuous.	
Weight	g	90	220
Wall fixing screws		Min. M4x25	Min. M4x35
Mounting		In any position	

COMPONENTS

① BODY: anodized aluminium
② BALL: steel
③ INSERT: nickel-plated brass
④ O-Ring: NBR
⑤ POPPET: NBR
⑥ PISTON: anodized aluminium
⑦ PISTON GASKET: NBR
⑧ O-Ring: NBR
⑨ SPRING : steel
⑩ PIN: nickel-plated brass
⑪ NUT: nickel-plated brass
⑫ PIN HOLDER: nickel-plated brass
⑬ SNAP RING: galvanized steel
⑭ SILENCER

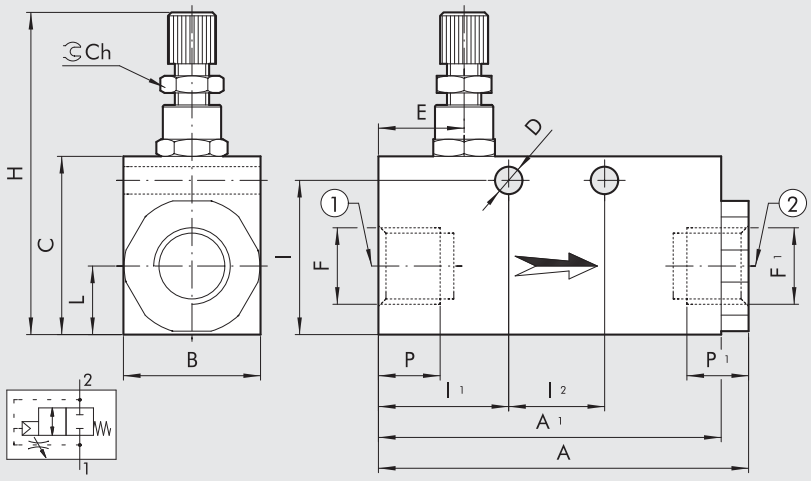


OPERATION



Pi = inlet pressure
Po = outlet pressure
Pc = switching pressure

DIMENSION



Code	Description	F	F¹	A	A¹	B	C	Ch	D	E	H	I	I¹	I²	L	P	P¹
W3606000002	VAP 1/4	G1/4	G1/4	56	50	20	30	8	4.5	10	49-52	25.5	18	16	10	9	9
W3606000004	VAP 1/2	G1/2	G1/2	75.8	65	30	40	8	4.5	13	59-62	35.5	26.5	16	15	12	12

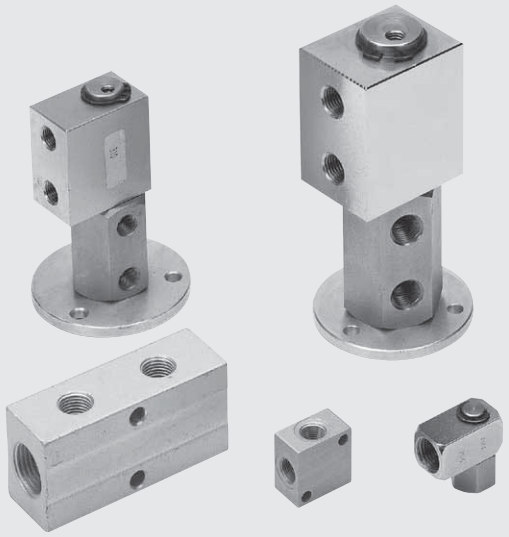
NOTES

ROTARY JOINTS AND DISTRIBUTION FRAMES

METAL WORK PNEUMATIC

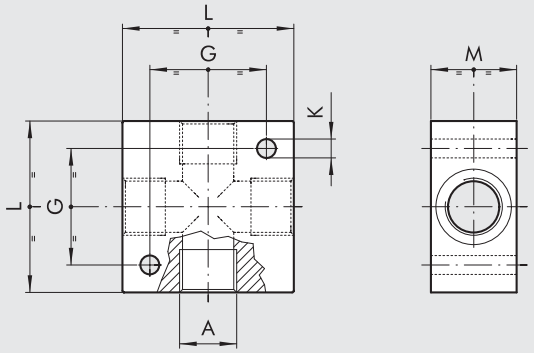
TECHNICAL DATA

Threaded ports		1/8	1/4	3/8	1/2
Max pressure	bar	0 - 12			
	MPa	0 - 1.2			
Operating temperature	°C	–10 - 80			
Fluid		Lubricated or unlubricated filtered air			
Body		Rotary joints: Nickel-plated brass			
		Distribution frame: Anodised aluminium			
Gaskets		NBR			



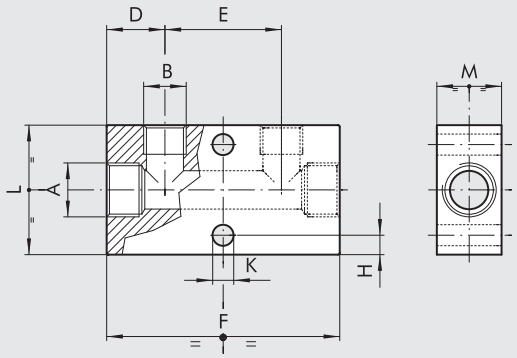
DISTRIBUTION FRAME

4-WAYS DISTRIBUTION FRAME



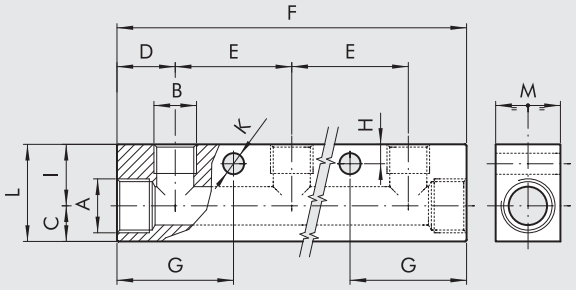
Code	A	G	K	L	M
W0501101001	G 1/8	17	4.5	25	15
W0501111002	G 1/4	26	5.5	40	20
W0501121003	G 3/8	34	5.5	50	25
W0501131004	G 1/2	34	5.5	50	30

DISTRIBUTION FRAM 2-WAYS LINEAR 1/8" OUTLETS



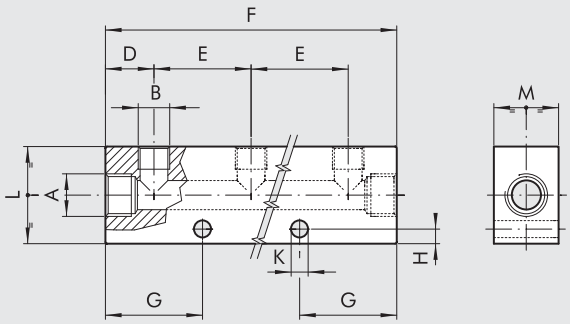
	INLETS		OUTLETS								
Code	N°	A	N°	B	D	E	F	H	K	L	M
W0502111001	2	G 1/4	2	G 1/8	15	30	60	4.5	5.3	30	20
W0502121002	2	G 3/8	2	G 1/4	18	36	72	6	6.5	40	20
W0502131002	2	G 1/2	2	G 1/4	22	36	80	6	6.5	40	30

DISTRIBUTION FRAME WITH MULTIPLE STRAIGHT 1/4" OUTLETS



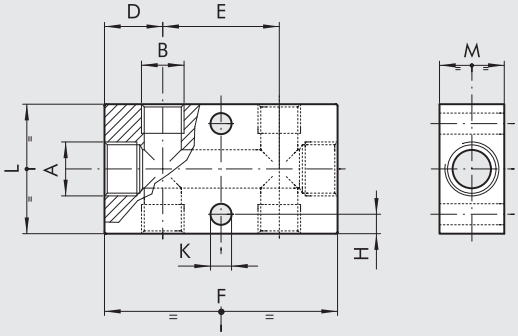
	INLETS		OUTLETS											
Code	N°	A	N°	B	D	E	F	G	H	K	I	C	L	M
W0502121006	2	G 3/8	3	G 1/4	18	36	108	36	6	6.5	19	11	30	20
W0502121008	2	G 3/8	4	G 1/4	18	36	144	36	6	6.5	19	11	30	20
W0502121010	2	G 3/8	5	G 1/4	18	36	180	36	6	6.5	19	11	30	20
W0502121012	2	G 3/8	6	G 1/4	18	36	216	36	6	6.5	19	11	30	20
W0502131006	2	G 1/2	3	G 1/4	18	36	108	36	6	6.5	24	16	40	30
W0502131008	2	G 1/2	4	G 1/4	18	36	144	36	6	6.5	24	16	40	30
W0502131010	2	G 1/2	5	G 1/4	18	36	180	36	6	6.5	24	16	40	30
W0502131012	2	G 1/2	6	G 1/4	18	36	216	36	6	6.5	24	16	40	30

DISTRIBUTION FRAME WITH MULTIPLE STRAIGHT 1/8" OUTLETS



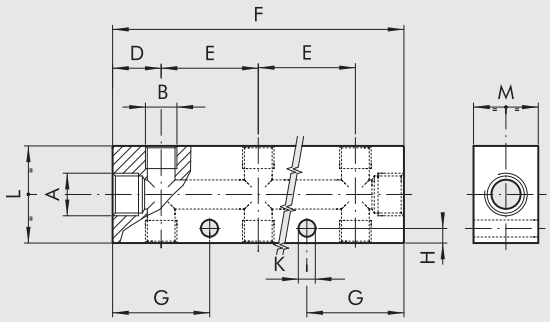
	INLETS		OUTLETS									
Code	N°	A	N°	B	D	E	F	G	H	K	L	M
W0502111005	2	G 1/4	3	G 1/8	15	30	90	30	4.5	5.3	30	20
W0502111007	2	G 1/4	4	G 1/8	15	30	120	30	4.5	5.3	30	20
W0502111009	2	G 1/4	5	G 1/8	15	30	150	30	4.5	5.3	30	20
W0502111011	2	G 1/4	6	G 1/8	15	30	180	30	4.5	5.3	30	20

DISTRIBUTION FRAME WITH 2 OPPOSED OULETS



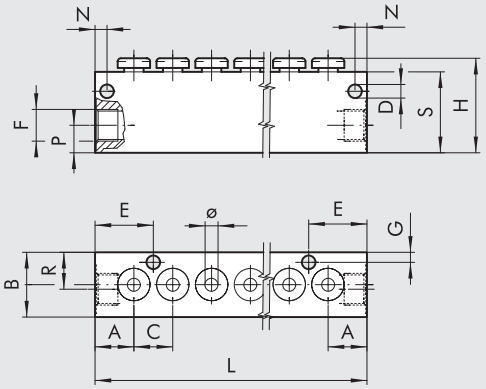
	INLETS		OUTLETS								
Code	N°	A	N°	B	D	E	F	H	K	L	M
W0503111013	2	G 1/4	2 + 2	G 1/8	15	30	60	4.5	5.3	30	20
W0503121014	2	G 3/8	2 + 2	G 1/4	18	36	72	6	6.5	40	20
W0503131014	2	G 1/2	2 + 2	G 1/4	22	36	80	6	6.5	40	30

DISTRIBUTION FRAME WITH 1/8"-1/4" OPPOSED OUTLETS



	INLETS		OUTLETS									
Code	N°	A	N°	B	D	E	F	G	H	K	L	M
W0503111015	2	G 1/4	3 + 3	G 1/8	15	30	90	30	4.5	5.3	30	20
W0503111017	2	G 1/4	4 + 4	G 1/8	15	30	120	30	4.5	5.3	30	20
W0503111019	2	G 1/4	5 + 5	G 1/8	15	30	150	30	4.5	5.3	30	20
W0503121016	2	G 3/8	3 + 3	G 1/4	18	36	108	36	6	6.5	40	20
W0503121018	2	G 3/8	4 + 4	G 1/4	18	36	144	36	6	6.5	40	20
W0503121020	2	G 3/8	5 + 5	G 1/4	18	36	180	36	6	6.5	40	20
W0503131016	2	G 1/2	3 + 3	G 1/4	22	36	116	40	6	6.5	40	30
W0503131018	2	G 1/2	4 + 4	G 1/4	22	36	152	40	6	6.5	40	30
W0503131020	2	G 1/2	5 + 5	G 1/4	22	36	188	40	6	6.5	40	30

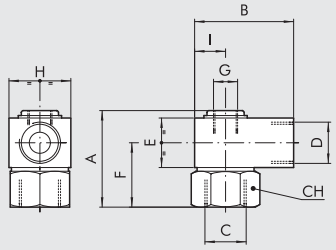
DISTRIBUTOR, Ø 4-6-8 mm



Code	N. positions	Ø	F	A	B	C	D	E	G	H	L	M	N	P	R	S
7304106	6	4	1/8	12	20	12	4.2	3.7	3.1	29	84	6	3.7	8.5	11.4	25
7304112	12	4									156					
7306206	6	6	1/4	14	20	14.6	4.2	21.3	3.1	34	101	6	3.7	10	11	30
7306212	12	6									188.6					
7308306	6	8	3/8	18	25	16.6	4.2	26.3	4.2	39	119	5	5	14	14	35
7308312	12	8									218.6					

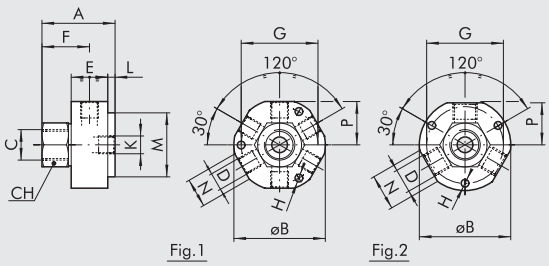
ROTARY JOINT

SINGLE ROTARY JOINT



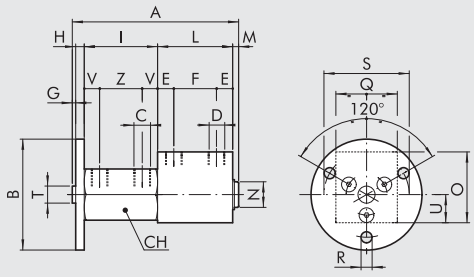
Code	A	B	C	D	E	F	G	H	I	CH	r.p.m.
W0511101101	32.5	30	G 1/8	G 1/8	16	22	–	16	8	16	550
W0511121121	32.5	30	G 1/4	G 1/4	16	22	–	16	8	16	550
W0511131131	44	40	G 3/8	G 3/8	25	28.5	G 1/8	25	12.5	22	300
W0511141141	55	65	G 1/2	G 1/2	30	35	G 3/8	40	20	30	200
W0511151151	70	65	G 3/4	G 3/4	40	45	G 1/2	40	20	36	160
W0511161161	80	80	G 1	G 1	45	52.5	G 3/4	50	26	45	140

MULTIPLE ROTARY JOINT



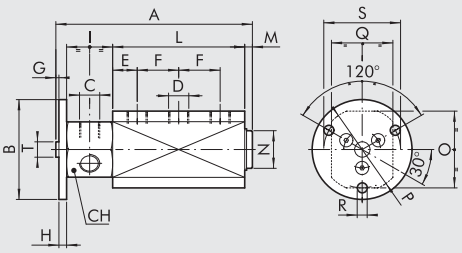
				INLETS		OUTLETS												
Code	Figure	A	B	N°	C	N°	D	E	F	G	H	K	L	M	N	P	CH	r.p.m.
W0513131101	1	40	50	1	G 3/8	6	G 1/8	20	26	42	4.2	G 1/8	4	35	16	23.7	22	300
W0512131121	2	40	50	1	G 3/8	3	G 1/4	20	26	42	4.2	G 1/4	4	35	19	23	22	300

2 INDEPENDENT WAY ROTARY JOINTS



			INLETS		OUTLETS																		
Code	A	B	N°	C	N°	D	E	F	G	H	I	L	M	N	O	Q	R	S	T	U	V	Z	CH	r.p.m.
W0514101101	97.5	64	2	G 1/8	2	G 1/8	12	20	2	5	43	44	3.5	15	40	25	6.3	50	10	20	11.5	20	30	300
W0514121121	132	64	2	G 1/4	2	G 1/4	15	30	2	5	60	60	5	24.5	50	40	6.3	50	10	25	15	30	36	200

3 INDEPENDENT WAY ROTARY JOINTS

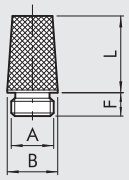


			INLETS		OUTLETS																
Code	A	B	N°	C	N°	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	T	CH	r.p.m.
W0515121121	128	64	3	G 1/4	3	G 1/4	16	27	2	5	30	86	5	24.5	50	54	40	6.3	50	10	36	200

SILENCERS AND EXHAUST REGULATOR

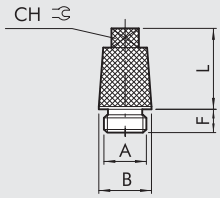
METAL WORK PNEUMATIC

SILENCER MW SC



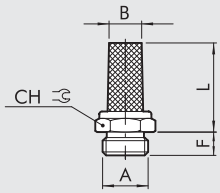
	Code	A	B ±0.2	F	L ±3%
Materials:	W0970530001	M5	6	4.5 ±0.5	10
Nickel-plated brass	W0970530002	G 1/8	12	6 ±0.5	15
Sintered nickel-plated bronze	W0970530003	G 1/4	15	6.7 ±0.5	19
	W0970530004	G 3/8	19	8.5 ±0.5	28.5
	W0970530005	G 1/2	23	8.7 ±0.5	33
Features:	W0970530006	G 3/4	29	11 ±1	40.5
Pmax: 12 bar	W0970530007	G 1	36	11.5 ±1	50.5
Temp.: –10°C - +80°C					

SILENCER MW SCQ



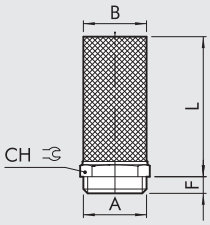
	Code	A	B ±0.2	F	L ±3%	CH
Materials:	W0970530012	G 1/8	12	6 ±0.5	15	7
Nickel-plated brass	W0970530013	G 1/4	15	7.5 ±0.5	19	8
Sintered nickel-plated bronze	W0970530014	G 3/8	19	8.5 ±0.5	29.2	10
	W0970530015	G 1/2	23	9 ±0.5	31.5	14
	W0970530016	G 3/4	29	10 ±1	41.5	17
Features:	W0970530017	G 1	36	12 ±1	51.2	23
Pmax: 12 bar						
Temp.: –10°C - +80°C						

