

PXF4 socket type is a plug & socket type compact temperature controller developed as a successor to PXR4 socket type. It has 48 × 48 mm front panel with color LCD, and an 85.7-mm deep body behind the panel.

## FEATURES

- Enhanced control function
  - Fast sampling speed of 50 ms
  - Improved indication accuracy
  - Freely configurable control cycle (100 ms to 99 s)
  - Variety in control method
- User-friendly interface
  - Wide viewing angle LCD, high luminance white LED backlight
  - Digit select key for easier value-setting
- Various functions
  - 8 steps ramp/soak function
  - Parameter loader interface
- Universal input
  - Accepts thermocouple, RTD, voltage, and current



## SPECIFICATIONS

### 1. General specifications

#### Power supply:

100 V (-15%) to 240 V (+10%) AC, 50/60 Hz;  
24 V (±10%) DC/AC

#### Power consumption:

10 VA MAX. (100 to 240 V AC), 5 VA MAX. (24 V DC/AC)

#### Insulation resistance:

20 MΩ or more (at 500 V DC)

#### Withstand voltage:

Power source ↔ all terminals: 1500 V AC for 1 min  
Relay contact output ↔ all terminals: 1500 V AC for 1 min  
Between others 500 V AC for 1 min

### 2. Input section

#### 2.1 Process value input

Number of input: 1

#### Input setting:

Programmable scale

Input signal: See Table 1

(Universal input: thermocouple, RTD, voltage, current)

#### Standard measurement range and input type:

See Table 1

#### Indication accuracy (at Ta = 23°C):

- Thermocouple input: ±0.5%FS ±1 digit ±1°C

\*Exceptions:

Thermocouple B: 0 to 400°C: no accuracy assurance

Thermocouple R: 0 to 500°C: ±1%FS ±1 digit ±1°C

Thermocouples: -200 to -100°C: ±2°C ±1 digit

- RTD input: ±0.8°C ±1 digit or ±0.2% ±1 digit of indicated value, whichever is larger
- mV input, voltage input, current input: ±0.3%FS ±1 digit
- \* Note that the sensor should be sufficiently warmed up to secure the accuracy

#### Temperature effect on sensitivity:

±0.3%FS/10°C

#### Indication resolution:

See Table 1

#### Input sampling rate:

50 ms

#### Input impedance:

- Thermocouple, mV input: 1 MΩ or more
- Current input: 150 Ω or less (built-in diode)
- Voltage input: About 1 MΩ

#### Variation by signal source resistance:

- Thermocouple, mV input: ±0.3%FS ±1 digit per 100 Ω
- Voltage input: ±0.3%FS ±1 digit per 500 Ω

#### Allowable wiring resistance:

RTD: 10 Ω or less (per wire)

#### Allowable input voltage:

- DC voltage input: within ±35V
- Current input: within ±25 mA
- Thermocouple, RTD, mV input: within ±5 V

#### Noise reduction ratio:

- Normal mode: 40 dB (50/60 Hz)
- Common mode: 120 dB (50/60 Hz)
- Between input and power supply: ±1°C at 220 V AC, 50/60 Hz

#### Input correction:

- User adjustment: ±50%FS for each of zero and span point
- Process value shift: ±10%FS
- Input filter: 0.0 to 120.0 s (filter OFF if set at 0.0)
- Square root extraction: -0.1 to 105% (OFF if set to -0.1%)

**Overrange, underrange:**

Out of the range between -5% and 105% FS (accuracy not guaranteed between -5 and 0, and between 100 and 105% FS)

\*Exceptions:

- JPt, Pt, 0–10 V DC: out of the range between -2% and 105% FS
- Thermocouple E: out of the range between -5% and 102% FS

**3. Output section**

**3.1 Control output**

**Number of points: 1**

**Type:**

selected among (1) to (3) below

- (1) Relay contact output (SPDT)
  - Proportional cycle: 1 to 150 seconds
  - Contact structure: SPDT (single pole double throw)
  - Contact capacity: 250 V AC/30 V DC, 5 A (resistive load)
  - Mechanical life: 50 million operations MIN. (100 operations/min)
  - Electrical life: 100,000 operations MIN. (rated load)
- (2) SSR drive output
  - Proportional cycle: 1 to 150 s
  - ON voltage: 12 V DC (between 10.7 and 13.2V DC)
  - OFF voltage: 0.5 V DC or lower
  - Maximum current: 20 mA DC
  - Load resistance: 600 Ω MIN.
- (3) Current output (4 to 20 mA DC)
  - Accuracy: ±5%FS
  - Load resistance: 500 Ω MAX.

