

COMMUNICATION METER



FEATURES

- Communication Type: RS-485 (2-wire), Baud Rate: 2400/4800/9600/19200
- Display: 5-digit seven segment LED
- Display range: -19999~99999, Decimal point Programmable
- Auxiliary power: AC 110V /220V
- Protocol: ASCII command format

1. MODEL: PF - D485

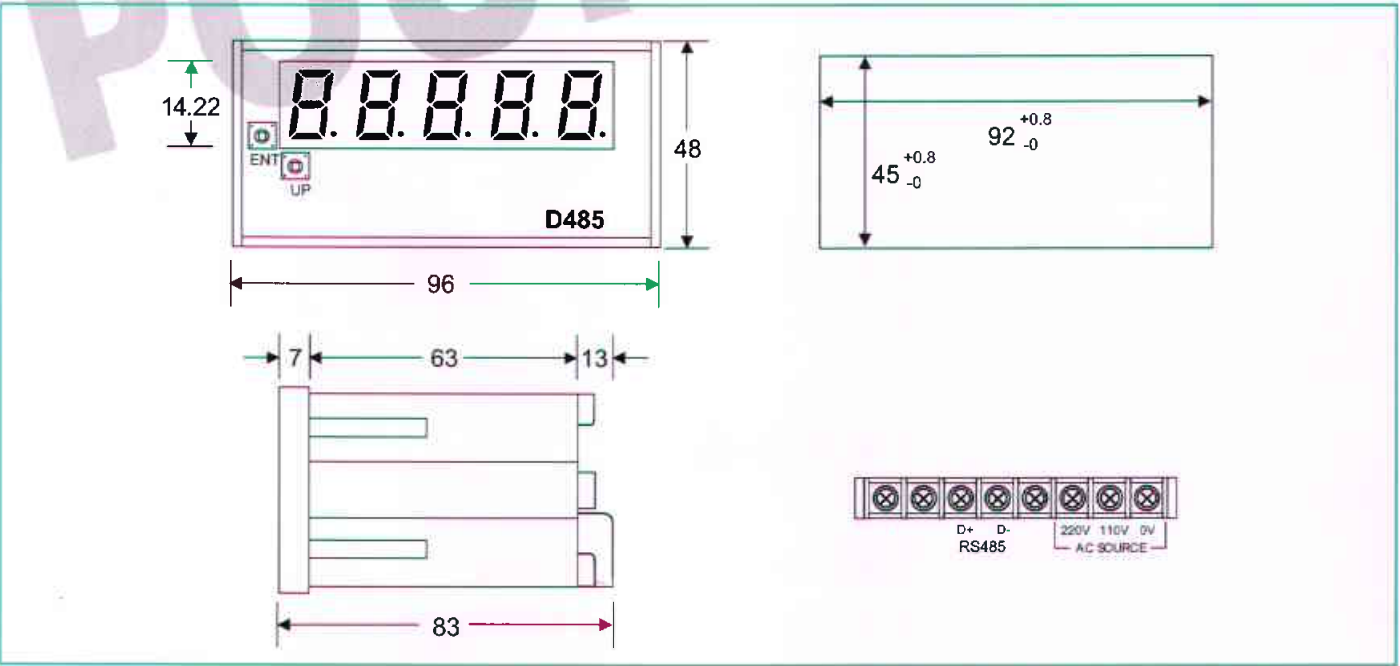
Command Set:

Command Syntax	Command Name	Command Description
\$AA	Return Display Value	Return the display value from a specified slave device
%AA (Data)	Set Display Value	Set the display value of the specified slave device.

3. Specification

- Aux. power supply : AC110&220V±20% (50 or 60Hz)
(optional DC24V or 48V or 110V or 220V
switching AC 100~240V ±10%)
- Readout range : -19999~99999
- Display : Red high efficiency LEDs high 14.22mm
- Protocol : ASCII command format
- Communication type : RS485 (2-wire)
- Baud rate : 2400/4800/9600/19200
- Temperature coefficient : 100ppm/°C (0-50°C)
- Dielectric strength : 1.5Kvac/min (input/power)
- Operating condition : 0-50°C (20 to 90% RH non-condensed)
- Storage condition : 0-70°C (20 to 90% RH non-condensed)

4. Dimension and connection diagram



RS232 TO RS485/422 ISOLATION CONVERTER



FEATURES

- Built-in microprocessor
- Auto baud rate
- Auto tune-up to 115.2Kbps
- Power reverse protection
- Networking up to 1200m
- Power and data flowing indicator