SILENCER MW SE



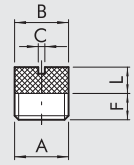
	Code	A	B ±0.5	F	L ±5%	CH
Materials:	W0970530021	M5	4	4 ±0.5	13	8
Nickel-plated brass	W0970530020	M7	5	5 ±0.5	21	10
Sintered nickel-plated bronze	W0970530022	G 1/8	7	6 ±0.5	21	13
	W0970530023	G 1/4	8.5	8 ±0.5	23.5	16
	W0970530024	G 3/8	11	8 ±0.5	33	19
Features:	W0970530025	G 1/2	15	10 ±0.5	37	24
Pmax: 12 bar	W0970530026	G 3/4	21.5	10 ±1	43.5	30
Temp.: –10°C - +80°C	W0970530027	G 1	27	11.5 ±1	56	36

HIGH-CAPACITY SILENCER MW SL



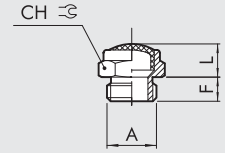
	Code	A	B ±1	F	L ±5%	CH
Materials:	W0970530036	G 3/4	37	12 ±1	215	50
Nickel-plated brass	W0970530037	G 1	37	12 ±1	215	50
Sintered nickel-plated bronze	W0970530038	G 1 1/4	37	15 ±1.5	215	50
	W0970530039	G 1 1/2	37	15 ±1.5	215	50
	W0970530040	G 2	37	17 ±1.5	220	65
Features:						
Pmax: 12 bar						
Temp.: –10°C - +80°C						

SILENCER MW STT



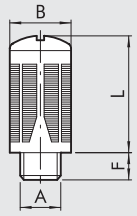
	Code	A	B ±0.2	F	L ±3%	C
Materials:	W0970530042	G 1/8	9.5	6.5 ±0.5	6	2
Nickel-plated brass	W0970530043	G 1/4	12.6	6 ±0.5	7	1.5
Sintered nickel-plated bronze	W0970530044	G 3/8	16.2	7.5 ±0.5	8.5	1.5
	W0970530045	G 1/2	20.5	10 ±0.5	9.6	2.5
	W0970530046	G 3/4	26	11 ±1	12	1.5
Features:	W0970530047	G 1	33	13 ±1	11	–
Pmax: 12 bar						
Temp.: –10°C - +80°C						

SILENCER MW SFE



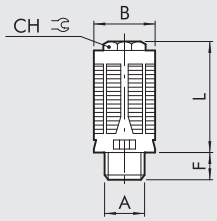
	Code	A	F	L ±3%	CH
Materials:	W0970530051	M5	3.7 ±0.5	4.7	8
Nickel-plated brass	W0970530052	G 1/8	6.2 ±0.5	8.2	13
Stainless steel wire	W0970530053	G 1/4	7.7 ±0.5	11.3	16
	W0970530054	G 3/8	8 ±0.5	11.5	19
	W0970530055	G 1/2	10.3 ±0.5	13	24
Features:	W0970530056	G 3/4	10 ±1	15	30
Pmax: 12 bar	W0970530057	G 1	12 ±1	18	36
Temp.: –10°C - +80°C					

DYNAMIC SILENCER MW SPL



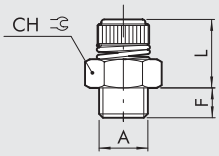
	Code	A	B ±0.2	F	L ±3%
Materials:	W0970530062	G 1/8	15.4	6.2 ±0.5	27
Black acetal resin	W0970530063	G 1/4	19.6	8 ±0.5	35
Acoustic insulation	W0970530064	G 3/8	24.7	11.3 ±0.5	47
	W0970530065	G 1/2	24.7	10.7 ±0.5	47
	W0970530066	G 3/4	48	18 ±1	96
Features:	W0970530067	G 1	48	18 ±1	97
Pmax: 6 bar					
Temp.: –10°C - +60°C					

SILENCER MW SPL-F



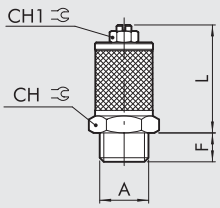
	Code	A	B ±0.2	F ±0.5	L ±3%	CH
Materials:	W0970530072	G 1/8	16.3	5.5	29	10
Black acetal resin	W0970530073	G 1/4	20	7.4	36.5	13
Felt	W0970530074	G 3/8	24.8	11	47	17
	W0970530075	G 1/2	24.8	11	47	17
Features:						
Pmax: 12 bar						
Temp.: –10°C - +60°C						

SILENCED EXHAUST REGULATOR MW SVE



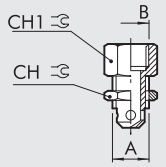
	Code	A	F	L ±0.5	CH
Materials:	W0970520001	G 1/8	6.7 ±0.5	19 - 23	13
Nickel-plated brass	W0970520002	G 1/4	7.4 ±0.5	21 - 24.5	15
Sintered nickel-plated bronze	W0970520003	G 3/8	9.7 ±0.5	23.5 - 29.5	22
Stainless steel spring	W0970520004	G 1/2	10.6 ±0.5	23 - 28	22
	W0970520005	G 3/4	12 ±1	29 - 35	30
Features:	W0970520006	G 1	13.8 ±1	27 - 34	36
Pmax: 12 bar					
Temp.: –10°C - +80°C					

SILENCED EXHAUST REGULATOR MW SVL



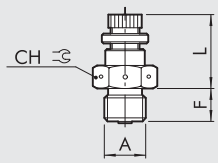
	Code	A	F	L ±0.5	CH	CH1
Materials:	W0970520010	M5	4 ±0.5	17 - 27	8	6
Nickel-plated brass	W0970520011	G 1/8	7 ±0.5	31 - 40	16	9
Sintered nickel-plated bronze	W0970520012	G 1/4	7.5 ±0.5	30 - 37.5	16	9
	W0970520013	G 3/8	10.5 ±0.5	37.5 - 51.5	22	9
	W0970520014	G 1/2	12.4 ±0.5	39.5 - 47.5	22	9
Features:	W0970520015	G 3/4	12.4 ±1	56.5 - 81	30	13
Pmax: 12 bar	W0970520016	G 1	12.4 ±1	58.5 - 84.5	36	13
Temp.: –10°C - +80°C						

EXHAUST REGULATOR MW DSN



	Code	A	B	CH	CH1
Materials:	W0970520021	G 1/8	G1/8	12	12
Nickel-plated brass	W0970520022	G 1/4	G1/8	14	16
	W0970520023	G 3/8	G1/4	19	17
	W0970520024	G 1/2	G1/4	24	22
Features:					
Pmax: 12 bar					
Temp.: –10°C - +80°C					

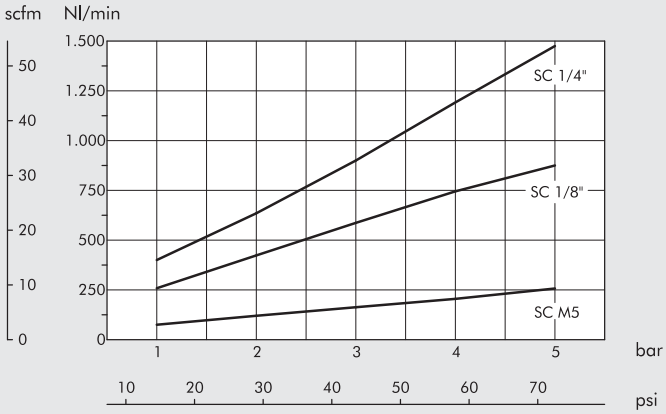
EXHAUST REGULATOR MW DSE

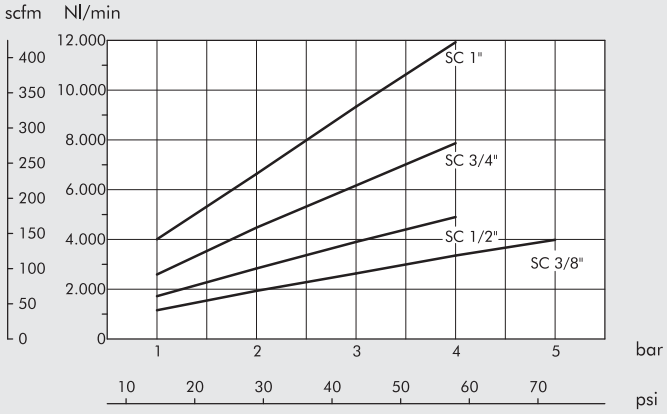


	Code	A	F	L ±0.5	CH
Materials:	W0970520031	G 1/8	7.5 ±0.5	16.8 - 20	14
Nickel-plated brass	W0970520032	G 1/4	10 ±0.5	21.5 - 29	17
Features:					
Pmax: 12 bar					
Temp.: –10°C - +80°C					