**3.2 Alarm output (option)**

**Number of outputs:**

Relay contact output: Up to 2

**Output specifications:**

Relay contact output  
 Contact structure: SPST (single pole single throw)  
 Contact capacity: 250 V AC/30 V DC, 1 A (resistive load)  
 Minimum ON/OFF current: 10 mA (5 V DC)  
 Mechanical life: 20 million operations MIN.  
 (100 operations/min)  
 Electrical life: 100,000 operations MIN. (rated load)

**Alarm kind:**

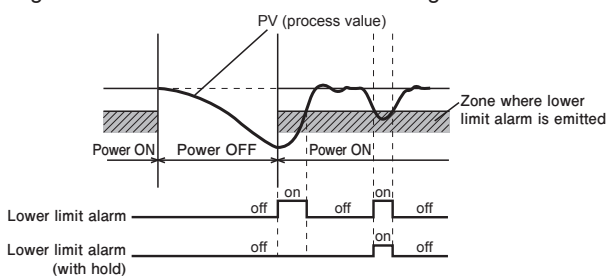
Absolute alarm, deviation alarm, zone alarm, upper and lower limit, and hold function available for each kind of alarms.  
 Alarm latch, Excitation/non-excitation selecting function provided.

**Output cycle:**

100 ms

**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.



**4. Indication/setting section**

**4.1 Display unit**

**Type:**

LCD (with backlight)

**Indication contents:**

- Process value indication: 11-segment, 4-digit [white]
- Setpoint indication: 11-segment, 4-digit [green]
- Screen No. indication: 7-segment, 3-digit [orange]
- Status indication: 23 indicator lamps

**4.2 Setting section**

Five embossed keys

**5. Control functions**

**5.1 Control types**

**ON/OFF control**

**PID control**

- PID parameters determination: Auto tuning

**Fuzzy PID control**

- PID parameters determination: Auto tuning

**Self tuning control**

**PID2 control**

- PID parameters determination: Auto tuning

**5.2 Control parameters**

- Proportional band (P): 0.0–999.9% (On/off control when P=0)
- Integral time (I): 0 to 3200 s  
Integral time control invalidated when I = 0.
- Differential time (D): 0.0 to 999.9 s  
Differential time control invalidated when D = 0.
- Control cycle: 100 to 900 ms (in 100 ms), 1 to 99 s (in s)
- Anti-reset windup: 0 to 100% of measurement range
- Hysteresis band: 50% of measurement range (available only during the on/off control)

**5.3 Control mode**

**Mode type:**

Auto, Manual

\*In the manual mode on/off control, available MVs are 100% and 0%.

**Mode switching:**

- Auto↔Manual: Balanceless·bumpless

**6. Data backup at power failure**

On non-volatile memory

**7. Self-diagnosis**

Program error supervision by watchdog timer

**8. Operation and storage conditions**

**Operating ambient temperature:**

-10 to 50°C

**Storage temperature:**

-20 to 60°C

**Operating/storage ambient humidity:**

90%RH MAX. (no condensation)

**Warm-up time:**

30 min MIN

**Vibration:**

During transportation 9.8 m/s<sup>2</sup> (1G) or less

**Impact:**

During transportation: 294 m/s<sup>2</sup> (30G) or less

## **9. Structure**

### **Mounting method:**

Panel flush mounting, DIN rail mounting  
(DIN rail mounting requires the dedicated socket.)

### **External terminals:**

8-pin or 11-pin socket, M3.5 screw terminals

\*The socket is a separate order item.

### **Case:**

- Material: ABS, PPO
- Flammability: equivalent to UL94V-0
- Color: Black

### **Protection structure:**

- Panel front side: equivalent to IP66 and NEMA 4X  
(When the panel is mounted using our genuine packing.  
Not water-proof if mounted closely together.)
- Body (slits on top and bottom): equivalent to IP20

### **Dimensions:**

48 (W) × 48 (H) × 85.7 (D) mm

### **Weight:**

Approx. 200g

## **10. User customize function**

### **Parameter mask function:**

You can switch between show/hide of parameters.

### **Program (ramp/soak) function:**

- Number of program patterns: 1 or 2
- 8 ramps and 8 soaks in total

### **User key:**

You can assign the following functions to the user key:  
auto/manual switching, standby on/off, etc.

