Fuji Electric

PX series
Digital temperature
Controller

MICRO-CONTROLLER X (48mm×48mm)

MICRO-CONTROLLER X

DATA SHEET

PXE

PXE controller enables ON-OFF control and PID control by means of the thermocouple and resistance bulb as input, which is compact temperature controller with front dimensions 48 x 48 mm and with depth 62mm.

FEATURES

1. Depth dimension is 62mm and thickness of the front panel is 1.6mm.
2. Simple key operation.
3. PID with auto-tuning and fuzzy control are provided as standard.
4. Waterproof specification of front panel conforms with NEMA4X as standard.
5. Two alarms can be provided as an option.

SPECIFICATIONS

1. General specifications

Power supply voltage	100 V (-15%) to 240 V (+10%) AC, 50/60 Hz
Power consumption	When using 100 V AC: 5 VA or less When using 220 V AC: 6 VA or less
Insulation resistance	20 MΩ or more (500 V DC)
Dielectric strength	Power supply-others ... 1500 V AC for 1 min When output is SSR/SSC driving output, it is isolated between input and output.
Input impedance	Thermocouple: 1 MΩ or more
Allowable signal source resistance	Thermocouple: 100Ω 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 120.0 sec settable in 0.1 sec steps (first order lag filter)
Noise reduction ratio	Normal mode noise (50/60 Hz): 40 dB or more Common mode noise (50/60 Hz): 120 dB or more

2. Control function

Control action	PID control (with auto tuning, self-tuning) Fuzzy control (with auto tuning) ON-OFF control
Proportional band (P)	0.1 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
Proportional action when I, D = 0.	
Proportional cycle	1 to 150 sec settable in 1 sec step
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	0.2 sec
Control cycle	0.2 sec

3. Input section

Input signal	Thermocouple : J, K, R, B, S, T, E, N, PLII Resistance bulb : Pt100
Measuring range	See measuring range table (Table1)
Burnout	Control output upper/lower are selectable

4. Output section of standard type (control output)

Control output 1	Select one as follows Relay contact: 1a contact: 220V AC/30V DC, 3A (resistive load) Electrical life 100,000 operations (rated load) Minimum switching current 100mA (24V DC) SSR / SSC drive (Voltage pulse): ON: 10.2 to 15 V DC OFF: 0.5V DC or less Max. current: 20mA or less

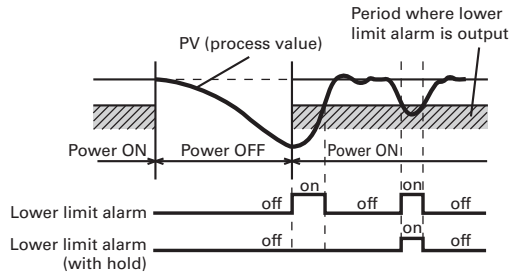
5. Operation and display section

Parameter setting method	Digital setting by 4 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: ± (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: 1a contact: 220 V AC/30 V DC, 1 A (resistive load) Electrical life 100,000 operations (rated load) Minimum switching current 100 mA (5 V DC) MAX 2 points output cycle 0.2 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. PC loader function (under development)

Function	Sets, saves and copies the parameter.
Communication cable	Dedicated cable (USB ←→PXE)
Cable length	2m

8. Other functions

Parameter mask function	Selectable the Display/Non-display of all parameters by parameter setting Settable the Display/Non-display of each parameter block
Conformity standards	CE marking
RoHS Conformity	Compliant product

9. Power failure processing

Memory protection	Held by non-volatile memory

10. Self-check

Method	Program error supervision by watchdog timer

11. 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
Conditions of 3-year warranty: -10℃ to 40℃ (ambient temperature in use) Note) Basic warranty period is one year.	

