Fuji Electric

Innovating Energy Technology

Z Series

Digital Temperature Controller

Micro Controller PXR Series

21B1-E-0021

Micro Controller PXR

[1] Features

PXR9	PXR5	PXR7	PXR4	PXR3
[96×96mm]	[48×96mm]	[72×72mm]	[48×48mm]	[24×48mm]

option

RS485 communication | Digital input | Alarm 2 points | Heater burnout | Heating/cooling control function | Ramp/soak function | Re-Transmission

(Except PXR3)

Large LED display

Further enlarged

PXW4 (Existing model) → **PXR4**

Character height

	PXR3	PXR4 PXR5	PXR7	PXR9
PV display	11mm	13mm	17mm	20mm
SV display		11mm	12mm	12mm

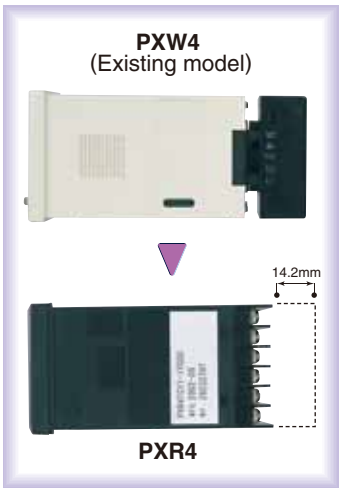
Visibility excellent

even at a distance!

Short depth

More compact

Helpful for designing of small and thin panels and equipments.



contents

Temperature controller PXR

Features 2
Products range 6
Ordering code 7
Specifications 8
Outline diagram/panel-cut 11
Connection diagram 12
PXR4 Socket type 14
Functions 19
Sensor fault operation 22
Table of parameters 23

Digital thermostat PAS3

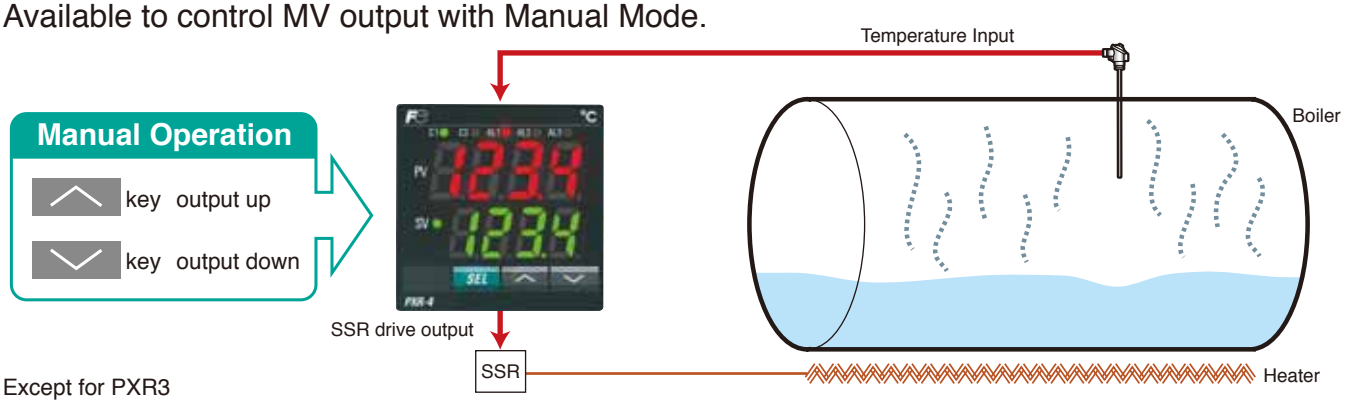
Specifications 28
Outline diagram/panel-cut 29
Connection diagram 29

Temperature controller list

PX series 30

Manual operation (standard)

Available to control MV output with Manual Mode.



Front waterproof structure (standard)

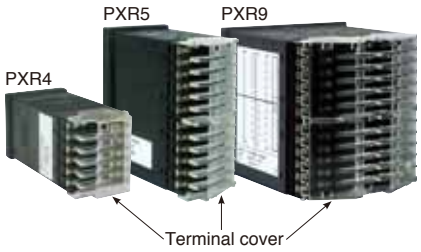
The front display and operation section is waterproof in conformity with NEMA-4X:IP66. So the front panel is washable with water.
(Use of the attached packing for waterproof is required.)

DIN rail mounting

DIN rail mounting (PXR3)

Mountable to a DIN rail using the DIN rail mounting adapter available at option.
With this adapter, also mountable to a wall.

Terminal block protecting cover



The terminal block can be protected with the terminal cover available at option.

DIN rail mounting (PXR4)

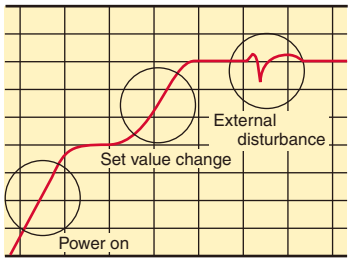
- Easy to install the wiring
- Easy to replace

See on page 14.

Diversified control and tuning functions (standard)

Simple ON/OFF control, PID with auto tuning, fuzzy PID with auto tuning and PID with self-tuning are standard with PXR.

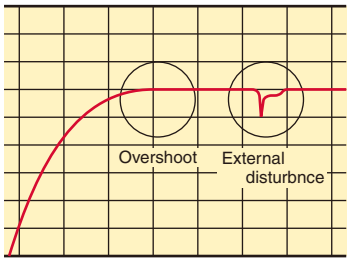
● Self-tuning



At power on, changing a set value or during external disturbance, tuning is made automatically so that the PID parameters are reoptimized

Note: For some objects to control, PID values could not be optimized.

● Fuzzy control



Suppresses the overshoot without wasting start up time. Also, quickly reverts to set points at the event of external disturbances

Micro Controller PXR

[1] Features

Various functions and abundant options

More functions

Standard equipment

1. **Diverse control and tuning functions** ··· Capable of covering various controls within a wide range from simple ON/OFF control to fuzzy PID control.
2. **Front waterproof structure (conforming with NEMA-4X:IP66)** ··· The front panel is washable with water.

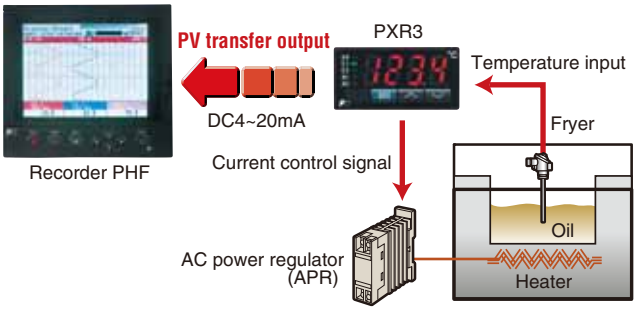
Optional functions

1. **Re-transmission output in 4 to 20 mA DC** ··· PV (process value), SV (set value) and MV (manipulated output value) can be transferred to other measuring instrument.
2. **8-step ramp/soak function** ··· Allows use as a simple programmable controller with a set value program.
3. **RS-485 communication** ··· Selectable between MODBUS protocol and Z-ASCII (Fuji's original).
4. **Digital input** ··· SV (set value) is selectable and various events are executable by external switches, etc.
5. **Heating and cooling control** ··· Applicable to even a self-heating process.
6. **Heater burnout alarm** ··· Equipment damage can be prevented.
7. **Various alarm function** ··· Delay action, excitation/non-excitation selection or latch function can be combined with alarm.
8. **Remote SV input** ··· SV (set value) can be selected with 1 to 5V DC signals from outside.

1 Re-transmission output in 4 to 20 mA DC

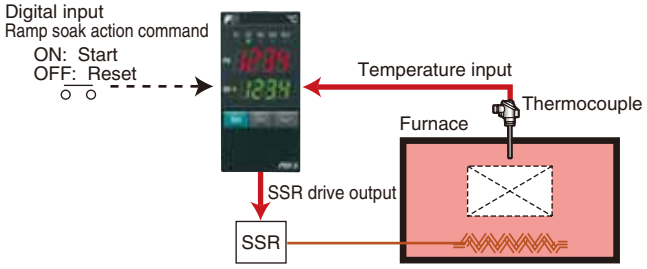
A cost corresponding to one temperature sensor can be reduced just by connecting a PV transfer signal to a recorder.

- Output signal:4 to 20 mA DC
- Kinds of output:Any one of process value (PV), set value (SV), control output (MV) and PV-SV (DV)



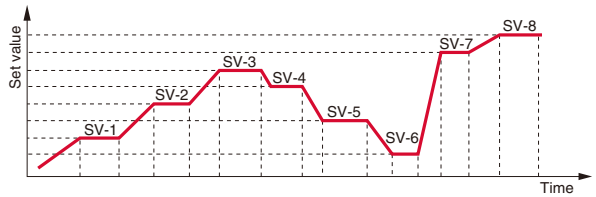
2 8-step ramp/soak function

Temperature gradient control of furnace ▶▶▶ For control in a heat pattern



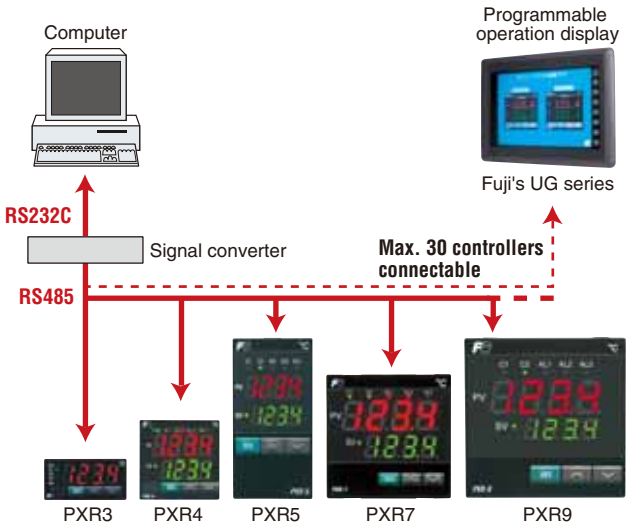
[Ramp soak function]

Temperature rise/fall pattern is controlled by setting a heat pattern having a gradient. Action start/resetting can be commanded externally.



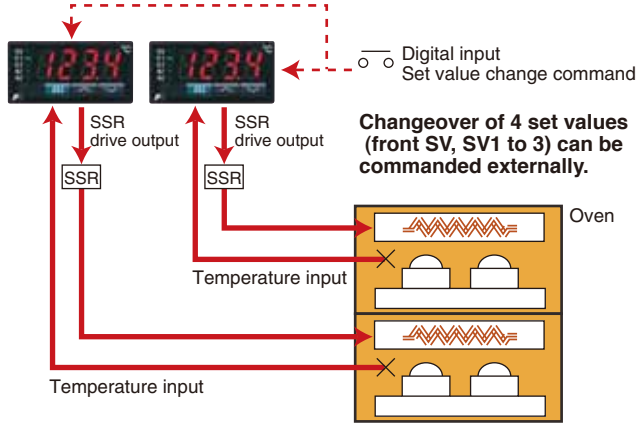
3 RS-485 communication

Via the RS-485 interface, PXR is connectable with a computer, programmable operation display and PLC.



4 Digital input

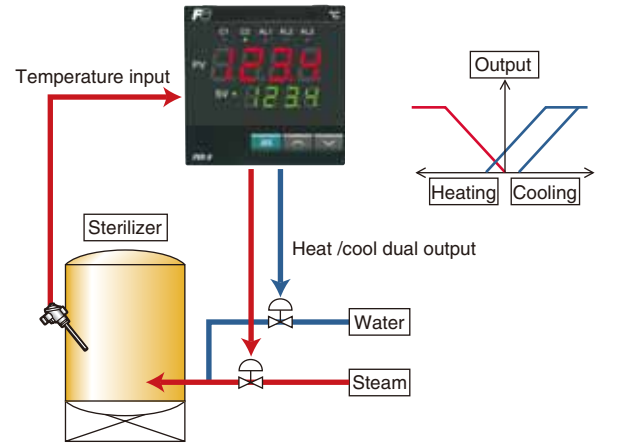
Temperature control of oven ▶▶▶ For changing set value readily



5 Heating and cooling control

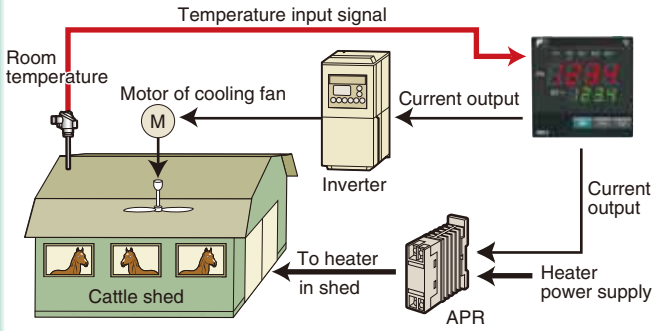
For control of both heating and cooling with a single controller

Heating and cooling outputs can be overlapped with each other or a dead band can be provided.



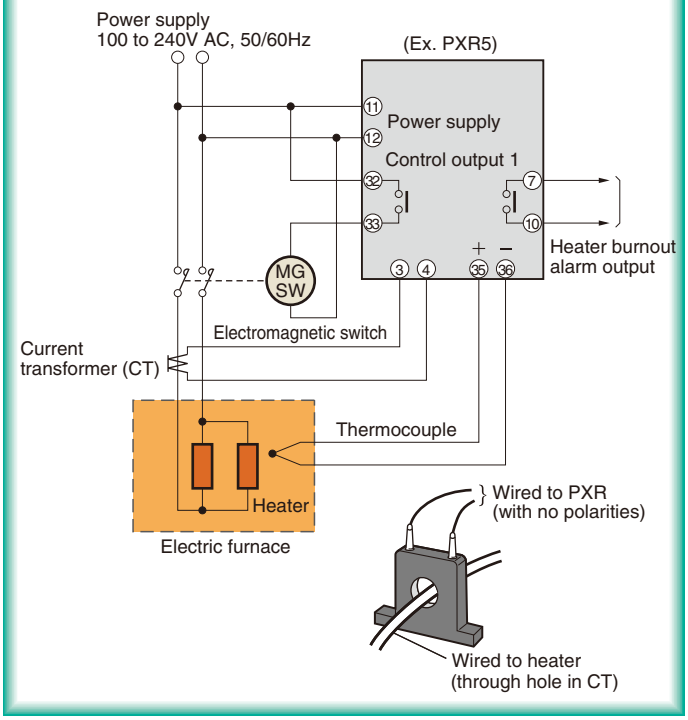
[Energy saving in cattle shed]

- Both heating and cooling are controlled with only one temperature controller utilizing its 2 control outputs.
- Power consumption can be curbed by controlling a cooling fan motor with inverter.



6 Heater burnout alarm

Alarm output will be issued when heater burnout is detected.

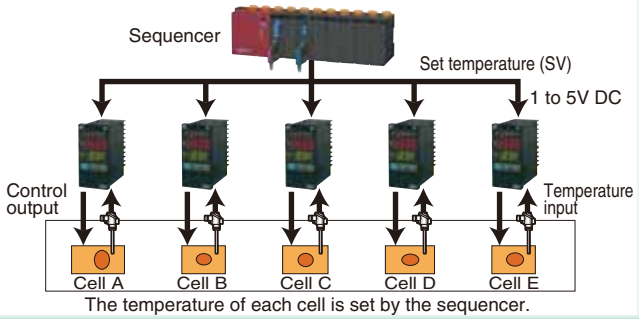


7 Various alarm function

Max. 3 points are settable.

	Kind of alarm	Action diagram
Absolute value alarms	Upper-limit absolute alarm	ALn PV
	Lower-limit absolute alarm	ALn PV
	Upper-limit absolute alarm (with hold)	ALn PV
	Lower-limit absolute alarm (with hold)	ALn PV
Deviation value alarms	Upper-limit deviation alarm	ALn SV PV
	Lower-limit deviation alarm	ALn SV PV
	Upper and Lower limits deviation alarm	ALn ALn SV PV
	Upper-limit deviation alarm (with hold)	ALn SV PV
	Lower-limit deviation alarm (with hold)	ALn SV PV
	Upper and Lower limits deviation alarm (with hold)	ALn ALn SV PV
Range alarms	Range upper and lower limits deviation (ALM1/2 independent operation)	ALn ALn SV PV
	Range upper and lower limits absolate value	AL2 AL1 PV
	Range upper and lower limits deviation	AL2 AL1 SV PV
	Rnge upper limit absolute value and lower limit deviation	AL2 SV AL1 PV
	Range upper limit deviation and lower limit absolute value	AL1 AL2 SV PV

8 Precise temperature control achieved by remote SV input from outside

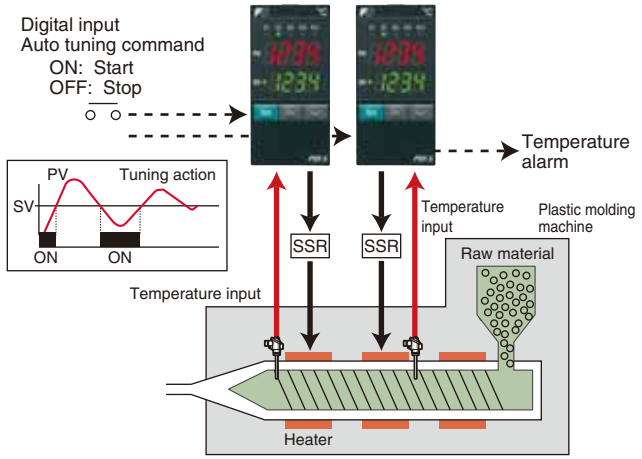


The temperature of each cell is set by the sequencer.

9 Temperature control of plastic molding machine

▶▶▶ For stable temperature. Fuzzy + PID control applicable

Start/stop of auto tuning can be commanded externally.



