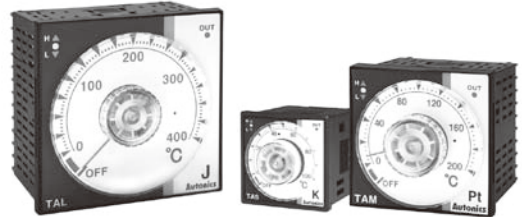


# TA Series Analog Setting Non-Indicating type, PID Control

## Analog and non-indicating type, PID control, set temperature by dial

### ■ Features

- Improved control performance with built-in microcomputer
- Adopting new Auto-tuning PID control algorithm : Selectable ON/OFF, PID control (with the external slide SW)
- Easy to check controlling status with deviation indicating lamp : Deviation LED(red, green), output LED(red) indicator
- Dial setting output OFF function
- Sensor broken display function



⚠ Please read "Caution for your safety" in operation manual before using.



(Pending)

### ■ Ordering information

TA S - B 4 R P 4 C

|                                   |            |   |             |                    |     |
|-----------------------------------|------------|---|-------------|--------------------|-----|
| Unit                              | C          | Celsius °C                                    |             |                    |     |
|                                   | F          | Fahrenheit °F                                 |             |                    |     |
| Temperature range for each sensor |            | °C  | °F          | Temperature sensor |     |
|                                   | 0          | -50 to 100                                    | -58 to 212  | Pt                 | —   |
|                                   | 1          | 0 to 100                                      | 32 to 212   | Pt                 | — K |
|                                   | 2          | 0 to 200                                      | 32 to 392   | Pt                 | J K |
|                                   | 3          | 0 to 300                                      | 32 to 572   | —                  | J — |
|                                   | 4          | 0 to 400                                      | 32 to 752   | Pt                 | J K |
|                                   | 6          | 0 to 600                                      | 32 to 1,112 | —                  | — K |
|                                   | 8          | 0 to 800                                      | 32 to 1,472 | —                  | — K |
| C                                 | 0 to 1,200 | 32 to 2,192                                   | —           | — K                |     |
| Sensor input type                 | P          | DPt100Ω                                       |             |                    |     |
|                                   | J          | J(IC)   |             |                    |     |
|                                   | K          | K(CA)   |             |                    |     |
| Control output                    | R          | Relay output                                  |             |                    |     |
|                                   | S          | SSR drive voltage output                      |             |                    |     |
| Power supply                      | 4          | 100-240VAC 50/60Hz                            |             |                    |     |
|                                   | B          | ON/OFF control & PID control combined         |             |                    |     |
| Control method                    | S          | DIN W48 x H48mm(8pin plug type) <sup>※1</sup> |             |                    |     |
|                                   | M          | DIN W72 x H72mm                               |             |                    |     |
|                                   | L          | DIN W96 x H96mm                               |             |                    |     |
| Size                              | M          | DIN W72 x H72mm                               |             |                    |     |
|                                   | L          | DIN W96 x H96mm                               |             |                    |     |
| Item                              | TA         | Analog setting type temperature controller    |             |                    |     |

※1: 8pin socket(PG-08, PS-08) is sold separately.

|     |                                  |
|-----|----------------------------------|
| (A) | Photo electric sensor            |
| (B) | Fiber optic sensor               |
| (C) | Door/Area sensor                 |
| (D) | Proximity sensor                 |
| (E) | Pressure sensor                  |
| (F) | Rotary encoder                   |
| (G) | Connector/Socket                 |
| (H) | Temp. controller                 |
| (I) | SSR/ Power controller            |
| (J) | Counter                          |
| (K) | Timer                            |
| (L) | Panel meter                      |
| (M) | Tacho/ Speed/ Pulse meter        |
| (N) | Display unit                     |
| (O) | Sensor controller                |
| (P) | Switching mode power supply      |
| (Q) | Stepper motor& Driver&Controller |
| (R) | Graphic/ Logic panel             |
| (S) | Field network device             |
| (T) | Software                         |
| (U) | Other                            |