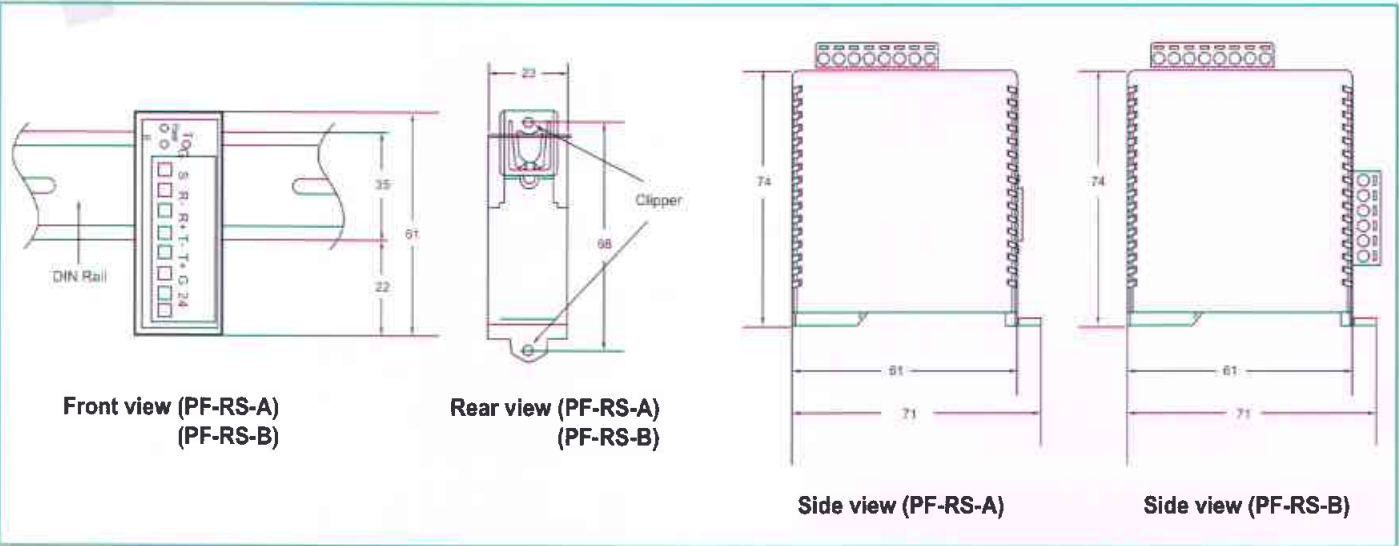
1. MODEL: PF - RS - ■

- A = RS 232 to RS485/422
- B = RS422/485 repeater

2. Specification

- Communication speed (bps) : 300, 600, 1299, 2400, 4800, 9600
19.2K, 38.4K, 57.6K, 115.2K
(Auto baud rate)
- RS232 connector : Female DB-9
- RS485/422 connector : Plug-in screw terminal
- Temp. coefficient : 100ppm/°C
- Dielectric strength : 3.0KVac/1Min (power/input/output)
- Operating condition : 0 ~ 55°C (20 ~ 90% RH
non-condensed)
- Storage condition : 0 ~ 70°C (20 ~ 90% RH
non-condensed)
- Installation : DIN rail or panel mounting
- Auxiliary power : 10 ~ 30VDC PF-RS-A 1.6W
PF-RS-B 2.0W

3. Dimension



4. Terminal connection

PIN	Description
T+	RS485 Data + RS422 Data Transmission +
T-	RS485 Data - RS422 Data Transmission -
R+	RS422 Data Receive +
R-	RS422 Data Receive -
S	Shield
G	Ground
24	+24VDC

DB-9

PIN	Name	Description
1	DCD	Data Carrier Detect
2	RD	Receive Data (a.k.a RxD, Rx)
3	TD	Transmit Data (a.k.a TxD, Tx)
4	DTR	Data Terminal Ready
5	SGND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator



DATA ACQUISITION MODULES



FEATURES

- Universal input channel
- Field isolation upgradeable
- Baud rate selectable
- Modbus RTU protocol
- Compact design,