Micro Controller PXR

[2] Products range

Type			PXR3	PXR4	PXR7	PXR5	PXR9	PXR4 Socket
External dimensions	Front size		24×48mm	48×48mm	72×72mm	48×96mm	96×96mm	48×48mm
	Panel depth (with watertight packing)		97mm	78.8mm	79.7mm	78mm	79.5mm	84.7mm
Control method	ON/OFF		●	●	●	●	●	●
	PID with auto tuning		●	●	●	●	●	●
	Fuzzy PID with auto tuning		●	●	●	●	●	●
	PID with self-tuning		●	●	●	●	●	●
	Heating and cooling (PID,fuzzy PID)		●	●	●	●	●	–
Input signal	Resistance bulb	Pt100	●	●	●	●	●	●
	Thermocouple	J,K,R,B,S,T,E,N,PLⅡ	●	●	●	●	●	●
	Voltage/current	DC1~5V, DC4~20mA	●	●	●	●	●	●
Output signal	Control output1 (heating)	Relay contact	●	●	●	●	●	●
		SSR/SSC drive	●	●	●	●	●	●
		DC4~20mA	●	●	●	●	●	●
	Control output 2 (cooling)	Relay contact	●	●	●	●	●	–
		SSR/SSC drive	●	●	●	●	●	–
		DC4~20mA	●	●	●	●	●	–
Manual operation (Note1)			–	●	●	●	●	●
Alarm output (option)			● (Max. 2 points)	● (Max. 3 points)	● (Max. 3 points)	● (Max. 3 points)	● (Max. 3 points)	● (Max. 2 points)
Heater burnout alarm (option)			–	●	●	●	●	–
8-step ramp soak (option)			●	●	●	●	●	●
RS-485 communication (option)			●	●	●	●	●	–
Digital input (option)			● (Max. 2 points)	● (Max. 2 points)	● (Max. 2 points)	● (Max. 2 points)	● (Max. 2 points)	–
Re-transmission (4 to 20mA DC)			●	●	●	●	●	–
Remote-Setpoint			–	●	●	●	●	–
Power supply voltage	AC100~240V 50/60Hz		●	●	●	●	●	●
	DC24V, AC24V 50/60Hz		●	●	●	●	●	●
Front waterproof structure			●	●	●	●	●	●
External terminal structure			Plug-in terminal	M3 screw terminal	M3 screw terminal	M3 screw terminal	M3 screw terminal	Socket
DIN rail mounting			●	–	–	–	–	●
Terminal cover			–	●	●	●	●	–
Applicable standards	UL, C-UL		●	●	●	●	●	●
	CSA		●	●	–	●	●	●
	CE mark		●	●	●	●	●	●

■Others

DIN rail mounting type (PXR4)

See PXR4 (Socket type) on page 14.

[3] PXR Ordering code

24×48mm Size

PXR 4 5 6 7 8 – 9 10 11 12 13 – 14

Digit	Specification	Note
4	**<Size of front H x W>**	
	24 × 48 mm	3
5	**<Input signal>**	
	Thermocouple ˚C	T
	Thermocouple ˚F	R
	RTD Pt100Ω 3-wire type ˚C	N
	RTD Pt100Ω 3-wire type ˚F	S
	1 to 5V DC	A
	4 to 20mA DC	B
6	**<Control output 1>**	
	Relay contact output	A
	SSR/SSC driving output	C
	4 to 20mA DC output	E
7	**<Control output 2>**	
	None	Y
	Relay contact output	A
	SSR/SSC driving output	C
	4 to 20mA DC output	E
8	**<Revision code>**	1
9	**<Optional specifications 1>**	
	None	0
	Alarm 1 point	1
	8 ramp/soak	4
	Alarm 1 point + 8 ramp/soak	5
	Alarm 2 point	F
	Alarm 2 point + 8 ramp/soak	G
10	**<Instruction Manual> <Power supply voltage>**	
	None 100 to 240V AC	N
	English 100 to 240V AC	V
	None 24V AC/24V DC	C
	English 24V AC/24V DC	B
11	**<Optional specifications 2>**	0 0 0
12	None	M 0 0
13	RS-485 Modbus interface	N 0 0
	RS-485 Z-ASCII interface	Q 0 0
	Re-transmission + Digital input 1 point	R 0 0
	Re-transmission	T 0 0
	Digital input 2 points	V 0 0
	RS-485 Modbus interface + Digital input 1 point	W 0 0
	RS-485 Z-ASCII interface + Digital input 1 point	
14	**<Non-standard specification>**	
	Non-standard parameter setting	F

Note 1: Process alarm (2 points) (the codes " F and G " in the 9th digit) cannot be specified.
Note 2: Control output 2 (the codes " A, C, and E " in the 7th digit) cannot be specified.
Note 3: Control output 2, communication digital input (2 points), alarm (2 points), and 24V power supply (the codes " A, C and E " in the 7th digit, " F and G " in the 9th digit, and " A, B, and C " in the 10th digit) cannot be specified.

PXR3 : Optional items

Contents	Model
Adaptor for Din rail	ZZP∗CTK368715P1

48×48mm Size
72×72mm Size

PXR 4 5 6 7 8 – 9 10 11 12 13

Digit	Specification	Note
4	**<Front dimensions>**	
	48 × 48 mm Screw-terminal type	4
	72 × 72 mm Screw-terminal type	7
5	**<Input signal>**	
	Thermocouple ˚C	T
	Thermocouple ˚F	R
	Resistance bulb Pt100 3-wire type ˚C	N
	Resistance bulb Pt100 3-wire type ˚F	S
	1 to 5V DC	A
	4 to 20mA DC	B
6	**<Control output 1>**	
	Relay contact output	A
	SSR/SSC driving output	C
	4 to 20mA DC output	E
7	**<Control output 2>**	
	None	Y
	Relay contact output	A
	SSR/SSC driving output	C
	4 to 20mA DC output	E
	Re-transmission (4 to 20mA DC)	R
8	**<Revision code>**	1
9	**<Optional specifications 1>**	
	None	0
	Alarm 1 point	1
	Alarm for heater break	2
	Alarm 1 point + Alarm for heater break	3
	8 ramp/soak	4
	Alarm 1 point + 8 ramp/soak	5
	Alarm for heater break + 8 ramp/soak	6
	Alarm 1 point + Alarm for heater break + 8 ramp/soak	7
	Alarm 2 point	F
	Alarm 2 point + 8 ramp/soak	G
	Alarm 2 point + Alarm for heater break + 8 ramp/soak	H
	Alarm 3 point	M
	R-SP	D
	R-SP + Alarm 2 point	P
10	**<Instruction Manual for><Power>**	
	None 100 to 240V AC	N
	English 100 to 240V AC	V
	None 24V AC/24V DC	C
	English 24V AC/24V DC	B
11	**<Optional specifications 2>**	0 0 0
12	None	M 0 0
13	RS 485 (Modbus)	N 0 0
	RS 485 (Z-ASCII)	S 0 0
	Digital input (1 point)	T 0 0
	Digital input (2 point)	V 0 0
	RS 485 (Modbus) + Digital input (1 point)	W 0 0
	RS 485 (Z-ASCII) + Digital input (1 point)	

48×96mm Size
96×96mm Size

PXR 4 5 6 7 8 – 9 10 11 12 13

Digit	Specification	Note
4	**<Front dimensions>**	
	48 × 96mm Screw terminal type	5
	96 × 96mm Screw terminal type	9
5	**<Input signal>**	
	Thermocouple ˚C	T
	Thermocouple ˚F	R
	Resistance bulb Pt100 3-wire type ˚C	N
	Resistance bulb Pt100 3-wire type ˚F	S
	1 to 5V DC	A
	4 to 20mA DC	B
6	**<Control output 1>**	
	Relay contact output	A
	SSR/SSC driving output	C
	4 to 20mA DC output	Note 1 E
7	**<Control output 2>**	
	None	Y
	Relay contact output	A
	SSR/SSC driving output	C
	4 to 20mA DC output	E
	Re-transmission (4 to 20mA DC)	R
8	**<Revision code>**	1
9	**<Optional specifications 1>**	
	None	0
	Alarm 1 point	1
	Alarm for heater break	Note 2 2
	Alarm 1 point + Alarm for heater break	Note 2 3
	8 ramp/soak	4
	Alarm 1 point + 8 ramp/soak	5
	Alarm for heater break + 8 ramp/soak	Note 2 6
	Alarm 1 point + Alarm for heater break + 8 ramp/soak	Note 2 7
	Alarm 2 point	F
	Alarm 2 point + 8 ramp/soak	G
	Alarm 2 point + Alarm for heater break + 8 ramp/soak	Note 2 H
	Alarm 3 point	M
	R-SP	Note 2 D
	R-SP + Alarm 2 point	Note 2 P
10	**<Instruction manual> <Power supply voltage>**	
	None 100 to 240V AC	Note 4 N
	English 100 to 240V AC	V
	None 24V AC/24V DC	Note 4 C
	English 24V AC/24V DC	B
11	**<Optional specifications 2>**	0 0 0
12	None	M 0 0
13	RS485 (Modbus) communication	N 0 0
	RS485 (Z-ASCII) communication	S 0 0
	Digital input 1 point	T 0 0
	Digital input 2 points	Note 3 V 0 0
	RS485 (Modbus) communication + Digital input 1 point	W 0 0
	RS485 (Z-ASCII) communication + Digital input 1 point	

Note 1: Cannot be combined with heater break alarm.
(No. 2, 3, 6, 7 and H on the 9th digit cannot be specified.)
Note 2: Cannot be combined with RS485 + 1-point digital input.
(V00 and W00 on the 11, 12, and the 13th digits cannot be specified.)
Note 3: In the case of 2-point digital input, either of control output 2 or heater break alarm or R-SP can be selected.
(2-point digital input, control output 2 + heater break alarm cannot be specified at the same time.)
Note 4: The parameter of manual operation is hidden when it is default setting.

The default settings of input signals, measured ranges, and setting values are shown below.

Thermocouple specified : Thermocouple K, Measured range: 0 to 400˚C, Setting value: 0˚C
Resistance bulb specified : Pt, Measured range: 0 to 150˚C, Setting value: 0˚C
Voltage, Current specified : Scaling: 0 to 100%, Setting value: 0%

In any case other than the description above, specify input signals and measured range.
The input signals for the thermocouple and the resistance bulb can be switched with the front panel keys.

The default settings of control action is reverse for control output 1 and direct for control output 2.
The reverse and direct actions can be switched with keys on the face panel.

PXR4/5/9 : Optional items

Contents	Model
Terminal Cover	PXR4/7 : ZZP PXR1-A230 PXR5/9 : ZZP PXR1-B230
CT for heater burnout alarm	1~30A: ZOZ∗CCTL-6-S-H 20~50A: ZOZ∗CCTL-12-S36-8

Note 1: Cannot be combined with heater break alarm.
(2, 3, 6, 7, H cannot be specified on 9th digit.)
Note 2: In case of the combination 9th digit code:3, 7, F, G, H, M or P and PXR4 the following installation condition are required.
1) Max.ambient temperature: 40°C
2) Individual mounting. (Side-by-side mounting is not allowed.)
Note 3: Cannot be combined with RS485 + 1-point digital input.
(V and W cannot be specified on 11th digit.)
Note 4: In the case of control output 2, either of heater break alarm or remote SV input can be selected.
(A, C, E and R on the 7th digit, and 2,3,6,7,H, D and P on the 9th digit cannot be specified.)
Note 5: The parameter of manual operation is hidden when it is default setting.

Micro Controller PXR

[4] Specifications

■ General specifications

Power supply voltage	100 V (-15%) to 240 V (+10%) AC, 50/60 Hz or 24 V (±10%) AC 50/60 Hz, 24 V (±10%) DC
Power consumption	When using 100 V AC: 6 VA (PXR3),8 VA (PXR4,7),10 VA (PXR5,9) When using 220 V AC: 8 VA (PXR3),10 VA (PXR4,7),12 VA (PXR5,9) When using 24 V AC/DC: 8 VA (PXR3),10VA (PXR4,7),12VA (PXR5,9)
Insulation resistance	20 MΩ or more (500 V DC)
Dielectric strength	Power supply-ground ... 1500 V AC for 1 min Power supply-others ... 1500 V AC for 1 min Ground-relay output ... 1500 V AC for 1 min Ground-alarm output ... 1500 V AC for 1 min Others ... 500 V AC for 1 min
Input impedance	Thermocouple: 1 MΩ or more Voltage: 450Ω k or more Current: 250Ω (external resistor)
Allowable signal source resistance	Thermocouple: 100Ω or less Voltage: 1kΩ or less
Allowable wiring resistance	Resistance bulb: 10Ω or less per wire
Reference junction compensation accuracy	±1˚C (at 23˚C)
Input value correction	±10% of measuring range
Set value correction	±50% of measuring range
Input filter	0 to 900.0 sec settable in 0.5 sec steps (first order lag filter)
Noise reduction ratio	Normal mode noise (50/60 Hz): 50 dB or more Common mode noise (50/60 Hz): 140 dB or more
Applicable standards	UL (UL873) CSA (C22.2 No.24-93) ... Not available on 72x72mm size CE mark (LVD : EN61010-1, EMC : EN61326-1)

■ Control function of standard type

Control action	PID control (with auto tuning, self-tuning) Fuzzy control (with auto tuning)
Proportional band (P)	0 to 999.9% of measuring range settable in 0.1% steps
Integral time (I)	0 to 3200 sec settable in 1 sec steps
Differential time (D)	0 to 999.9 sec settable in 0.1 sec steps
On/off action if P = 0. Proportional action when I, D = 0.	
Proportional cycle	1 to 150 sec settable in 1 sec steps Only for relay contact output or SSR/SSC drive output
Hysteresis width	0 to 50% of measuring range For On/off action only
Anti-reset windup	0 to 100% of measuring range Automatically validated at auto tuning
Input sampling cycle	0.5 sec
Control cycle	0.5 sec

■ Input section

Input signal	Thermocouple : J, K, R, B, S, T, E, N, PLⅡ Resistance bulb : Pt100 Voltage, current: 1 to 5 V DC, 4 to 20 mA DC (Apply current input after connecting the furnished 250Ω resistor to input terminal.)
Measuring range	See measuring range table
Burnout	For thermocouple or resistance bulb input Control output upper/lower are selectable

■ Output section of standard type (control output 1)

Control output 1	Select one as follows Relay contact: SPDT contact: 220V AC/30V DC, 3A (resistive load) For PXR3, SPST contact Mechanical life 10 million operations (no load) Electrical life 100,000 operations (rated load) Minimum switching current 100mA (24V DC) For PXR3, 10 mA (5 V DC) SSR / SSC drive (Voltage pulse): ON: 17 to 25 V DC, For PXR3, 12 to 16 V DC OFF: 0.5V DC or less Max. current: 20mA or less 4 to 20mA DC: Allowable load resistance 600Ω or less For PXR3, 100 to 500Ω

■ Control functions of heating/cooling control type (option)

Control action	PID control (with auto tuning)
Heating side proportional band (P)	0 to 999.9 % of measuring range
Cooling side proportional band (P)	Heating side "P" × cooling side coefficient (Automatically set in auto tuning) Cooling side proportional band coefficient: 0 to 100.0 On/off action if P=0
Integral time (I)	0 to 3200 sec (common to heating and cooling sides)
Differential time (D)	0 to 999.9 sec (common to heating and cooling sides)
P,I,D=0:ON/OFF action (without dead band) for heating and cooling I,D=0:Proportional action	
Proportional cycle	1 to 150 sec For relay contact output or SSR/SSC drive output only
Hysteresis width	0.5% of measuring range common to heating and cooling sides, For On/off action only
Anti-reset windup	0 to 100% of measuring range Automatically validated at auto tuning
Overlap, dead band	±50% of heating side proportional band
Input sampling cycle	0.5 sec
Control cycle	0.5 sec
Manual operation	Manual operation -3 to 103% (except for PXR3)

■ Output section of heating/cooling control type (control output 2) (option)

Control output 2	Select one as follows Relay contact: SPST contact: 220V AC/30V DC, 3A (resistive load) Mechanical life 10 million operations (no load) Electrical life 100,000 operations (rated load) Minimum switching current 100mA (24V DC) For PXR3, 10 mA (5 V DC) SSR/SSC drive (Voltage pulse): ON: 17 to 25 V DC, For PXR3, 12 to 16 V DC OFF: 0.5V DC or less Max. current: 20mA or less 4 to 20mA DC: Allowable load resistance 600Ω or less For PXR3, 100 to 500Ω

■ Operation and display section

Parameter setting method	Digital setting by 3 keys With key lock function
Display	Process value/set value Selective display (PXR3 : Single display) 4 digits, 7-segment LED
Status display LED	Control output, process alarm output, Heater burnout alarm output (unavailable for PXR3)
Setting accuracy	0.1% or less of measuring range
Indication accuracy (at 23˚C)	Thermocouple: (0.5% of measuring range) 1 digit 1˚C For thermocouple R at 0 to 500˚C ... (1% of measuring range) 1 digit 1˚C For thermocouple B at 0 to 400˚C ... (5% of measuring range) 1 digit 1˚C Resistance bulb, voltage/current: (0.5% of measuring range) 1 digit

■ Alarm (option)

Alarm kind	Absolute alarm, deviation alarm, zone alarm with upper and lower limits for each Hold function available (see page 15) Alarm latch, Excitation/non-excitation selecting function provided
Alarm ON-delay	Delay setting 0 to 9999 sec settable in 1 sec steps
Process alarm output	Relay contact: SPST contact: 220 V AC/30 V DC, 1 A (resistive load) Mechanical life 10 million operations (no load) Electrical life 100,000 operations (rated load) Minimum switching current 100 mA (5 V DC) For PXR3, 10 mA (5 V DC). MAX 2 points (PXR3), MAX 3 points (PXR4, 5, 7, 9) output cycle 0.5 sec

[4] Specifications

■ Heater burnout alarm (option, unavailable for PXR3)

Heater current detection (option), unavailable for PXR3	Current detector: CTL-6-S-H for 1 to 30 A / CTL-12-S36-8 for 20 to 50 A Current detection accuracy: 10% of measuring range Alarm settable range: 1 to 50 A Available only when control output is relay contact or SSR/SSC drive. However, detection is possible when control output ON lasts 500 ms or longer.
Heater burnout alarm output unavailable for PXR3	Relay contact: SPST contact: 220 V AC/30 V DC, 1 A (resistive load) Mechanical life 10 million operations (no load) Electrical life 100,000 operations (rated load) Minimum switching current 100 mA (24 V DC) 1 output, output updating cycle 0.5 sec

■ Digital input (option)

Points	1 or 2
Electrical specifications	5 V DC, approx. 2 mA (OFF judgment for 3 V DC or more, ON judgment for 2 V DC or less)
Input pulse width	Min. 0.5 sec
Function (any one settable)	Set value (front SV, SV1 to 3) changeover Control action start/stop Ramp/soak action start / reset Auto tuning start / stop Alarm latch cancel and built-in timer start

■ Timer function (option)

Start	By digital input
Setting	0 to 9999 sec settable in 1 sec steps
Action	Event ON-delay or OFF-delay
Signal output	Alarm output relay used. Up to 3 points available.