12. Structure

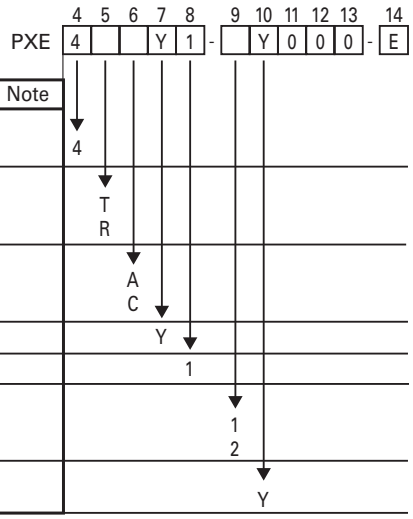
Mounting method	Panel flush mounting
External terminal	Terminal screw (M3)
Case material	Plastic (non-combustible grade UL94V-0 equivalent)
Dimensions	48 × 48 × 63.5mm
Weight	Approx. 100g
Protective structure	Front waterproof structure: NEMA4X (IEC standard IP66 equivalent) (when mounted on panel with 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

input signal		measuring range(°C)	measuring range(°F)
Resistance bulb	Pt100	-200 to 850	-300 to 1500
Thermocouple	J	0 to 800	0 to 1500
	K	-200 to 1200	-300 to 2200
	R	0 to 1600	0 to 2900
	B	0 to 1800	0 to 3200
	S	0 to 1600	0 to 2900
	T	-200 to 400	-300 to 700
	E	-200 to 800	-300 to 1400
	N	0 to 1300	0 to 2300
	PL2	0 to 1300	0 to 2300

PXE Model Code Configuration

Digit	Specification	Note
4	<Front dimensions> 48 × 48mm	
5	<Input signal> Thermocouple, Resistance bulb Pt100 [°C] Thermocouple, Resistance bulb Pt100 [°F]	
6	<Control output 1> Relay contact output Voltage pulse output (24V DC)	
7	-	
8	<Revision code>	
9	<Alarm output> Alarm (1 pc.) Alarm (2 pcs.)	
10	<Instruction manual> Japanese/English/Chinese	



Input signal, measurement range, and set value at the time of deliver are as follows.
Thermocouple K,
Measurement range; 0 to 400°C,
Set value; 0°C
Input signal of the thermocouple and the resistance bulb can be switched by key operation on the front panel.

■ Scope of delivery

Scope of delivery	Controller, panel mounting bracket, watertight packing, instruction manual

Option

Rear terminal cover	Type: ZZPPXR1-A230
Loader communication cable	Type: TQ401838C1

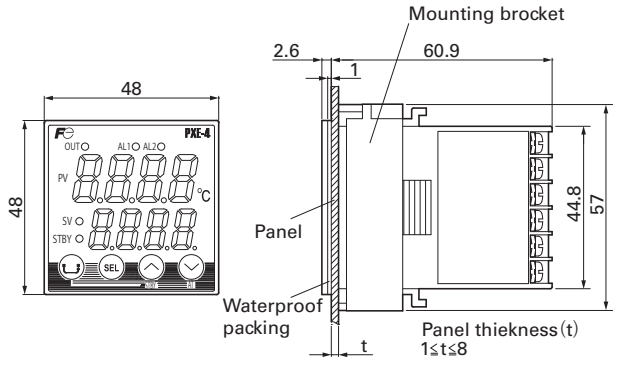
■ Insulation block diagram

Power supply section	Measurement value input
Relay contact control output	Internal circuit
Alarm relay contact1	Voltage pulse control output
Alarm relay contact2	Communication (loader)

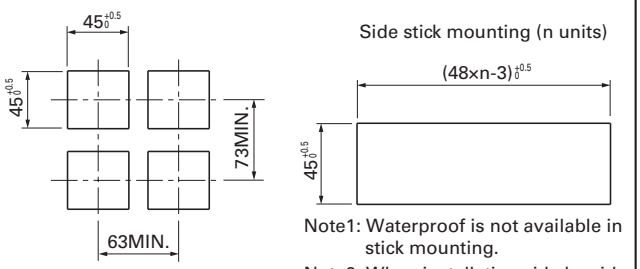
Note: Basic insulation (dielectric strength voltage 1500V AC) between blocks delimited by line ═══.
Non-insulation between the blocks delimited by line - - - -.