1. MODEL: PF - DAM - ■

No	Model ID	Description	No of Channel	Signal Type	Power Consumption	Specific Feature
1	@ IO_UI_08	Universal Analog Input	8	High level: 0-20mA, 4-20mA 0-5V, 1-5V, 0-10V Low level: -150mv ~ 150mv T/C: J: -210 ~ 1200°C K: -270 ~ 1370°C T: -270 ~ 400°C E: -270 ~ 1000°C R: -50 ~ 1760°C S: -50 ~ 1760°C B: 0°C ~ 1820°C N: -270 ~ 1300°C RTD: PT100 (DIN) -200°C ~ 850°C	24VDC, 120mA	Field upgradeable Isolated Input
2	@ IO_AI_08	Analog Input	8	Current: 0-20mA, 4-20mA Voltage: 0-10V, 0-5V, 1-5V	24VDC, 120mA	Field upgradeable Isolated Output
3	@ IO_AO_02	Analog Output	2	Current: 0-20mA, 4-20mA Voltage: 0-10V, 0-5V, 1-5V	24VDC, 160mA	Field upgradeable Isolated Output
4	@ IO_DI_16	Digital Input	16	24V DC Sink	24VDC, 130mA	
5	@ IO_DO_PR_08	Power Relay Digital Output	8	Power Relay 220VAC (30VDC) 2A Load	24VDC, 120mA	
6	@ IO_DIO_16	Digital Input / Output	DI: 8 DO: 8	DI: 24VDC Sink DO: 24VDC Source, 0.5A	24VDC, 140mA	
7	@ IO_CI_02	Counter Input	CI: 2 DOPR: 4	DI: 24VDC Sink DO: Power Relay 220VAC (30VDC) 2A Load	24VDC, 92mA	
8	@ IO_PWR_24	24V Power Supply		Output: 24V, 1.2A	85-265VAC, 47-63HZ	

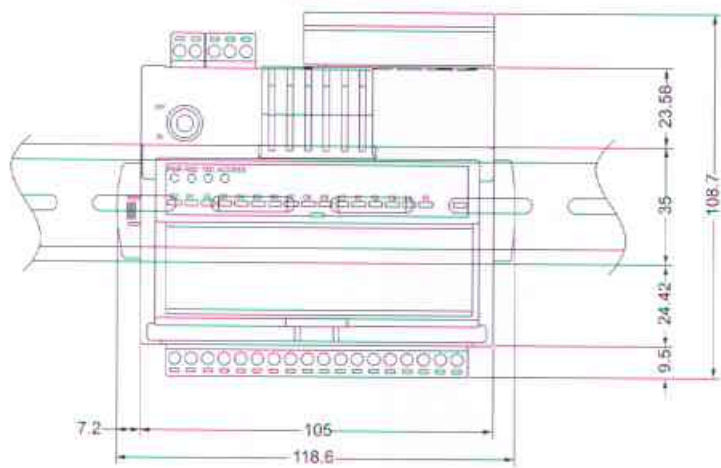
2. Specification

MODEL ID	DESCRIPTION	SPECIFICATION
@ EM_RS485_Isolated	Isolated RS485 Module	Voltage Isolation: 1000VAC
@ EM_UI_Isolated	Isolated UI Input Module	Channel to Channel Isolation: 350VAC/DC Channel to System Isolation: 1000VAC/DC
@ EM_AO_Isolated	Isolated AO Output Module	Channel to Channel Isolation: 1000VAC/DC Channel to System Isolation: 1000VAC/DC