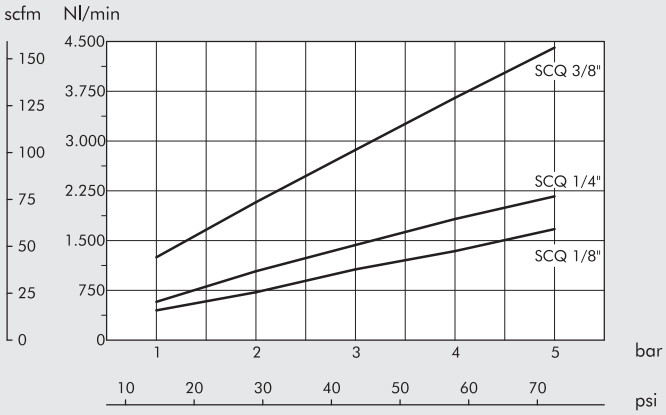
FLOW CHARTS

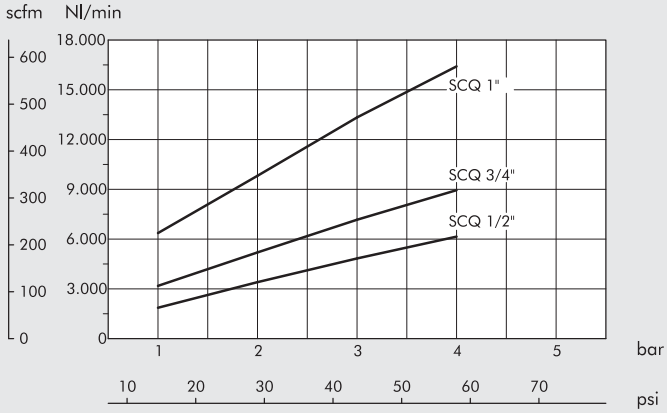
SILENCER MW SC



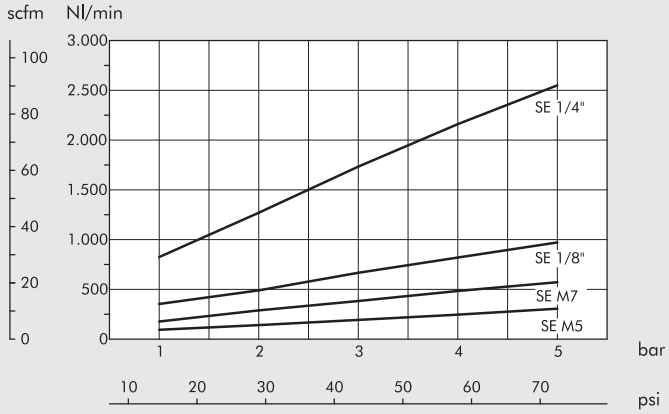


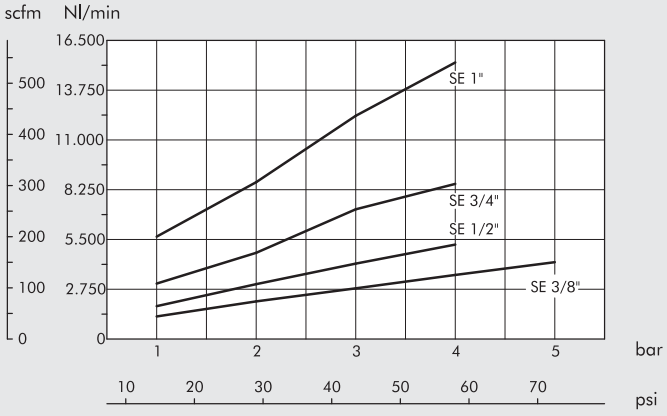
SILENCER MW SCQ





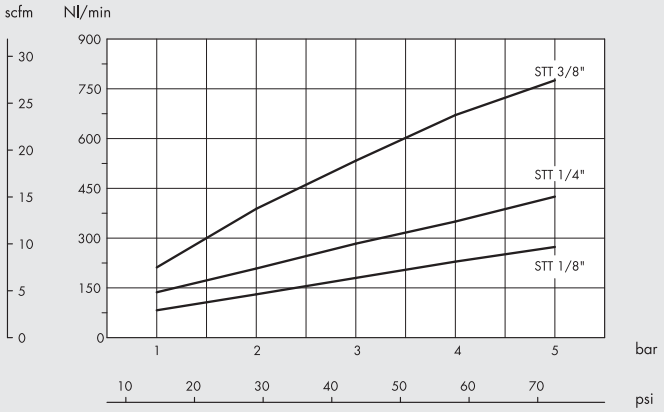
SILENCER MW SE

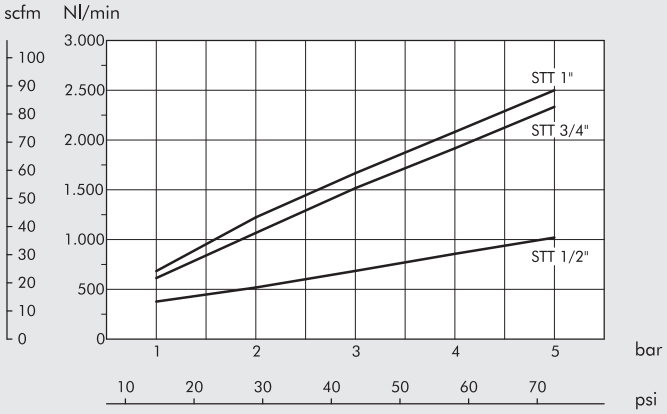




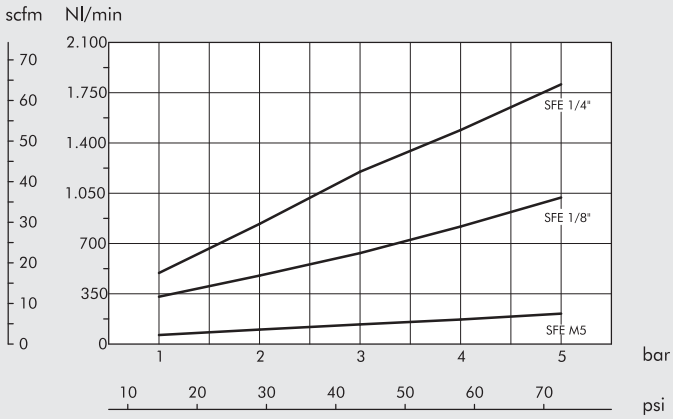
FLOW CHARTS

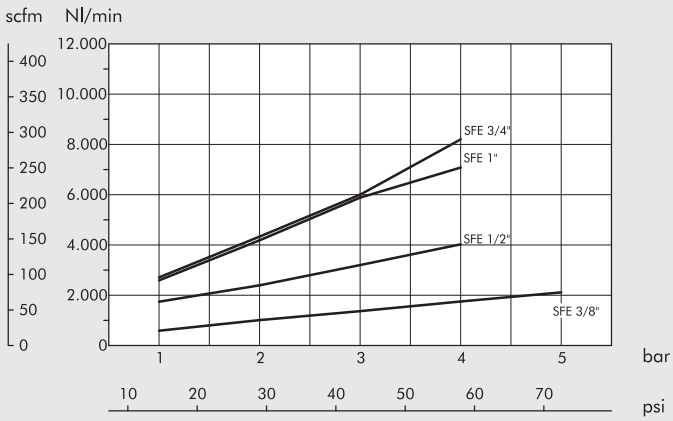
SILENCER MW STT



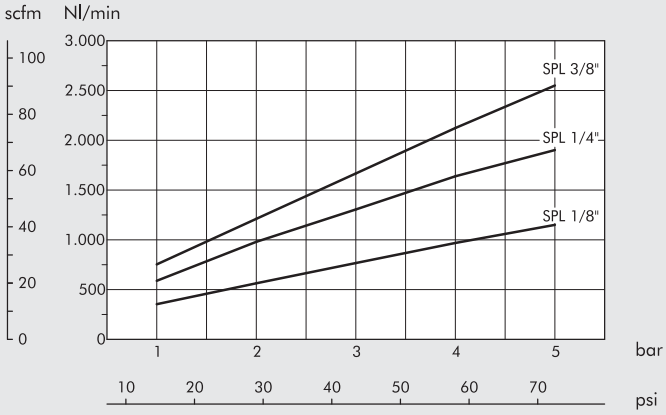


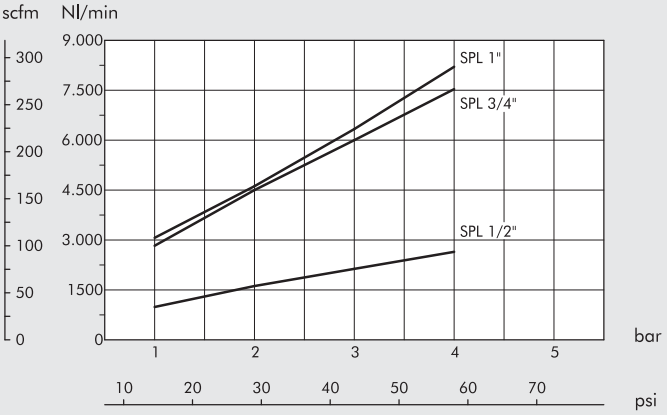
SILENCER MW SFE





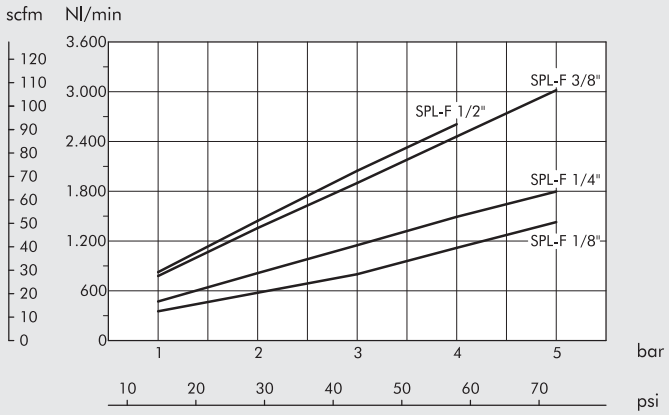
SILENCER MW SPL



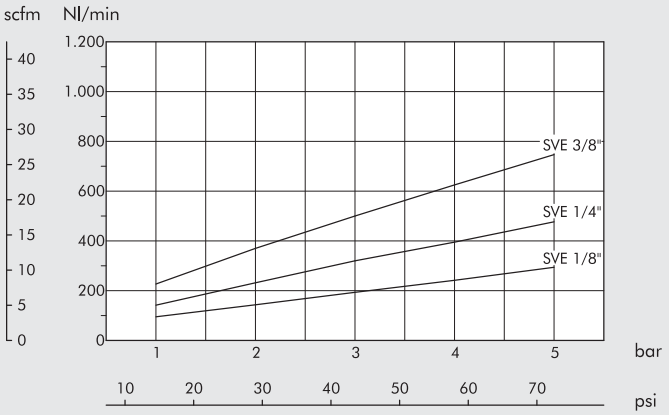


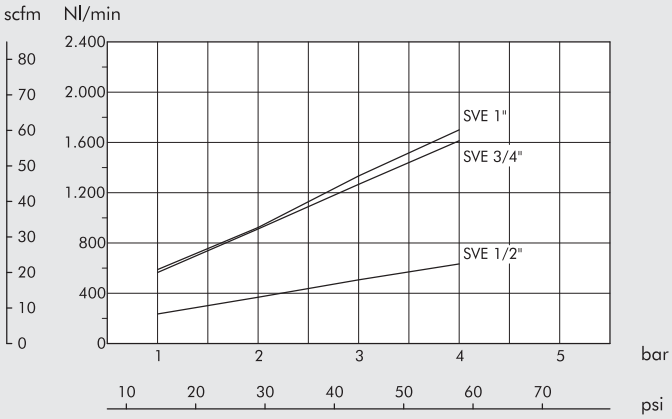
FLOW CHARTS

SILENCER MW SPL-F

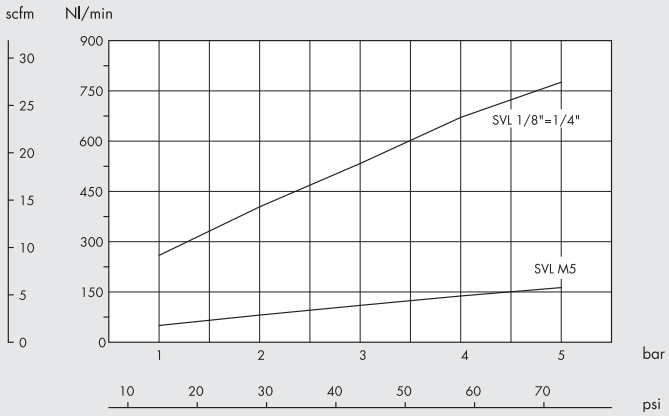


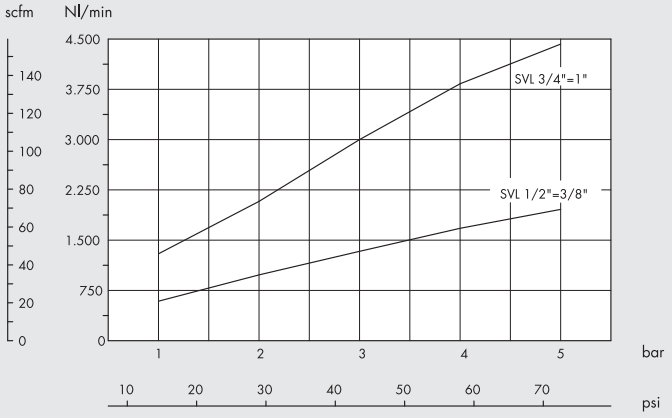
SILENCER MW SVE





SILENCER MW SVL





NOISE ABATEMENT

Reduction of the noise that you obtain mounting a silencer on a compressed air exhaust, measured by feeding at 5 bar, at a distance of 1 m with 45° angle to the axis of the silencer (for SFE model at 90° in order to avoid the direct jet).

Middle values in the sizes.

MW SC	- 35 Db	MW SPL	- 30 Db
MW SCQ	- 35 Db	MW SPL-F	- 35 Db
MW SE	- 28 Db	MW SVE	- 25 Db
MW STT	- 32 Db	MW SVL	- 25 Db
MW SFE	- 30 Db		

PNEUMO-POWER

Supplies 24V electric power via an M8 connector. Compressed air to power the generator can be supplied merely by connecting a pipe to the 1/8" threaded port. To interrupt energy production, all you have to do is to switch off the compressed air supply by means of a cock or solenoid valve. Voltage remains constant irrespective of changes in input pressure or the load applied (within the limits specified in the catalogue). An easy-to-read light display shows the status of the appliance at all times.

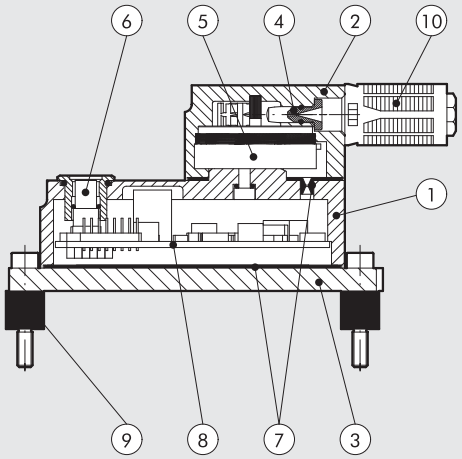
TECHNICAL DATA		50-1	50-2	50-3
Maximum power at 7 bar	W	3	7.5	12
Nominal voltage supplied		24 VDC		
Voltage tolerance		±3%		
		Including line regulation, load regulation and factory setup		
Ripple and Noise		mMax 250 mV p-p o 79 mV rms		
		Measured at 20Mhz bandwidth by using a pair-wire terminated with a 0.1µF and 47µF load capacitor		
Rise time at 7 bar at max. load	sec	2.5	1.5	1
		See graph on page **E5**.23		
Hold time at 7 bar at 50% of load	sec	1.3	0.9	0.8
		See graph on page **E5**.23		
Electrical connector		M8 - 3 poles		
Overload protection e cortocircuito		"Hiccup mode" with automatic recovery upon cessation of overload		
Overvoltage protection		Intervention if output voltage > 120% than nominal value		
Electromagnetic compatibility		In compliance with the following standards:		
		EN 61000-2: Part 6-2: Generic standards - Immunity for industrial environments		
		EN 61000-2: Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments		
Life at 6.3 bar	h	20.000		
Signals		LED diagnostics.		
		Visual signals are flanked by a diagnostic pin on the M8 connector, which closet a GND contact when the voltage is 24 VDC ±3%		
Index of protection for electronic devices		IP 65		
Input fluid		Filter unlubricated air		
Minimum input pressure	bar	4	3	3
Maximum input pressure	bar	7	7	7
Max air consumption at 7 bar (Leq)	Nl/min	32	50	75
Air ports		Input: G1/8"		
		Exhaust: G1/8"		
Temperature range	°C	0 - 50		
Max noise level at 7 bar		75 dB		
Casing material		Painted aluminium		
Assembly position		Any		
Fixing		Using 3 M4x10 screws		
		The device can be stabilised using rubber vibration dampers forniti in dotazione		
Weight	g	330		

LED DIAGNOSTICS OVERVIEW	
LED off or red LED flashing	Temporarily on start-up: the output voltage has not yet reached 24V
	It this condition persists, the applied load is probably excessive with respect to the input pressure.
Green LED fixed	Normal operation: the output voltage has reached 24V
	Optimal use of the compressed air supply.
Green LED flashing	Normal operation: the output voltage has reached 24V but the generator is used below capacity
	(can supply more power at the same compressed air supply)
Red and Green LED flashing	Charge short-circuited: output voltage is automatically cut off. It will return within the tolerance range upon elimination of overload.
Red LED fixed	The maximum supply pressure has been exceeded and the device risks getting damaged.

METAL WORK PNEUMATIC

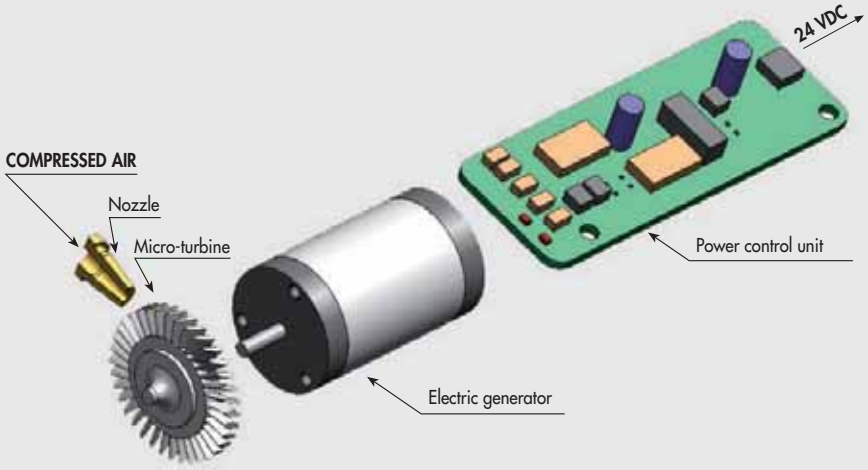
COMPONENTS

① Aluminium body, treated and painted
② Aluminium body, treated and painted
③ Aluminium base, treated and painted
④ Brass nozzle
⑤ Turbine and electrical generator unit
⑥ M8 3-pin connector
⑦ NBR gaskets
⑧ Electronic board
⑨ Vibration dampers
⑩ Silencer



FUNCTION DIAGRAM

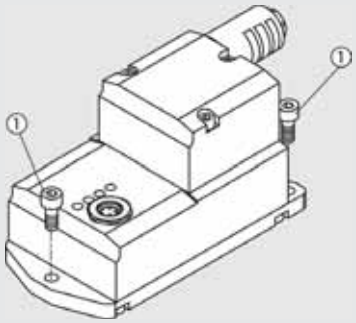
The compressed air is supplied via a nozzle that converts pressure energy into kinetic energy. The supersonic jet of air strikes the blades of a micro-turbine, which is integral with an electrical generator. An electronic power management unit ensures constant voltage output at varying input pressures and applied electrical loads. The electrical power thus generated can supply any type of utility.



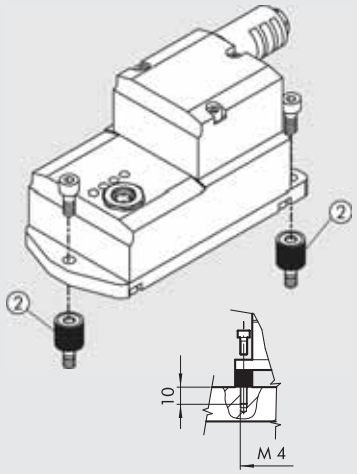
FIXING

The generator can be fixed on a flat surface using the 3 M4x10 screws ① (fig Ⓐ), and the 3 vibration dampers ② supplied with the device (fig. Ⓑ)

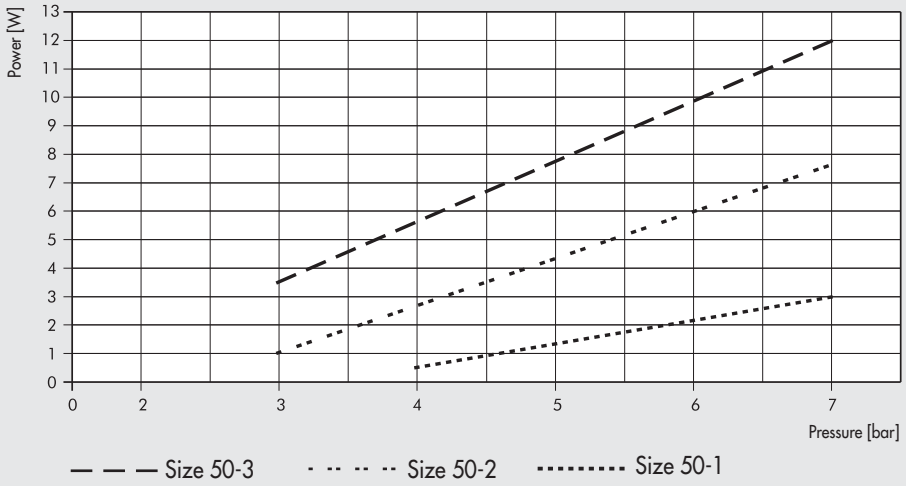
Ⓐ



Ⓑ

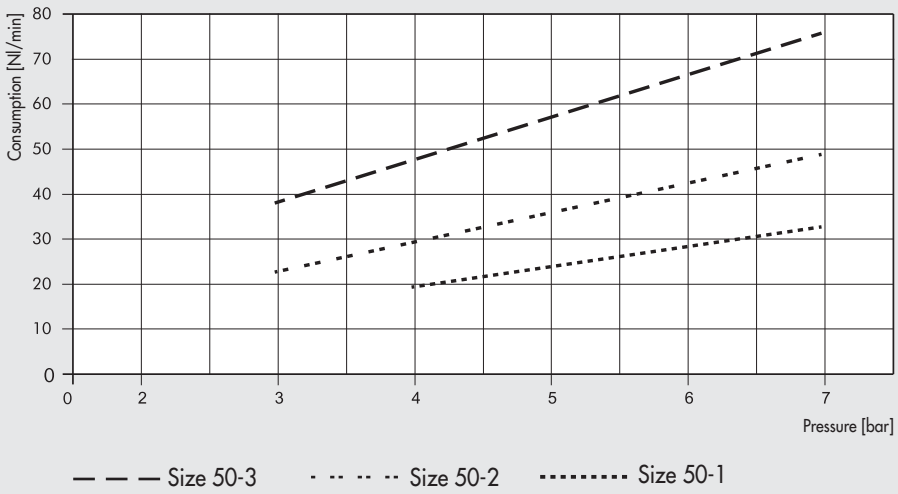


PRESSURE / AVAILABLE POWER

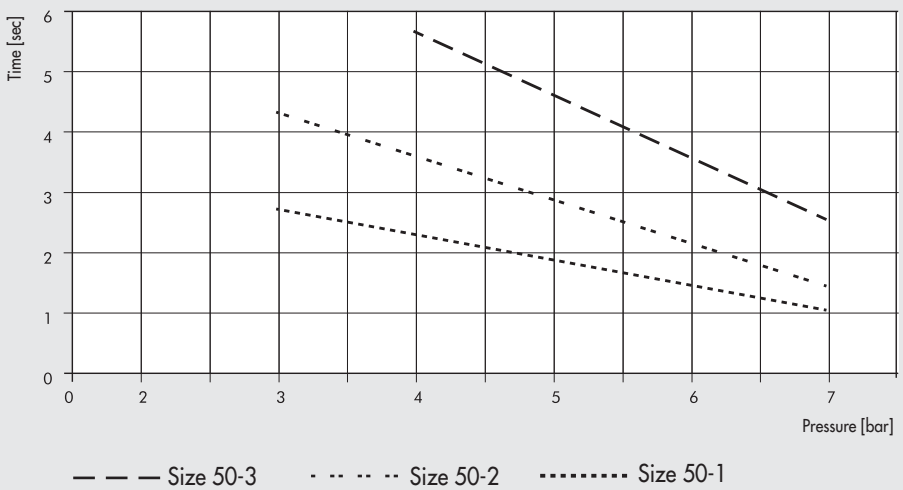


Important: if the input pressure is not sufficient to generate the power required by the electric load, the generator keeps switching on and off (intermittently).
You only need to increase the air pressure (as shown in the chart) to get the required power.

PRESSURE / AIR CONSUMPTION

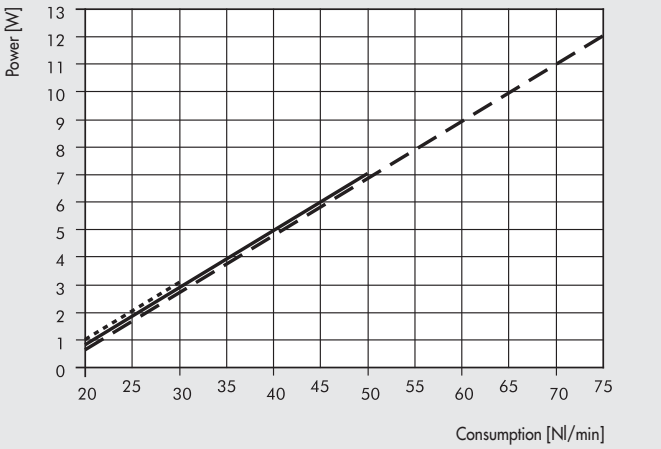


PRESSURE AND ACTUATION TIME WITH ELECTRICAL LOAD



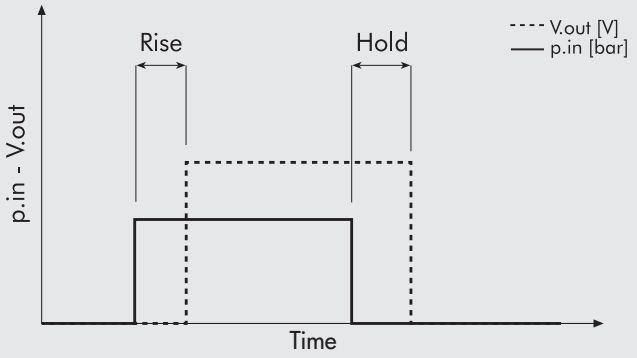
The above graph shows, for a set input pressure, the maximum time required to reach the rated output voltage (with maximum electrical load applicable for this pressure) as the size of the device changes.
For example, with a size 50-2 device having an input pressure of 5.2 bar, a 24VDC output voltage will be available about two seconds after start-up.

AVAILABLE AIR / POWER CONSUMPTION



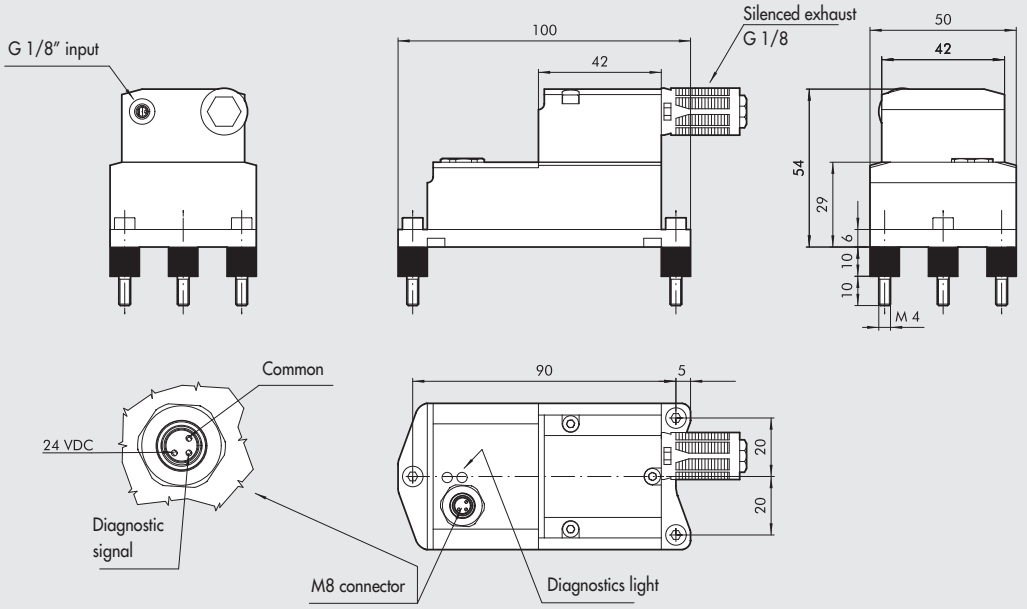
— — — Size 50-3 ——— Size 50-2 ····· Size 50-1

RISE TIME AND HOLD TIME GRAPH



Rise time: the delay from activation of the compressed air supply to 24V power supply to the M8 connector.
Hold time: the time for which 24V is maintained after the compressed air supply has been switched off.