OUTLINE DIAGRAM (Unit: mm)

Outline

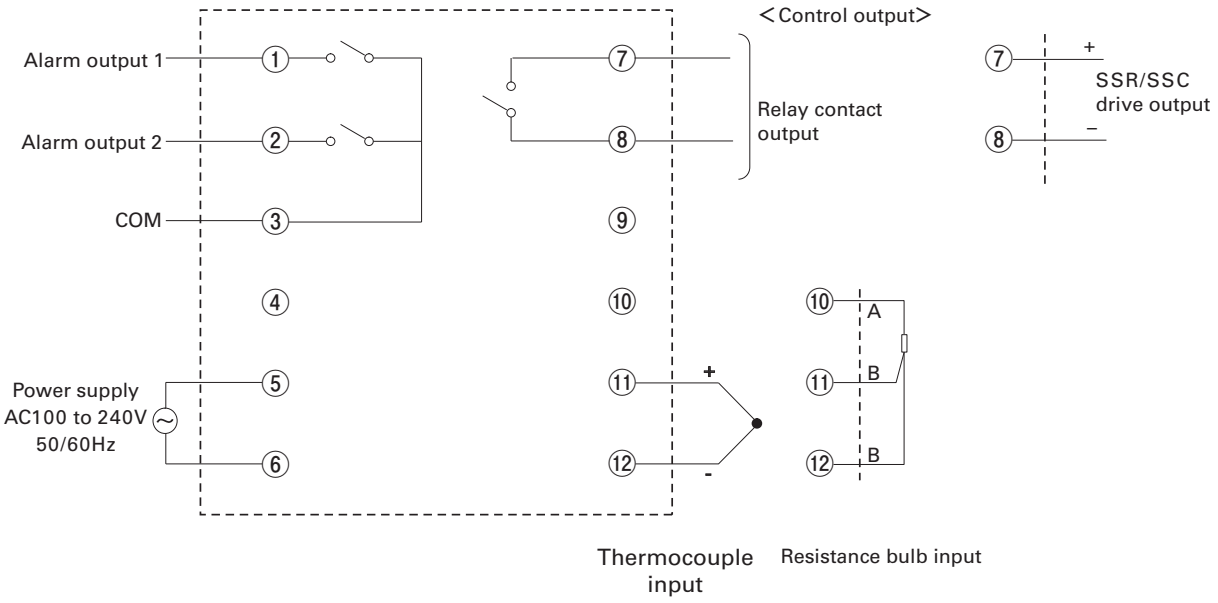


Panel cut



Note1: Waterproof is not available in stick mounting.
Note2: When installation side by side is in use, which is not covered under 3-year warranty.

CONNECTION DIAGRAM



3-year warranty
Warranty period is 3 years if following conditions is satisfied.
[Warranty period]
Warranty period of delivered product is 3 years from the date that the product was shipped from our factory.
[Warranty coverage]
Following coverage is determined as usage conditions.
1) Ambient temperature in use: –10 to +40
2) Mounting method:standard stand-alone mounting
Note) If installation is conducted such as placing each unit close together side by side, which is not covered under warranty.

Following conditions are not covered under warranty.
- Improper handling and usage by user
- Malfunction is caused by other reason besides the deliveried product.
- Modification and repair by user
- Others, natural disaster and disaster etc.. ,for which vendor or manufacturer does not bear any responsible.

Furthermore, warranty stated in this is considered only for the delivered product itself.
Please note that warranty does not cover any damages attributable to malfunction of the delivered product.

⚠ Caution on Safety

*Before using this product, be sure to read its instruction manual in advance.

Fuji Electric

Your distributor:
Coulton Instrumentation Ltd
17 Somerford Business Park, Christchurch, BH23 3RU, UK
Tel: +44 1202 480 303
E-mail: sales@coulton.com
Web: www.coulton.com

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