e-Front runners

PX series
Digital temperature
Controller

Socket Type

MICRO-CONTROLLER X (48mm×48mm)

MICRO-CONTROLLER X

DATA SHEET

PXR4
SOCKET

With front dimensions of 48×48mm, this socket type temperature controller enables On-Off control, PID control or 8-step ramp/soak function, using thermocouple, resistance bulb or DC1 to 5V signal as input.

Though small-sized, it can be equipped with a variety of functions.

FEATURES

1. PID with auto-tuning, PID self-tuning and fuzzy control are installed as standard.
2. Front side waterproof specification in conformity with NEMA4X (standard).
3. Two alarms are equipped, and 8-step ramp/soak function can be installed as an option.

SPECIFICATIONS

1. 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

2. 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

3. 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

4. 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

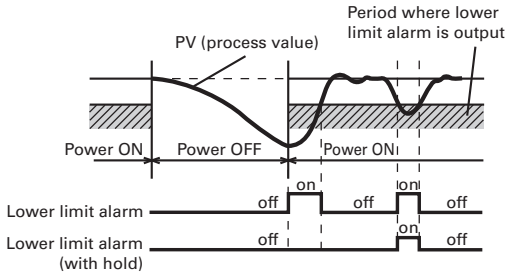
5. Operation and display section

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

6. 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

What is alarm with hold?
The alarm is not turned ON immediately even when the process value is in the alarm band. It turns ON when it goes out the alarm band and enters again.



7. 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.

8. Power failure processing

Memory protection	Held by non-volatile memory

9. Self-check

Method	Program error supervision by watchdog timer

10. 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

11. 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)

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
		PL2	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.

PXR4 Temperature Controller Socket Series

Ordering Information (PXR4 Socket Version)

P	X	R	4	–	A	B	S	1	–	C	D	0	A	1

To create a part number f ll in the boxes above with the appropriate number and/or letter from the corresponding list below.

Front Panel Size
4 = 1/16 DIN (48x48mm)

Box A: Input Signal
T = Thermocouple (°C)
R = Thermocouple (°F)
N = RTD, Pt100 ohm, 3-wire type (°C)
S = RTD, Pt100 ohm, 3-wire type (°F)
B = 4-20mA DC, 1-5V DC
A = 0-20mA DC, 0-5V DC

Box B: Control Output 1
A = Relay contact output
C = SSR or SSC drive output
E = 4-20mA DC output[1]

Box C: Alarm Options
4 = None
5 = Hign.low alarm 1 point
G = High/low alarm 2 points

Box D: Power Supply
V = Standard (100-240V AC, 50/60Hz)
B = 24V AC/DC (50/60Hz)

Accessories

PXR4 Loader Assembly	Program loader for PXR4
PXR4 Terminal Cover	Terminal block protective cover

■ Scope of delivery

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

Option

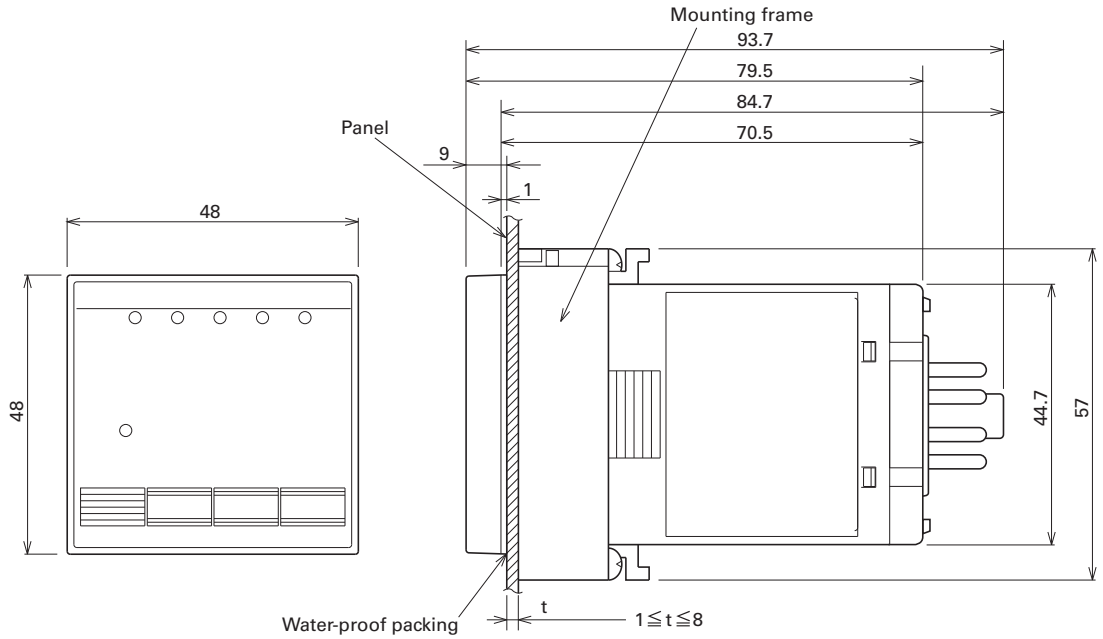
Shunt resistor 250Ω ±0.1%	Model: ZZPPXR1-A190

■ Insulation block diagram

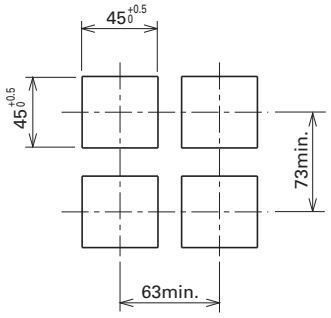
Power supply section	Measurement input Internal circuit
Relay contact control output 1	
Alarm relay output 1, 2	Voltage pulse, 4 to 20mA DC control output 1

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.

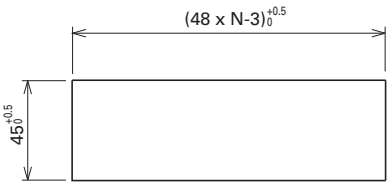
OUTLINE DIAGRAM (Unit: mm)



Panel cutout size (Unit: mm)



Side stick mounting (n units)



Note: Waterproof is not available in stick mounting.