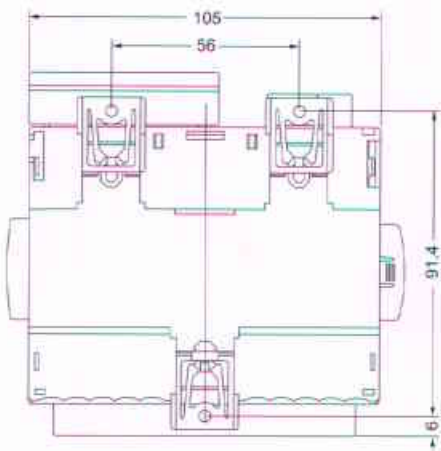
DATA ACQUISITION MODULES

3. Dimension Unit: mm

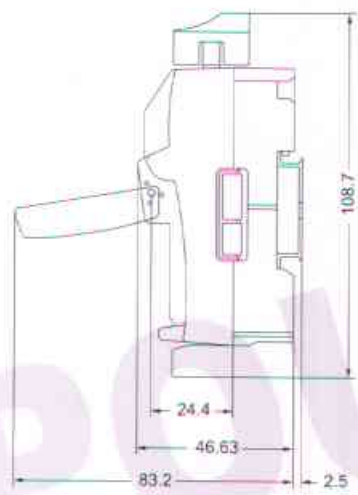
FONT VIEW



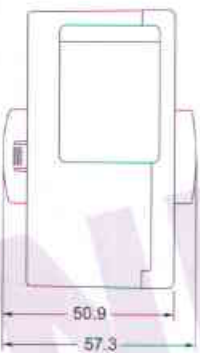
REAR VIEW



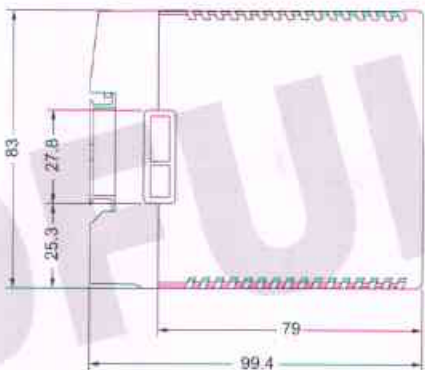
SIDE VIEW



SOURCE FRONT VIEW

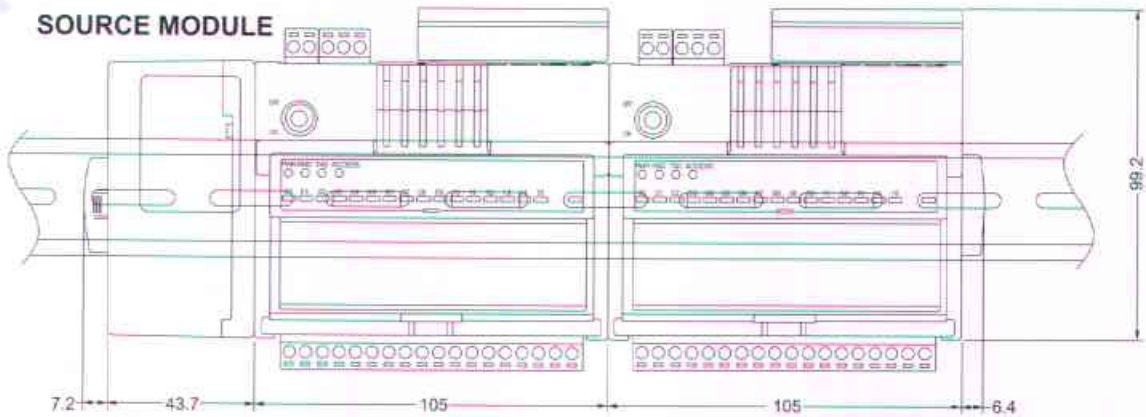


SOURCE SIDE VIEW



MULTI-CHANNEL MODULE ASSEMBLY

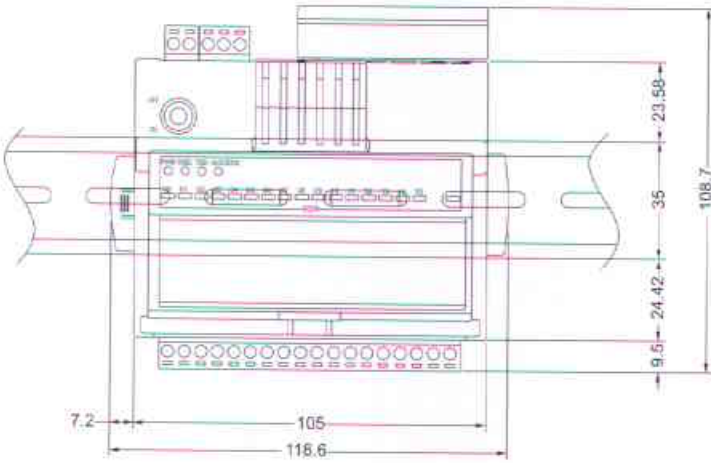
SOURCE MODULE



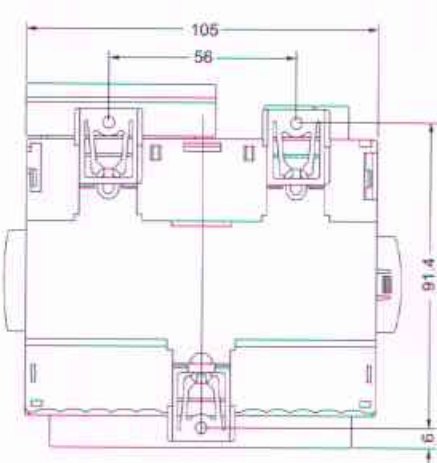
DATA ACQUISITION MODULES

3. Dimension Unit: mm

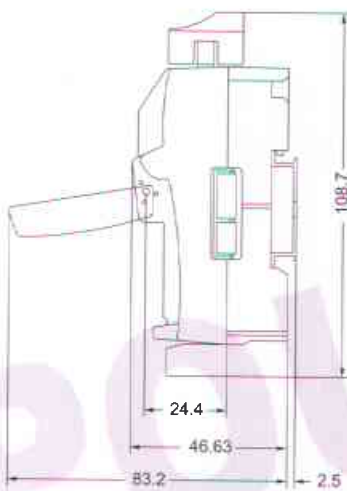
FONT VIEW



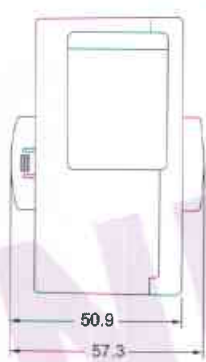
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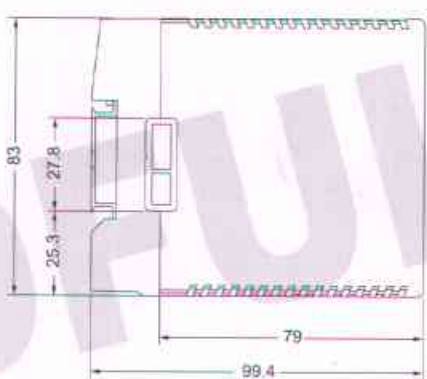
SIDE VIEW