■ Communication function (option)

Physical specifications	EIA RS485
Communication protocol	Modbus™ RTU mode or PXR protocol (Z-ASCII)
Communication method	2 wire method. Half duplex bit serial, start-stop sync type.
Data type	8 bits. Parity: odd/even/none.
Communication rate	9600bps
Connection aspect	multi-drop/up to 32 controllers connectable including master station
Communication distance	Total extension 500 m or less.
RS232C / RS485 Signal converter (recommendation)	Isolated type Manufacturer: SYSMEX RA Co.,Ltd (Japan) Model: RC-770X http://www.sysmex-ra.co.jp Manufacturer: OMRON Co., Ltd (Japan) Model: K3SC-10 http://www.omron.co.jp/

■ Re-transmission output function (option)

Output signal	DC 4-20mA
Load resistance	500Ω or less (PXR3), 600Ω or less (PXR4, 5, 7, 9)
Output updating	500ms
Output accuracy	0.3% FS (at 23˚C)
Resolution	2000 or more
Kind of output signal	Any one among PV, SV, DV and MV (selectable by parameter)

■ Remote setpoint (option, not available on 24x48mm size)

Input signal	1 to 5 V DC, 1 point
Accurcy	±0.5% 1 digit (at 23˚C)
Input sampling cycle	0.5 sec
Input scaling	Allowed
Display of remote mode	LED on Front panel
Input impedance	1MΩ or more

■ Other functions

Parameter mask function	Parameter display is disabled by software.
Ramp/soak function (option)	2 program pattern of 4 steps each, or 1 program parttern × 8 steps Digital input allows to start/reset the action.

■ Power failure processing

Memory protection	Held by non-volatile memory

■ Self-check

Method	Program error supervision by watchdog timer

■ Operation and storage conditions

Ambient operating temperature	-10˚C to 50˚C
Ambient operating humidity	Less than 90% RH (no condensation)
Storage temperature	-20˚C to 60˚C

■ Optional items

Current detector (CT) (unavailable for PXR3)	For 1 to 30 A: CTL-6-S-H For 20 to 50 A: CTL-12-S36-8 (see page 17)
DIN rail mounting adapter (for PXR3)	ZZP*CTK368715P1 (for outline diagram, see page 11)
Terminal cover	PXR4 : ZZPPXR1-A230 PXR5/9 : ZZPPXR1-B230 (for outline diagram, see page 11)
Instruction manual	For communication function (see list of related documents on page 10)

■ Structure

Mounting method	Panel flush mounting PXR3 can be mounted to rail/wall by using the DIN rail mounting adapter available at option.
External terminal	Plug-in terminal (PXR3) or M3 screw terminal (PXR4, 5, 7, 9)
Case material	Plastic (non-combustible grade UL94V-0 equivalent)
Dimensions	See the outline diagram on page 11.
Weight	Approx. 150 g (PXR3), 200 g (PXR4), 250g (PXR7) 300 g (PXR5), 300 g (PXR9)
Protective structure	Front waterproof structure: NEMA4X (IEC standard IP66 equivalent)(when mounted on panel with our genuine packing. Waterproof feature unavailable in close mounting of multiple units) Rear case: EC IP20
Outer casing	Black (front frame, case)

■ Scope of delivery

Scope of delivery	Controller, panel mounting bracket, front watertight packing, instruction manual, 250 resistor (for current input)

■ Measuring range table

input signal		measuring range(˚C)	measuring range(˚F)
resistance bulb	Pt100	-199 to 850 ✻	-326 to 1562
Thermocouple	J	0 to 800	32 to 1472
	K	0 to 1200	32 to 2192
	R	0 to 1600	32 to 2912
	B	0 to 1800	32 to 3272
	S	0 to 1600	32 to 2912
	T	-150 to 400	-238 to 752
	E	-150 to 800	-238 to 1472
	N	0 to 1300	32 to 2372
	PLII	0 to 1300	32 to 2372
DC voltage	1 to 5V	scaling range	-1999 to 9999
DC current	4 to 20mA		

Note 1: For current input connect the supplied 250Ω resister at the input terminal.
Note 2: When the measuring range exceeds 1000˚C (1832˚F), decimal point cannot be used.
✻ PXR3' s Measuring range for Pt100 is -150 to 850˚C (-238 to 1562˚F)

Micro Controller PXR

[4] Specifications

■ Insulation block diagram

Power supply section	Measurement input Heater current detector input Remote SV input Internal circuit
Relay contact control output 1	
Relay contact control output 2	Voltage pulse, 4 to 20mA DC control output 1 Voltage pulse, 4 to 20mA DC control output 2 Transfer output Digital input (In case of Re-Transmission by PXR3)
Alarm relay output 1	
Alarm relay output 2	
Alarm relay output 3 or heater break alarm output (PXR3 not included)	Communication (RS-485) Digital input (In case of Re-Transmission by PXR3, 4, 5, 7, 9)

Note: Basic insulation (dielectric strength 1500 V AC) between blocks delimited by line ——.
Functional insulation (dielectric strength 500 V AC) between blocks delimited by line - - - -.
Non isolated between blocks which are not delimited from each other.

■ Caution in use Control output

Model	Voltage puls (for SSR drive)		DC 4 to 20 mA Allowable load resistance
	Voltage	Max. Current	
PXR3	15V DC	20mA	100 to 500Ω
PXR4, 5, 7, 9	24V DC	20mA	600Ω or less
PXV3	5.5V DC	20mA	600Ω or less
PXV	24V DC	60mA	600Ω or less
PXW	24V DC	60mA	600Ω or less
PXZ	24V DC	60mA	600Ω or less

Differences from other models are listed at left. For replacement, check is required to see if the specifications of control end are satisfied.

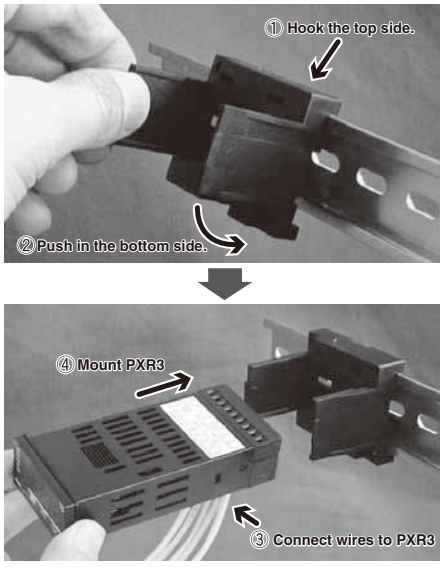
■ List of related documents

		PXR3	PXR4, 7	PXR5	PXR9
Instruction manual		TN1PXR3-E	TN1PXR-E	TN1PXR5/9-E	
Operation manual		ECNO:409	ECNO:406		
Communication function manual	MODBUS	TN512642-E			
	Z-ASCII	TN512644-E			

*The above documents can be downloaded from our Internet home page.
http://www.fic-net.jp/eng

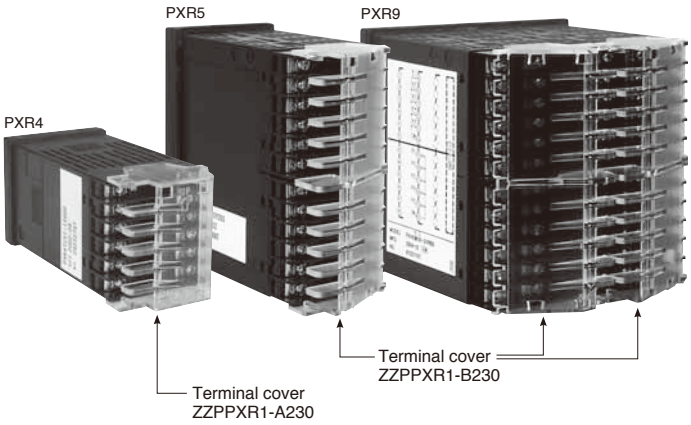
Mounting to DIN rail (PXR3 only)

Mountable to a DIN rail using the DIN rail mounting adapter available at option. With this adapter, also mountable to a wall.

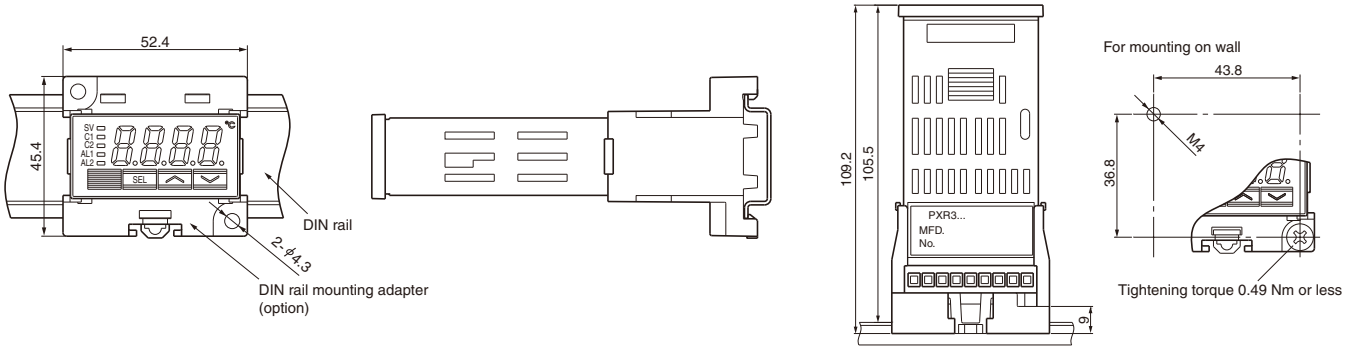


Terminal cover (PXR4, 5, 9)

The terminal block can be protected by the terminal cover available at option.



With PXR3 DIN rail mounting adapter (available at option)



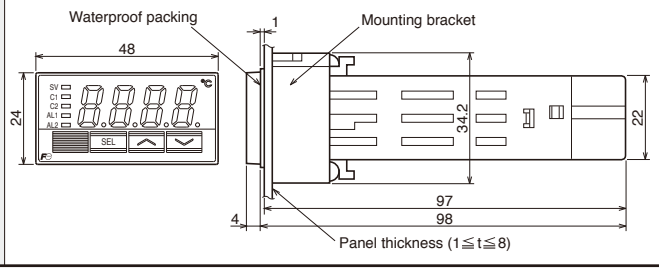
Caution on drilling in panel: In case of coating, etc. after drilling, the above dimensions must be followed in the finished status.

[5] Outline and Panel Cutout Dimensions

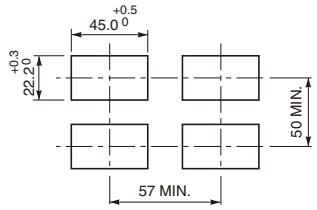
(unit: mm)

PXR3

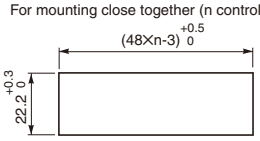
Outline



Panel cut



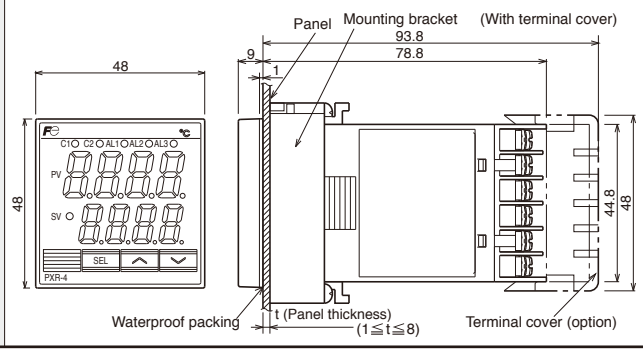
For mounting close together (n controllers)



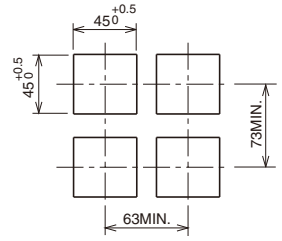
Note: Waterproof feature is unavailable if mounted close together.

PXR4

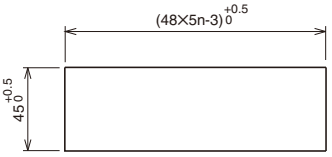
Outline



Panel cut



For mounting close together (n controllers)

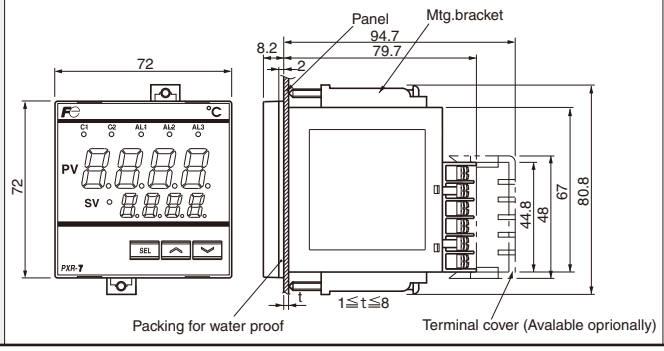


Note: Waterproof feature is unavailable if mounted close together.

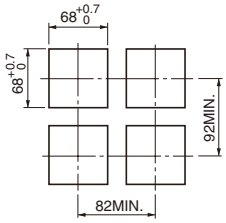
Note: If mounting close together is required at power supply voltage of 240 V AC, arrange the specifications so that more than 3 relay contact outputs will not be used. (Relay contact outputs include control outputs 1 and 2, process alarm outputs 1 and 2 and heater burnout alarm output.)

PXR7

Outline

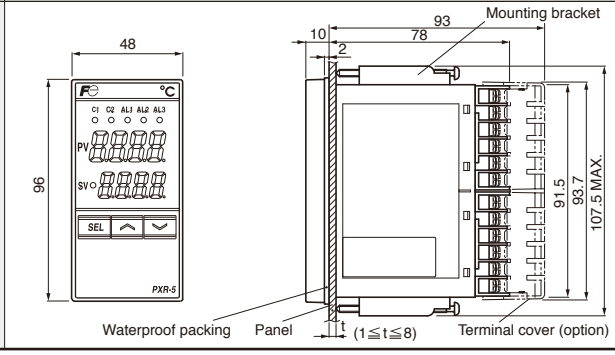


Panel cut

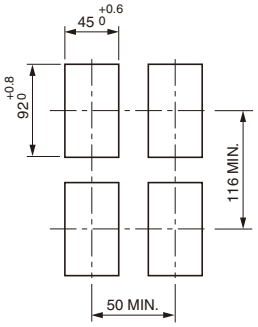


PXR5

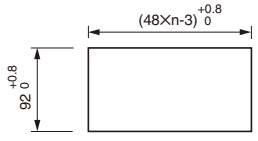
Outline



Panel cut



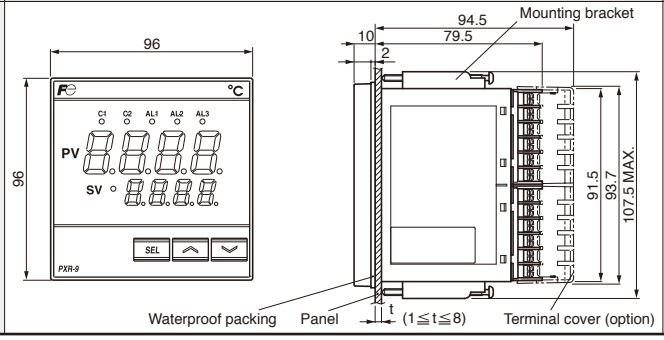
For mounting close together (n controllers)



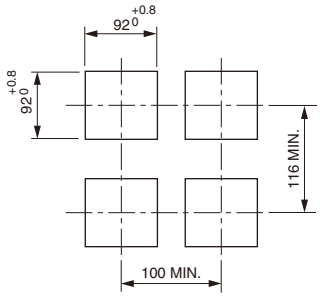
Note: Waterproof feature is unavailable if mounted close together.