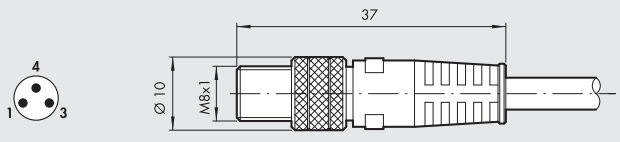
DIMENSIONS



Code	Description
0251530000	PNEUMO POWER 50-1 3 W 24 VDC
0251550000	PNEUMO POWER 50-2 7.5 W 24 VDC
0251570000	PNEUMO POWER 50-3 12 W 24 VDC

ACCESSORIES

M8 CONNECTOR WITH CABLE



Pin	Wire color	
1	Brown	+ 24V
3	Blue	GND
4	Black	Diagnostics

Code	Description
0240009053	M8 male 3-pin connector with 2.5 metres of cable

NOTES

STAINLESS STEEL ACCESSORIES

● **FLOW MICRO-REGULATOR SERIES MRFX** **E6**.2

● **IN-LINE FLOW REGULATOR SERIES RFLX** **E6**.4

● **CHECK VALVE SERIES VNRX** **E6**.6

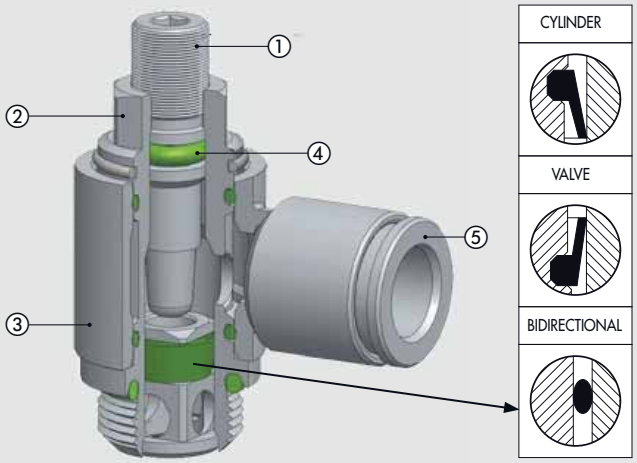
FLOW MICRO-REGULATOR SERIES MRFX

Main features:
- AISI 316L (EN 1.4404) stainless steel body and FKM/FPM seals
- reduced dimensions
- excellent regulation
- adjustment using an Allen wrench
- available in Ø4 - Ø6 - Ø8 - Ø10 and 1/8" - 1/4" - 3/8" threaded ports
- comes with a ring that can rotate even with the MRF mounted in position.

TECHNICAL DATA		1/8"			1/4"			3/8"
Pipe		Ø4	Ø6	Ø8	Ø6	Ø8	Ø10	Ø10
Max input pressure	MPa	1						
	bar	10						
	psi	145						
Temperature range	°C	0 to 150						
	°F	32 to 302						
Max flow rate on regulation at 6.3 bar	Nl/min	150	190	200	380	430	500	1000
Max flow rate on exhaust at 6.3 bar with closed needle	Nl/min	60	110	110	190	250	300	470
Max flow rate on exhaust at 6.3 bar with open needle	Nl/min	80	200	250	250	350	380	1000
Regulation		Allen wrench						
Internal system		Tapered needle						
Fluid		Filtered, lubricated or unlubricated compressed air						

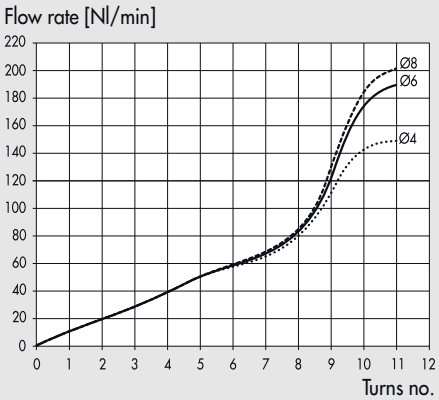
COMPONENTS

① REGULATION NEEDLE: AISI 316L stainless steel
② BODY: AISI 316L stainless steel
③ REVOLVING RING: AISI 316L stainless steel
④ GASKET: FKM/FPM
⑤ RELEASE BUSHING: AISI 316L stainless steel

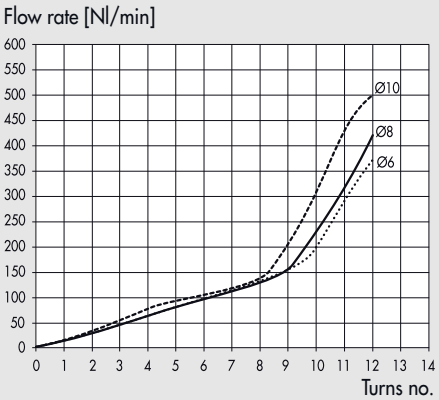


FLOW CHARTS

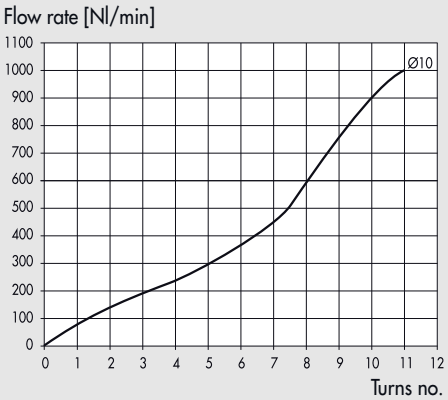
MRFX 1/8" - PIPE Ø 4 - Ø 6 - Ø 8



MRFX 1/4" - PIPE Ø 6 - Ø 8 - Ø 10



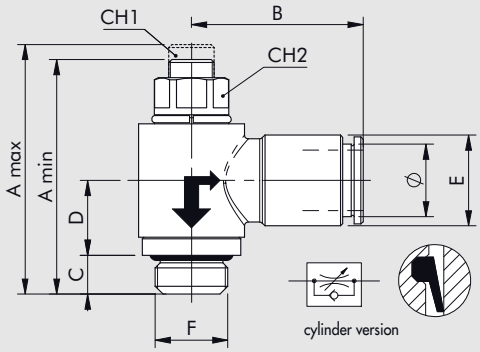
MRFX 3/8" - PIPE Ø 10

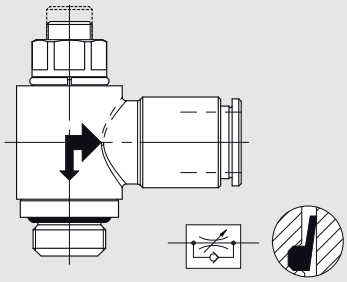


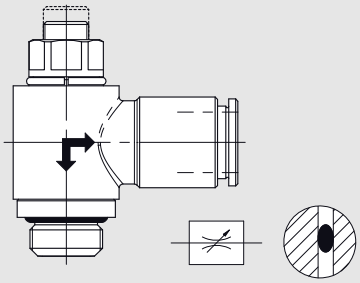
SYNOPTIC, SIZES AND VERSIONS

M R F	O	X	C	4	1/8
FAMILY	**TYPE**	**MATERIAL**	**FUNCTION**	**Ø PIPE**	**Ø THREAD**
Flow micro-regulator	**O** Needle with hexagon socket	**X** AISI 316L stainless steel	**C** For cylinder **V** For valve **B** Bidirectional	**4** Ø 4 **6** Ø 6 **8** Ø 8 **10** Ø 10	**1/8** G 1/8" **1/4** G 1/4" **3/8** G 3/8"

DIMENSIONS AND ORDERING CODES





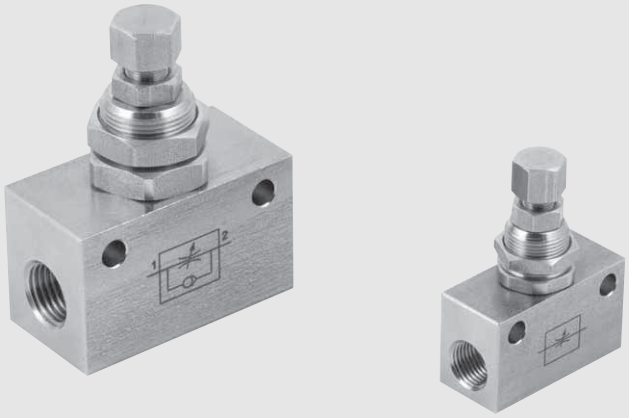


Code	Description	F	Ø	CH1	CH2	A min	A max	B	C	D	E
9001011CX	MRF O X C 4 1/8	1/8	4	2	9	29	32	19.5	5	10.5	9
9001011VX	MRF O X V 4 1/8	1/8	4	2	9	29	32	19.5	5	10.5	9
9001011BX	MRF O X B 4 1/8	1/8	4	2	9	29	32	19.5	5	10.5	9
9001003CX	MRF O X C 6 1/8	1/8	6	2	9	29	32	22	5	10.5	12
9001003VX	MRF O X V 6 1/8	1/8	6	2	9	29	32	22	5	10.5	12
9001003BX	MRF O X B 6 1/8	1/8	6	2	9	29	32	22	5	10.5	12
9001004CX	MRF O X C 6 1/4	1/4	6	3	10	35	40	23.5	6.5	11.5	12
9001004VX	MRF O X V 6 1/4	1/4	6	3	10	35	40	23.5	6.5	11.5	12
9001004BX	MRF O X B 6 1/4	1/4	6	3	10	35	40	23.5	6.5	11.5	12
9001005CX	MRF O X C 8 1/8	1/8	8	2	9	29	32	22.5	5	10.5	14
9001005VX	MRF O X V 8 1/8	1/8	8	2	9	29	32	22.5	5	10.5	14
9001005BX	MRF O X B 8 1/8	1/8	8	2	9	29	32	22.5	5	10.5	14
9001006CX	MRF O X C 8 1/4	1/4	8	3	10	35	40	24	6.5	11.5	14
9001006VX	MRF O X V 8 1/4	1/4	8	3	10	35	40	24	6.5	11.5	14
9001006BX	MRF O X B 8 1/4	1/4	8	3	10	35	40	24	6.5	11.5	14
9001008CX	MRF O X C 10 1/4	1/4	10	3	10	35	40	26.5	6.5	11.5	16
9001008VX	MRF O X V 10 1/4	1/4	10	3	10	35	40	26.5	6.5	11.5	16
9001008BX	MRF O X B 10 1/4	1/4	10	3	10	35	40	26.5	6.5	11.5	16
9001009CX	MRF O X C 10 3/8	3/8	10	4	14	42	52	28	9	13	16
9001009VX	MRF O X V 10 3/8	3/8	10	4	14	42	52	28	9	13	16
9001009BX	MRF O X B 10 3/8	3/8	10	4	14	42	52	28	9	13	16

IN-LINE FLOW REGULATOR SERIES RFLX

The in-line flow regulator regulates the speed of the piston rod in the pneumatic cylinders.
Two versions are available:
- type U (unidirectional) regulates the flow only in one of the two directions of air flow.
- type B (bidirectional) regulates the flow in both directions of air flow.

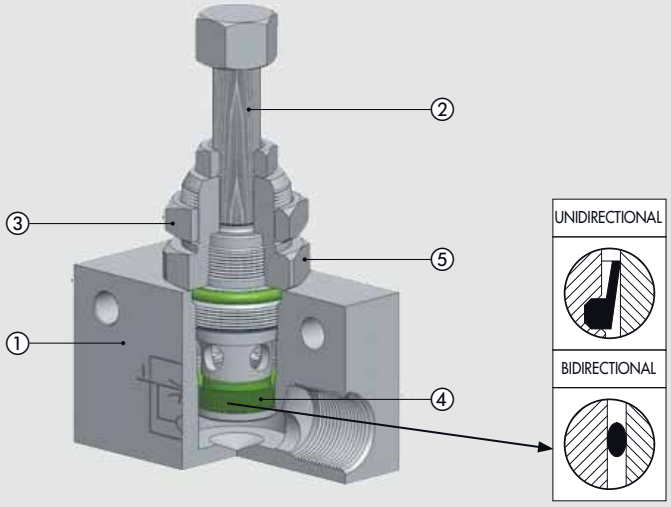
Regulation: manual or with box wrench.
AISI 316L (EN 1.4404) stainless steel body
The gasket are in FKM/FPM.



TECHNICAL DATA		1/8"	1/4"
Max input pressure	MPa	1	
	bar	10	
	psi	145	
Temperature range	°C	0 to 150	
	°F	32 to 302	
Max flow rate on regulation at 6.3 bar	Nl/min	110	650
Max flow rate on exhaust at 6.3 bar with closed needle	Nl/min	130	500
Max flow rate on exhaust at 6.3 bar with open needle	Nl/min	140	670
Regulation		Box wrench	
Internal system		Tapered needle	
Fluid		Filtered, lubricated or unlubricated compressed air	

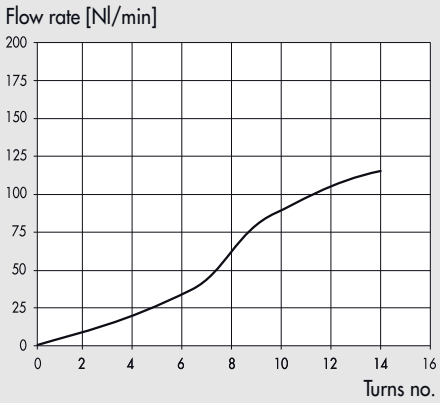
COMPONENTS

① BLOCK: AISI 316L stainless steel
② REGULATION NEEDLE: AISI 316L stainless steel
③ WALL LOCKING RING NUT: AISI 316L stainless steel
④ GASKET: FKM/FPM
⑤ NIPPLE: AISI 316L stainless steel

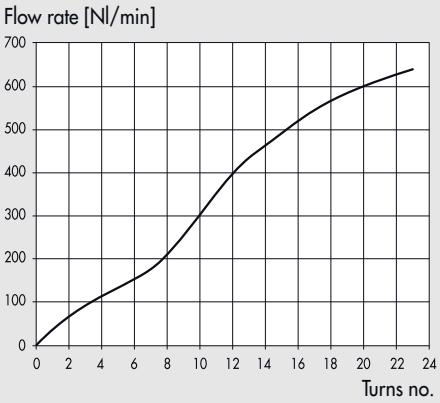


FLOW CHARTS

RFLX 1/8"



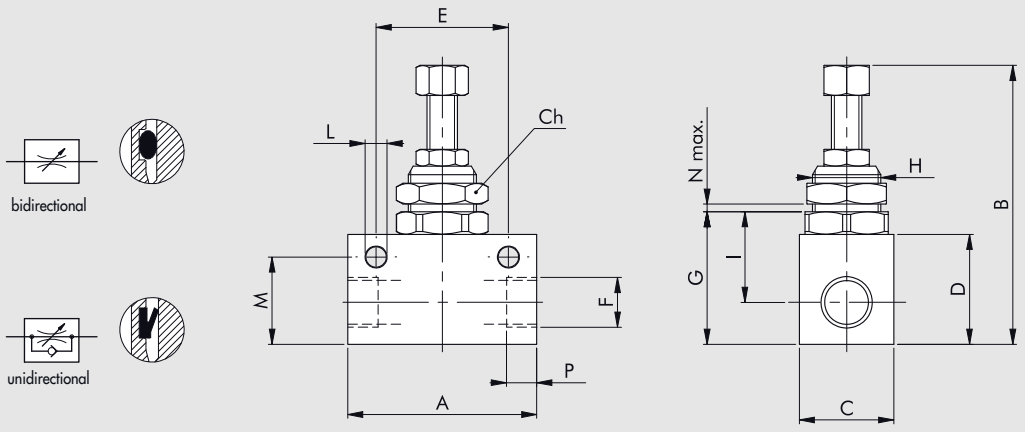
RFLX 1/4"



SYNOPTIC, SIZES AND VERSIONS

R F L	X	U	1/8
FAMILY	**MATERIAL**	**FUNCTION**	**Ø THREAD**
In-line flow regulator	**X** AISI 316L stainless steel	**U** Unidirectional **B** Bidirectional	**1/8** G 1/8" **1/4** G 1/4"

DIMENSIONS AND ORDERING CODES



Code	Description	F	P	E	H	N max	A	B max	C	G	I	D	M	Ch	L
9041002X	RFL X U 1/8	1/8	8.5	24	M12x0.75	4.5	34	56	15	23	13	20	16	14	4.5
9041003X	RFL X U 1/4	1/4	7	35	M18x1.5	4.5	50	75	25	35	20	30	23	22	5.5
9041202X	RFL X B 1/8	1/8	8.5	24	M12x0.75	4.5	34	56	15	23	13	20	16	14	4.5
9041203X	RFL X B 1/4	1/4	7	35	M18x1.5	4.5	50	75	25	35	20	30	23	22	5.5

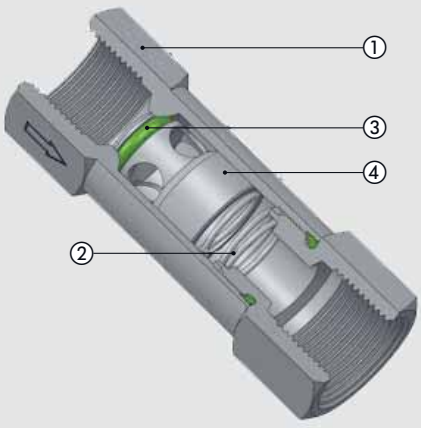
CHECK VALVE SERIES VNRX

This allow air flow in only one of the two directions.
AISI 316L (EN 1.4404) stainless steel body.
The gasket are in FKM/FPM.