SOURCE FRONT VIEW

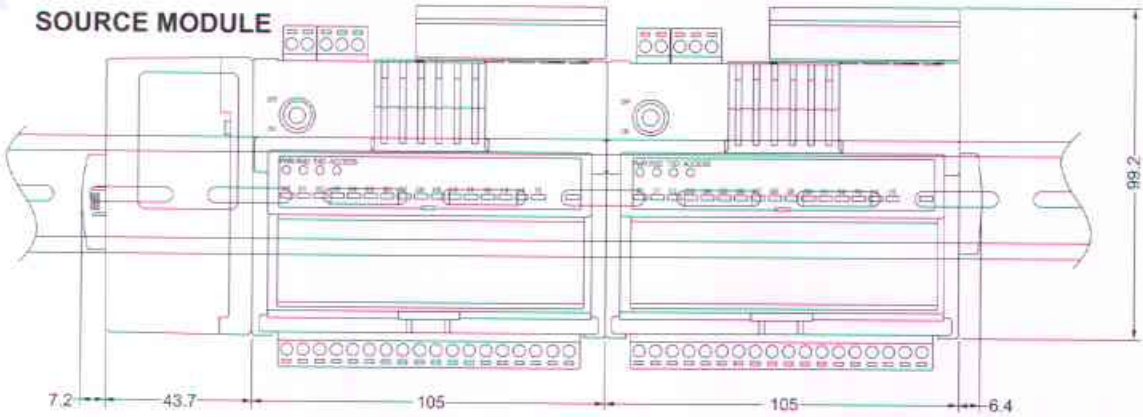


SOURCE SIDE VIEW



MULTI-CHANNEL MODULE ASSEMBLY

SOURCE MODULE



DIGITAL TEMPERATURE CONTROLLER



FEATURES

- Thermocouple/RTD/DC1~5V/DC4~20mA programmable inputs
- PID control + Overshoot Fuzzy with Autotuning
- Selectable alarm type: absolute, deviation, and zone
- Dustproof and waterproof protection
- Digital communication with Modbus
- HBA for single phase
- Heating/cooling dual control outputs

1. MODEL:

PFT Model and Suffix Code →

		4	-	5	6	7	-	8	9	10	11	12	-	13	14
Digit	Specification	Note													
4	(Front panel size)														
	48x48mm (1/16 DIN) size		4												
	48x96mm (1/8 DIN Horizontal) size		5												
	96x48mm (1/8 DIN Vertical) size		6												
	72x72mm (3/16 DIN) size		7												
	96x96mm (1/4 DIN) size		9												
5	(Input signal)														
	Thermocouple (°C)			T											
	Thermocouple (°F)			U											
	Resistance bulb Pt-100, 3-wire (°C)			R											
	Resistance bulb Pt-100, 3-wire (°F)			S											
	1-5V DC			V											
6	4-20mA DC			A											
	(Control output1)														
	None				N										
	Control reverse action contact output Form A (Relay)				A										
	Control direct action contact output Form A (Relay)				B										
	Control reverse action contact output Form C (Relay)	1			G										
7	Control direct action contact output Form C (Relay)	1			H										
	SSR/SSC drive reverse action output (Pulse)				C										
	SSR/SSC drive direct action output (Pulse)				D										
	4-20 mA DC reverse action output				E										
	4-20 mA DC direct action output				F										
	(Control output2)														
8	None														
	Control reverse action contact output Form A (Relay)														
	Control direct action contact output Form A (Relay)														
	SSR/SSC drive reverse action output (Pulse)														
	SSR/SSC drive direct action output (Pulse)														
	4-20 mA DC reverse action output														
9	4-20 mA DC direct action output														
	(Alarm output1) (P-AL)														
	None														
	See alarm code table														
	(Alarm output2) (P-AH)														
	None														
10	See alarm code table														
	(Additional specifications)														
	None														
	With 8 ramp/soak														
	(Additional accessory)														
	None														
11	With current transformer for heater breaker alarm														
	(Digital communication)														
	None														
	RS-485														
	(Power supply voltage)														
	90~260V AC (50/60Hz)														
12	24V DC / 24V AC ±10%														
	(Dustproof and Waterproof)														
	None														
	Dustproof and waterproof														

Note 1 : When Form C relay is selected, control output 2 is not available.