PXR9

Outline



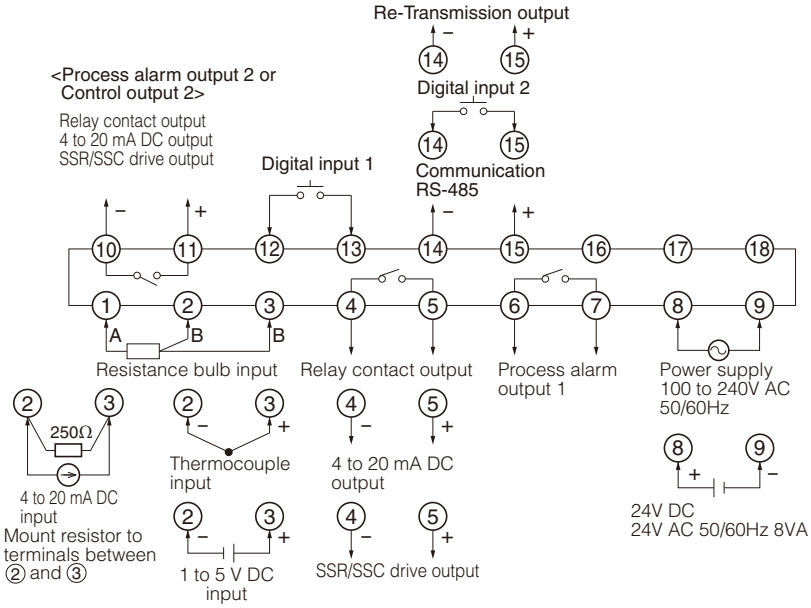
Panel cut



Micro Controller PXR

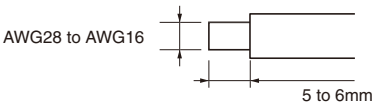
[6] External connection diagram

PXR3

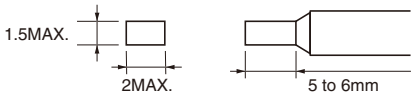


Usable wiring material

- Wire
  Type: Single Wire
  Gauge: AWG28 (0.1 mm²) to AWG16 (1.25 mm²)
  Strip-off length: 5 to 6 mm

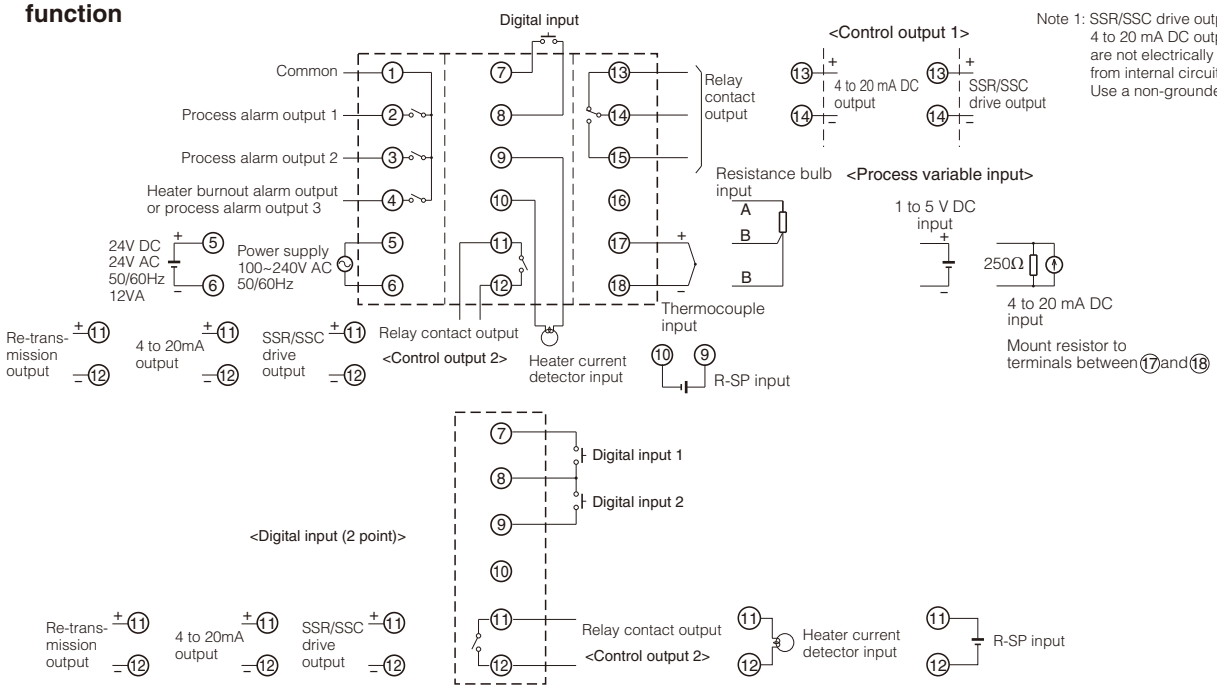


- Bar terminal
  Dimension of strip-off conductor section: 2 x 1.5 mm or smaller
  Length of strip-off conductor section: 5 to 6 mm



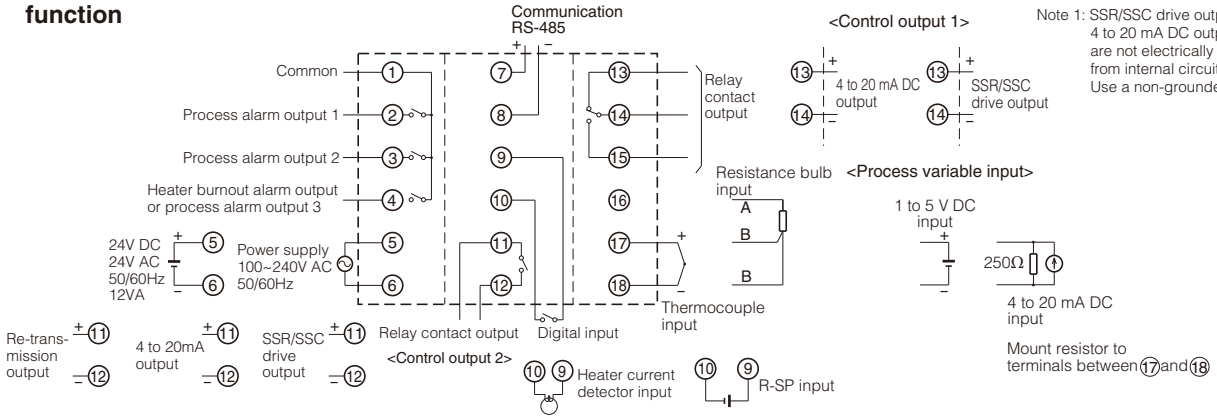
PXR4
PXR7

● Without communication function



Note 1: SSR/SSC drive output and 4 to 20 mA DC output are not electrically insulated from internal circuit. Use a non-grounded sensor.

● With communication function



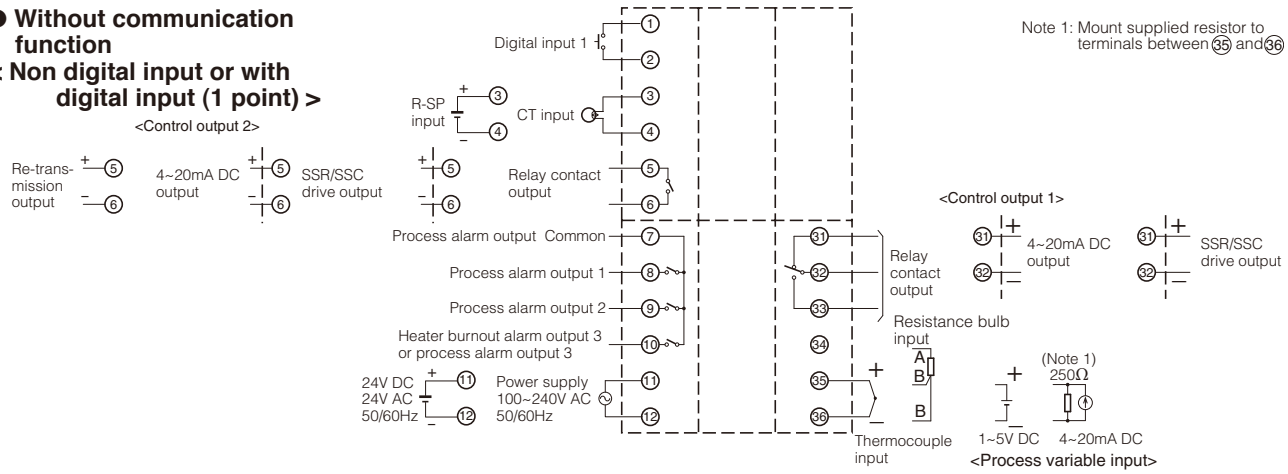
Note 1: SSR/SSC drive output and 4 to 20 mA DC output are not electrically insulated from internal circuit. Use a non-grounded sensor.

< use M3 screw >

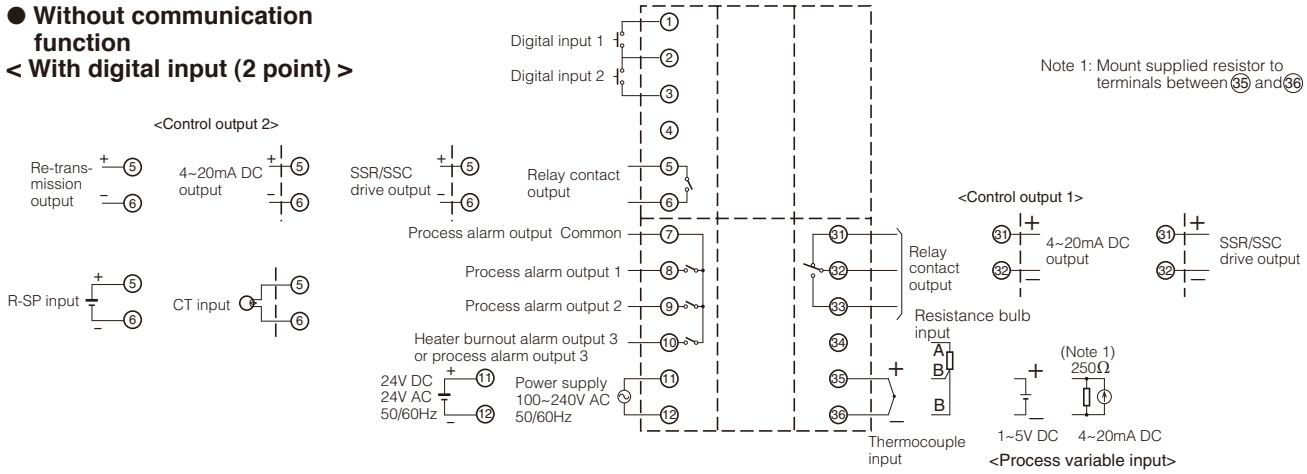
[6] External connection diagram

PXR5
PXR9

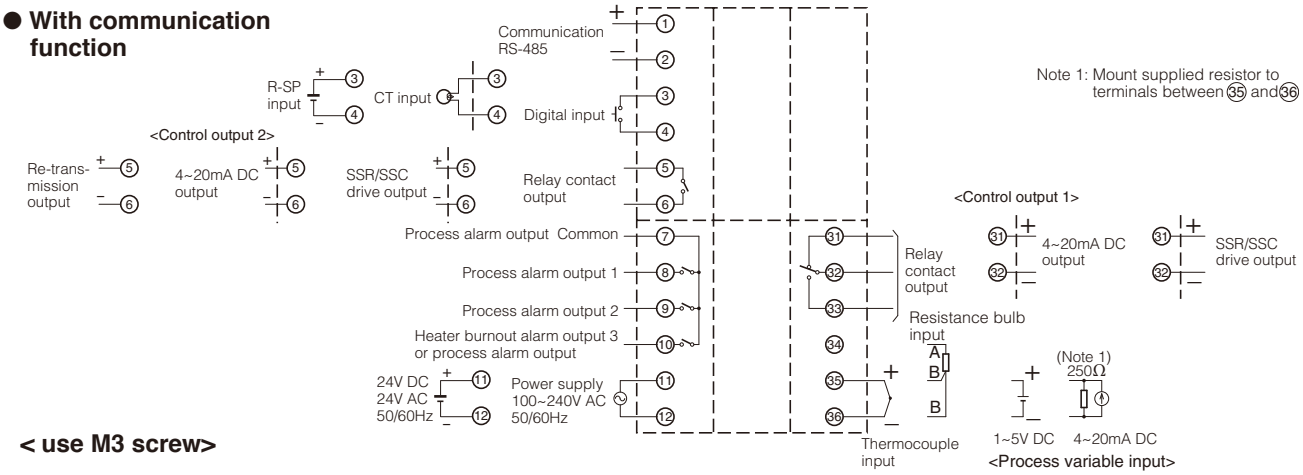
● Without communication function
< Non digital input or with digital input (1 point) >



● Without communication function
< With digital input (2 point) >

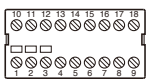


● With communication function

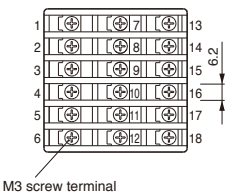


< use M3 screw>

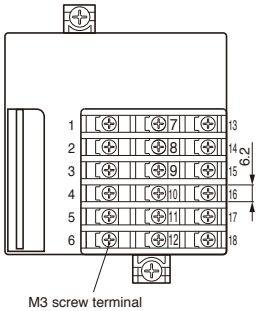
PXR3



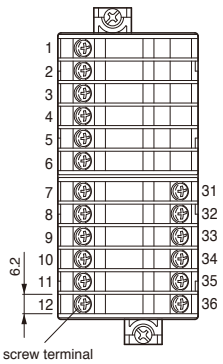
PXR4



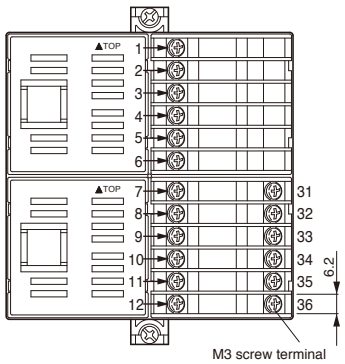
PXR7



PXR5



PXR9



Micro Controller PXR

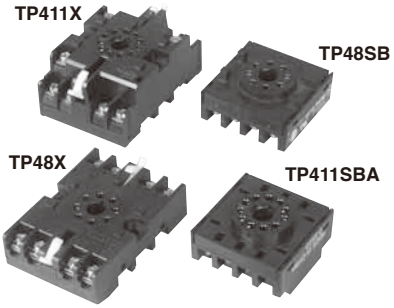
[7] PXR4 Socket type ordering code

48×48mm Size
Socket type

PXR 4 5 6 7 8 – 9 10 11 12 13

Digit	Specification	Note	Code
4	**<Front dimensions>**		
	48 × 48mm (Socket type)		4
5	**<Input signal>**		
	Thermocouple °C		T
	Thermocouple °F		R
	Resistance bulb Pt100 3-wire type I (°C)	Note 5	N
	Resistance bulb Pt100 3-wire type I (°F)	Note 5	S
	1 to 5V DC		A
	4 to 20mA DC		B
	Resistance bulb Pt100 3-wire type II (°C)	Note 6	W
6	**<Control output 1>**		
	Relay contact output		A
	Voltage pulse output (24V DC)		C
	4 to 20mA DC output		E
7	**<Terminal form>**		
	Socket type		S
8	**<Revision code>**		1
9	**<Optional specifications>**		
	None		0
	Alarm (1 pc.)		1
	Ramp-soak		4
	Alarm (1 pc.) + Ramp-soak		5
	Alarm (2 pcs.)		F
	Alarm (2 pcs.) + Ramp-soak		G
10	**<Instruction manual> <Power supply voltage>**		
	None 100 to 240V AC		N
	English 100 to 240V AC		V
	None 24V AC/24V DC		C
	English 24V AC/24V DC		B
11	**<Socket>**		
	None		0
	For rail mounting (8pin screw terminal)	Note 1	1
	For panel mounting (8pin screw terminal)	Note 2	2
	For rail mounting (11pin screw terminal)	Note 3	4
	For panel mounting (11pin screw terminal)	Note 4	5
12	**<Flont & Case color>**		
	Black		0
	White		W
13	–		0

Appearance of various sockets



Note1) Type: TP48X
Note2) Type: TP48SB
Note3) Type: TP411X
Note4) Type: TP411SBA
Note5) Input terminal (Pt100 input) assignment is same as PXW4/PXZ4/PXV4.
Note6) Input terminal (Pt100 input) assignment is different from PXW4/PXZ4/PXV4, but in case of thermocouple input terminal assignment is same.

Input signal, measurement range, and set value at the time of deliver are as follows.
When thermocouple is specified: Thermocouple K, Measurement range; 0 to 400°C, Set value; 0°C
When resistance bulb is specified: Pt, Measurement range; 0 to 150°C, Set value; 0°C
When voltage/current is specified: Scaling; 0 to 100%, Set value; 0%
For the cases other than the above, specify input signal and measurement range.
Input signal of the thermocouple and the resistance bulb can be switched by key operation on the front panel.
Control action is set to reverse action when delivered. The reverse action and normal action can be switched by key operation on the front panel.