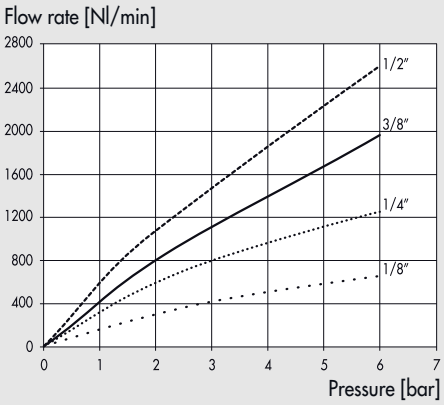
TECHNICAL DATA		1/8"	1/4"	3/8"	1/2"
Ports		G 1/8"	G 1/4"	G 3/8"	G 1/2"
Nominal diameter	mm	5	8	10	12
Nominal flow rate	Nl/min	650	1250	1950	2600
Operating temperature range	°C	-10 to 150			
	°F	14 to 302			
Operating pressure	bar	2 to 10			
	MPa	0.2 to 1			
Opening pressure	bar	0.2 (20 KPa)			
Fluid		Lubricated or unlubricated filtered air			

COMPONENTS

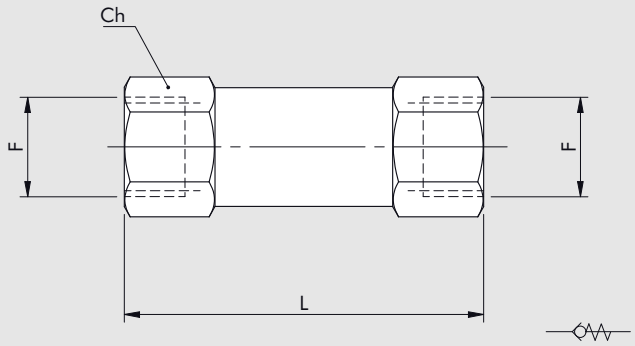
① BODY: AISI 316L stainless steel
② VALVE SPRING: AISI 302 stainless steel
③ GASKET: FKM/FPM
④ POPPET: AISI 316L stainless steel



FLOW CHARTS



DIMENSIONS AND ORDERING CODES



Code	Description	F	L	Ch
W3601000001X	VNR X 1/8	1/8	40	13
W3601000002X	VNR X 1/4	1/4	48	16
W3601000003X	VNR X 3/8	3/8	51	21
W3601000004X	VNR X 1/2	1/2	62	24

NOTES

NOTES

DOCUMENTATION

- TECHNICAL DOCUMENTATION Z1
- ALPHANUMERIC INDEX Z2

TECHNICAL DOCUMENTATION

PRINCIPLES OF PNEUMATICS

PRESSURE:

The ratio between a force and the surface on which it acts.

$$P = \frac{F\ (N)}{S\ (m^2)} = Pa$$

ATMOSPHERIC PRESSURE:

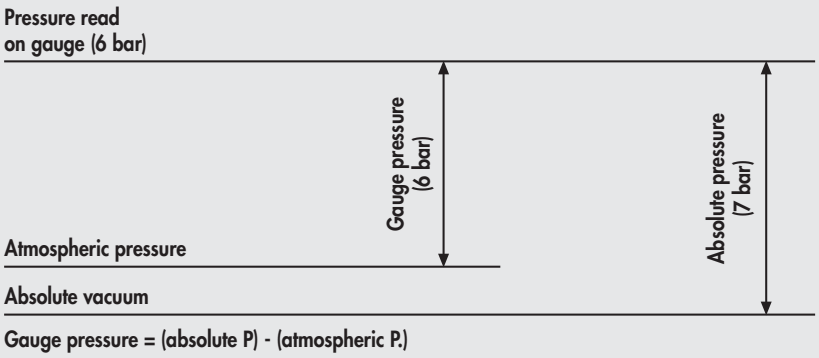
Equivalent to the pressure exerted on a surface at sea level at 20°C and with 65% humidity: 10.33 m H_2O; 760 mm Hg; 1.013 x 10^5 Pa.

ABSOLUTE PRESSURE:

The pressure above the absolute zero value - pressure 0 = absolute vacuum.

GAUGE PRESSURE:

The pressure referring to ambient atmospheric pressure: it is normally indicated by the pressure gauges used in pneumatic circuits.



Gauge pressure = (absolute P) - (atmospheric P.)

UPSTREAM PRESSURE:

Pressure of the compressed air at the pneumatic component inlet.

DOWNSTREAM PRESSURE:

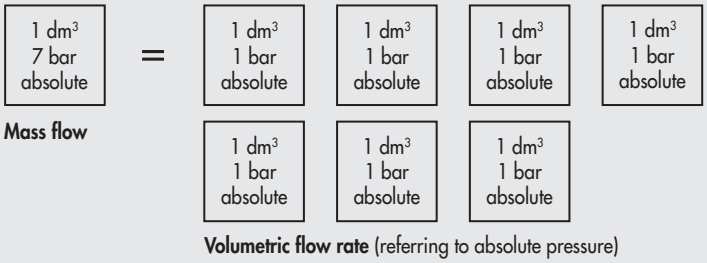
Pressure of the compressed air at the pneumatic component outlet.

ΔP PRESSURE DROP:

Difference between upstream and downstream pressure.

FLOW RATE:

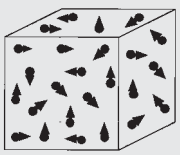
The volume of air passing through a given section in a unit of time.
In pneumatics, the volume unit of measurement is Nl (Normal litre).
In practice it represents the volumetric capacity of the air referring to ambient atmospheric pressure. E.g. in a conduit of a given section, there is a mass flow of 1 litre of air (1 dm^3) at 7 bar absolute pressure. This value expressed as volume of air corresponds to 7 litres of air (7 dm^3) at the ambient atmospheric pressure (1 bar).



- With the same pressure, the flow rate is directly proportional to the port cross section.
- With the same cross section, the pressure is directly proportional to the flow rate.
- Without a ΔP (difference between upstream and downstream pressure), there can be no flow rate.

PASCAL'S LAW:

A confined fluid transmits externally applied pressure uniformly in all directions.



Density of air, measured to 20°C to the atmospheric pressure: 1.275 $\frac{kg}{m^3}$

METAL WORK PNEUMATIC

CALCULATING THE FLOW RATE OF A VALVE USING FLOW COEFFICIENT k_V

Coefficient k_V gives approximate values when used for compressed air.
The flow rate Q_N at a normal volume through a valve is:

Subsonic flow: $P_2 > \frac{P_1}{2}$

$$Q_N = 28{,}6 \cdot k_v \cdot \sqrt{P_2 \cdot \Delta P} \sqrt{\frac{293}{273 + t}}$$

Supersonic flow: $P_2 < \frac{P_1}{2}$

$$Q^*_N = 14{,}3 \cdot k_v \cdot P_1 \cdot \sqrt{\frac{293}{273 + t}}$$

where
Q_N = flow rate at a normal volume [Nl/min]
Q_N^* = critical flow rate at a normal volume [Nl/min]
k_V = hydraulic coefficient in $\frac{l}{min}\left(\frac{kg}{dm^3 \cdot bar}\right)^{1/2}$
P_1 = absolute upstream pressure [bar]
P_2 = absolute downstream pressure [bar]
ΔP = difference in pressure $P_1 - P_2$ [bar]
t = input air temperature [°C]

CALCULATING THE FLOW RATE OF A VALVE USING FLOW COEFFICIENTS C AND B

The flow rate Q_N at a normal volume through a valve is:

Subsonic flow: $P2 > b \cdot P_1$

$$Q_N = C \cdot P_1 \cdot \sqrt{1 - \left(\frac{r - b}{1 - b}\right)^2} \cdot \sqrt{\frac{293}{273 + t}}$$

Supersonic flow: $P2 < b \cdot P_1$

$$Q^*_N = C \cdot P_1 \cdot \sqrt{\frac{293}{273 + t}}$$

where
Q_N = flow rate at a normal volume [Nl/min]
Q_N^* = critical flow rate at a normal volume [Nl/min]
C = conductance in [Nl/min · bar]
P_1 = absolute upstream pressure [bar]
P_2 = absolute downstream pressure [bar]
r = upstream pressure : downstream pressure ratio P_2 / P_1
b = critical pressure ratio $b = P_2^* / P_1$
t = input air temperature [°C]

CALCULATING THE FLOW RATE OF A VALVE USING FLOW COEFFICIENTS C_V

The flow rate Q_N at a normal volume through a valve is:

Subsonic flow: $P_2 > 0.528 \cdot P_1$

$$Q_N = 400 \cdot C_V \cdot \sqrt{P_2 \Delta P} \cdot \sqrt{\frac{273}{273 + t}}$$

Supersonic flow: $P_2 < 0.528 \cdot P_1$

$$Q^*_N = 200 \cdot C_V \cdot P_1 \cdot \sqrt{\frac{273}{273 + t}}$$

where
Q_N = flow rate at a normal volume [Nl/min]
Q_N^* = critical flow rate at a normal volume [Nl/min]
C_V = coefficient of flow [US · GPM / p.s.i.]
P_1 = absolute upstream pressure [bar]
P_2 = absolute downstream pressure [bar]
t = input air temperature [°C]

CALCULATING THE NOMINAL FLOW RATE

The nominal flow rate Q_{Nm} of a valve, i.e. the flow at normal volume passing through a valve with (P_1 = 6 [bar] (P_1 = 7 [bar] absolute) and ΔP = 1 [bar], can be obtained from the previous formula as follows:

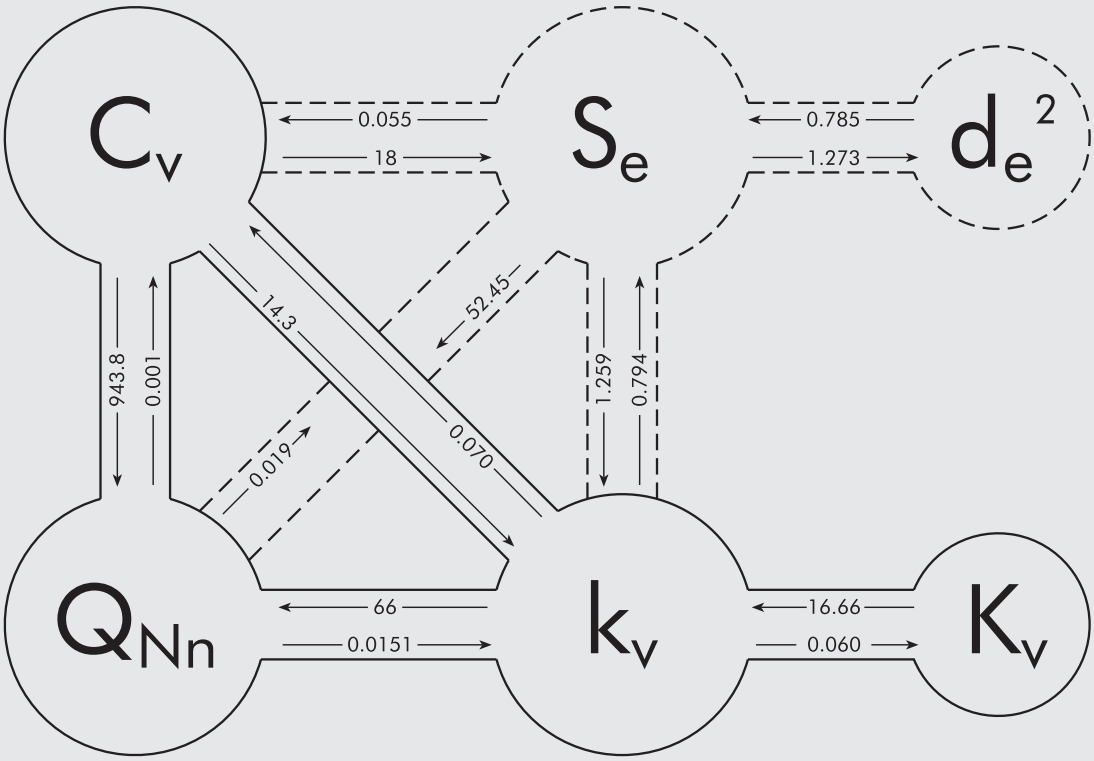
$$Q_{Nn} = 66 \cdot k_v$$

$$Q_{Nn} = 943.8 \cdot C_V$$

$$Q_{Nn} = 7 \cdot C \cdot \sqrt{1 - \left(\frac{0{,}857 - b}{1 - b}\right)^2}$$

Equalising the first two formulae gives: $k_v = 14.3 \cdot C_V$

• REACTIONS BETWEEN Q_{Nn} - C_V - k_v - K_V - S - de^2



Q_{Nn} = flow rate in [Nl/min] with p_1 = 6 [bar] (P_1 = 7 [bar] absolute) and ΔP = 1 [bar]

k_v hydraulic coefficient in $\frac{l}{min}\left(\frac{kg}{dm^3 \cdot bar}\right)^{1/2}$

K_V hydraulic coefficient in $\frac{m^3}{h}\left(\frac{kg}{dm^3 \cdot bar}\right)^{1/2}$

C_V coefficient of flow [US · GPM / p.s.i.]

S_e equivalent cross section [mm^2]

$d_e^2 = S \cdot \frac{4}{\pi}$ through diameter^2 in [mm^2] obtained from the equivalent cross section

CONVERSION TABLES

TABLE 1 - CONVERSION BETWEEN SYSTEMS OF MEASUREMENT

	Technical system and CGS system	→ Multiply by	International system	← Multiply by	British system
Length	m	1	m	0.0254	in (inch)
			m	0.3048	ft (foot)
Time	s	1	s	1	s
Area	m^2	1	m^2	0.000645	in^2
			m^2	0.0929	ft^2
Volume	m^3	1	m^3	$16.39 \cdot 10^{-4}$	in^2
			m^3	0.02832	ft^2
Speed	$m \cdot s^{-1}$	1	$m \cdot s^{-1}$	0.3048	$ft \cdot s^{-1}$
Acceleration	$m \cdot s^{-2}$	1	$m \cdot s^{-2}$	0.3048	$ft \cdot s^{-2}$
Mass	$kg \cdot s^2 \cdot m^{-1}$	9.81	kg	0.4536	lb (pound)
			kg	14.594	slug = lb $f \cdot s^2 \cdot ft^{-1}$
Force	kg o kp	9.81	N	4.4483	lb f (pound)
	kg	0.981	da N = 10 N		
Torque	$kg \cdot m$	9.81	$N \cdot m$	1.356	lb $f \cdot ft$
Density	$kg \cdot s^2 \cdot m^{-1}$	9.81	$kg \cdot m^{-3}$	16.02	$lb \cdot ft^{-3}$
Specific weight	$kg \cdot m^{-1}$	9.81	$N \cdot m^{-3}$	157.16	lb $f \cdot ft^{-3}$
Work, energy	$kg \cdot m$	9.81	J	1.356	lb $f \cdot ft$
			KWh = $3.6 \cdot 10^6$ J		
Heat	Cal	4186	J	1055.1	BTU
Power	$kg \cdot m \cdot s^{-1}$	9.81	W	1.3558	lb $f \cdot ft \cdot s^{-1}$
	CV	735	W	745.7	HP
Pressure	$kg \cdot m^{-2}$	9.81	Pa	6.8948·10	p.s.i.=lb $f \cdot in^{-2}$
	$kg \cdot cm^{-2}$	$9.81 \cdot 10$	Pa		
	$kg \cdot cm^{-2}$	0.981	bar = 10^5 Pa		
Mass flow	$kg \cdot s \cdot m^{-1}$	9.81	$kg \cdot s^{-1}$	0.4536	$lb \cdot s^{-2}$
Volume flow	$m^3 \cdot s^{-1}$	1	$m^3 \cdot s^{-1}$	0.02832	$ft \cdot s^{-1}$
	Nl/min^{-1}	0.0000167	$Nm^3 \cdot S^{-1}$	0.000472	scfm
Dynamic viscosity	$kg \cdot s \cdot m^{-2}$	9.81	Pa·s	6.896	lb $f \cdot s \cdot in^{-2}$
	Po (poise-system CGS)	0.1	Pa·s		
Kinematic viscosity	$m^2 \cdot s^{-2}$	1	$m^2 \cdot s^{-2}$	0.0929	$ft^2 \cdot s^{-1}$
	St (stokes-system CGS)	10^{-4}	$m^2 \cdot s^{-2}$		
	Technical system and CGS system	← **Divide by**	**International system**	→ **Divide by**	**British system**

TABLE 2 - TEMPERATURE CONVERSION

°F = [1.8 · °C] + 32
°C = [°F - 32] · 0.55
K = °C + 273

°C = degrees Celsius

K = degrees Kelvin

°F = degrees Fahrenheit

TABLE 3 - MULTIPLES AND SUB-MULTIPLES

Name	Symbol	Value
tera	T	10^{12}
giga	G	10^9
mega	M	10^6
kilo	k	10^3
etto	h	10^2
deca	da	10
deci	d	10^{-1}
centi	c	10^{-2}
milli	m	10^{-3}
micro	µ	10^{-6}
nano	n	10^{-9}
pico	p	10^{-12}

TABLE 4 - PRESSURE UNIT CONVERSION FACTORS

To obtain the pressure for the following units, multiply the number given for the source units by the coefficient shown.

Source units	Pa	kPa	MPa	bar	mbar	kp/cm²	cm H_2O	mm H_2O	mm Hg	p.s.i.
Pa	1	10^{-3}	10^{-5}	10^{-5}	10^{-2}	$10.1972 \cdot 10^{-6}$	$10.1972 \cdot 10^{-3}$	$101.972 \cdot 10^{-3}$	$7.50062 \cdot 10^{-3}$	$0.145038 \cdot 10^{-3}$
kPa	10^3	1	10^{-3}	10^{-2}	10	$10.1972 \cdot 10^{-3}$	10.1972	101.972	7.50062	0.145038
MPa	10^6	10^3	1	10	10^4	10.1972	$10.1972 \cdot 10^3$	$101.972 \cdot 10^3$	$7.50062 \cdot 10^3$	$0.145038 \cdot 10^3$
bar	10^5	10^2	10^{-1}	1	10^3	1.01972	$1.01972 \cdot 10^3$	$10.1972 \cdot 10^3$	750.062	14.5038
mbar	100	0.1	10^{-4}	10^{-3}	1	$1.01972 \cdot 10^{-3}$	1.01972	10.1972	0.750062	$14.5038 \cdot 10^{-3}$
kp/cm²	98066.5	98.0665	$98.0665 \cdot 10^{-3}$	0.989665	980.665	1	1000	10.000	735.559	14.2233
cm H_2O	98.0665	$98.0665 \cdot 10^{-3}$	$98.0665 \cdot 10^{-6}$	$0.98665 \cdot 10^{-3}$	0.98665	10^{-3}	1	10	0.735559	$14.2233 \cdot 10^{-3}$
mm H_2O	9.80665	$9.80665 \cdot 10^{-3}$	$9.80665 \cdot 10^{-6}$	$98.0665 \cdot 10^{-6}$	$98.0665 \cdot 10^{-3}$	10^{-4}	0.1	1	$73.5559 \cdot 10^{-3}$	$14.2233 \cdot 10^{-3}$
mm Hg	133.322	$133.322 \cdot 10^{-3}$	$133.322 \cdot 10^{-3}$	$1.33322 \cdot 10^{-3}$	1.33322	$1.35951 \cdot 10^{-3}$	1.35951	13.5951	1	$19.3368 \cdot 10^{-3}$
p.s.i.	6894.76	6.89476	$6.89476 \cdot 10^{-3}$	$68.9476 \cdot 10^{-3}$	68.9476	$70.307 \cdot 10^{-3}$	70.307	703.07	51.7149	1

TABLE 5 - AIR CONSTANTS

Entity	Symbol	Value	
Dynamic viscosity	μ	$17.89 \cdot 10^{-6}$	Pa s
Kinematic viscosity	γ	$14.61 \cdot 10^{-6}$	$m^2 s^{-1}$
Density	ρ	1.225	$kg\ m^{-3}$
Specific heat at constant pressure	Cp	1.004	$KJ\ kg^{-1}\ K^{-1}$
Speed of sound	a	340.29	$m\ s^{-1}$
Gas constant	R	287.1	$J\ kg^{-1}\ K^{-1}$

TABLE 6 - CONTENT OF WATER VAPOUR IN SATURATED COMPRESSED AIR

Grams of water vapour per cubic metre (g/m^3) of air at ambient atmospheric pressure 1.013 bar (0 bar gauge pressure), saturated and compressed at the given pressures and temperatures.