DIGITAL TEMPERATURE CONTROLLER

Alarm Code Table

01	High absolute alarm	05	High deviation alarm	09	Low deviation alarm with hold	12	High/low range absolute alarm *1
02	Low absolute alarm	06	Low deviation alarm	10	High/low deviation alarm with hold	13	High/low range deviation alarm *1
03	High absolute alarm with hold	07	High/low deviation alarm	11	High/low range deviation alarm *1 (AH/AL individual action)	14	High heater break alarm *2
04	Low absolute alarm with hold	08	High deviation alarm with hold			15	Low heater break alarm *2

* 1 : Number 12 to 15 is available only for alarm output 1 (P-AL) type
* 2 : Heater break alarm is allocated to alarm output 1 (P-AL)

2. Specification

(I) Input

Input signal	Thermocouple: J, K, R, B, S, T, E, N, PLII RTD: Pt100 Voltage, Current: 1~5V DC, 4~20mA DC (with 250Ω)	
Input accuracy	Thermocouple: ±0.5%F.S. ±digital ±1°C with the exception of R Thermocouple, 0~400°C: ±1%F.S. ±1 digital ±1°C B Thermocouple, 0~500°C: ±5%F.S. ±1 digital ±1°C RTD, Vdc, mAdc: ±0.5%F.S. ±1 digital	
CJC accuracy (23 ±5°C)	±1°C	
Sampling time	0.5sec	
Input Range Table		
Input Signal	Input Range °C	Input Range °F
TC K type	0~1200	32~2192
TC J type	0~800	32~1472
TC E type	-199~800	-328~1472
TC T type	-199~400	-328~752
TC R type	0~1600	32~2912
TC S type	0~1600	32~2912
TC B type	0~1800	32~3272
TC N type	0~1300	32~2372
TC PL II type	0~1300	32~2372
Pt100	-150~850	-238~1562
1-5Vdc	Scaling Range : -1999~9999	
4-20mAdc	Engineering Units	

(II) Control

Control action	1. PID control (with autotuning and Fuzzy) • Reverse and direct action are available • ON/OFF, P, PI, PID are programmable 2. Heating/cooling dual PID control • Reverse and direct action are available • ON/OFF, P, PI, PID are programmable
Control cycle	0.5sec
Proportional band	0~999.9%(P/2 for dual control)
Integral time	0~3200 sec
Derivative time	0~999.9 sec
Hysteresis width	0~50%F.S. for ON/OFF action
Anti-reset windup	0~100%F.S.

(III) Output

C Form Relay	250V AC/30V DC, 3A
A Form Relay	250V AC/30V DC, 3A
SSR/SSC drive (voltage pulse)	15~18V DC at ON/ 0.5V DC or less at OFF Current:60mA or less
4~20mA DC	Load resistance less than 600Ω

(IV) Alarm output

Alarm output	A Form Relay 250V AC/30V DC, 1A
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(V) General specifications

Power Supply	90~260V AC or 24V AC/24V DC
Operation condition	0~50°C (20~90%RH non-condensed)
Storage condition	0~70°C (20~90%RH non-condensed)