[8] Specifications

■ General specifications

Power supply voltage	100 V (-15%) to 240 V (+10%) AC, 50/60 Hz or 24 V (±10%) AC 50/60 Hz, 24 V (±10%) DC
Power consumption	When using 100 V AC: 8 VA or less When using 220 V AC: 10 VA or less When using 24 V AC/DC: 10VA
Insulation resistance	20 MΩ or more (500 V DC)
Dielectric strength	Power supply-ground ... 1500 V AC for 1 min Power supply-others ... 1500 V AC for 1 min Ground-relay output ... 1500 V AC for 1 min Ground-alarm output ... 1500 V AC for 1 min Others ... 500 V AC for 1 min
Input impedance	Thermocouple: 1 MΩ or more Voltage: 450 kΩ or more Current: 250Ω (external resistor)
Allowable signal source resistance	Thermocouple: 100Ω or less Voltage: 1 kΩ or less
Allowable wiring resistance	Resistance bulb: 10Ω or less per wire
Reference junction compensation accuracy	±1°C (at 23°C)
Input value correction	±10% of measuring range
Set value correction	±50% of measuring range
Input filter	0 to 900.0 sec settable in 0.5 sec steps (first order lag filter)
Noise reduction ratio	Normal mode noise (50/60 Hz): 50 dB or more Common mode noise (50/60 Hz): 140 dB or more

■ Control function of standard type

Control action	PID control (with auto tuning, self-tuning) Fuzzy control (with auto tuning) Self tuning
Proportional band (P)	0 to 999.9% of measuring range settable in 0.1% step
Integral time (I)	0 to 3200 sec settable in 1 sec step
Differential time (D)	0 to 999.9 sec settable in 0.1 sec step
On/off action if P = 0. Proportional action when I, D = 0.	
Proportional cycle	1 to 150 sec settable in 1 sec step Only for relay contact output or SSR/SSC drive output
Hysteresis width	0 to 50% of measuring range For On/off action only
Anti-reset windup	0 to 100% of measuring range Automatically validated at auto tuning
Input sampling cycle	0.5 sec
Control cycle	0.5 sec

■ Input section

Input signal	Thermocouple : J, K, R, B, S, T, E, N, PLⅡ Resistance bulb : Pt100 Voltage, current: 1 to 5 V DC, 4 to 20 mA DC (Apply current input after connecting the furnished 250Ω resistor to input terminal.)
Measuring range	See measuring range table (Table1)
Burnout	For thermocouple or resistance bulb input Control output upper/lower are selectable

■ Output section of standard type (control output 1)

Control output 1	Select one as follows Relay contact: SPDT contact: 220V AC/30V DC, 3A (resistive load) Mechanical life 10 million operations (no load) Electrical life 100,000 operations (rated load) Minimum switching current 100mA (24V DC) SSR / SSC drive (Voltage pulse): ON: 17 to 25 V DC OFF: 0.5V DC or less Max. current: 20mA or less 4 to 20mA DC: Allowable load resistance 600Ω or less

■ Operation and display section

Parameter setting method	Digital setting by 3 keys With key lock function
Display	Process value/set value Independent display 4 digits, 7-segment LED
Status display LED	Control output, process alarm output
Setting accuracy	0.1% or less of measuring range
Indication accuracy (at 23°C)	Thermocouple: ±(0.5% of measuring range) ±1 digit ±1°C For thermocouple R at 0 to 500°C ... ± (1% of measuring range) ±1 digit ±1°C For thermocouple B at 0 to 400°C ... ± (5% of measuring range) ±1 digit ±1°C Resistance bulb, voltage/current: ± (0.5% of measuring range) ±1 digit

■ Alarm (option)

Alarm kind	Absolute alarm, deviation alarm, zone alarm with upper and lower limits for each Hold function available (See the figure below.) Alarm latch, Excitation/non-excitation selecting function provided
Alarm ON-delay	Delay setting 0 to 9999 sec settable in 1 sec steps
Process alarm output	Relay contact: SPST contact: 220 V AC/30 V DC, 1 A (resistive load) Mechanical life 10 million operations (no load) Electrical life 100,000 operations (rated load) Minimum switching current 100 mA (5 V DC) MAX 2 points output cycle 0.5 sec

■ Other functions

Parameter mask function	Parameter display is disabled by software.
Ramp/soak function (option)	2 program pattern of 4 steps each, or 1 program pattern × 8 steps Digital input allows to start/reset the action.

■ Power failure processing

Memory protection	Held by non-volatile memory

■ Self-check

Method	Program error supervision by watchdog timer

■ Operation and storage conditions

Ambient operating temperature	-10°C to 50°C (In low-temperature environment, start-up time may vary in power activation.)
Ambient operating humidity	Less than 90% RH (no condensation)
Storage temperature	-20°C to 60°C

■ Structure

Mounting method	Panel flush mounting, DIN rail mounting. (Mounting socket is required for mounting DIN rail.)
External terminal	8 pins or 11 pins terminals (Socket is required for wiring separately.)
Case material	Plastic (non-combustible grade UL94V-0 equivalent)
Dimensions	48 × 48 × 84.7mm
Weight	Approx. 200 g
Protective structure	Front waterproof structure: NEMA4X (IEC standard IP66 equivalent) (when mounted on panel with our genuine packing. Waterproof feature unavailable in close mounting of multiple units) Rear case: IEC IP20
Outer casing	Black (front frame, case)

Micro Controller PXR

[8] Specifications

Table 1 Measuring range table

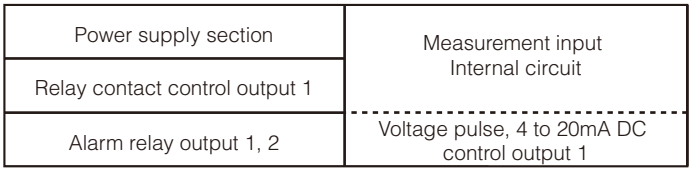
Group	input signal		measuring range(°C)	measuring range(°F)
I	Resistance bulb	Pt100	-150 to 850	-238 to 1562
	Thermocouple	J	0 to 800	32 to 1472
		K	0 to 1200	32 to 2192
		R	0 to 1600	32 to 2912
		B	0 to 1800	32 to 3272
		S	0 to 1600	32 to 2912
		T	-150 to 400	-238 to 752
		E	-150 to 800	-238 to 1472
		N	0 to 1300	32 to 2372
		PLⅡ	0 to 1300	32 to 2372
II	DC voltage	1 to 5V	scaling range	-1999 to 9999
	DC current	4 to 20mA		

Note 1: For current input connect the supplied 250Ω resister at the input terminal.
Note 2: Setting cannot be changed to a different group.
Note 3: When the measuring range exceeds 1000°C (1832°F), decimal point cannot be used.

■ Scope of delivery

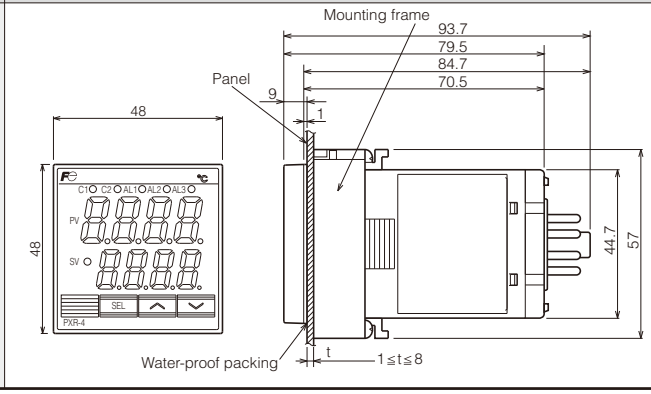
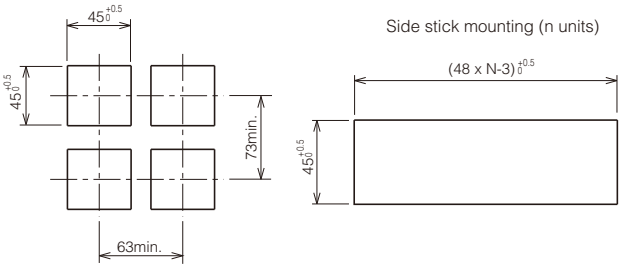
Scope of delivery	Controller, panel mounting bracket, watertight packing, instruction manual (as ordered), socket (as ordered), 250Ω resistor (for current input)

■ Insulation block diagram



Note: Basic insulation (dielectric strength 1500 V AC) between blocks delimited by line ——.
Functional insulation (dielectric strength 500 V AC) between blocks delimited by line - - - -.
Non isolated between blocks which are not delimited from each other.

[9] Outline and Panel Cutout Dimensions

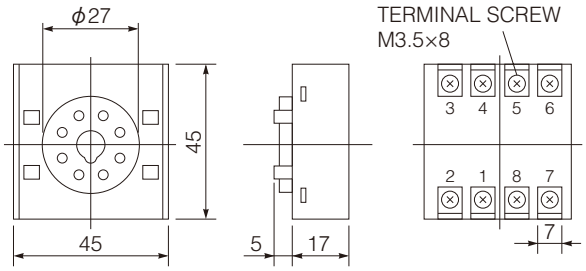
Type	Outline	Panel cut
PXR4 Socket type		

Note: Waterproof is not available in stick mounting.

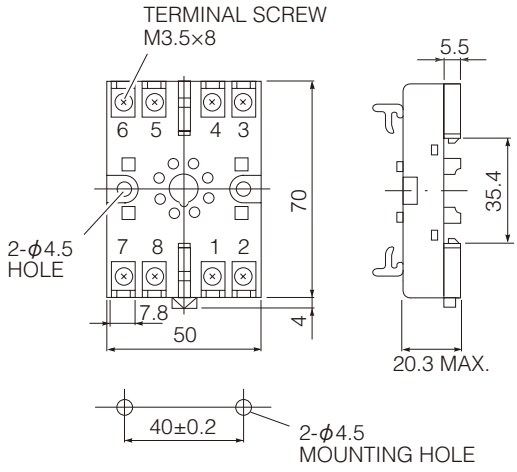
[10] Socket Outline Diagram (unit: mm)

Without alarm

TP48SB TYPE (FOR PANEL MOUNTING)

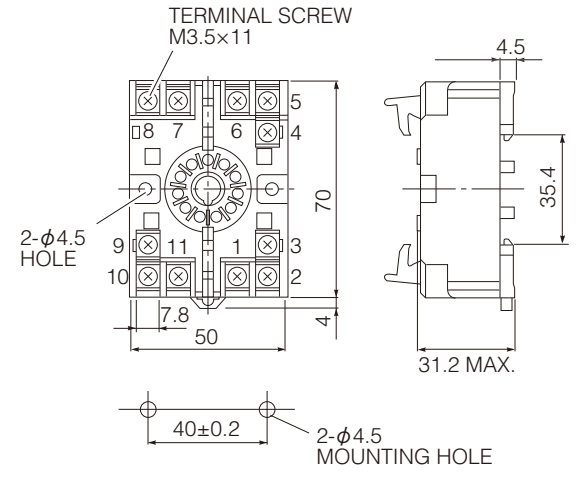


TP48X TYPE (FOR RAIL MOUNTING)

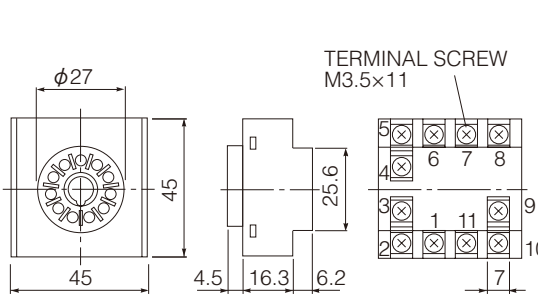


With alarm

TP411X TYPE (FOR RAIL MOUNTING)



TP411SBA TYPE (FOR PANEL MOUNTING)



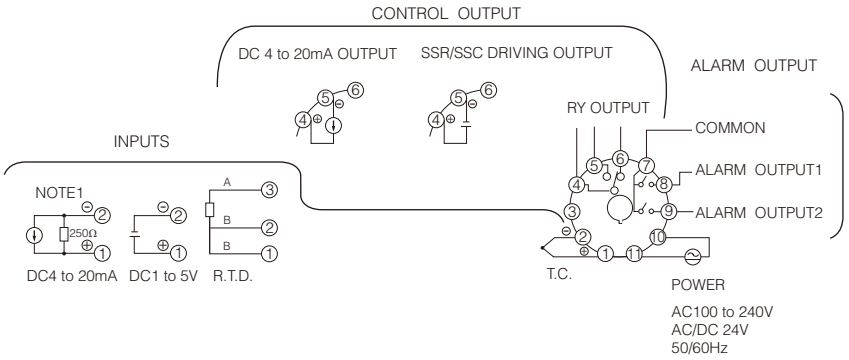
Micro Controller PXR

[11] External connection diagram

(1) With alarm functions 11-pin socket

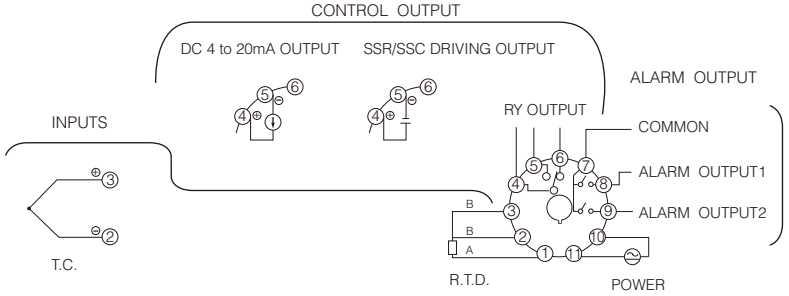
● When compatible with PXW4/PXZ4/PXV4 thermocouple input terminal

(When either one of the following is selected for the 5th digit of the code symbols: "T," "R," "W," "A" and "B")
Note that the terminal layout of the resistance bulb input type differs from that of PXW4/PXZ4/PXV4.



● When compatible with PXW4/PXZ4/PXV4 resistance bulb input terminal

(When either one of the following is selected for the 5th digit of the code symbols: "N" and "S")
Note that the terminal layout of the thermocouple input type differs from that of PXW4/PXZ4/PXV4.

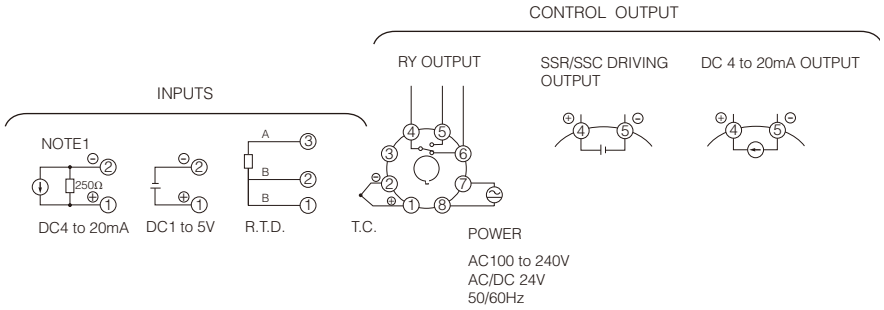


NOTE 1 : Use the 250Ω resistance (accessory).

(2) Without alarm functions 8-pin socket

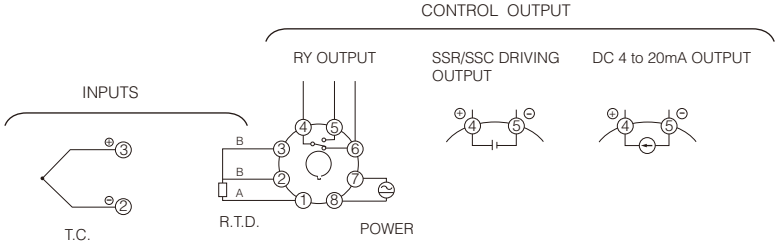
● When compatible with PXW4/PXZ4/PXV4 thermocouple input terminal

(When either one of the following is selected for the 5th digit of the code symbols: "T," "R," "W," "A" and "B")
Note that the terminal layout of the resistance bulb input type differs from that of PXW4/PXZ4/PXV4.



● When compatible with PXW4/PXZ4/PXV4 resistance bulb input terminal

(When either one of the following is selected for the 5th digit of the code symbols: "N" and "S")
Note that the terminal layout of the thermocouple input type differs from that of PXW4/PXZ4/PXV4.



NOTE 1 : Use the 250Ω resistance (accessory).

[12] Functions

Function0 Manual Operation

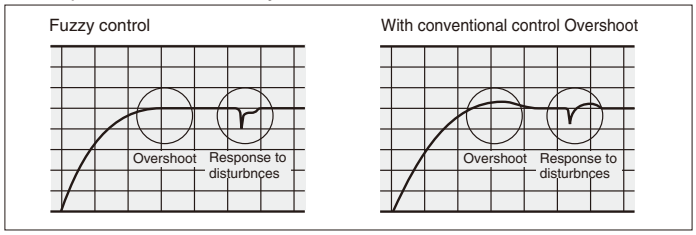
This function is selectable operation mode either "Auto" or "Manual" operation by change the parameter.
MV output value is changeable by manual operation on Manual mode.
- Operation mode is stored while power down.
- Changeover method: Auto → Manual: Balanceless bump less
  Manual → Auto: Balance bump less
- MV setting value resolution: 1%(Settable by front key)
- MV setting range: -3~103%
- Auto-tuning and Self-tuning are not available while manual operation mode.

Function1 Control function

Fuzzy control function

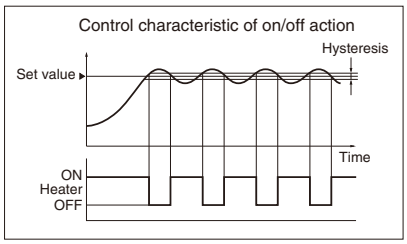
Fuzzy operation is used to suppress overshoot so that the response to external disturbances is improved. By monitoring process value, overshoot is suppressed with the startup
time remaining unchanged. At the same time, response to external disturbances is also improved.

● Comparison between fuzzy control and conventional control



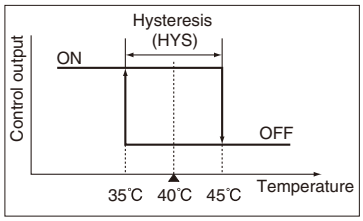
On/off action (2-position action)

When process value (PV) is below the set value (SV), output is turned on and the heater is energized as shown below. When PV is above SV, output is turned off and the heater is de-energized. In this way, output is turned on/off repeatedly with respect to the SV to keep the temperature constant. This method of control is called "on/off action (2-position action)."
- When "0" is assigned to parameter P, the on/off action will be selected.



Point On/off action hysteresis setting

In on/off control, output turns on/off with respect to the set value. Therefore, output would change frequently in response to a slight change in the temperature. This might shorten the service life of the output relay and adversely affect the equipment connected with the temperature controller. To prevent this, a gap (hysteresis) is provided in the on/off action. This action gap is usually called "hysteresis."

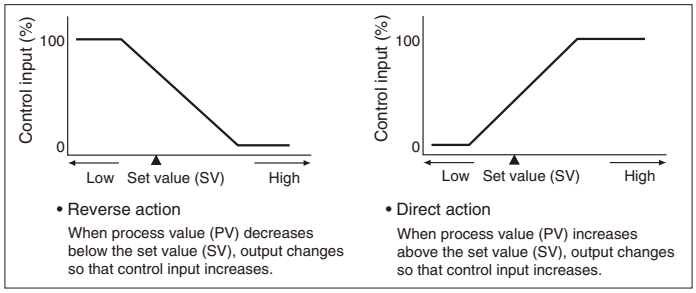


Example 1) Suppose that the temperature controller has a measuring range of 0 to 150˚C and a hysteresis (HYS) of 10. When the set value is adjusted to 40˚C, the heater turns off at 45˚C and turns on at 35˚C.

Example 2) For turning off the heater at 45˚C in the figure at left, parameter [SVOF] should be set at "-5." Then, the heater turns off at 45˚C and turns on at 35˚C. (The above action is effective when the ONOFF parameter is set at OFF.)