## **11. Certification**

- CSA
- UL, C-UL: expected date of certification: March 2019

## **12. EU Directive Compliance**

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

\*The following table shows the difference of outputs among other micro-controller X series models.

	SSR driving output		Allowable load resistance for 4 to 20mA DC output
	Voltage	Maximum current	
PXR3	DC15V	20mA	100 ~ 500 Ω
PXR4/5/7/9	DC24V	20mA	600 Ω or less
PXV3	DC5.5V	20mA	600 Ω or less
PXV/PXW/PXZ	DC24V	20mA	600 Ω or less
PXF	DC12V	20mA	500 Ω or less

Table 1 Measurement range

Input type		Measurement range [°C]	Minimum input increment [°C]
RTD	JPt100	-199.9 to 600.0	150
	Pt100	-200 to 850	150
Thermocouple	J	-100 to 1000	400
	K	-200 to 1300	400
	R	0 to 1700	1700
	B	0 to 1800	1800
	S	0 to 1700	1700
	T	-199.9 to 400.0	399.9
	E	-200 to 800	800
	L	-100 to 850	950
	N	-200 to 1300	1500
	PL-II	0 to 1300	1300
	W	0 to 2300	2300
	U	-200 to 400.0	599.9
DC voltage	0–5 V DC	-1999 to 9999 (Scaling range)	—
	1–5 V DC		
	0–10 V DC		
	2–10 V DC		
	0–100 mV DC		
	0–20 mA DC		
DC current	4–20 mA DC		

Notes:

1. When the temperature exceeds 1000°C, the decimal point does not appear on the screen.
2. Input signal, measurement range, and set value at the time of delivery are as follows:  
 Thermocouple K, Measurement range from 0 through 400°C, Set value 0°C.  
 Switching the input signal among thermocouple, RTD, current, and voltage is available by key operation on the front panel.

## CODE SYMBOLS

Digit	Specifications	Note
4	<Front panel size W × H> 48×48mm	
5	<Input signal> Universal input Universal input (PXW/PXZ/PXV)	
6	<Control output> Relay contact (SPDT) SSR drive output Current output	
7	<Terminal form> Socket type	
8	<Revision code>	
9	<Alarm output> None 2 points	
10	<Power supply voltage> 100 to 240V AC 24 V AC/DC	
11		
12		
13		

Standard type      PXF 4 5 6 7 8 - 9 10 11 12 13  
 4    U 2    Y 0 0

## SCOPE OF DELIVERY

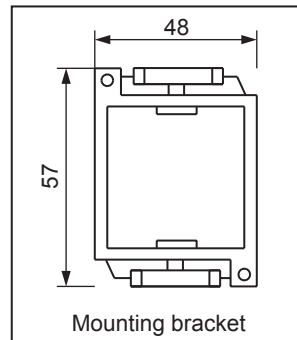
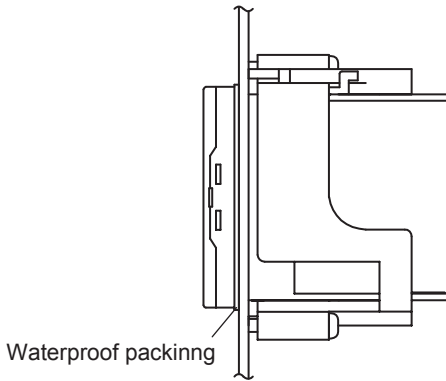
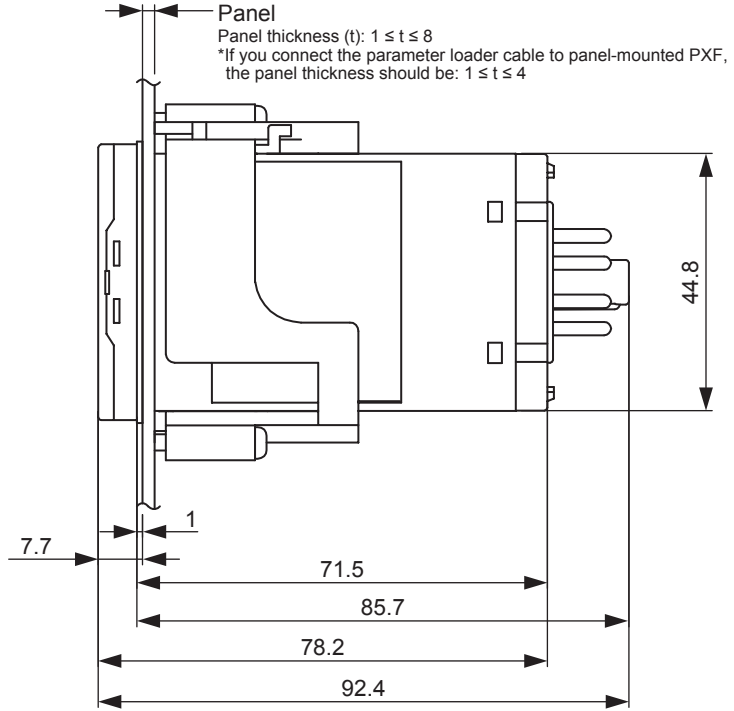
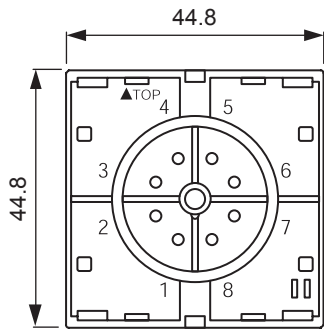
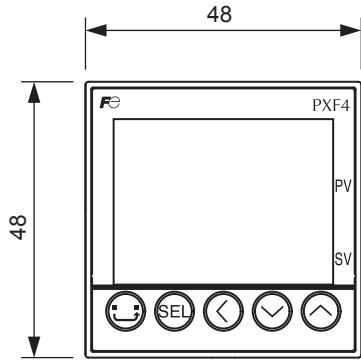
- Controller × 1
- Instruction manual × 1
- Panel mounting frame × 1
- Watertight packing × 1