DIGITAL PID TEMPERATURE CONTROLLER

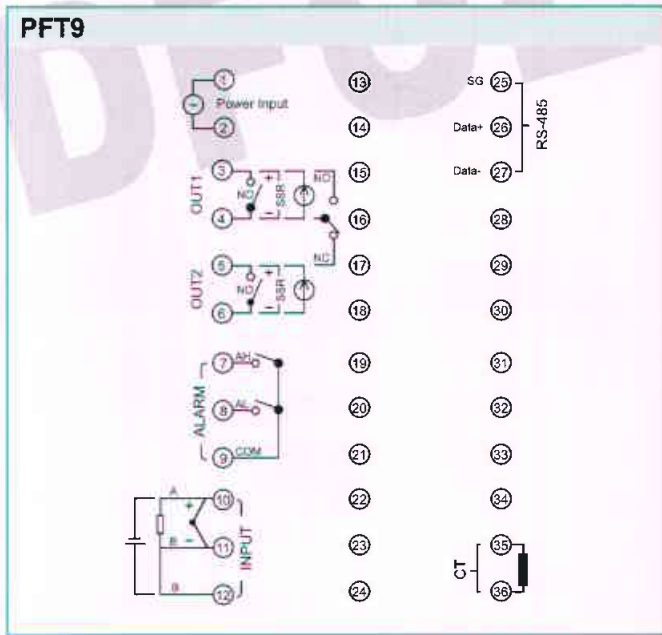
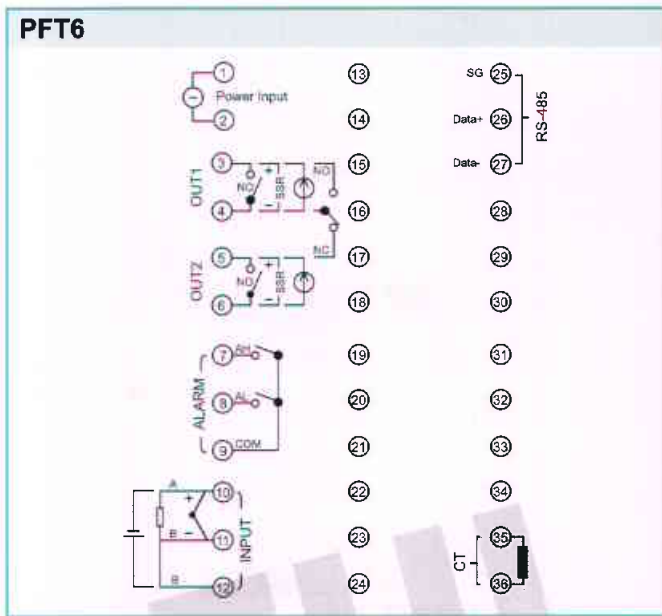
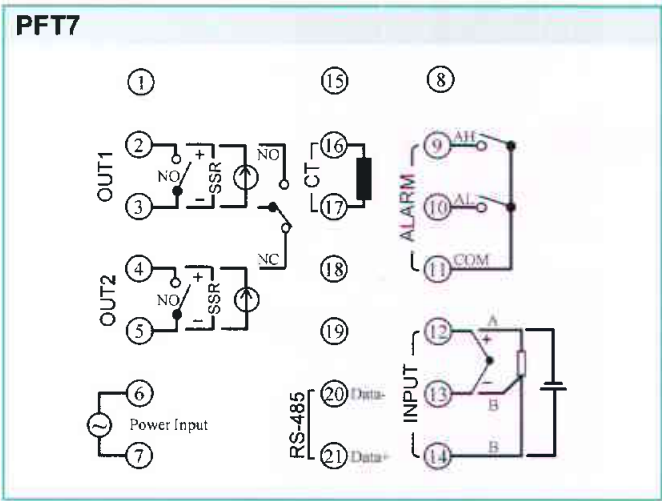
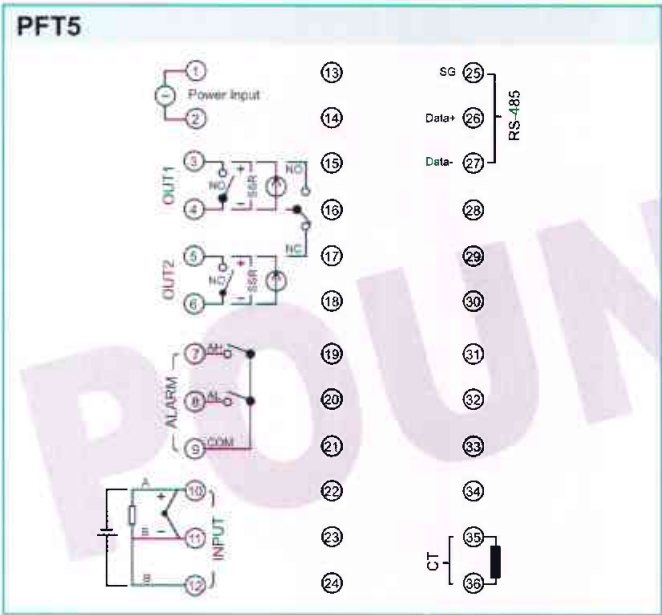
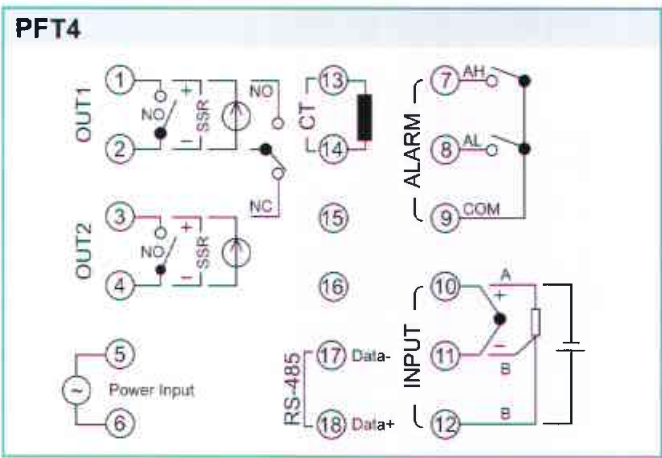
(VI) General specifications (Cont'd)

Allowable signal source resistance	Thermocouple: less than 100Ω Voltage: less than 1KΩ
Allowable wiring resistance	RTD: less than 10Ω per wire
Input digital filter	0~900 sec