Point Changeover of output action

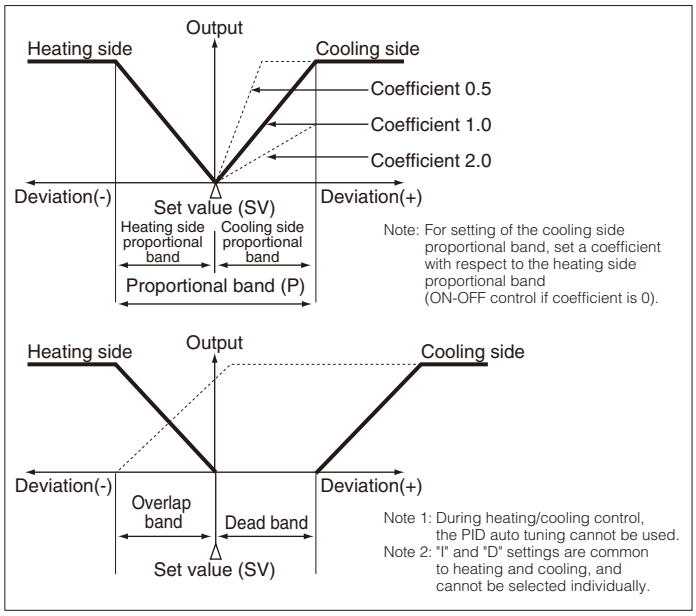
Direct action or reverse action is settable by parameter [P-n1].



- Reverse action
  When process value (PV) decreases below the set value (SV), output changes so that control input increases.
- Direct action
  When process value (PV) increases above the set value (SV), output changes so that control input increases.

Heating / cooling control (option)

By a single controller both heating and cooling control output are obtained. (Both control outputs 1 and 2 are used.)



Note: For setting of the cooling side proportional band, set a coefficient with respect to the heating side proportional band (ON-OFF control if coefficient is 0).

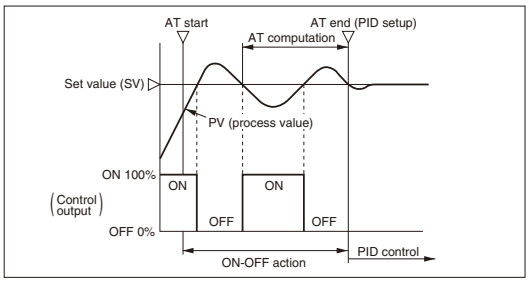
Note 1: During heating/cooling control, the PID auto tuning cannot be used.
Note 2: "I" and "D" settings are common to heating and cooling, and cannot be selected individually.

Function2 PID tuning function

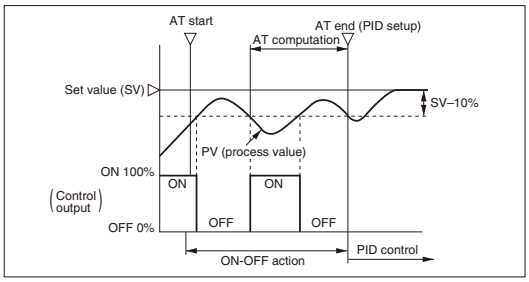
Auto-tuning (AT)

PID parameters are autometically set by the controller's measurement and computation function.This instrument provides 2 types of auto-tuning functions;the standard type(auto-tuning with SV used as reference)and the low SV type(auto-tuning with the value 10% below SV used as reference).

(a) Standard type

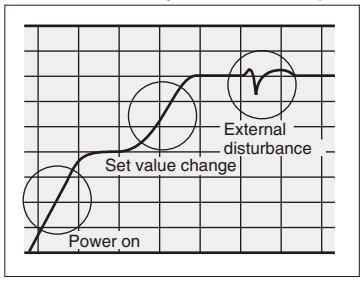


(b) Low PV type



Self-tuning function

At power on, changing a set value or during external disturbance, tuning is made automatically so that the PID parameters are reoptimized.



Note: For some objects to control, PID values could not be optimized.

Micro Controller PXR

[12] Functions

Function3 Alarm (option)

• Kind of alarm and alarm type code

	ALM1	ALM2	ALM3	Alarm type	Operation figure
	0	0	0	No alarm	PV
Absolute value alarm	1	1	1	Upper-limit absolute value	ALn, PV
	2	2	2	Lower-limit absolute value	ALn, PV
	3	3	3	Upper-limit absolute value (with hold)	ALn, PV
	4	4	4	Lower-limit absolute value (with hold)	ALn, PV
Deviation value alarm	5	5	5	Upper-limit deviation	ALn, SV, PV
	6	6	6	Lower-limit deviation	ALn, SV, PV
	7	7	7	Upper and lower limits deviation	ALn, ALn, SV, PV
	8	8	8	Upper-limit deviation (with hold)	ALn, SV, PV
	9	9	9	Lower-limit deviation (with hold)	ALn, SV, PV
	10	10	10	Upper and lower limits deviation (with hold)	ALn, ALn, SV, PV
Range alarm	11	11	11	Range upper and lower limits deviation (ALM1/2 indepen-dent operation)	ALn, ALn, SV, PV
	—	12	—	Range upper and lower limits absolute value	AL2, AL1, PV
	—	13	—	Range upper and lower limits deviation	AL2, AL1, SV, PV
	—	14	—	Range upper limit absolute value and lower limit deviation	AL2, SV, AL1, PV
	—	15	—	Range upper limit deviation and lower limit absolute value	AL1, AL2, SV, PV

• Timer code

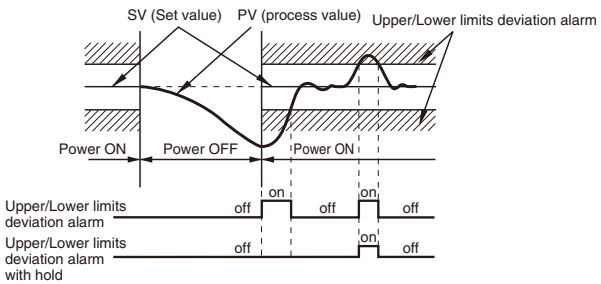
	ALM1	ALM2	ALM3	Alarm type	Operation figure
Timer	32	32	32	ON-delay timer	DI, ALM, dLYn
	33	33	33	OFF-delay timer	DI, ALM, dLYn
	34	34	34	ON/OFF-delay timer	DI, ALM, dLYn, dLYn

If change the kinds of parameter, please power ON/OFF PXR.

Note : (1) Alarm output is ON in the alarm band marked ▨

(2) What is alarm with hold?

The alarm is not turned ON immediately even when the measured value is in the alarm band.It turns ON when it goes out the alarm band and enters again.



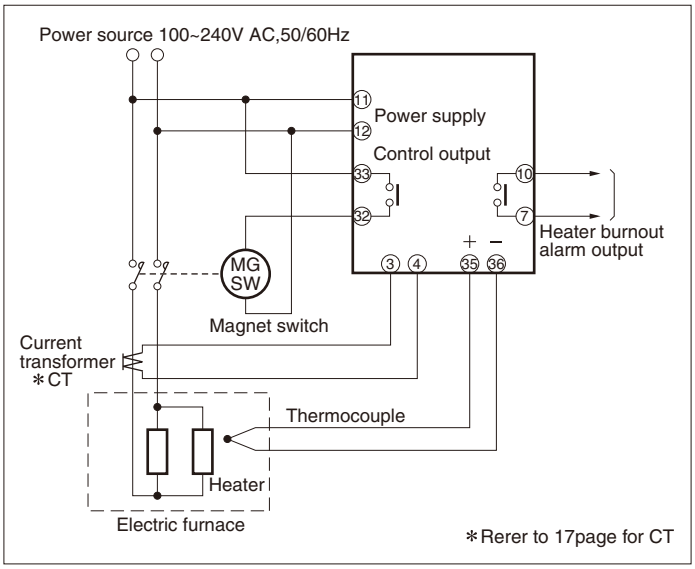
• Alarm code for setting value 2 points

	ALM1	ALM2	ALM3	Alarm type	Operation figure
Upper and lower limits alarm	16	16	16	Upper and lower limits absolute value	An-L, An-H, PV
	17	17	17	Upper and lower limits deviation	An-L, An-H, SV, PV
	18	18	18	Upper limit absolute value and lower limit deviation	An-L, SV, An-H, PV
	19	19	19	Upper limit deviation and lower limit absolute value	An-H, An-L, SV, PV
	20	20	20	Upper and lower limits absolute value (with hold)	An-L, An-H, PV
	21	21	21	Upper and lower limit deviation (with hold)	An-L, An-H, SV, PV
	22	22	22	Upper limit absolute value and lower limit deviation (with hold)	An-L, SV, An-H, PV
	23	23	23	Upper limit deviation and lower limit absolute value (with hold)	An-H, An-L, SV, PV
Range alarm	24	24	24	Range upper and lower limits absolute value	An-L, An-H, PV
	25	25	25	Range upper and lower limits deviation	An-L, An-H, SV, PV
	26	26	26	Range upper limit absolute value and lower limit deviation	An-L, SV, An-H, PV
	27	27	27	Range upper limit deviation and lower limit absolute value	An-H, An-L, SV, PV
	28	28	28	Range upper and lower limits absolute value (with hold)	An-L, An-H, PV
	29	29	29	Range upper and lower limits deviation (with hold)	An-L, An-H, SV, PV
	30	30	30	Range upper limit absolute value and lower limit deviation (with hold)	An-L, SV, An-H, PV
	31	31	31	Range upper limit deviation and lower limit absolute value (with hold)	An-H, An-L, SV, PV

Function4 Heater burnout alarm (option)

- Heater burnout is detected then the alarm is emitted immediately.
- Separate type current trasformer(CT)specified by Fuji should be used.
- Alarm action point can be set by front panel keys.
- Detection is made only on a single-phase heater.
- This function cannot be used when controlling a heater with thyrister phase angle control system.

● Example of the connection of the heater burnout alarm (type PXR5, PXR9)



Function5 Parameter mask function

This instrument provides a function (parameter mask function) to mask (conceal) the display of individual parameters.
To effect parameter mask(non-display)or non- mask (display),appropriate values should be set to DSP1-13.

Example of setting to (DSP1-13)

(a) To mask parameter P
1) Check DSP value for Preferring to parameter table
2) Add 2 to the value set to DSP3.

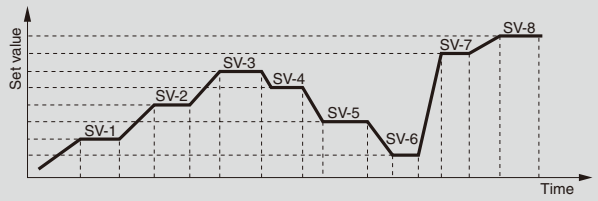
Parameter	DSP
P	DSP3-2
I	DSP3-4
D	DSP3-8

(b) To mask parametaer P,I,D
1) Check DSP value for P,I,D referring to parameter table.
2) Add 2+4+8=14 to the value set to DSP3.

For allocation of DSP of each parameter, refer to the parameter table on Page18. DSP1-13 cannot be masked.

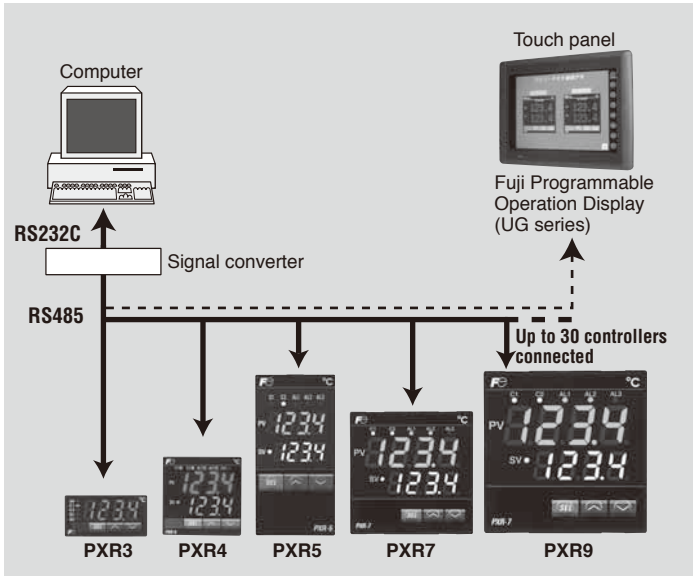
Function6 Ramp soak function (option)

Function of automatically changing the set point value with the elapsing of time, in accordance with the preset pattern, as shown below.This function is capable of programming a 2 program pattern of 4 steps each, or 1 program parttern × 8 steps.



Function7 RS-485 Communication function (option)

With RS-485 (Modbus™ protocol) interface, a connection with computer, touch panel or PLC is allowed.



Either communication protocol below is selectable. Selection should be made according to system configuration.

1) ModbusTM RTU mode:
An open protocol generally used in particular outside Japan. In case the host side supports this protocol, connection is allowed without a program.

2) Z-ASCII (Fuji's original)
Because transmission code is ASCII, programming with PLC, etc. is simple.

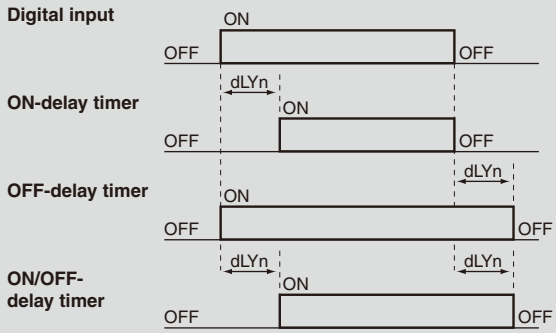
Function8 Digital input (option)

External digital input allows one of the following functions.
- Change the set value (Front SV, SV1-3)
- Start/stop the control action
- Start/reset the ramp/soak
- Start/stop the auto tuning
- Cancel the alarm latch
- Start the incorporated timer

* The above functions can be combined when two digital inputs are used.

Function9 Timer function (option)

By Digital input, ON-delay or OFF delay timer can be started.
That is, relay output is turned on/off after certain period of time preset in parameter dLY1/dLY2/dLY3. As for relay output, alarm output relays are used. Up to 3 timer outputs can be obtained.

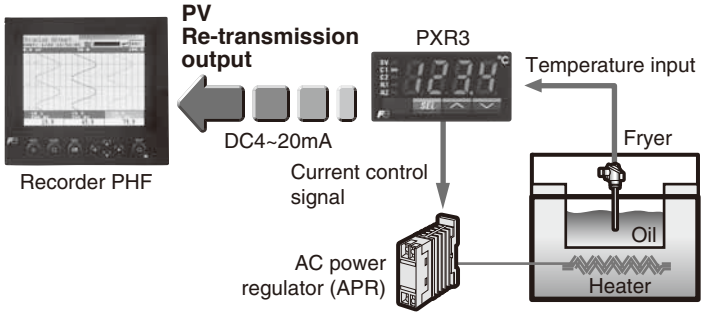


This function is available only with digital input (option).

Function10 Analog Re-transmission (option)

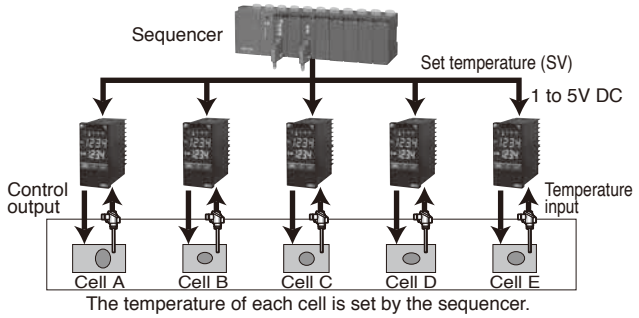
- Output signal : 4 to 20 mA DC
- Kind of output : Any one of process value (PV), set value (SV), manipulated output value (MV) and process variable - set value (DV) (setting by front keys)

A cost corresponding to one temperature sensor can be reduced just by connecting a PV transfer signal to a recorder.



Function11 Remote SV input (option)

- SV (set value) can be selected with signals from outside.
- SV input signal: 1 to 5V DC

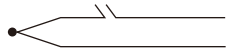


The temperature of each cell is set by the sequencer.

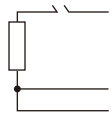
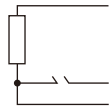
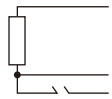
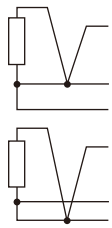
Micro Controller PXR

[13] Sensor fault operation

• Thermocouple

Condition		Display	Control output
Break		U U U U	ON or more than 20mA (Note) OFF or less than 4mA
Short circuit		short-circuit point Temperature display	Input is controlled as short-circuit point temperature. (Note)

• Resistance bulb input

Condition		Display	Control output
Break		U U U U	ON or more than 20mA (Note) OFF or less than 4mA
		L L L L	OFF or less than 4mA (Note) ON or more than 20mA
		L L L L	ON or more than 20mA (Note) OFF or less than 4mA
	2-wire or 3-wire break		
Short circuit		L L L L	OFF or less than 4mA (Note) ON or more than 20mA

• 1-5V DC

Break		L L L L	OFF or less than 4mA (Note) ON or more than 20mA
Short circuit			

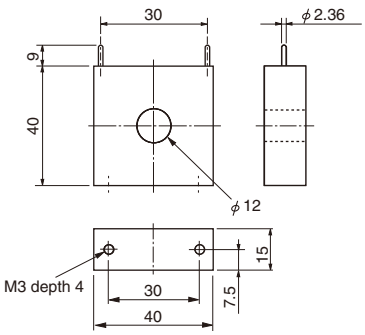
• 4-20mA DC

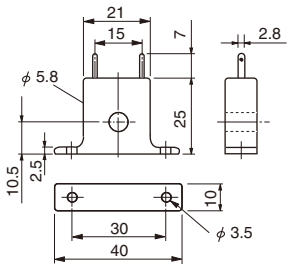
Over-range	U U U U	OFF or less than 4mA (Note)
Under-range	L L L L	ON or more than 20mA

(Note) Control output changes in operation according to the designation of burnout direction (parameter, “P-n1”).
In case of Manual Mode, control output signal is MV output value.

