Fuji Electric

Temperature Controller

MICRO-CONTROLLER X

48 × 48 mm

DATA SHEET

PXE4-2

Digital temperature controller PXE is a compact and versatile controller that accepts thermocouples and RTD inputs and controls temperature with the ON-OFF control and PID control.

FEATURES

1. Compact design with a depth of 62 mm including 1.6 mm front panel
2. Simple key operation
3. PID, fuzzy, and 2-degrees-of-freedom PID control
4. NEMA 4X front panel
5. Heating and cooling dual control
6. Interface for parameter loader cable (bus-power available) and free loader software

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	Between power supply and others: 1500 V AC for 1 min When you select the SSR drive output, functional insulation (500 V AC) is provided between inputs and outputs
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) Fuzzy control (with auto tuning) 2-degrees-of-freedom PID 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
Control function	Dual control (heating/cooling) During dual control, the alarm output 1 functions as the control output 2.

3. Input section

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

4. Output section of standard type (control output 1)

Control output	Select one as follows Relay contact: SPST contact: 220V AC/30V DC, 3A (resistive load) Electrical life 100,000 operations (rated load) Minimum switching current 100mA (24V DC) SSR 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 and set value are displayed independently 4 digits, 7-segment LED
LED indicator	Control output, alarm, standby, SV
Setting accuracy	0.1% or less of measuring range
Indication accuracy (at 23°C)	Thermocouple input: ±0.5% FS ±1 digit ±1°C Note that the accuracy is not assured for the type R thermocouple with 0–500°C range and for the type B thermocouple with 0–400°C range. RTD input: ±0.5% FS ±1 digit

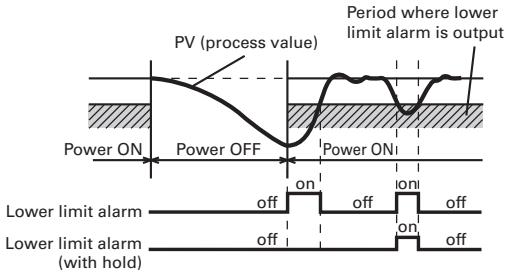
6. Alarm or control output 2 (option)

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 or control output 2	Relay contact: SPST 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

During dual control, the alarm output 1 functions as the control output 2.

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	Selectable the Display/Non-display of all parameters by parameter setting Settable the Display/Non-display of each parameter block

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 55°C
Ambient operating humidity	Less than 90% RH (no condensation)
Storage temperature	-20°C to 60°C

11. 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)

12. EU Directive Compliance CE

LVD (2014/35/EU) EN 61010-1 EN 61010-2-030
EMC (2014/30/EU) EN 61326-1 (Table 2) EN 55011 (Group 1 Class A) EN 61000-3-2 (Class A) EN 61000-3-3
RoHS (2011/65/EU) EN 50581

Table 1 Measuring range table

input signal		measuring range (°C)	measuring range (°F)
RTD	PT1	–200 to 850	–300 to 1500
	PT2	–199.9 to 500.0	–199.9 to 800.0
Thermocouple	J1	0 to 800	0 to 1500
	J2	0 to 400	0 to 700
	K1	0 to 400	0 to 700
	K2	–200 to 1200	–300 to 2200
	K3	0 to 400	0 to 700
	T1	–200 to 400	–300 to 700
	T2	–199.9 to 400.0	–199.9 to 700.0
	R	0 to 1600	0 to 2900
	B	0 to 1800	0 to 3200
	S	0 to 1600	0 to 2900
	E	–200 to 800	–300 to 1400
	N	0 to 1300	0 to 2300
	PL-2	0 to 1300	0 to 2300

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
You can switch between the thermocouple input and the RTD input by using the front panel keys.