	Pressure - bar												
Temperature °C	0	0.4	0.63	1	1.6	2.5	4	6.3	8	10	12.5	16	20
0	4.82	3.45	2.97	2.42	1.87	1.39	0.97	0.67	0.54	0.44	0.36	0.29	0.23
5	6.88	4.93	4.24	3.46	2.68	1.99	1.39	0.95	0.77	0.63	0.52	0.41	0.33
10	9.41	6.74	5.80	4.73	3.66	2.72	1.90	1.30	1.06	0.87	0.70	0.56	0.45
15	12.7	9.08	7.83	6.39	4.94	3.67	2.56	1.76	1.43	1.17	0.95	0.76	0.61
20	17.4	12.5	10.7	8.75	6.77	5.02	3.51	2.41	1.95	1.60	1.30	1.04	0.84
25	23.6	16.9	14.6	11.9	9.18	6.82	4.77	3.27	2.65	2.17	1.77	1.40	1.14
30	30.5	21.8	18.8	15.3	11.9	8.81	6.16	4.22	3.43	2.81	2.29	1.81	1.47
35	39	27.9	24	19.6	15.2	11.3	7.87	5.40	4.38	3.59	2.92	2.32	1.88
40	49.6	35.5	30.6	24.9	19.3	14.3	10	6.87	5.57	4.55	3.72	2.95	2.39
45	63.5	45.45	39.2	31.9	24.7	18.3	12.8	8.79	7.13	5.84	4.76	3.77	3.06
50	81	58	49.9	40.7	31.5	23.4	16.4	11.2	9.10	7.45	6.07	4.82	3.90

TABLE 7 - VOLUME FLOW UNIT CONVERSION FACTORS

To obtain volume flow for the following units, multiply the number given for the source units by the coefficient shown.

Source units	m_3/s	l/s	cm^3/s	m^3/h	m^3/min	l/h	l/min	ft^3/min (scfm)	gallone/min UK	gallone/min USA
m^3/s	1	10^3	10^6	3600	60	$3.6 \cdot 10^3$	$60 \cdot 10^3$	$2.1188 \cdot 10^3$	$13.198 \cdot 10^3$	$15.850 \cdot 10^3$
l/s	10^{-3}	1	10^3	3.6	$60 \cdot 10^{-3}$	$3.6 \cdot 10^3$	60	2.1188	13.198	15.850
cm^3/s	10^{-6}	10^{-3}	1	$3600 \cdot 10^{-6}$	$60 \cdot 10^{-6}$	3.6	$60 \cdot 10^{-3}$	$2.1188 \cdot 10^{-3}$	$13.198 \cdot 10^{-3}$	$15.850 \cdot 10^{-3}$
m^3/h	$0.277778 \cdot 10^{-3}$	0.27778	$0.277778 \cdot 10^3$	1	$16.667 \cdot 10^{-3}$	10^3	16.667	0.58856	3.6661	4.4028
m^3/min	$16.667 \cdot 10^{-3}$	16.667	$16.667 \cdot 10^3$	60	1	$6 \cdot 10^4$	10^3	35.313	219.97	264.17^{-3}
l/h	$0.27778 \cdot 10^{-6}$	$0.27778 \cdot 10^{-3}$	0.27778	10^{-3}	$16.667 \cdot 10^{-6}$	1	$16.667 \cdot 10^{-3}$	$0.58856 \cdot 10^{-3}$	$3.6661 \cdot 10^{-3}$	$4.4028 \cdot 10^{-3}$
l/min	$16.667 \cdot 10^{-6}$	$16.667 \cdot 10^{-3}$	16.667^{-6}	$60 \cdot 10^{-3}$	10^{-3}	60^{-3}	1	$35.313 \cdot 10^{-3}$	$219.97 \cdot 10^{-3}$	$264.17 \cdot 10^{-3}$
ft^3/min	$0.47195 \cdot 10^{-3}$	0.47195	$0.47195 \cdot 10^3$	1.6990	$28.317 \cdot 10^{-3}$	$1.6990 \cdot 10^3$	28.317	1	6.2288	7.4804
UK gallon/min	$75.768 \cdot 10^{-6}$	75.768^{-3}	75.768	0.27276	$4.5461 \cdot 10^{-3}$	272.76	4.5461	0.16054	1	1.2009
US gallon/min	$63.090 \cdot 10^{-6}$	$63.090 \cdot 10^{-3}$	63.090	0.22712	$3.7854 \cdot 10^{-3}$	227.12	3.7854	0.13368	0.83266	1

TABLE 8 - RECOMMENDED FLOW RATE

Maximum recommended flow rate in Nl/min for pneumatic circuit piping. Flow rate values are calculated as follows:
- pipes Ø 2 to Ø 12 with a pressure drop equal to 0.3% of operating pressure per metre of pipe.
- pipes Ø 15 to Ø 40 with a pressure drop equal to 0.15% of the operating pressure per metre of pipe.

	Inside diameter in mm - Nominal diameter in gas inches										
Pressure bar	Ø 2	Ø 4	1/8" Ø 6	1/4" Ø 8	3/8" Ø 10	Ø 12	1/2" Ø 15	3/4" Ø 20	1" Ø 25	1 1/4" Ø 32	1 1/2" Ø 40
2	3.5	19	53	110	190	300	370	750	1350	2500	4300
4	6.2	35	97	200	350	550	700	1400	2400	4500	7800
6	9	50	140	290	500	800	1000	2000	3500	6500	11500
8	11.8	66	185	380	660	1050	1300	2600	4500	8500	15000
10	14.5	82	230	470	820	1300	1600	3250	5700	10500	18500

METAL WORK PNEUMATIC

TABLE 9 - INDICATIVE AIR CONSUMPTION FOR DIFFERENT TYPES OF EQUIPMENT

Type of equipment	Consumption at full load Nl/min.	Type of equipment	Consumption at full load Nl/min.
6 mm Ø drill	300	Bench tamper	350
12 mm Ø drill	500	8 kg tamper	700
20 mm Ø drill	1150	10 mm Ø riveting machine	450
45 mm Ø drill	1650	20 mm Ø riveting machine	1000
M6 screwdriver or bolt screwer	300	4 kg chisel	380
M10 screwdriver or bolt screwer	400	6 kg chisel	500
M16 impulse screwer	1150	Small paint-spray gun	160
M25 impulse screwer	1650	Industrial paint-spray gun	500
1" Ø wheel grinder	350	1 mm Ø cleaning bellows	65
6" Ø disk grinder	1500	2 mm Ø cleaning bellows	250
9" Ø disk grinder	2100	5 mm Ø nozzle sandblasting machine	1600
Polishing machine	1200	8 mm Ø nozzle sandblasting machine	4200
1000 kg hoist	2150	Plaster sprayer	500
Spot welder	300	Heavy-duty concrete vibrator	2500
		35 kg concrete breaker	1650
		18 kg breaker	1850
		30 kg breaker	2850

DEGREE OF PROTECTION

NORMA EN 60529 E CEI 529

IP 6 5

- 6 — DEGREE OF PROTECTION AGAINST THE PENETRATION OF FOREIGN BODIES COMING INTO CONTACT WITH LIVE PARTS.
- 5 — DEGREE OF PROTECTION AGAINST THE PENETRATION OF LIQUIDS

1nd No.	DESCRIPTION	2nd No.	DESCRIPTION
0	Not protected	0	Not protected
1	Protected against solid bodies greater than Ø 50 mm	1	Protected against water falling vertically (condensate)
2	Protected against solid bodies greater than Ø 12 mm	2	Protected against drops of water falling up to 15° off the vertical
3	Protected against solid bodies greater than Ø 2.5 mm	3	Protected against rain water up to 60° off the vertical
4	Protected against solid bodies greater than Ø 1 mm	4	Protected against sprays of water from any direction.
5	Protected against dust	5	Protected against jets of water fired from any direction
6	Totally protected against dust	6	Protected against sea waves or the like
		7	Protected against the effects of immersion

CHECK COMPATIBILITY

Pneumatic products include elastomer gaskets that are made of acryl-nitrile butadiene (NBR), polyurethane or fluorocarbon rubber (FKM/FPM).
It is important for them not to come into contact with incompatible substances, which could cause them to swell or crack and subsequently malfunction.

In particular, it is necessary to check compatibility of:
- the oil used in the air compressor
- any oil used in the lubricator
- the oil or cutting fluids used on the machine, which could get into the cylinders and from there the valves.

We have drawn up a compatibility table containing a list of chemicals and elastomers, and also Hostaform®, the technopolymer most commonly used in our products. Please refer to the English webpage **www.metalwork.it/eng/materiali_compatibilita.html** or the Italian webpage **www.metalwork.it/ita/materiali_compatibilita.html**.

The website **http://divapps.parker.com/divapps/seal/mobile/FluidCompatibility/Desktop/** of Parker Pradifa, one of our gasket suppliers, contains an interactive table defining incompatibility.

Below are some the oils that are definitely compatible with all the elastomers used with our products:
- UNI and ISO FD 22 lubricants (Energol HPL, Spinesso, Mobil DTE, Tellus Oil).
- low pressure compressor oil: SHELL CORENA OIL D 46
- high pressure compressor oil: SHELL RIMULA X OIL 40.

Please note that some ester-based synthetic oils used in compressors are extremely incompatible with NBR and polyurethane. ROTOROIL 8000 F2 is one of them.

Metal Work can provide you with further information or carry out research and tests if required.

AIR PURITY CLASS

The ISO 8573-1 standard establishes the level of air quality in terms of solid particles, humidity and oil concentration.

Example:

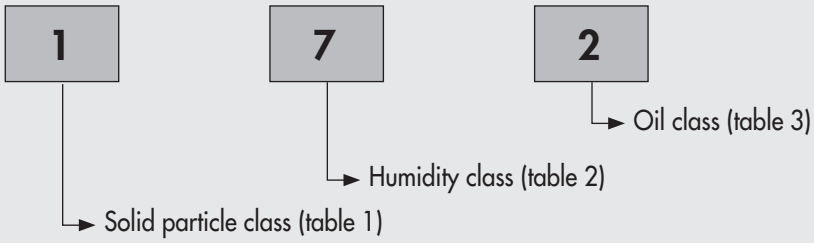


TABLE 1 - SOLID PARTICLE CLASSES

Class	Maximum number of particles for m³ Particle size, d [µm]		
	0.1 < d ≤0.5	0.5 < d ≤1.0	1.0 < d ≤5.0
0	As specified by the equipment user or supplier and more stringent than class 1		
1	≤20000	≤400	≤10
2	≤400000	≤6000	≤100
3	Not specified	≤90000	≤1000
4	Not specified	Not specified	≤10000
5	Not specified	Not specified	≤100000

Class	Concentration, C_p [mg/m³]
6	$0 < C_p \leq 5$
7	$5 < C_p \leq 10$
X	$C_p > 10$

TABLE 2 – HUMIDITY CLASSES

Class	Pressure dewpoint [°C]
0	As specified by the equipment user or supplier and more stringent than class 1
1	≤-70
2	≤-40
3	≤-20
4	≤+3
5	≤+7
6	≤+10

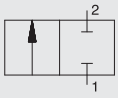
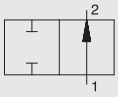
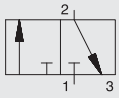
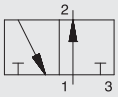
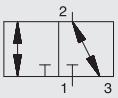
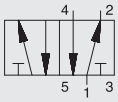
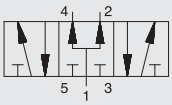
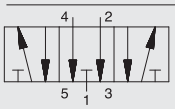
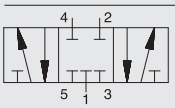
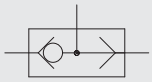
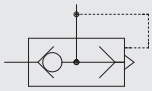
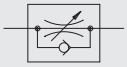
Class	Concentration of liquid water, C_W [g/m³]
7	$C_W \leq 0.5$
8	$0.5 < C_W \leq 5$
9	$5 < C_W \leq 10$
X	$C_W > 10$

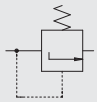
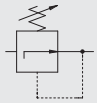
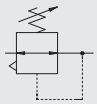
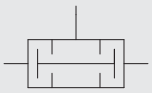
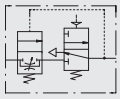
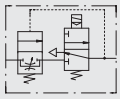
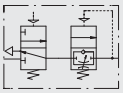
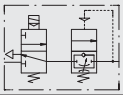
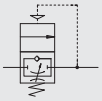
TABLE 3 – OIL CLASSES

Class	Oil concentration (aerosol, liquid, vapour) [mg/m³]
0	As specified by the equipment user or supplier and more stringent than class 1
1	≤0.01
2	≤0.1
3	≤1
4	≤5
X	>5

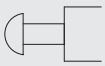
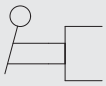
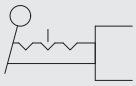
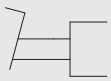
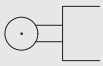
PNEUMATIC SYMBOL

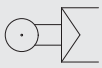
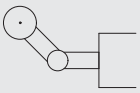
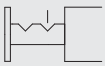
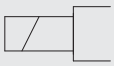
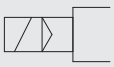
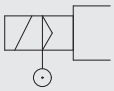
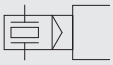
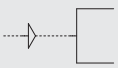
DISTRIBUTION AND REGULATION

	2-way/2 positions valve (2/2) normally closed
	2-way/2 positions valve (2/2) normally open
	3-way/2 positions valve (3/2) normally closed
	3-way/2 positions valve (3/2) normally open
	3-way/2 positions valve (3/2) NC-NO
	5-way/2 positions valve (5/2)
	5-way/3 positions valve (5/3) pressurized centres
	5-way/3 positions valve (5/3) open centres
	5-way/3 positions valve (5/3) closed centres
	Unidirectional valve
	Check valve with spring
	Circuit selector valve (OR element)
	Quick-release valve
	Flow regulator with variable choke
	Unidirectional flow regulator with variable throat

	Sequence valve
	Pressure reducer without blowoff valve
	Pressure reducer with blowoff relief valve
	Pressure piloted reducer with blowoff relief valve
	Shutoff valve
	Dual pressure valve (AND element)
	Progressive pneumatic starter (APR)
	Progressive solenoid starter (APR)
	Progressive pneumatic starter (APR) (SK 100 only)
	Progressive solenoid starter (APR) (SK 100 only)
	3-way shutoff valve (V3V) with lockable control
	3-way shutoff valve (V3V) with pneumatic control
	3-way shutoff valve (V3V) with solenoid control
	2/2 progressive pneumatic valve (VAP) (SK 100 only)
	2/2 progressive solenoid valve (VAP) (SK 100 only)

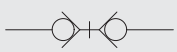
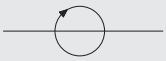
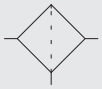
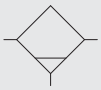
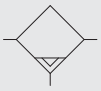
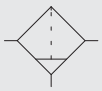
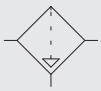
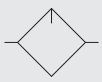
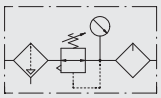
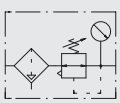
CONTROLS

	Manual control
	Manual pushbutton control
	Manual lever control
	Manual control with 2-position lever
	Manual control with 3-position lever
	Manual pedal-operated control
	Mechanical control with ferrule
	Mechanical control with sensitive ferrule
	Mechanical control with spring
	Mechanical control with roller lever

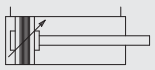
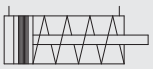
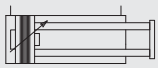
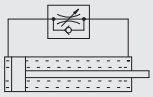
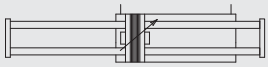
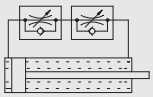
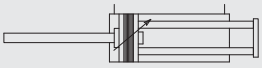
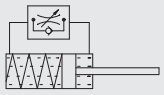
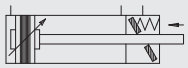
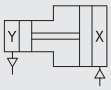
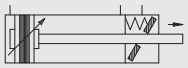
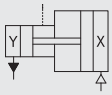
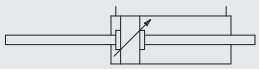
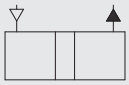
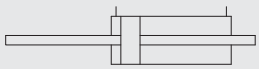
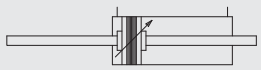
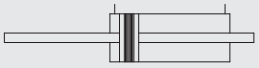
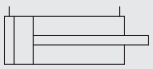
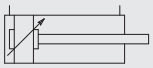
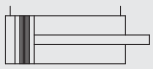
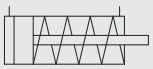
	Mechanical control with sensitive roller lever
	Mechanical control with unidirectional roller lever
	Mechanical control with drawer
	Electrical control
	Solenoid control
	Solenoid, pilot-assisted control
	Piezoelectric control
	Pneumatic control
	Mechanical stop
	Release device

METAL WORK PNEUMATIC

TRANSMISSION AND PREPARATION

	Pneumatic pressure source
	Operating line
	Pilot line
	Discharge line
	Flexible line connection
	Electric cable
	Line connection (welding, screwing)
	Line connection (welding, screwing)
	Crossing of unconnected lines
	Discharge point
	Discharge hole without connection
	Discharge hole with connection
	Power pick-up point with closing cap
	Power pick-up point with port
	Quick-fit coupling without unidirectional valve
	Quick-fit coupling with unidirectional valve
	Quick-fit coupling (de-coupling with open terminal section)
	Quick-fit (de-coupling with closed terminal section)
	1-way swivel coupling
	3-way swivel coupling
	Silencer
	Tank
	Filter
	Condensate separator with manual discharge
	Condensate separator with automatic discharge
	Filter with condensate separator with manual discharge
	Filter with condensate separator with automatic discharge
	Lubricator
	Pressure gauge
	Pressure switch
	Optical tester
	FRL+pressure gauge maintenance unit
	FRL+pressure gauge simplified maintenance unit
	FR+pressure gauge maintenance unit

TRANSFORMATION

	DE magnetic cylinder with adjustable bilateral cushioning		SE magnetic cylinder
	DE magnetic twin-rod cylinder with adjustable bilateral cushioning		Hydraulic brake with adjustment in one direction only
	DE magnetic twin-rod cylinder with adjustable bilateral cushioning		Hydraulic brake with adjustment in both directions
	DE magnetic twin-rod cylinder with adjustable bilateral cushioning-single through rod		Cushion
	DE magnetic cylinder with adjustable bilateral cushioning + DZB mechanical lock		Pressure multiplier for fluids with identical characteristics
	DE magnetic cylinder with adjustable bilateral cushioning + DZBA mechanical lock		Pressure multiplier for fluids with different characteristics
	DE cylinder with adjustable bilateral cushioning, through-rod		Pneumatic/hydraulic transducer
	DE through-rod cylinder		Constant volume compressor
	DE magnetic cylinder with adjustable bilateral cushioning, through-rod		Constant volume pneumatic motor, unidirectional flow
	DE magnetic cylinder, through-rod		Constant volume pneumatic motor, bidirectional flow
	DE cylinder		Variable volume pneumatic motor, unidirectional flow
	DE cylinder with cushioning		Variable volume pneumatic motor, bi-directional flow
	DE magnetic cylinder		Rotary pneumatic motor
	SE cylinder		Cylinder with adjustable single cushioning

NOTES

ENVIRONMENT AND ENERGY SAVING

Metal Work SpA has always placed great emphasis on environmental issues, and now – following creation of the Environmental Management System and receipt of UNI EN ISO 14001 certification in 2000 – we wish to make our commitment public.