# TA Series

## Specifications

| Series                         | TAS  | TAM  | TAL           |
|--------------------------------|--|--|---------------|
| Power supply                   | 100-240VAC 50/60Hz   |  |               |
| Allowable voltage range        | 90 to 110% of rated voltage  |  |               |
| Power consumption              | Max. 4VA   |  |               |
| Size                           | DIN W48×H48mm  | DIN W72×H72mm  | DIN W96×H96mm |
| Display method                 | Deviation LED(red, green), Output LED(red)   |  |               |
| Setting type                   | Dial setting   |  |               |
| Setting accuracy <sup>※1</sup> | F.S. ±2% (room temperature 23°C±5°C)   |  |               |
| Input type                     | RTD  | DPT100Ω (allowable line resistance max. 5Ω per a wire)                     |               |
|                                | Thermocouples  | K(CA), J(IC)   |               |
| Control                        | ON/OFF Control   | Hysteresis: 2°C fixed  |               |
|                                | PID Control  | Control period: Relay output - 20 sec. / SSR drive voltage output - 2 sec. |               |
| Control output                 | Relay  | 250VAC 3A 1c   |               |
|                                | SSR  | 12VDC±2V 20mA Max.   |               |
| Functions                      | PV deviation indicatable, Error indicatable  |  |               |
| Dielectric strength            | 2,000VAC 50/60Hz for 1min.(between input terminal and power terminal)                            |  |               |
| Vibration                      | 0.75mm amplitude at frequency of 5 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours |  |               |
| Relay life cycle               | Mechanical   | Min. 10,000,000 operations(18,000 operations/hr)                           |               |
|                                | Electrical   | Min. 100,000 operations(900 operations/hr)                                 |               |
| Insulation resistance          | Min. 100MΩ(at 500VDC megger)   |  |               |
| Noise resistance               | ±2kV R-phase, S-phase the square wave noise (pulse width: 1us) by the noise simulator            |  |               |
| Memory retention               | Approx. 10 years (when using non-volatile semiconductor memory type)                             |  |               |
| Environment                    | Ambient temperature  | -10 to 50°C, storage: -20 to 60°C  |               |
|                                | Ambient humidity   | 35 to 85%RH, storage: -35 to 85%RH   |               |
| Unit weight                    | Approx. 65g  | Approx. 378g   | Approx. 387g  |

※1: Out of room temperature range: Below 100°C model is F.S. ±4% , Over 100°C model is F.S. ±3%

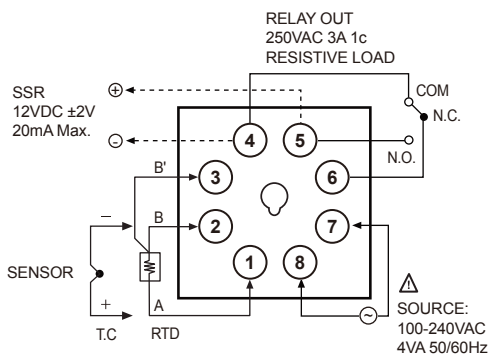
※Environment resistance is rated at no freezing or condensation.

## Connections

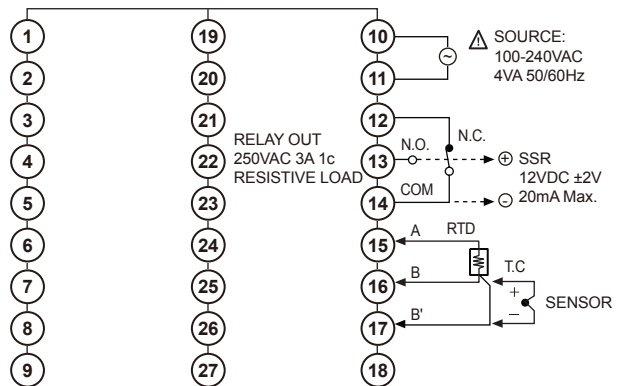
※RTD: DPT100Ω(3-wire type)    ※Thermocouple: K(CA), J(IC)

### ● TAS

(※Socket(PG-08, PS-08) is sold separately)