■ Scope of delivery

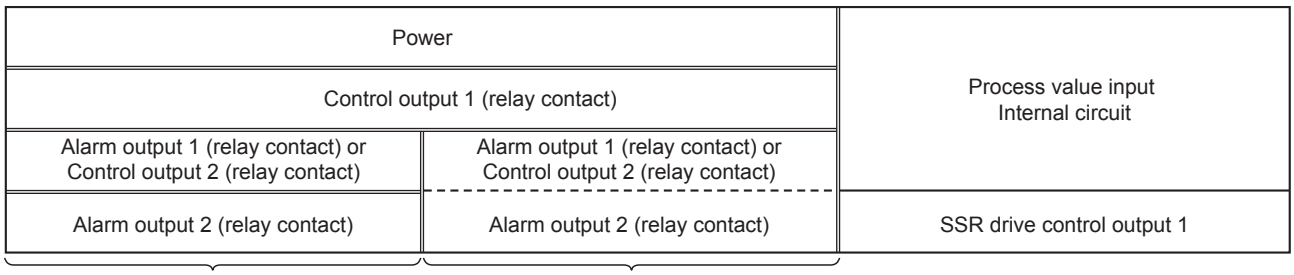
Scope of delivery	Controller, panel mounting bracket, watertight packing, instruction manual

■ Option

Rear terminal cover	Type: ZZPPXR1-A230
Parameter loader interface cable	Type: ZZP*TQ501923C3

■ Insulation block diagram

═══ Basic insulation (1500 V AC)　　—— Functional insulation (500 V AC)　　- - - - No insulation



When the 9th code is "J":
Each of the alarm output 1 and the alarm output 2 has independent COM terminal.

When the 9th code is "1" or "2":
COM terminal is shared between the alarm output 1 and the alarm output 2

CODE SYMBOLS

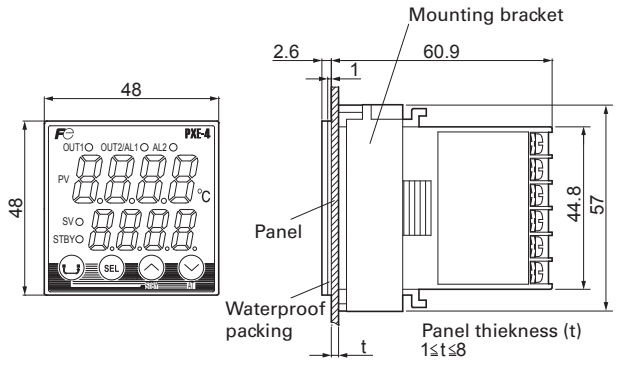
	4	5	6	7	8		9	10	11	12	13		14
PXE	4	T		Y	2	-		Y	0	0	0	-	E

Digit	Specification	Note
4	<Front dimensions> 48 × 48mm	
5	<Input signal> Thermocouple, Resistance bulb Pt100 [°C]	
6	<Control output> Relay contact output SSR drive output	
7	-	
8	<Revision code>	
9	<Alarm output> 1 point 2 points 2 points (independent COM)	Note1
10	<Instruction manual> Japanese/English/Chinese	

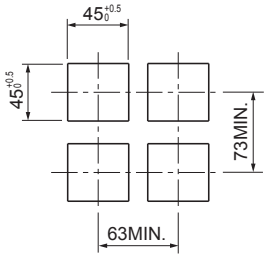
Note 1: During dual control, the alarm output 1 functions as the control output 2.

DIMENSIONS (Unit: mm)

Outline

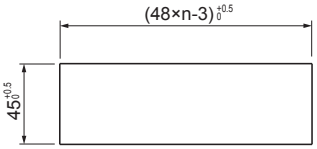


Panel cut



* The above-indicated dimensions must be secured even when coating is added on the panel.