Metal Work is fully committed to:

A. complying with all the applicable laws and regulations
B. continuously seeking to reduce emissions and waste
C. continuously seeking to reduce the consumption of water, energy and raw materials
D. adopting technological processes having the lowest environmental impact
E. training all employees in order to encourage the adoption of measures to safeguard the environment.

Metal Work products are sold all over the world. Being pneumatic products, they intrinsically consume large amounts of energy. We are aware of this and we feel it our responsibility to provide our customers with information to help them reduce energy wastage.

At the end of their working life, our products have to be disposed of. Even at this final stage, it is important to note that most of their parts can be recycled, which is why we provide you with information to help you to dispose of them correctly.

MATERIALS USED IN METAL WORK PRODUCTS

Nearly all Metal Work **products** are designed so that at the end of their working life they can be taken apart to separate the constituents. Only certain small subassemblies are difficult to dismantle, so they have to be disposed of still assembled. The materials of which our products are made are listed in detail on the first page of the catalogue for each family, under the heading "Component Parts". There is a full list and a cutaway drawing of a typical product in each family. The choice of using selected materials and lubricants has contributed to position Metal Work products in the class of NON-HAZARDOUS SPECIAL WASTE at the end of their useful life, in accordance with Directive 91/689/CE. This condition only applies if the products have not been contaminated during operation by pollutants included in the list of hazardous substances.

Product **packaging** adopts the following criteria:

- Each product comes in a cardboard box. The cardboard is corrugated and made of recycled material. The printed words cover a small area to save as much ink as possible.
- When cardboard boxes cannot be used as they do not provide enough protection or the right shape is unavailable, some products are protected by sheets of polyethylene bubble wrap.
- Small products are contained in clear polyethylene bags.
- Gaskets are contained in black polyethylene bags as they are sensitive to light.
- Pneumatic cylinders are protected by polyethylene mesh.
- The single products are then placed in larger boxes, which are also made of recycled corrugated cardboard and have a white paper film on the outside.
- The boxes and loose products are held in position inside the larger box by means of crumbled sheets of paper which are fully recycled and can be reused.
  As a result of this policy, 95% of the packaging material is comprised of cardboard, and 80% of this is obtained from recycled paper.

CONAI

Metal Work is a member of CONAI, the Italian Packaging Consortium, set up to promote the recovery and recycling of packaging material. It must be highlighted that Metal Work is required by law to pay CONAI an environmental contribution of € 30/tonne for paper and cardboard, and € 72.30/tonne for plastic packaging (2008 figures). Clearly, it is in the interest of all of us to reduce the weight of packaging, recycle it and prefer paper to plastic.

Below is a list of materials and general indications on how to dispose of them.

METAL
- Aluminium
- Cast aluminium alloy
- Cast zamak
- Steel
- Brass
- Sintered bronze

These materials can be taken to a recycling plant as scrap.

PLASTIC
- POM - Acetal Polyoxymethylene Copolymer: Hostaform® and others
- PA - Polyamide polymer/Nylon: Grilamid, Durethaned, Zytel and others
- ABS - Acrylonitrile butadiene styrene polymer: Novodur and others
- PET - Polyester resin: Rynite® and others
- PPS - Poly-Phenylene Sulphide: Fortron®
- PTFE - Polytetrefluoroethene

These materials can be taken to a recycling plant.

ELASTOMERS
- NBR
- Polyurethane
- FKM/FPM

Since they are only used in our products in small quantities, are greasy and, after long use, are also covered in metal filings, these materials are not taken to a recycling plant but are classified as **non-hazardous special waste.**

OTHERS
- Magnets (neodymium, plastoferrite, plasto-neodymium)
- PC boards
- Magnetic sensors
- Coils (PA+steel+copper)
- Power cables (PA or PU + copper)

These materials, which are generally present in our products in small quantities, are classified as **non-hazardous special waste** and are normally accepted as **urban waste.**
Large amount of power cables and coils can be **sold** as **scrap** to companies specialised in recycling power cables.

PACKAGING
- Cardboard
- Polyethylene bubble wrap – LDPE
- Polyethylene mesh – LDPE
- Clear or black polyethylene bags

These materials can be **fully recycable** and can be **taken to disposal centres** for paper and plastic.

SYMBOLS LABELLING OF MATERIALS AND PACKAGING

Labelling to identify the packaging material is optional, and is a self-declared statement by the manufacturer.
The normative reference for handling used packaging is Directive 94/62/CE as revised by Directive 2004/12/CE.
Other interesting international standards are:

- EN ISO 1043:2002: Plastics – Symbols and abbreviations
- EN ISO 11469:2001: Plastics – Identification and marking of plastic products
- EN ISO 14021:2002: Environmental labels and declarations – Self-declared environmental claims.

Mobius cycle. This means the material can be recycled.

X % This means that the material, which can be recycled, contains X % by mass of recycled material.

The RESY symbol, together with the manufacturer's identification code, certifies that the cardboard packaging possesses the requirements to be recycled by the Paper Mills Association.

Marks indicating the material used for packaging and liquid containers.
NO LONGER USED.

Material identification abbreviation and number (Resolution 97/129/CE) + graphic symbol (CR 14311:2002)

MATERIAL	ABBREVIATION	NUMBER	SYMBOL
Polyethylene terephthalate	PET	1	
High-density polyethylene	HDPE	2	
Polyvinyl chloride	PVC	3	
Low-density polyethylene	LDPE	4	
Polypropylene	PP	5	
Polystyrene	PS	6	
Other technopolymers		7	
Corrugated cardboard	PAP	20	
Non-corrugated cardboard	PAP	21	
Paper	PAP	22	
Steel FE	40		
Aluminium	ALU	41	
Other metals		42	
Wood	FOR	50	
Colourless glass	GL	70	
Green glass	GL	71	
Brown glass	GL	72	
Paper and cardboard/various metals	C/*	80	
Paper and cardboard/plastic	C/*	81	
Paper and cardboard/aluminium	C/*	82	
Paper and cardboard/tin	C/*	83	
Paper and cardboard/plastic/aluminium	C/*	84	
Paper and cardboard/plastic/aluminium/tin	C/*	85	
Plastic/aluminium	C/*	90	
Plastic/tin	C/*	91	
Plastic/various metals	C/*	92	
Glass/plastic	C/*	95	
Glass/aluminium	C/*	96	
Glass/tin	C/*	97	
Glass/various metals	C/*	98	

*: Abbreviation of predominant material. Examples:
C/PAP 84: material comprised of paper or cardboard, plastic and aluminium, with a predominance of paper or cardboard (brick).
C/LPDE 90: material comprised of plastic and aluminium, with a predominance of plastic (coffee pack).

METAL WORK PNEUMATIC

ENERGY SAVING

Compressed air is clean energy but producing it requires electricity, which costs money and consumes environmental resources.
Below are some indicative averages of the energy ratio of compressed air to its sources.
The values vary as a function of the output of the compressor and other factors.

Specific power:	6.5	W/Nl/min	i.e. it takes 6.5 W to generate 1 normal litre per minute of compressed air.
Oil factor:	0.254	lit oil/kWh	i.e. 0.254 litres of oil are burnt to produce 1 kW/h.
	0.00165	lit oil/Nl/min/h	i.e. 0.00165 litres of oil are burnt to produce 1 Nl/min of compressed air.
CO_2 factor:	0.702	kg/kWh	i.e. 0.702 kg of carbon dioxide is dispersed into the environment to produce 1 kWh.
	0.00456	kg/Nl/min/h	i.e. 0.00456 kg of carbon dioxide is dispersed into the environment to produce 1 Nl/min. for 1 hour.
Cost of air:	0.00065	€/Nl/min/h	i.e. it cost € 0.00065 to generate 1 normal litre/minute of compressed air for one hour.

EXAMPLE:

Flow rate 100 Nl/min, for **10 hours a day** for **230 days** a year:

Power: 6.5 x 100 Nl/min = **650 W**
Electricity consumption: 650 W x 10 hours/day x 230 days/year = 1495.000 Wh = **1495 KWh/year**
Oil burnt equivalent: 0.254 l/kWh x 1495 kWh = **380 litres/year**
Carbon dioxide emissions: 0.702 kg/kWh x 1495 kWh = **1050 kg/year**

THE 4 PILLARS OF SAVING

Considerable energy savings can be achieved by following four simple rules

1 Choose the correct cylinder size

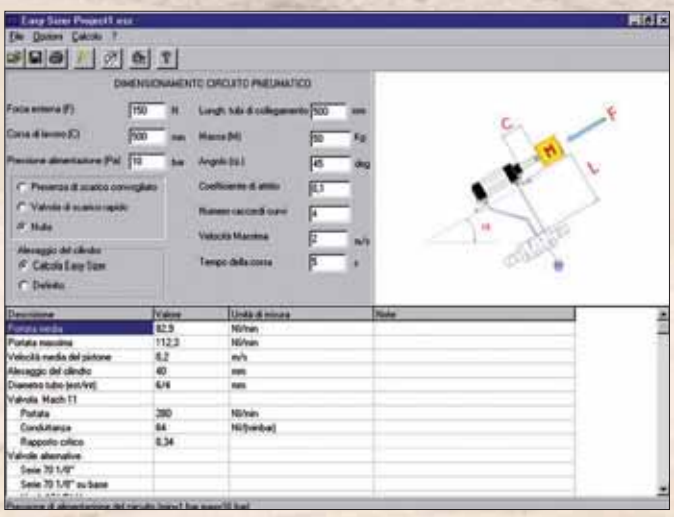
Pneumatic actuators, especially cylinders, consume at each stroke an amount of air that depends on the pressure and the bore.
Using the right cylinder at the right pressure allows considerable saving.
A cylinder that requires a smaller flow enables you to associate valves, fittings and pipes of a smaller size, thereby saving on the cost of the products.
Example
Cylinder Ø 80 mm, stroke 200 mm, 6 bar,
12 cycles/min, 16 hours a day, 230 days a year.
Consumption: 144 Nl/min => 940 W => 3460 kWh/year
=>880 litres of oil => 2428 kg of CO_2
If you pay € 0.10/kWh: => € 346/year.
If the cylinder has been oversized by mistake and a 63 mm cylinder could be used in its place, the figure would be:
Consumption: 90 Nl/min=>584W =>2140 kWh/year
=> 546 litres of oil => 1502 kg of CO_2
If you pay € 0.10/kWh: => € 214/year.
SAVE: € 132 a year.

2 Use economizers

If in a cylinder you require a thrust in one direction only, e.g. piston rod extension, and a lower thrust and pressure is sufficient in the other direction, you can save a lot of energy by mounting an economizer valve.
It reduces feed pressure to the cylinder chamber and allows air to flow freely during discharge.
Example
If, in the previous example, you install on one of the ports of the Ø 80 cylinder an econimizer that reduces the pressure from 6 to 12 bar,
you **SAVE: € 115 a year.**

METAL WORK PNEUMATIC

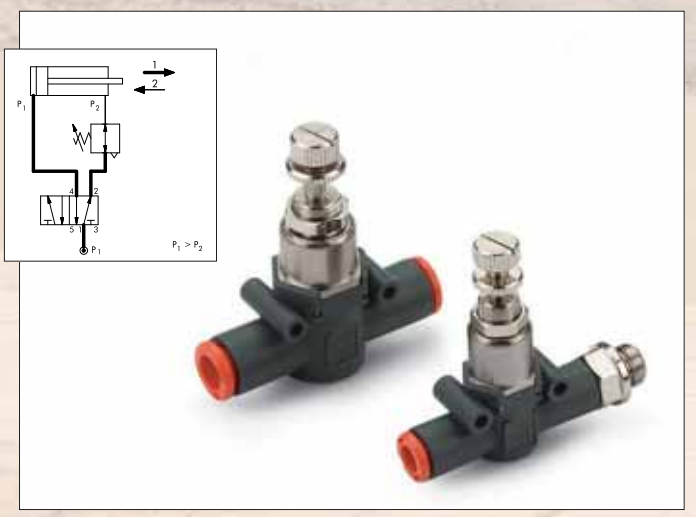
provides easy-to-use software called **EASY SIZER...**



...for sizing pneumatic cylinders, valves, pipes and units.
You can download it from www.metalwork.it

METAL WORK PNEUMATIC

proposes a series of **miniature economizers...**



...to mount straight onto the cylinder port or in line on the pipe.
See the line-on-line catalogue, series RML-RMS-RMC.

3 Eliminate air leaks

Compressed air leaks in the system waste a large amount of money.
The problem is that, besides electricity consumption, the compressor undergoes more stress than necessary, even when the machine is not in operation.
Two things can be done to reduce this wastage.
• Periodically check for air leaks.
This should be done when the machinery is not running, so that the leaks can be heard.
So-called sniffers can be bought from the trade to help you detect even small leaks.
• Fit solenoid valves on each machine.
These cutout devices seal off the flow of air when the machine is off.
This prevents accidental leaks and wastage for production requirements when cleaning using compressed air.
Example
In a system operating at 6 bar, there is a leak equivalent to that of a 2 mm hole.
The air flow, in this case, is 220 Nl/min.
The leak is 24 hours a day all year round.
Consumption: 220 Nl/min => 1430 W => 12526 kWh/year => 3180 litres of oil => 8.8 tonnes CO_2
If electricity costs € 0.10/kWh =>
you **WASTE € 1252 a year**

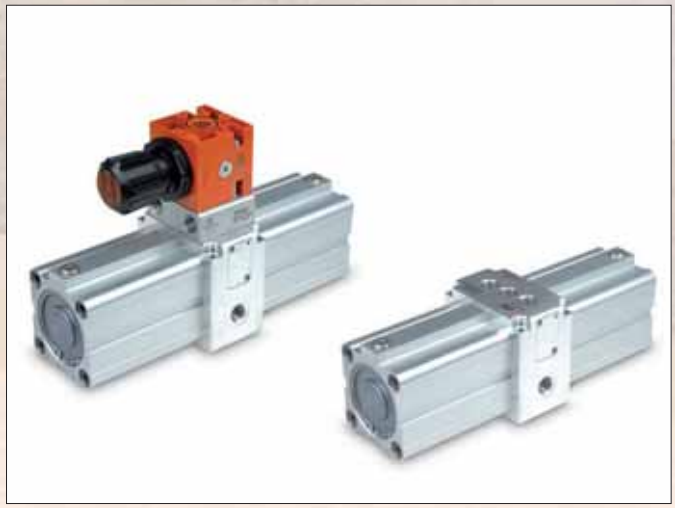
4 Design and operate the air distribution system correctly

The rules of good practice must be followed when designing, developing and operating a pneumatic system.
The followings aspects should be taken into consideration.
• Size pipes so as not to have excessive load losses.
See Table 8 – RECOMMENDED FLOW RATE on page **Z1**.6 in the catalogue.
• Size the compressor and the system for the minimum required pressure - pressure that is too high requires additional energy, which is then lost.
If a system contains a few components requiring a higher pressure, you can use a pressure multiplier, or booster, for them only.
• Deactivate compressors when not used.
Even when not in use, they consume 30-40% of the full power.
Example
A system operates at 7 bar. The average air consumption is 10 Nm^3/min for 16 hours a day for 230 days a year.
But it would be enough to use air at 6 bar.
Reducing the pressure from 7 to 6 bar gives the following:
Air saving of 142 Nm^3/min. => 929 kWh
=> 34100 kWh/year => 8680 litres of oil => 24 tonnes CO_2
If electricity costs 0.10 €/kWh: =>
you **SAVE € 3410 a year**

METAL WORK PNEUMATIC offers shut-off **solenoid valves...**

...of the V3V type, with instant opening, or the APR type, with progressive start up.
Refer to the catalogue of Skillair, New Deal and One units.

METAL WORK PNEUMATIC proposes high-efficiency pressure multipliers **boosters...**



...that can be used to increase the air pressure only for components that effectively require it.

PNEUMATICS AND POTENTIALLY EXPLOSIVE ATMOSPHERES: EUROPEAN DIRECTIVE 2014/34/UE (ATEX)

As from 1st July 2003, all products marketed in the European Union and intended for use in potentially explosive atmospheres must be approved in compliance with European Directive 2014/34/UE, also known as ATEX.

This new directive also applies to non-electrical components, such as pneumatic controls, for which approval is mandatory.

The main innovations introduced by the new directive 2014/34/UE are:

- Inclusion of non-electrical equipment and devices, such as pneumatic cylinders.
- Each device is assigned a category associated to certain potentially explosive atmospheres.
- All products must bear the CE marking.
- Instructions for use and declarations of conformity must be supplied for each product sold for use in potentially explosive atmospheres.
- Products intended for use in potentially explosive atmospheres due to the presence of dust come under this directive, as do products destined for areas in which hazardous gases are present.