### ● TAM

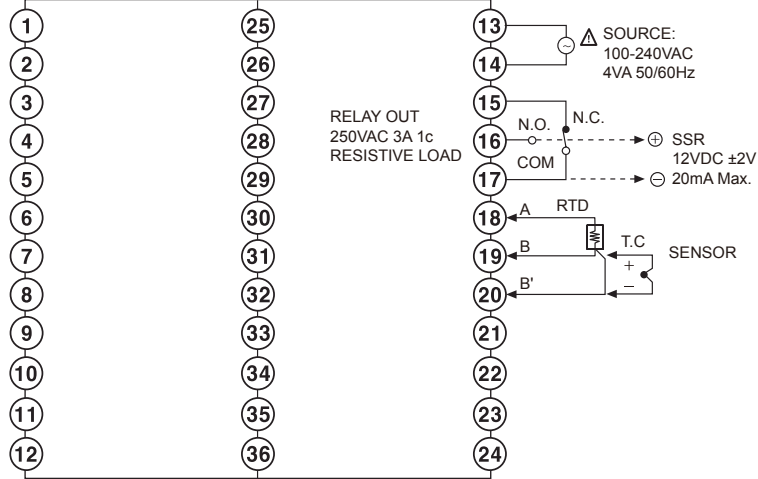


# Analog Setting Non-Indicating type, PID Control

## ■ Connections

※RTD: DP1100Ω (3-wire type) ※Thermocouple: K(CA), J(IC)

### ● TAL

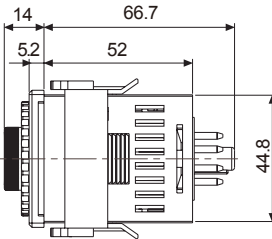
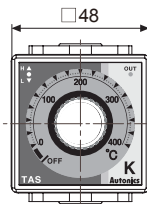
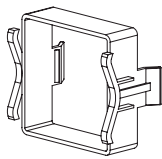


## ■ Dimensions

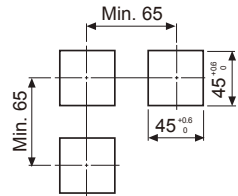
(unit: mm)

### ● TAS

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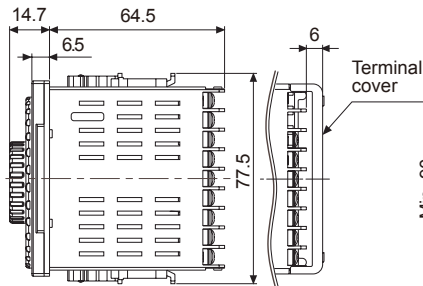
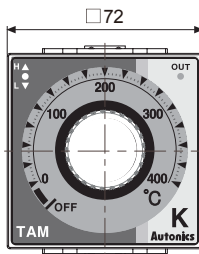
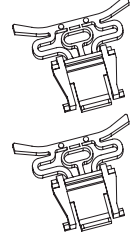


### ● Panel cut-out

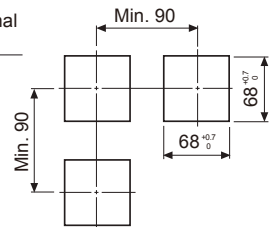


### ● TAM

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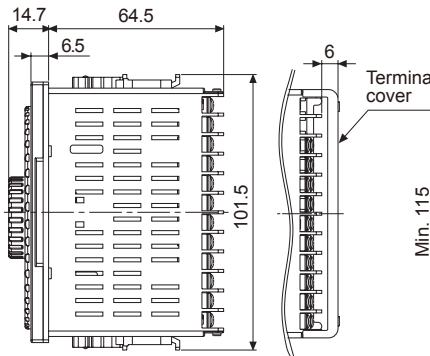
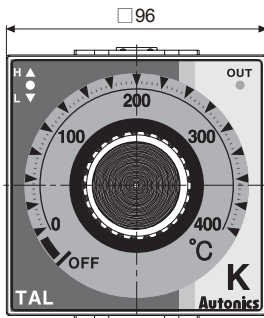
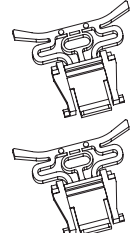