Heater burnout alarm current detector (CT)

・Specification : For 20-50A
・Type : CTL-12-S36-8



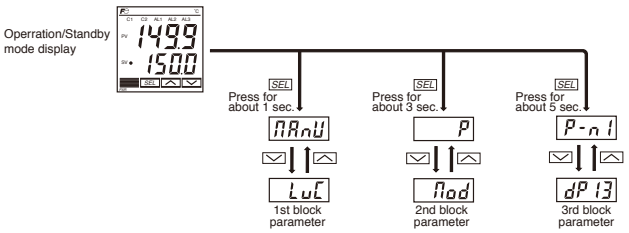


・Specification : For 1-30A
・Type : CTL-6-S-H
"CTL-6-S" is printed on commodity as type.

[14] Parameter table

Parameter table PXR (1/4)

Parameters for the PXR are classified under three blocks according to the frequency of use. The parameters of the second and third blocks are used at initialization or when they are of absolute necessity. Some parameters may not be displayed at the time of delivery depending on the type.



• Parameters of the first block

Parameter display symbol	Parameter name		Description	Setting range	Value prior to delivery	User's set value	Parameter mask DSP
MAnU	MAnU	Auto/Manual setting	Switches between Auto and Manual mode.	on : Manual mode oFF : Auto mode	OFF		dSP13-32
StbY	STby	Standby setting	Switches between RUN and Standby for control.	on: Control standby (Output: OFF, Alarm: OFF) oFF: Control RUN	OFF		dSP1-1
CMod	CMod	Remote/Local setting	Switches between Remote and Local operations.	rEM : Remote LoCL : Local	LoCL		dSP13-8
ProG	ProG	Ramp-soak control	Switches between Start, Stop, and Hold for ramp-soak control.	oFF: Stop rUn: Start HLd: Hold	OFF		dSP1-2
LACH	LACH	Alarm latch cancel	Cancels the alarm latch.	0: Keeps the alarm latch. 1: Opens up the alarm latch.	0		dSP1-4
AT	AT	Auto-tuning	Used for setting the constants for P, I, and d by auto-tuning.	0: OFF (Resets the auto-tuning or does not use it.) 1: ON (Performs the auto-tuning in the SV standard type.) 2: ON (Performs the auto-tuning in low PV type (SV value-10%FS).)	0		dSP1-8
TM-1	TM-1	Timer 1 display	Displays the remaining time of timer 1.	- (Unit: seconds)	—		dSP1-16
TM-2	TM-2	Timer 2 display	Displays the remaining time of timer 2.	- (Unit: seconds)	—		dSP1-32
TM-3	TM-3	Timer 3 display	Displays the remaining time of timer 3.	- (Unit: seconds)	—		dSP1-64
AL1	AL1	Set value of alarm 1	Sets the value at which alarm 1 is detected.	When the alarm type is absolute value: 0 to 100%FS When the alarm type is deviation: -100 to 100%FS	10		dSP1-128
A1-L	A1-L	Lower limit value of alarm 1	Sets the lower limit value at which alarm 1 is detected.		10		dSP2-1
A1-H	A1-H	Upper limit value of alarm 1	Sets the upper limit value at which alarm 1 is detected.		10		dSP2-2
AL2	AL2	Set value of alarm 2	Sets the value during which alarm 2 is detected.	When the alarm type is absolute value: 0 to 100%FS When the alarm type is deviation: -100 to 100%FS	10		dSP2-4
A2-L	A2-L	Lower limit value of alarm 2	Sets the lower limit value at which alarm 2 is detected.		10		dSP2-8
A2-H	A2-H	Upper limit value of alarm 2	Sets the upper limit value at which alarm 2 is detected.		10		dSP2-16
AL3	AL3	Set value of alarm 3	Sets the value at which alarm 3 is detected.	When the alarm type is absolute value: 0 to 100%FS When the alarm type is deviation: -100 to 100%FS	10		dSP2-32
A3-L	A3-L	Lower limit value of alarm 3	Sets the lower limit value at which alarm 3 is detected.		10		dSP2-64
A3-H	A3-H	Upper limit value of alarm 3	Sets the upper limit value at which alarm 3 is detected.		10		dSP2-128
LoC	LoC	Key lock	Setting of key lock status.		0		dSP3-1

Type 1 to 3 Possible to set up within input range.

	AL1 to AL3	A1-H to A3-H	A1-L to A3-L
0 to 15	○	×	×
16 to 31	×	○	○
32 to 34	○	×	×

○: Setting enable, ×: Setting disable

	All parameters		SV	
LoC	Front key	Comm-unication	Front key	Comm-unication
0	○	○	○	○
1	×	○	×	○
2	×	○	○	○
3	○	×	○	×
4	×	×	×	×
5	×	×	○	×

○: Setting enable, × : Setting disable

Micro Controller PXR

[14] Parameter table

Parameter table PXR (2/4)

• **Parameters of the second block**

Parameter display symbol	Parameter name		Description	Setting range	Value prior to delivery	User's set value	Parameter mask DSP
P	P	Proportional band	Set P to 0.0 to select the ON/OFF control (Two-position control).	0.0 to 999.9%	5.0		dSP3-2
i	i	Integral time	Integration OFF at 0	0 to 3200 seconds	240		dSP3-4
d	d	Differentional time	Differentiation OFF at 0	0.0 to 999.9 seconds	60.0		dSP3-8
HYS	HYS	Hysteresis range for ON/OFF control	Sets the hysteresis for ON/OFF control.	0 to 50%FS	1		dSP3-16
CooL	CooL	Cooling-side proportional band coefficient	Automatically set by auto-tuning function. Selecting 0 switches to cooling-side ON/OFF operation.	0.0 to 100.0	1.0		dSP3-32
db	db	Dead band	Shifts the cooling-side output value.	-50.0 to +50.0	0.0		dSP3-64
bAL	bAL	Manual reset value	Do not modify the default value set at the factory.	-100 to 100%	0.0/50.0		dSP3-128
Ar	Ar	Anti-reset windup	Automatically set by auto-tuning function.	0 to 100%FS	100		dSP4-1
CTrL	CTrL	Control algorithm	Selects the control algorithm.	Pid: Runs normal PID control. FUZY: Runs PID control with fuzzy logic. SELF: Runs PID control with self-running.	Pid		dSP4-2
SLFb	SLFb	PV (Measured value) stable range	Sets the PV stable range for the self-tuning operation.	0 to 100%FS	2%FS		dSP4-4
onoF	onoF	Setting HYS (Hysteresis) mode	Selects the hysteresis operation at ON/OFF control.	oFF: Starts the two-position control at the values of SV+HYS/2 and SV-HYS/2. on: Starts the two-position control at the values of SV and SV+HYS, or SV and SV-HYS.	ON		dSP4-8
TC	TC	Cycle time of control output 1	Not shown at 4-20mA DC output	RY, SSR: 1 to 150 seconds (Contact output = 30,SSR/SSC-drive output=2)	30/2		dSP4-16
TC2	TC2	Cycle time of control output 2 (cooling-side)	Not shown at 4-20mA DC output	1 to 150 seconds (Contact output = 30,SSR/SSC-drive output=2)	30/2		dSP4-32
P-n2	P-n2	Input signal code	Set this parameter when changing the types of temperature sensors.	1 to 16	Note 1		dSP4-64
P-SL	P-SL	Lower limit of measuring range		-1999 to 9999	Note 1		dSP4-128
P-SU	P-SU	Upper limit of measuring range		-1999 to 9999	Note 1		dSP5-1
P-dP	P-dP	Setting the decimal point position		0 to 2	Note 1		dSP5-2
PVOF	PVOF	PV (process value) offset	Shift the display of the PV.	-10 to 10%FS	0		dSP5-8
SVOF	SVOF	SV (Setting value) offset	Shift the SV. But the SV display is not changed.	-50 to 50%FS	0		dSP5-16
P-dF	P-dF	Time constant of input filter		0.0 to 900.0 seconds	5.0		dSP5-32
ALM1	ALM1	Alarm type 1	Sets the types of alarm operations.	0 to 34	0/5		dSP5-64
ALM2	ALM2	Alarm type 2	Sets the types of alarm operations.	0 to 34	0/9		dSP5-128
ALM3	ALM3	Alarm type 3	Sets the types of alarm operations.	0 to 34	0/0		dSP6-1
STAT	STAT	Status display of ramp-soak		-	OFF		dSP6-2
PTn	PTn	Selecting ramp-soak execute type	Selects ramp-soak patterns.	1: Performs 1st to 4th segments. 2: Performs 5th to 8th segments. 3: Performs 1st to 8th segments.	1		dSP6-4
Sv-1	Sv-1	1st target value/ Switching-SV value	Sets the 1st target SV of ramp-soak operation. / Selected at switching-SV function for DI1	Within the SV limit.	0%FS		dSP6-8
TM1r	TM1r	First ramp segment time	Sets the first ramp segment time.	0 to 99h59m	0.00		dSP6-16
TM1S	TM1S	1st soak segment time	Sets the 1st soak segment time.	0 to 99h59m	0.00		dSP6-32

Note 1: When a customer does not specify the settings while ordering, the following settings are selected as factory defaults.
Thermocouple input : Thermocouple K Measured range: 0 to 400°C
Resistance bulb input : Measured range: 0 to 150°C
Voltage/Current input : Scaling: 0 to 100%

Parameter table PXR (3/4)

• Parameters of the second block

Parameter display symbol	Parameter name		Description	Setting range	Value prior to delivery	User's set value	Parameter mask DSP
SU-2	Sv-2	2nd target SV	Sets the 2nd target SV of ramp-soak operation.	Within the SV limit.	0%FS		dSP6-64
TM2r	TM2r	2nd ramp segment time	Sets the 2nd ramp segment time.	0 to 99h59m	0.00		dSP6-128
TM2S	TM2S	2nd soak segment time	Sets the 2nd soak segment time.	0 to 99h59m	0.00		dSP7-1
SU-3	Sv-3	3rd target SV	Sets the 3rd target SV of ramp-soak operation.	Within the SV limit.	0%FS		dSP7-2
TM3r	TM3r	3rd ramp segment time	Sets the 3rd ramp segment time.	0 to 99h59m	0.00		dSP7-4
TM3S	TM3S	3rd soak segment time	Sets the 3rd soak segment time.	0 to 99h59m	0.00		dSP7-8
SU-4	Sv-4	4th target SV	Sets the 4th target SV of ramp-soak operation.	Within the SV limit.	0%FS		dSP7-16
TM4r	TM4r	4th ramp segment time	Sets the 4th ramp segment time.	0 to 99h59m	0.00		dSP7-32
TM4S	TM4S	4th soak segment time	Sets the 4th soak segment time.	0 to 99h59m	0.00		dSP7-64
SU-5	Sv-5	5th target SV	Sets the 5th target SV of ramp-soak operation.	Within the SV limit.	0%FS		dSP7-128
TM5r	TM5r	5th ramp segment time	Sets the 5th ramp segment time.	0 to 99h59m	0.00		dSP8-1
TM5S	TM5S	5th soak segment time	Sets the 5th soak segment time.	0 to 99h59m	0.00		dSP8-2
SU-6	Sv-6	6th target SV	Sets the 6th target SV of ramp-soak operation.	Within the SV limit.	0%FS		dSP8-4
TM6r	TM6r	6th ramp segment time	Sets the 6th ramp segment time.	0 to 99h59m	0.00		dSP8-8
TM6S	TM6S	6th soak segment time	Sets the 6th soak segment time.	0 to 99h59m	0.00		dSP8-16
SU-7	Sv-7	7th target SV	Sets the 7th target SV of ramp-soak operation.	Within the SV limit.	0%FS		dSP8-32
TM7r	TM7r	7th ramp segment time	Sets the 7th ramp segment time.	0 to 99h59m	0.00		dSP8-64
TM7S	TM7S	7th soak segment time	Sets the 7th soak segment time.	0 to 99h59m	0.00		dSP8-128
SU-8	Sv-8	8th target SV	Sets the 8th target SV of ramp-soak operation.	Within the SV limit.	0%FS		dSP9-1
TM8r	TM8r	8th ramp segment time	Sets the 8th ramp segment time.	0 to 99h59m	0.00		dSP9-2
TM8S	TM8S	8th soak segment time	Sets the 8th soak segment time.	0 to 99h59m	0.00		dSP9-4
Mod	Mod	Ramp-soak mode	Selects the power-on start, repeat, and standby functions for ramp-soak operations.	0 to 15	0		dSP9-8

• Parameters of the third block

Parameter display symbol	Parameter name		Description	Setting range	Value prior to delivery	User's set value	Parameter mask DSP
P-n1	P-n1	Control action	Specifies control action and output at the input burn-out.	0 to 19	0/4		dSP9-16
SU-L	Sv-L	SV (Setting value) lower limiter	Sets the lower limit of the SV.	0 to 100%FS	0%FS		dSP9-32
SU-H	Sv-H	SV (Setting value) upper limiter	Sets the upper limit of the SV.	0 to 100%FS	100%FS		dSP9-64
dLY1	dLY1	Delay time 1	Delay time or timer value for alarm 1 relay.	0 to 9999 seconds	0		dSP9-128
dLY2	dLY2	Delay time 2	Delay time or timer value for alarm 2 relay.	0 to 9999 seconds	0		dSP10-1
dLY3	dLY3	Delay time 3	Delay time or timer value for alarm 3 relay.	0 to 9999 seconds	0		dSP10-2
CT	CT	Current transe display	Displays the current detector input value for HB alarm.	-	-		dSP10-4

Micro Controller PXR

[14] Parameter table

Parameter table PXR (4/4)

• Parameters of the third block

Parameter display symbol	Parameter name		Description	Setting range	Value prior to delivery	User's set value	Parameter mask DSP
Hb	Hb	HB (Set value of heater break alarm) setting	Sets the operation value that detects the heater break.	0 to 50.0A (Setting to 0.0A turns off the HB alarm.)	0.0		dSP10-8
A1hY	A1hY	Alarm 1 hysteresis	Sets the hysteresis range of ON and OFF of alarm 1.	0 to 50%FS	1		dSP10-16
A2hY	A2hY	Alarm 2 hysteresis	Sets the hysteresis range of ON and OFF of alarm 2.	0 to 50%FS	1		dSP10-32
A3hY	A3hY	Alarm 3 hysteresis	Sets the hysteresis range of ON and OFF of alarm 3.	0 to 50%FS	1		dSP10-64
A1oP	A1oP	Alarm 1 options	Sets the optional functions of alarms 1 and 2. 8888 Alarm latch (1: use, 0: not use) Alarm of error status (1: use, 0: not use) De-energized output (1: use, 0: not use)	000 to 111	000		dSP10-128
A2oP	A2oP	Alarm 2 options		000 to 111	000		dSP11-1
A3oP	A3oP	Alarm 3 options		000 to 111	000		dSP11-2
PLC1	PLC1	Lower limit for output 1	Sets the lower limit for output 1.	-3.0 to 103.0%	-3.0		dSP11-4
PHC1	PHC1	Upper limit for output 1	Sets the upper limit for output 1.	-3.0 to 103.0%	103.0		dSP11-8
PLC2	PLC2	Lower limit for output 2	Sets the lower limit for output 2.	-3.0 to 103.0%	-3.0		dSP11-16
PHC2	PHC2	Upper limit for output 2	Sets the upper limit for output 2.	-3.0 to 103.0%	103.0		dSP11-32
PCUT	PCUT	Output limit types	Sets the limit types of outputs 1 and 2 (breaking the limit, or maintained within the limit).	0 to 15	0		dSP11-64
oUT1	oUT1	Output value (MV) display	Displays the value of output 1.	-	-		dSP11-128
oUT2	oUT2	Output value (MV) display	Displays the value of output 2.	-	-		dSP12-1
rCJ	rCJ	RCJ (Cold junction compensation) setting	Sets the cold junction compensation function to ON/OFF.	ON: Performs the RCJ (Cold junction compensation). OFF: Does not perform the RCJ (Cold junction compensation).	on		dSP12-2
GAIn	GAin	PV gradient		0.001 to 2.000	1.000		dSP12-4
AdJ0	AdJ0	User-definable zero adjustment	Shifts the zero point of input value.	-50 to 50%FS	0		dSP12-8
AdJS	AdJS	User-definable span adjustment	Shifts the span of input value.	-50 to 50%FS	0		dSP12-16
di-1	di-1	DI1 (Digital input 1) operation	Sets the DI1 operations.	0 to 12	0		dSP12-32
di-2	di-2	DI2 (Digital input 2) operation	Sets the DI2 operations.	0 to 12	0		dSP12-64
STno	STno	Station No.	Sets the station No. for communication.	0 to 255	1		dSP12-128
CoM	CoM	Parity setting	Sets the parity for communication. (The baud rate is fixed at 9600bps.)	0: Odd parity 1: Even parity 2: No parity	0		dSP13-1
PCoL	PCoL	Communication protocol setting	Switches communication protocol between Modbus and ASCII.	0: Z-ACSⅡ 1: Modbus (RTU)	Depends on the type.		dSP13-2
Ao-T	Ao-T	Re-transmission output type	Selecting re-transmission output type.	0: PV / 1: SV / 2: MV / 3: DV	0		dSP13-4
Ao-L	Ao-L	Re-transmission base scale	Setting re-transmission base scale.	-100.0 to 100.0%	0.0		dSP13-4
Ao-H	Ao-H	Re-transmission span scale	Setting re-transmission span scale.	-100.0 to 100.0%	100.0		dSP13-4
rEMO	rEMO	Remote SV input zero adjustment	Shifts the zero point of input value.	-50 to 50%FS	0		dSP13-16
rEMS	rEMS	Remote SV input span adjustment	Shifts the span point of the input value.	-50 to 50%FS	0		dSP13-16
r-dF	r-dF	Remote SV input filter constant	Sets the filter constant of remote SV input value.	0.0 to 900.00 seconds	0.0		dSP13-16
rSv	rSv	Remote SV input value display	Displays the input value of remote SV input.	-	-		dSP13-16
dSP1 ~ dSP9 dP10 ~ dP13	dSP1 ~ dSP9 dP10 ~ dP13	Parameter mask	Sets whether or not to display each parameter.	0 to 255	Ordering specifi-cation		-

MEMO

Digital Thermostat (type:PAS3)

DIN 24× 48mm size

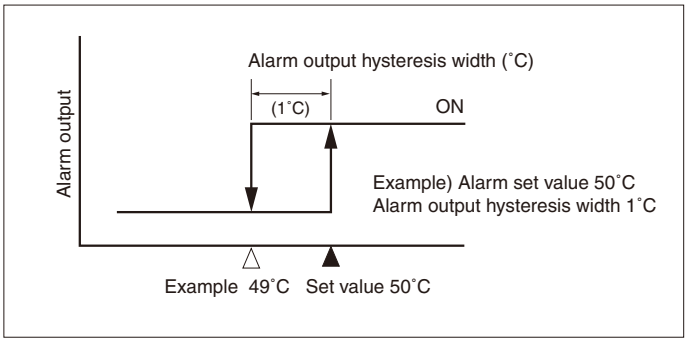
An alarm setter with on/off contact output.
Most suited for detecting overheat in machines, equipments, etc.