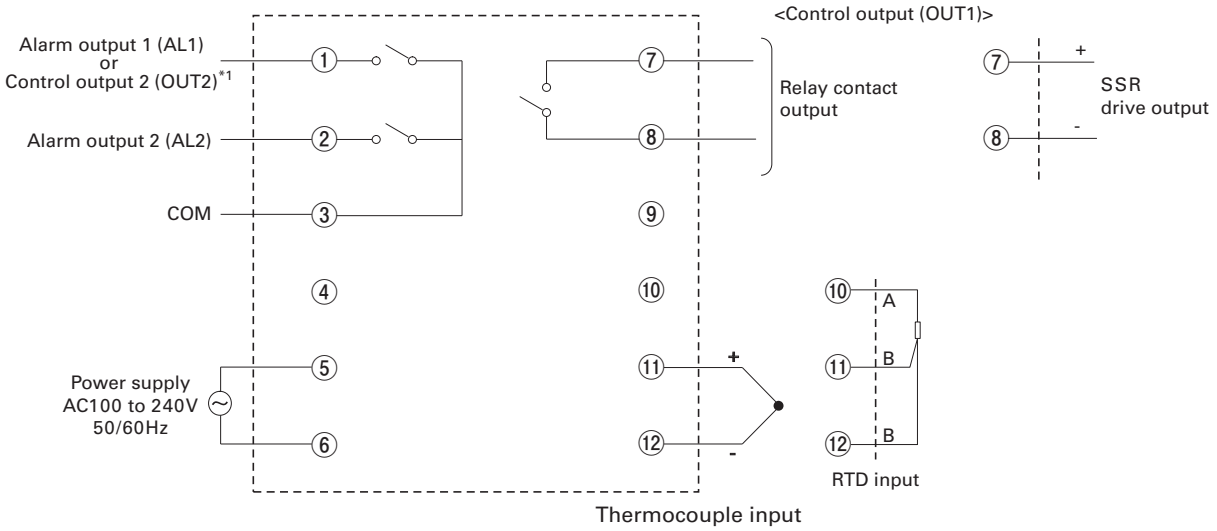
Side stick mounting (n units)



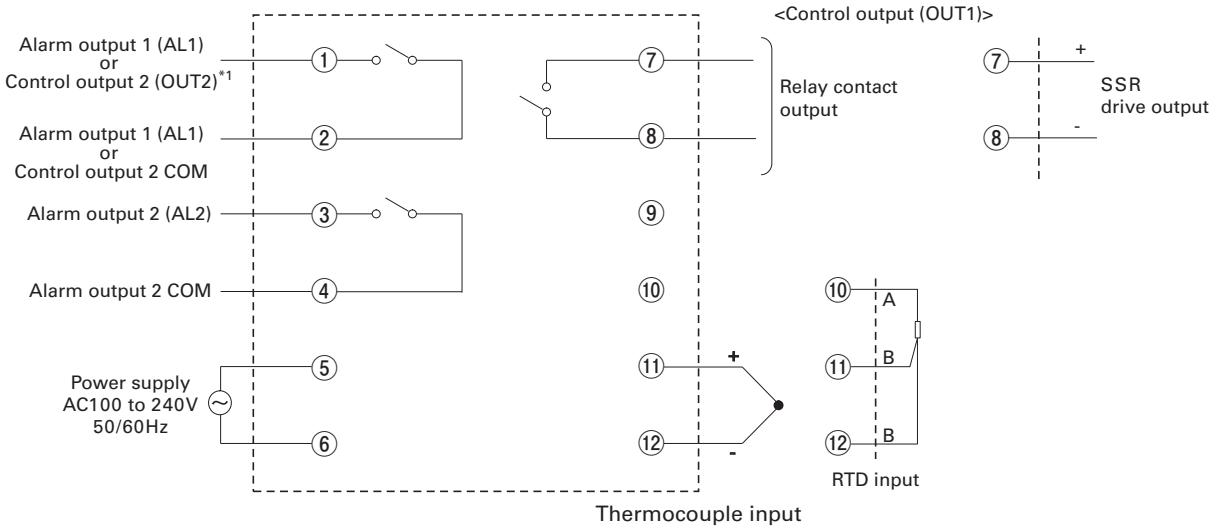
If multiple controllers are mounted closely and abreast, the front panel does not meet NEMA 4X and IP66 requirements because the packings cannot be used.

CONNECTION DIAGRAM

<When COM is shared between AL 1 and AL2>



<When AL1 and AL2 use independent COM>



*1: During dual control, the alarm output 1 functions as the control output 2.

⚠ Caution on Safety

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

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