A potentially explosive atmosphere may contain gases, mists, vapours or dust that form in factories or other areas in which flammable substances are continuously or occasionally present.
An explosion can occur when flammable substances and a source of ignition are present simultaneously in a potentially explosive atmosphere.

A source of ignition can be:

- of electrical origin (electric arcs, induced currents, heat generated by the Joule effect)
- of mechanical origin (hot surfaces generated by friction, sparks generated by impact between metal bodies, electrostatic discharge, adiabatic compression)
- of chemical origin (exothermic reactions between materials)
- a naked flame

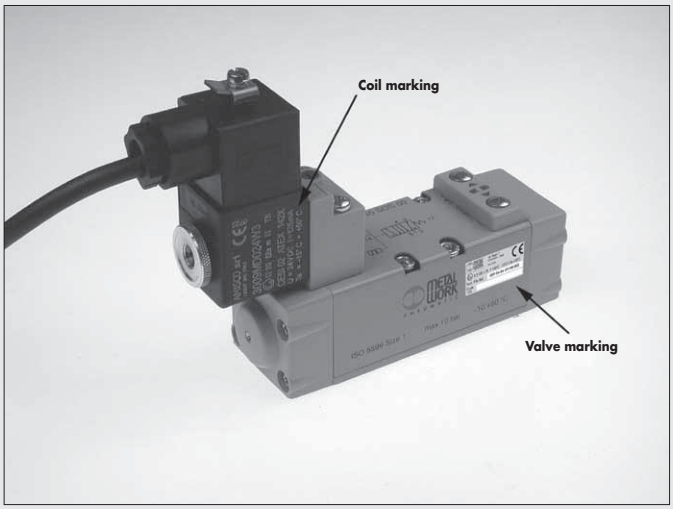
Products subject to approval are all those which, during normal use or due to a malfunction, present one or more sources of ignition for potentially explosive atmospheres.

Responsibility lies both with the manufacturer of the device and whoever installs it in equipment that is to operate in a hazardous atmosphere. This requires co-operation between the parties to ensure correspondence between the category of device and the hazardous area in which it is to operate.

The manufacturer of the device must comply with the specifications and classify the product according to directive 2014/34/UE. The manufacturer of the equipment, who knows the area in which the device will be operating, must select a suitable device according to the category, pursuant to directive 99/92/EC.

THE COMBINATION OF ELECTRICAL AND MECHANICAL PARTS

According to Directive 2014/34/UE, both electrical and mechanical devices are subject to approval.
It is important to note that the component which is classified in the lowest category defines the category of the entire device of which it is a part.
If, for example, the coil is marked Ex II 2 ... and the valve is marked Ex II 3... the coil + valve assembly must not be put into service in zone 1 or 21, only in zone 2 or 22.



GROUPS AND CATEGORIES

Devices for use in potentially explosive areas are divided into the following groups:
- GROUP I: devices used in mines
- GROUP II: devices used in surface installations

DEVICES FOR MINES GROUP I

Explosive gas content	No limit	Below a set limit
Category of device to be used according to 2014/34/UE	M1	M2

DEVICES FOR SURFACE INSTALLATIONS GROUP II

ZONES	0	20	1	21	2	22
Type of atmosphere	G GAS	D DUST	G GAS	D DUST	G GAS	D DUST
Presence of hazardous atmosphere	Continuously (>1000 h/year)*		Not present during normal operation (>10 <1000 h/year)*		Accidental presence (>0.1<10 h/year)*	
Category of devices to use according to 2014/34/UE	1		2		3	

*indicative

CORRESPONDENCE BETWEEN ZONES AND CATEGORIES ACCORDING TO 2014/34/UE.

ZONE 0/ZONE 20 → CATEGORY 1: Devices in this category ensure an adequate degree of safety even in the presence of rare malfunctions.
These devices are used in zones in which an explosive atmosphere is present continuously for long periods.

ZONE 1/ZONE 21 → CATEGORY 2: Devices in this category ensure an adequate degree of safety even in the presence of a probable malfunction.
These devices are used in zones in which an explosive atmosphere is present occasionally.

ZONE 2/ZONE 22 → CATEGORY 3: Devices in this category ensure an adequate degree of safety during normal operation.
These devices are used in zones in which an explosive atmosphere is rarely present and only for brief periods.

MARKING: HOW TO READ IT

MARKING ON NON-ELECTRICAL EQUIPMENT (UNI EN 13463)

EXAMPLE

A	B	C	D	E	F	G	H	L
Ex	II	2	GD	c	T4	T120°C	x	20°C<aT<60°C

- (A) = Means the equipment can be used in an ATEX zone
- (B) = Group: mining or other industries
- (C) = Category: indicates use in various zones
- (D) = Type of explosive atmosphere: **G** = gas; **D** = dust
- (E) = Method of protection from ignition sources: **c** = protection by constructional safety
- (F) = Temperature class: maximum surface temperature in atmosphere with gas
- (G) = Maximum surface temperature in atmospheres with dust
- (H) = Presence of specific operating conditions
- (L) = Ambient temperature for use of the equipmento

MARKING ON ELECTRICAL EQUIPMENT (UNI EN 13463 and CEI EN 60079)

EXAMPLE

A	B	C	D	E	F	G	H	L	M	N	O
Ex	II	3	G	Ex	nA c	IIC	T4	Gc	/	x	20°C<Ta<60°C
	II	3	D	Ex	tc	IIIC	T120°C	Dc	IP65	x	20°C<Ta<60°C

- (A) = Means the equipment can be used in an ATEX zone
- (B) = Group: mining or other industries
- (C) = Category: indicates use in various zones
- (D) = Type of explosive atmosphere: **G** = gas; **D** = dust
- (E) = Means the equipment may be used in an ATEX zone
- (F) = Method of protection from ignition sources (more than one possible)
  c = protection by constructional safety
  tc = protection by enclosures
  nA = non-sparking protection
  mA,mB = protection by encapsulation
  ia,ib,ic = sintrinsic safety
- (G) = Division of the explosivity group
  IIC: explosive subgroup that comprises all types of gas
  IIIC: explosive subgroup that includes combustible particles, conductive dust and not
- (H) = Temperature class: maximum surface temperature in atmosphere with gas
  maximum surface temperature in atmospheres with dust eri
- (L) = **Gc** = explosive atmospheres due to the presence of gas
  Dc = losive atmospheres due to the presence of dust
- (M) = Index of protection
- (N) = Presence of specific operating conditions
- (O) = Ambient temperature for use of the equipmento

TYPE OF PROTECTION AGAINST SOURCES OF IGNITION

Protection symbol		Zones						Description
		0	20	1	21	2	22	
c				X	X	X	X	Protection through constructional safety (PrEN13463-5).
d				X	X	X	X	Flameproof enclosure Type of protection of an electrical apparatus that contains parts capable of triggering an explosion in an enclosure able to withstand the pressures generated by internal explosions.
e				X	X	X	X	Enhanced safety Electrical appliance with a high safety coefficient.
i	ia	X	X	X	X	X	X	Intrinsic safety Electrical circuit in which neither sparks nor temperatures can trigger an explosion during normal operation or a malfunction.
	ib			X	X	X	X	
m				X	X	X	X	Encapsulation Special casing in which the parts that could trigger an explosion are immersed in a substance that prevents contact with the explosive atmosphere.
n						X	X	Type of protection for electrical appliances designed so that they do not ignite the surrounding explosive atmosphere during normal operation and in specific conditions of malfunction. There are 5 categories: nA (non-scintillating); nC (hermetic seal); nR (limited respiration); nL (limited energy); nP (pressurisation).
o				X	X	X	X	Immersion Electrical appliance immersed in oil.
p				X	X	X	X	Pressurised enclosure Pressurisation with respect to the external pressure is maintained by means of an inert gas.
q				X	X	X	X	Enclosure containing filling powder

TEMPERATURE CLAS

GROUP I: Temperature = 150 °C or = 450 °C according to the layer of dust accumulated on the device.

GROUP II

Temperature classes for gas (G)	Admissible surface temperature
T1	450 °C
T2	300 °C
T3	200 °C
T4	135 °C
T5	100 °C
T6	85 °C

USER AND SUPPLIER: OBLIGATIONS AND RESPONSIBILITIES

It is important to highlight the need for the user and supplier to collaborate and to exchange all the information required to define the types of products that can be used in full compliance with the safety standards.

USER: after performing a company-wide risk analysis (pursuant to directive 99/92/EC) and identifying the risk zone in which the purchased part will be operating, the user must inform the SUPPLIER, who must check that the products supplied are compatible with the zone indicated and that the environmental conditions are within the set operating range for the parts.
It is also important to make sure that the operating instructions are always attached to the products supplied.

CONFORMITY DECLARATIONS, CERTIFICATES, INSTRUCTIONS

Please look at our website www.metalwork.it under the heading "Directives and certificates", then "Atex".

SAFETY COMPONENTS: OVERVIEW OF THE STANDARDS

INTRODUCTION

The issue of safety in the workplace is of absolute importance and over the years the standard setters have developed a series of continuously evolving standards, the focal point of which remains the Machinery Directive.
In order to ensure conformity of the machine, the manufacturer must verify that it meets the safety requirements listed in the directive and guarantee compliance with the harmonised standards published in the European Union's Official Journal and relating to the product in question.
There are three types of safety standard for machinery:

- type **A**, which establish general principles applying to the design of all machinery
- type **B**, which deal with one or more safety aspects for a wide range of machinery
- type **C**, which deal in detail with the specific category of machines

Type **A** standards include EN ISO 12100, which cover the basic concepts and general principles for the design of safe machinery, and EN ISO 14121, which describe a hazard identification and risk assessment method.

Type **B** standards include EN ISO 13840, which provides the tools for designing parts of control systems linked to machine safety, mainly the control systems, which are made of components featuring various kinds of technology to reduce risks associated with use of the machine, and IEC 62061, which only refers to systems using electrical and electronic technologies.
One of the main affinities between EN ISO 13849 and IEC 62061 is that the former establishes as the desired safety parameter an index called PL (performance level) and the latter identifies a similar parameter called SIL (safety integrity level). Both indices represent the machine's reliability in terms of the probability of a dangerous failure. The table below shows their relationship:

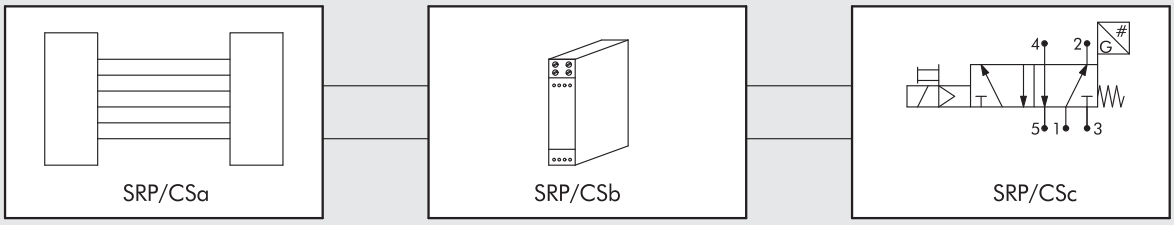
PL	SIL
a	No correspondence
b	1
c	1
d	2
e	3

EN 982 and EN 983 are also type B standards and both deal with safety, but unlike the previous standards they concern components (hydraulic and pneumatic respectively) rather than controlled devices.

When type **C** standards exist for a particular machine, the manufacturer can adopt them directly to achieve the presumption of compliance with the Machinery Directive; if no type C standard exists, it is still necessary to implement a risk-reduction strategy like the one described in harmonised standards type A and B.
Since revision 98/37/EC, the Machinery Directive has dealt not only with machines but also with safety components, namely components made and sold specifically to achieve a safety function and the breakage or malfunction of which jeopardizes personal health and safety.

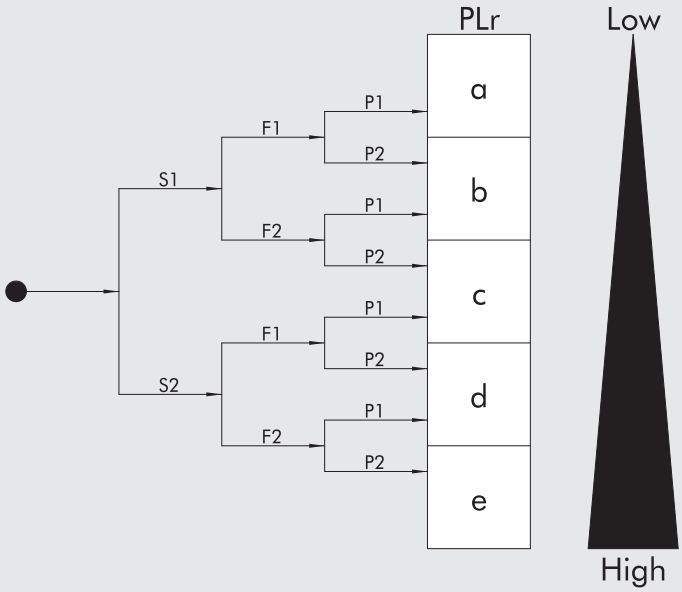
EN ISO 13849

When type C standards do not exist for a particular machine, the manufacturer can adopt the risk-reduction strategy indicated in EN ISO 13849. This standard is divided into two parts: the first part sets out the general principles and the method to follow; the second part is dedicated to validation of the results.
According to the first part of the standard, a machine designer can reduce the risk by designing special safety-related parts of control systems (SRP/CS) that perform one or more safety functions, such as emergency stops, prevention of unexpected start-up, isolation and energy dissipation.
We quote the example of a function comprising three SRP/CSs: a safety barrier (input – sensor), a PLC (processing - logic) and a valve (output - actuator). In the event of intrusion, the barrier relays a signal to the PLC, which activates the valve, the job of which is to relieve a section of the pressurized pneumatic circuit, thereby providing isolation and energy dissipation.



For each safety function it is necessary to determine the Performance Level requested (PLr), according to the procedure indicated in Annexe A to the standard. The following are assessed:

- the severity of the lesion (S), resulting from the failure
- the hazard exposure frequency (F)
- the possibility of avoiding the hazard (P)



If, for example, the severity of a lesion resulting from a failure is low and/or the hazard exposure frequency is low and/or the hazard avoidance possibility is high, the PLr will be low. On the contrary, if the severity and/or exposure frequency is/are high and/or the hazard avoidance possibility is low, then the PLr for that safety function will be high.
Therefore, for each SRP/CS or combination of SRP/CSs performing a safety function, the machine designer must determine the achievable performance level PL.
Certain parameters including the following must be used for this calculation:

- MTTFd (Mean Time to dangerous Failure) of the single components
- DC (Diagnostic Coverage)
- CCF (Common Cause Failure)
- function structure
- compliance of the components used with the basic and/or proven safety principles.

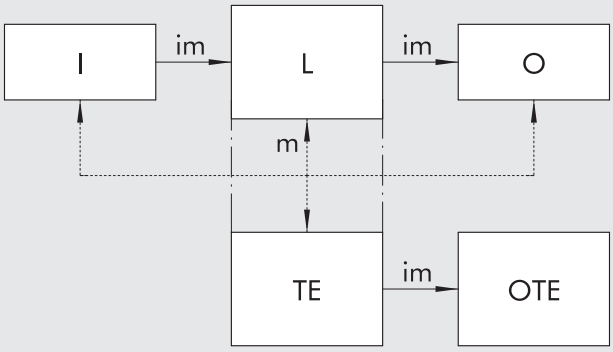
The **MTTFd**, which is the mean time between two dangerous failures, can be obtained from values referring to the operating cycles of the safety function and the B10d of the components, namely the number of cycles 10 percent of the components suffer a dangerous failure. The B10d is equal to double B10, which in turn is an index of the reliability of the component obtainable by following the instructions in EN ISO 19973.
The B10d values of Metal Work products are published on the company's website: http://www.metalwork.it/ita/dirett_macchine.html.

DC (diagnostic coverage) and **CCF** (common cause failure) are obtained using the appendices to EN ISO 13849-1; DC can be determined using failure mode and effects analysis (FMEA) or a similar method.

The structure of the function depends on the architecture. One possible kind is unmonitored single-channel architecture:

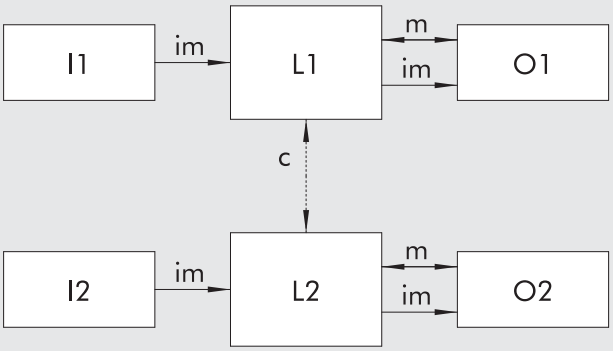
Were:
im: interconnection means
I: input device, e.g. sensor
L: logic
O: output device, e.g. valve

Then comes single-channel architecture with diagnostics. In this case, a module called Test Equipment (TE) provides an output (OTE) in some way linked to the status of the safety function:



Were:
im: interconnection means
I: input device, e.g. sensor
L: logic
m: means of surveillance
O: output device, e.g. valve
OTE: Test Equipment OUTPUT
TE: Test Equipment

A third example is double-channel architecture, which exploits the redundancy of a function – if one channel fails the other remains active:



Were:
im: interconnection means
I1, I2: input device, e.g. sensor
L1, L2: logic
m: means of surveillance
O1, O2: output device, e.g. valve
c: crossed check

As regards the conformity of components used to the basic and/or proven safety principles, reference should be made to a series of considerations presented in EN ISO 13849 standards, which guarantee that the SRP/CS and related components comply with the design, construction and assembly principles.
With these data, the machine designer can determine the safety function category (B, 1, 2, 3 or 4, in increasing order of importance) and the PL achieved; It is important therefore to check it is equal to or greater than the PLr required.

UL AND CSA STANDARDS

UL is an independent organisation involved in the safety certification of products for the North American market. The coils are certified to UL standard 429 - electrically-operated valves.
The UR mark concerns UL-recognised components and is used for the components that are part of a larger product or system. This is why UR can be read on the coil.
The certification of these components is only valid if they are used under the manufacturer's stated conditions (e.g. in our case, voltage +10%).
Companies manufacturing certified components are included in the UL-list of certified manufacturers.
The list does not include the name Metal Work but rather the name AMISCO (UL file E343908), with which we have an agreement for the supply and customisation of coils.
The use of approved coils does not automatically certify its application on a specific machine or plant. Such approval will therefore be up to the manufacturer of the machine or plant.
CSA (Canadian Standard Association) safety standards are applicable in Canada. The coil complies with CSA 22.2.

NOTES

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25C0800040XP	A1.104

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