- Front panel having a DIN size of 24 x 48mm.
- Because thermocouples (5 types) and thermistors (0 to 100˚C) are connectable.
- Alarm set value and measured temperature value can be checked promptly using the front keys.
- This thermostat is capable of issuing 2 relay contact outputs. Therefore, any output of Upper/Lower limit pair, 2 upper limit and 2 lower limit can be selected.
- Mountable to a DIN rail using the DIN rail mounting adapter available at option. With this adapter, also mountable to a wall.

■ Specifications

Item	Specification
Input	Number of inputs: 1 Input signal and measurable range: Refer to Table 1. Allowable signal source resistance: Thermocouple input 100Ω max. Measurement cycle: 2 sec. or less Burnout function: Thermocouple input: UUU display Thermistor input: LLL display (Upscale or downscale at burnout settable) Input impedance: Thermocouple input 1 MΩ or higher Input filter: 0 to 90 sec. (settable in 1 sec. steps) Primary lag filter Input value compensation: Settable within ±10% of measurable range
Indication	Indication means: LCD (without back light) Value/parameter indication: 4 digits of 7 segments each (However, at the 1st digit, only - or 1 is indicated within -999 to 1999.) Contents of indication: Measured value, alarm set value 1, alarm set value 2, various parameters Each indicator of alarms 1 and 2, ˚C scale
Operation	Number of keys: 3 keys, sheet type keys (embossed) Alarm value setting resolution: 1˚C Key lock function: (Change of setting can be inhibited.)
Accuracy	Indication accuracy: Refer to Table 1. (However, error of a temperature sensor is not included.) Reference contact compensation error: ±3˚C (at 23˚C)
Alarm output	Number of outputs: 1 or 2 (as specified in CODE SYMBOLS) Contact structure: 1a contact Alarm type: Refer to Table 2. Contact capacity: 220 V AC/30 V DC, 2 A (resistance load) 220 AC/30 DC, 1 A (inductive load) Mechanical life of contact: 20 million activations or more (100 activations/min.) Electrical life of contact: 100,000 activations or more (rated load) Output resetting cycle: 2 sec. or less Alarm value settable range: Settable within 0 to 100% of measurable range Hysteresis width settable range: 0 to 110% of measurable range (settable in 1˚C steps) Alarm action delay time: Settable within 1 to 120 sec.
Power supply	Power supply voltage: 100 V (–15%) to 240 V (+10%) AC 50/60 Hz (±10%) Power consumption: 3 VA max. (with 100 V AC), 6 VA max. (with 240 V AC)
Operating conditions	Ambient temperature: 0 to 50˚C Ambient humidity: 90% RH max. (condensation unallowable)
Applicable standards	UL, C-UL, CE mark.
Body structure	Mounting method: Panel flush mounting External dimensions (H x W x D): 24 x 48 x 85 mm Weight: Approx. 100 g Casing material: Plastic (corresponding to flame resistance grade UL94V-0) Front protective structure: IP66 (corresponding to NEMA-4X) when using Fuji's genuine front waterproof packing part External terminals: Plug-in type (for bar terminals) Finish color: Ivory

■ Alarm output hysteresis width



■ Input signal, measurable range and indication accuracy (Table 1)

Input signal		Measurable range (˚C)	Minimum resolution	Indication accuracy
Thermocouple	J	0 to 800	1˚C	±1%FS±1digit±3˚C
	K	0 to 1200	1˚C	±1%FS±1digit±3˚C
	R	0 to 1600	4˚C	±1%FS±1digit±4˚C
	T	0 to 400	1˚C	±1%FS±1digit±3˚C
	E	0 to 600	1˚C	±1%FS±1digit±3˚C
Thermistor	PB-36	0 to 100	1˚C	±4˚C

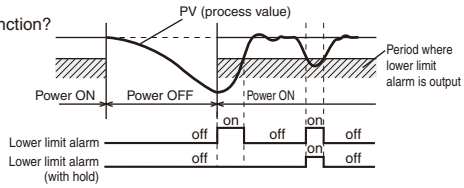
Note 1) Correct indication is not ensured within a range from 0 to 500˚C for an R type thermocouple.
Note 2) Switching between a thermistor and a thermocouple is not allowed. Thermocouple input type can be changed by front key operation.

■ Alarm types (Table 2)

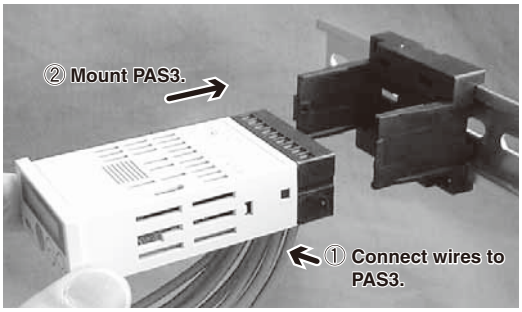
Code of PA1, 2	Alarm direction	Set value notation	With holding (Note 2)	Relay action at alarm	Action diagram (Note 1)
0	No alarm	–	–	–	
1	Upper limit	Absolute value	No	Relay excitation	
2	Lower limit	Absolute value	No	Relay excitation	
3	Upper limit	Absolute value	Yes	Relay excitation	
4	Lower limit	Absolute value	Yes	Relay excitation	
5	Upper limit	Absolute value	No	Relay non-excitation	
6	Lower limit	Absolute value	No	Relay non-excitation	
7	Upper limit	Absolute value	Yes	Relay non-excitation	
8	Lower limit	Absolute value	Yes	Relay non-excitation	

(Note 1) How to read action
□ area: A range in which "ALM1 or ALM2" is indicated on LCD at the front.
▨ area: A range in which alarm relay is excited
△point: Alarm set value
The horizontal axis represents measured values (PV).

(Note 2) What is the hold function?
Even if the process value is within the alarm range when turning on power, the alarm does not turn on immediately but only after it leaves and then returns to the alarm range.



■ DIN rail mounting



■ Model

Input signal	Temperature sensor	Number of alarm	Model
Thermocouple	Option	1	PAS3K1Y1
		2	PAS3K1A1
Thermistor	Provided	1	PAS3H1Y1
		2	PAS3H1A1

■ Optional items

Contents	Model
DIN rail mounting adapter	ZZP∗CTK368715P1

■ Setting at delivery

Measurable range	K thermocouple input (0 to 1200˚C) Thermistor input (0 to 100˚C)
Alarm set value	K thermocouple input: For 1-point alarm (upper limit 1200˚C) K thermocouple input: For 2-point alarm (upper limit 1200˚C, lower limit alarm 0˚C) Thermistor input: For 1-point alarm (upper limit 100˚C) Thermistor input: For 2-point alarm (upper limit 100˚C, lower limit alarm 0˚C)
Alarm hysteresis width	1˚C
Alarm delay time	0 sec.
Indication	Measured value
Burnout	Upscale at burnout
Input filter	5 sec.
Input value compensation	0%

Note 1) Switching between a thermistor and a thermocouple is not allowed.
Note 2) Thermocouple input type can be changed by front key operation.

■ Scope of delivery

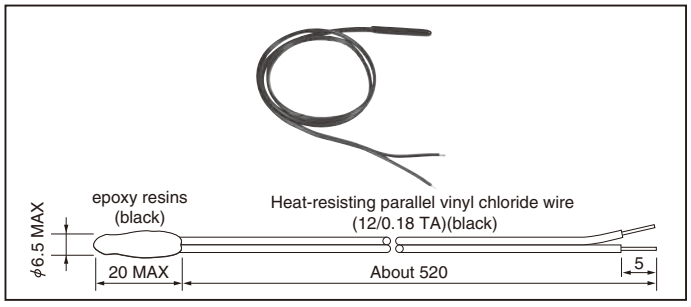
Thermostat unit, panel-mounting adapter,
front waterproof packing
Thermistor sensor added for thermistor input

■ Atached thermistor sensor

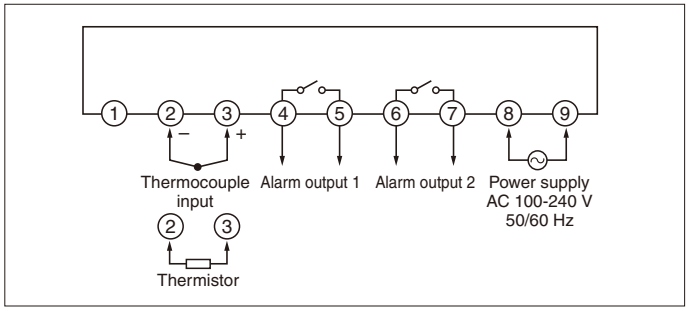
• Attachment for thermistor-input thermostat

Measurable range	0 to 100˚C
B constant	3390 K
Nominal resistance value	6 kΩ (0˚C)
Lead wire	Heat-resisting vinyl chloride wire
Lead wire length	500 mm
Lead wire heat resisting temperature	–20 to 105˚C
Color code	Black
Accuracy	Within 2˚C

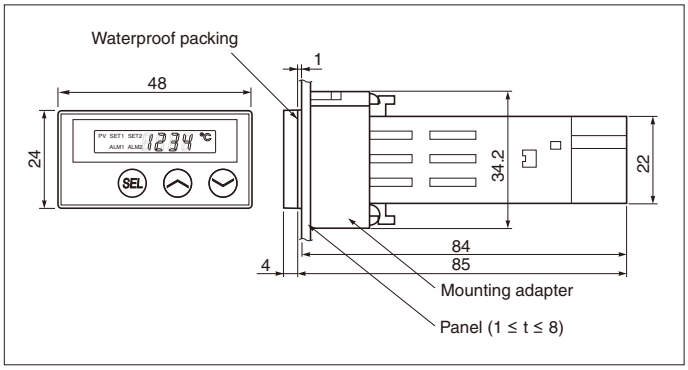
• Outline diagram (unit: mm)



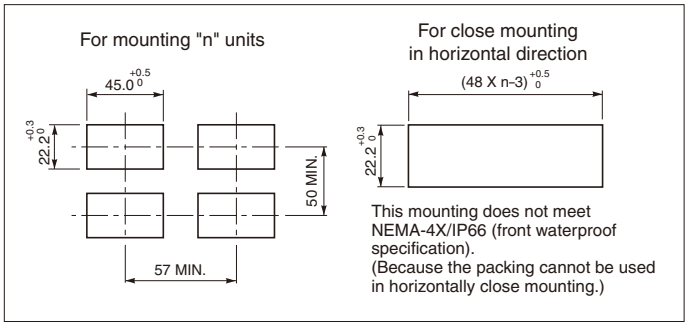
■ Connection diagram



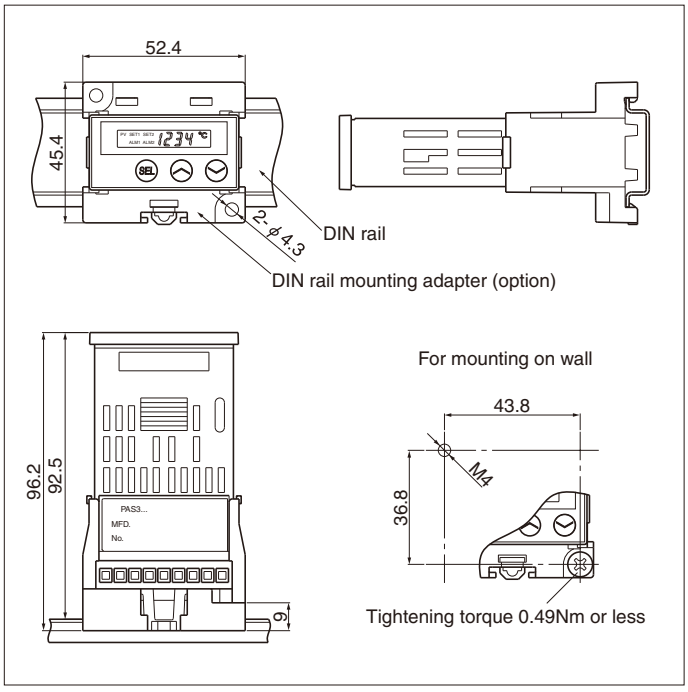
■ Outline diagram (unit:mm)



■ Panel cutout

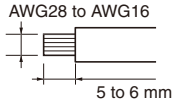


■ DIN rail mounting adapter (option)

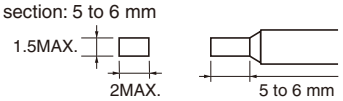


■ Usable wiring materials

• Wire (TYPE: Single wire)
Gauge: AWG28 (0.1 mm²) to AWG16 (1.25 mm²)
Strip-off length: 5 to 6 mm

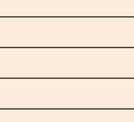
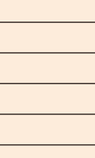
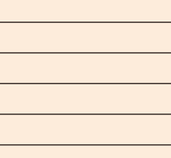
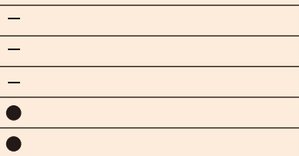
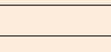


• Bar terminal
Dimension of strip-off conductor section: 2 x 1.5 mm or smaller
Length of strip-off conductor section: 5 to 6 mm



List of temperature controllers

PX Series

Classification		3-key type with large display					Socket type	Digital thermostat	Classification		
Type		PXR3	PXR4	PXR7	PXR5	PXR9	PXR4 Socket	PAS3	Type		
Front view (size mm)	Standard type	———	———	———	———	———	———	———	Standard type	Front view (size mm)	
	Waterproof type	PXR3 (48×24)	PXR4 (48×24)	PXR7  (48×24)	PXR5  (48×24)	PXR9  (96×96)	PXR4  (48×48)	PAS3  (48×24)	Waterproof type		
Input signal	Pt100	●					●	–	Pt100	Input signal	
	J thermocouple	●					●	●	J thermocouple		
	K thermocouple	●					●	●	K thermocouple		
	R thermocouple	●					●	●	R thermocouple		
	B thermocouple	●					●	–	B thermocouple		
	S thermocouple	●					●	–	S thermocouple		
	T thermocouple	●					●	●	T thermocouple		
	E thermocouple	●					●	●	E thermocouple		
	N thermocouple	●					●	–	N thermocouple		
	PLⅡ thermocouple	●					●	–	PLⅡ thermocouple		
	1 to 5V DC	●					●	–	1 to 5V DC		
	4 to 20mA DC	● (With resistor)					● (With resistor)	–	4 to 20mA DC		
Output signal	Relay	●					●	●	Relay	Output signal	
	For SSR/SSC drive	●					●	–	For SSR/SSC drive		
	4 to 20mA DC	●					●	–	4 to 20mA DC		
Control method	ON-OFF	●					●	●	ON-OFF	Control method	
	PID	●					●	–	PID		
	Auto tuning PID	●					●	–	Auto tuning PID		
	Fuzzy	●					●	–	Fuzzy		
	Self-tuning	●					●	–	Self-tuning		
	Heating/cooling control	●					–	–	Heating/cooling control		
Indicating accuracy		±0.5% FS ±1digit ±1˚C					±0.5% FS ±1digit ±1˚C	±3˚C	Indicating accuracy		
Communicating function (RS-485)		●					–	–	Communicating function (RS-485)		
Re-transmission output in 4 to 20 mA DC		●					–	–	Re-transmission output in 4 to 20 mA DC		
Timer function		●					–	–	Timer function		
Digital input		●					–	–	Digital input		
Ramp soak function		● (8 ramp/soak)					●	–	Ramp soak function		
Alarm output		●					●	●	Alarm output		
Heater burnout alarm (current output unavailable)		● (Unavailable for PXR3)					–	–	Heater burnout alarm (current output unavailable)		
Power supply voltage		100 to 240 V AC, 50/60 Hz or 24 V AC/DC					100 to 240 V AC, 50/60 Hz or 24 V AC/DC	100 to 240V AC	Power supply voltage		
Front waterproof structure		●					●	●	Front waterproof structure		

SPECIAL ATTENTION NEEDED for all Micro Controller X series products

(Please read carefully the following instructions.)

⚠WARNING **Over-temperature Protection**

Any control system design should take into account that any part of the system has the potential to fail.

For temperature control systems, continued heating should be considered the most dangerous condition, and the machine should be designed to automatically stop heating if unregulated due to the failure of the control unit or for any other reason.

The following are the most likely causes of unwanted continued heating:

1) Controller failure with heating output constantly on
2) Disengagement of the temperature sensor from the system
3) A short circuit in the thermocouple wiring
4) A valve or switch contact point outside the system is locked to keep the heat switched on.

In any application where physical injury or destruction of equipment might occur, we recommend the installation of independent safety equipment, with a separate temperature sensor, to disable the heating circuit in case of overheating.

The controller alarm signal is not designed to function as a protective measure in case of controller failure.

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