## SEPARATE ORDER ITEMS

			Item	Q`ty	Ordering code
			PC loader communication cable	1	ZZP*TQ501923C3
4th code	4	No alarm	8-pin socket for DIN rail mounting (TP48X)	1	ZZP*PXF2-C100
			8-pin socket for panel mounting (TP48SB)	1	ZZP*PXF2-C101
	G	Two alarms	11-pin socket for DIN rail mounting (TP411X)	1	ZZP*PXF2-C102
			11-pin socket for panel mounting (TP411SBA)	1	ZZP*PXF2-C103

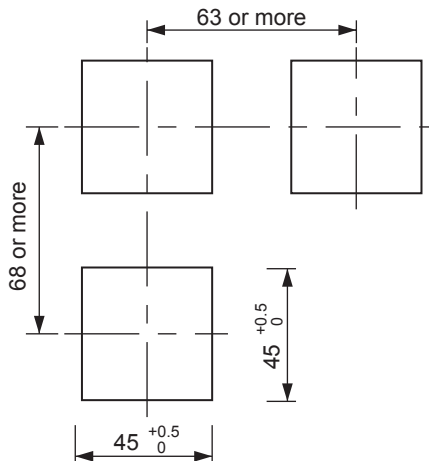
**PXF4-2  
SOCKET**

**OUTLINE DIAGRAM (Unit : mm)**

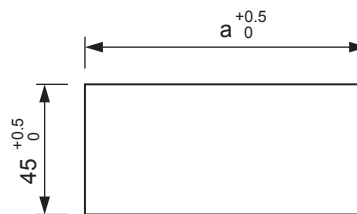


**PANEL CUTOUT SIZE (Unit : mm)**

Installing multiple controllers



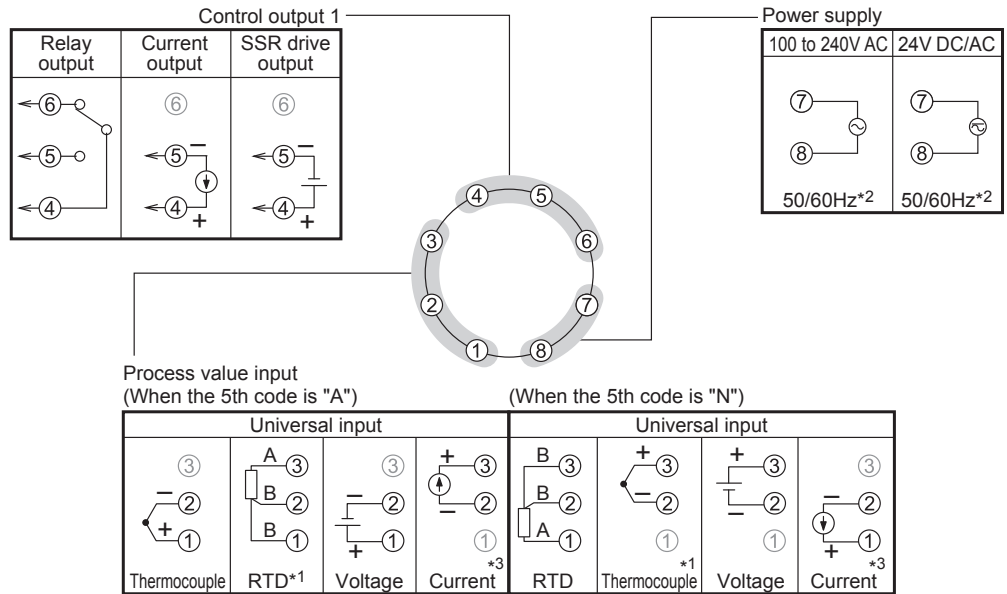
Side stick mounting



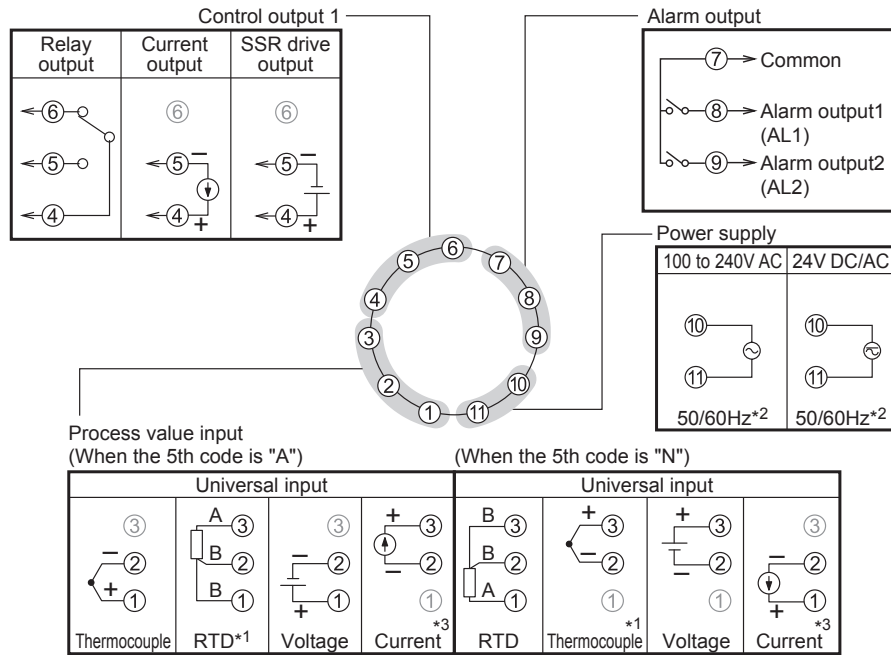
Number of units	2	3	4	5	6
a	93	141	189	237	285

# TERMINAL ALLOCATION

8-pin socket (for the versions that have no alarm)