### ● Panel cut-out

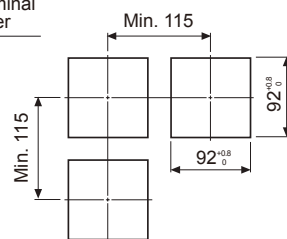


### ● TAL

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### ● Panel cut-out



(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/ Power controller

(J) Counter

(K) Timer

(L) Panel meter

(M) Tacho/ Speed/ Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching mode power supply

(Q) Stepper motor& Driver&Controller

(R) Graphic/ Logic panel

(S) Field network device

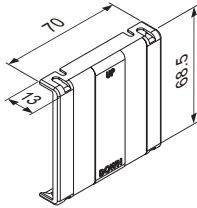
(T) Software

(U) Other

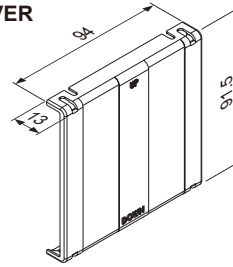
# TA Series

## ● Terminal cover(sold separately)

- RMA-COVER (72×72mm)

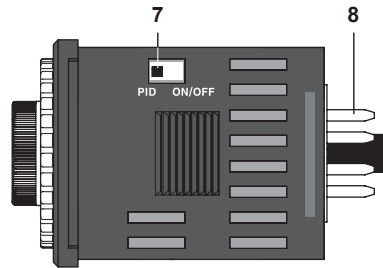
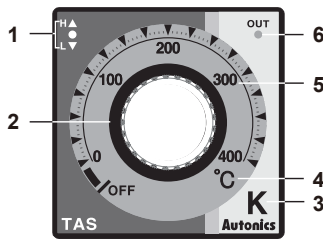


- RLA-COVER (96×96mm)



(unit: mm)

## ▣ Parts description



**1. Deviation indicator:** It shows deviation of present temperature(PV) based on set temperature(SV) by LED.  
Input deviation indicator [Deviation indicator: ● (green), ▲/▼ (red)]

| No | PV deviation temperature | Deviation indicator               | No | PV deviation temperature   | Deviation indicator             |
|----|--------------------------|-----------------------------------|----|----------------------------|---------------------------------|
| 1  | Input sensor OPEN        | ▲+●+▼ Lamp flash (every 0.5 sec.) | 5  | Below ±2°C                 | ● Lamp lights                   |
| 2  | Exceed max. input value  | ▲ Lamp flashes (every 0.5 sec.)   | 6  | -2°C to -10°C              | ●+▼ Lamp light                  |
| 3  | Over 10°C                | ▲ Lamp lights                     | 7  | Over -10°C                 | ▼ Lamp lights                   |
|    | 2°C to 10°C              | ▲+● Lamp light                    | 8  | Less than min. input value | ▼ Lamp flashes (every 0.5 sec.) |

※This is the same as Fahrenheit(°F).

※When power is on, all lamps light for 2sec., then all lamps turn off and control operation starts.

### 2. Set temperature(SV) dial:

Dial to change set temperature (SV). When changing set temperature, it is applied after 2 sec. for the stable input.

### 3. Input sensor type:

Indicates sensor type of present value. Input sensor type or input range each product is shown in the below table.

| Input sensor |         | Range No. | Temperature range (°C) | Temperature range (°F) |
|--------------|---------|-----------|------------------------|------------------------|
| Thermocouple | K(CA)   | 1         | 0 to 100               | 32 to 212              |
|              |         | 2         | 0 to 200               | 32 to 392              |
|              |         | 4         | 0 to 400               | 32 to 752              |
|              |         | 6         | 0 to 600               | 32 to 1,112            |
|              | J(IC)   | 8         | 0 to 800               | 32 to 1,472            |
|              |         | C         | 0 to 1,200             | 32 to 2,192            |
|              |         | 2         | 0 to 200               | 32 to 392              |
|              |         | 3         | 0 to 300               | 32 to 572              |
| RTD          | DPt100Ω | 4         | 0 to 400               | 32 to 752              |
|              |         | 0         | -50 to 100             | -58 to 212             |
|              |         | 1         | 0 to 100               | 32 to 212              |
|              |         | 2         | 0 to 200               | 32 to 392              |
|              |         | 4         | 0 to 400               | 32 to 752              |

※Set temperature within input range each sensor.