(VII) Communication

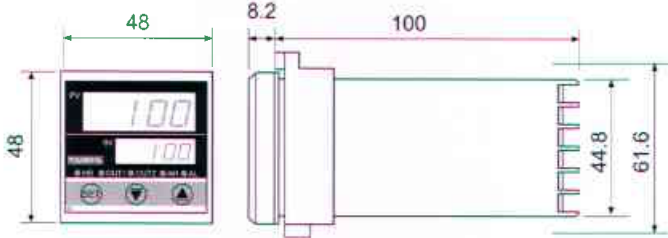
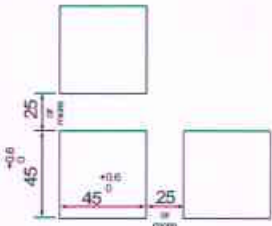
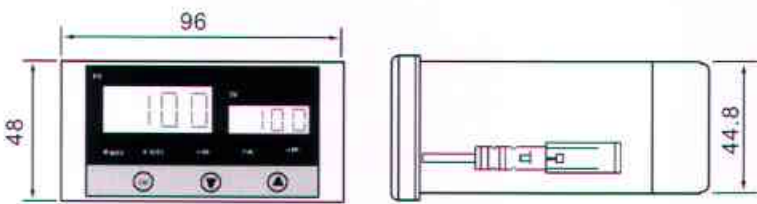
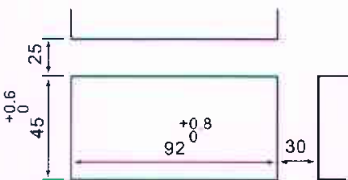
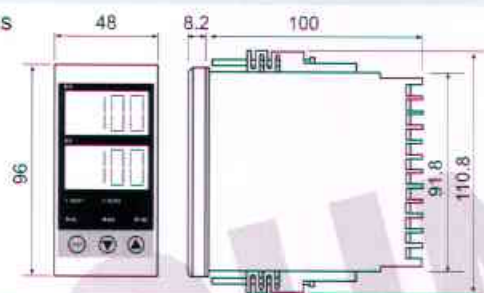
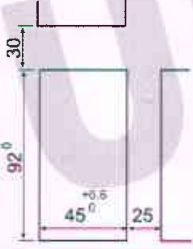
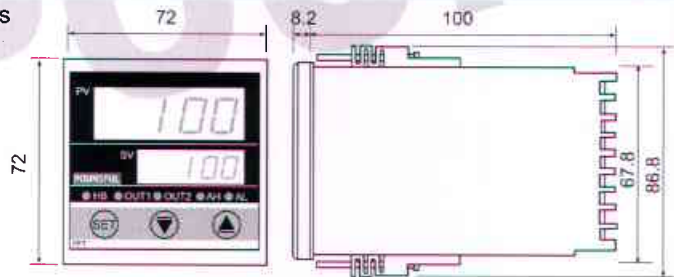
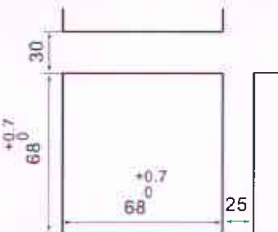
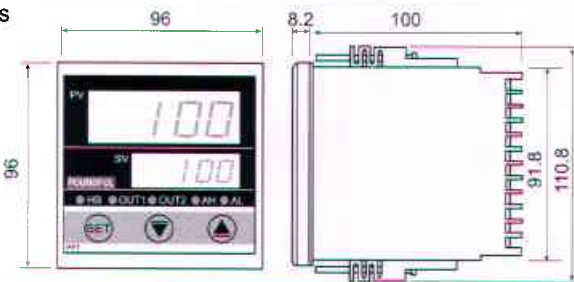
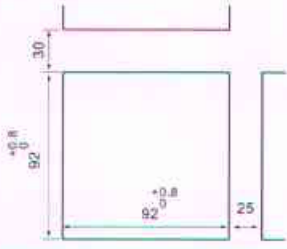
Communication Method	EIA RS-485 (two-wire)
Protocol	Modbus (RTU)
Communication rate	2400, 4800, 9600, 19200bps
Max. connection	30 units

3. Terminal connection



DIGITAL TEMPERATURE CONTROLLER

4. Dimensions & Panel Cutout Size (UNIT: mm)

<div>PFT4</div> <div>Dimensions</div> <div></div>	<div>Panel cutout size</div> <div></div>
<div>PFT5</div> <div>Dimensions</div> <div></div>	<div>Panel cutout size</div> <div></div>
<div>PFT6</div> <div>Dimensions</div> <div></div>	<div>Panel cutout size</div> <div></div>
<div>PFT7</div> <div>Dimensions</div> <div></div>	<div>Panel cutout size</div> <div></div>
<div>PFT9</div> <div>Dimensions</div> <div></div>	<div>Panel cutout size</div> <div></div>