11-pin socket (for the versions that have two alarms)



\*1: The terminal layout differs from that of PXW4/PXZ4/PXV4.

\*2: Check the power supply voltage before installation.

\*3: Terminal allocation is different from PXR4. A 250Ω shunt resistor is not required.

## INSULATION BLOCK DIAGRAM

Power supply (100 to 240 V AC)	Internal circuit
Control output 1 (relay contact)	Process value input
Alarm output 1 and 2 (relay contact)	Control output 1 (SSR drive, current, voltage)
Power supply (24 V DC/AC)	Internal circuit
Control output 1 (relay contact)	Process value input
Alarm output 1 and 2 (relay contact)	Control output 1 (SSR drive, current, voltage)

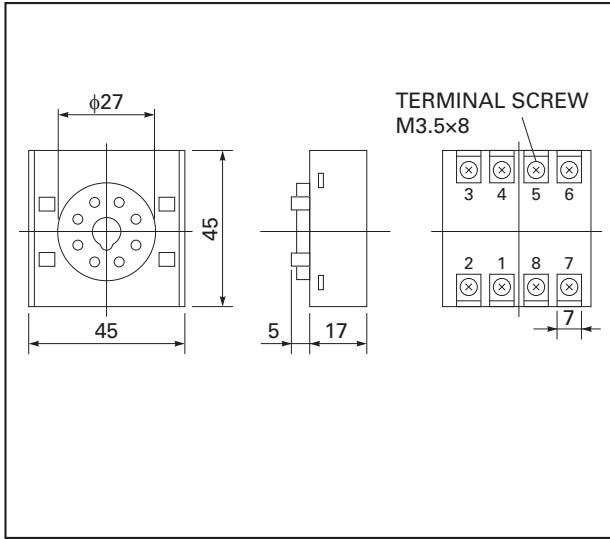
- : Basic insulation (1500 V AC)
- : Functional insulation (500 V AC)
- - - - - : No insulation