**4. Temperature unit indicator:** Indicates temperature unit(°C, °F) of set temperature(SV) and present value(PV).

**5. Temperature range indicator:** Indicates temperature range of set temperature(SV).

**6. Control output indicator lamp:** Light when control output(Relay output/SSR voltage output).

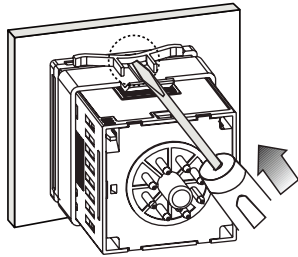
**7. Control mode selector switch:** Select PID control or ON/OFF control using switch.

**8. Terminal:** Terminals for external connections. For detail, refer to ▣ Connections.

# Analog Setting Non-Indicating type, PID Control

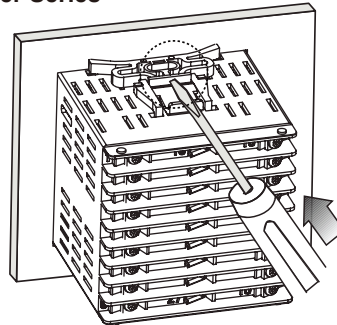
## Product mounting

### ● TAS(48×48mm) Series



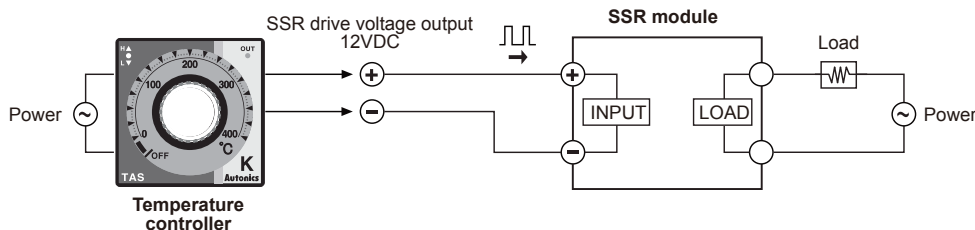
※Mount the product on the panel, fasten bracket by pushing with tools as shown above.

### ● Other Series



## Functions

### ● SSR drive voltage output

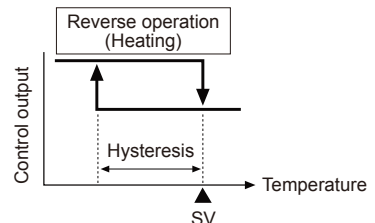


### ● ON/OFF control

ON/OFF control function is for controlling temperature by comparing present temperature(PV) to setting temperature(SV). ON/OFF control is fixed on reverse operation(Heating).

Output turns on to supply power to heater when present temperature(PV) falls lower than setting temperature(SV) and the output turns off to turn off heater when present temperature(PV) is higher than setting temperature(SV).

※Hysteresis is fixed 2°C during ON/OFF control.



### ● PID control

PID constants are suggested and implemented based on self tuning from supply power until reaching set temperature(SV), then self tuning is over after reaching set temperature(SV).

When power supply, in case that set temperature(SV) dial points at OFF or self tuning can not be started because present temperature (PV) is higher than set temperature(SV) or hunting occurs during self tuning, output control is switched to proportion band(P) because that is considered to error. At that time, proportion band is fixed at 10°C.

※Control cycle of PID control and proportion control is 20 sec. in relay output model and 2 sec. in SSR voltage output.

### ● STOP

Control output could stop without power off by setting the front setting volume to below min. setting range. If control output stops by STOP function, Green lamp in deviation indicator(●) will flash every 1sec.

### ● Error

Error mark will flash(every 1sec.) in PV indicator when error occurs during the control operation. It will operate normally, if input sensor is connected or returned to normal range.

| No | Display          | Description  |
|----|------------------|--|
| 1  | ▲+●+▼ Lamp flash | If input sensor line is broken or sensor is not connected. |
| 2  | ▲ Lamp flashes   | If measured sensor input is higher than temperature range. |
| 3  | ▼ Lamp flashes   | If measured sensor input is lower than temperature range.  |

(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

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