**PXF4-2  
SOCKET**

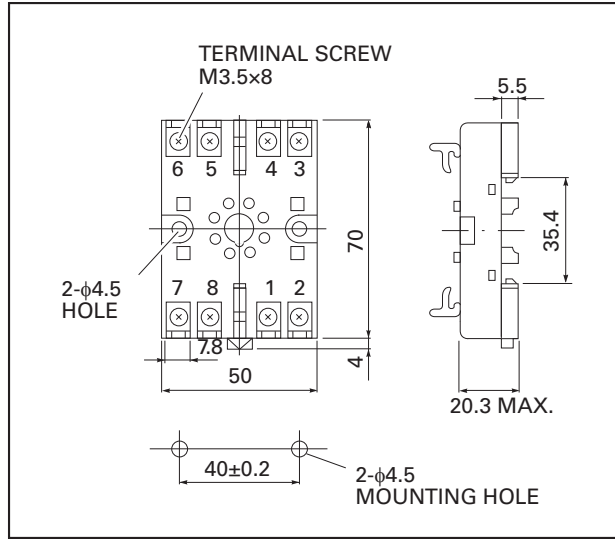
**SOCKET OUTLINE DIAGRAM (Unit : mm)**

8-pin socket (for the versions that have no alarm)

ZZP\*PXF2-C101 (for panel mounting) TP48SB

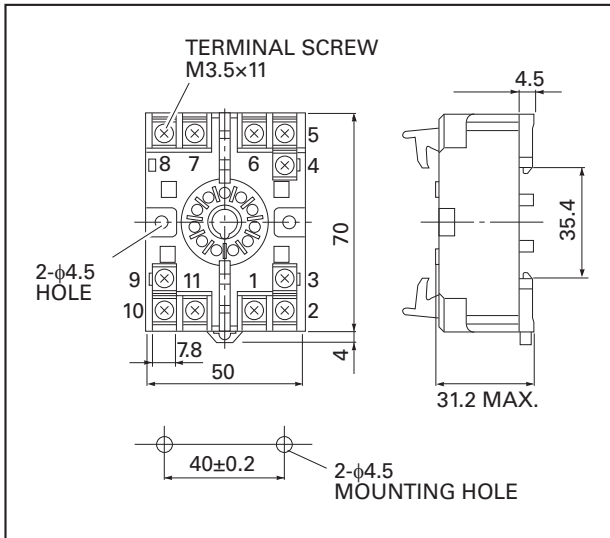


ZZP\*PXF2-C100 (for DIN rail mounting) TP48X

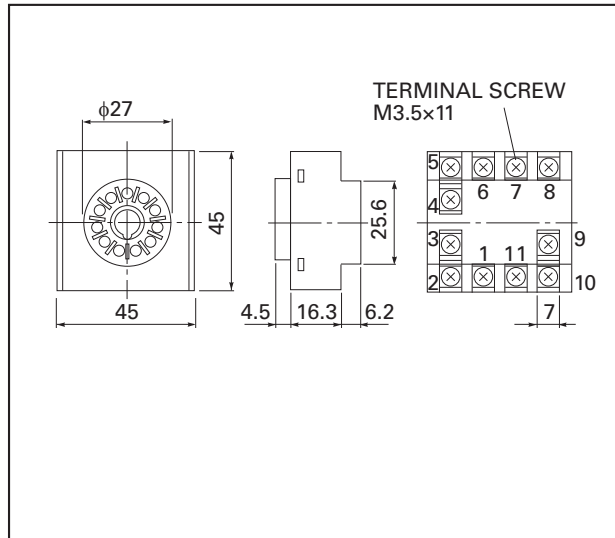


11-pin socket (for the versions that have two alarms)

ZZP\*PXF2-C102 (for DIN rail mounting) TP411X



ZZP\*PXF2-C103 (for panel mounting) TP411SBA



Information in this catalog is subject to change without notice.  
Read the instruction manuals thoroughly before using the products.

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