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 indicators
  : Deviation LED (red, green), output LED (red) indicators
- Dial setting output OFF function
- Sensor broken display function

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

CE c U us

◼ Ordering Information

TA	S	—	B	4	R	P	4	C

Unit	C	Celsius ℃			
	F	Fahrenheit ℉			

		℃	℉	Temperature sensor		
Temperature range for each sensor	0	-50 to 100	-58 to 212	DPt	—	—
	1	0 to 100	32 to 212	DPt	—	K (CA)
	2	0 to 200	32 to 392	DPt	J (IC)	K (CA)
	3	0 to 300	32 to 572	—	J (IC)	—
	4	0 to 400	32 to 752	DPt	J (IC)	K (CA)
	6	0 to 600	32 to 1,112	—	—	K (CA)
	8	0 to 800	32 to 1,472	—	—	K (CA)
	C	0 to 1,200	32 to 2,192	—	—	K (CA)

Sensor input type	P	DPt100Ω
	J	J (IC)
	K	K (CA)
Control output	R	Relay output
	S	SSR drive output
Power supply	4	100-240VAC 50/60Hz
Control method	B	ON/OFF control & PID control combined
Size	S	DIN W48 x H48mm (8-pin plug type)[1]
	M	DIN W72 x H72mm
	L	DIN W96 x H96mm
Item	TA	Analog setting type temperature controller

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

Autonics

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 [1]		F.S. ±2% (room temperature 23℃±5℃)		
Input type	RTD	DPt100Ω (allowable line resistance max. 5Ω per a wire)		
	Thermocouples	K (CA), J (IC)		
Control	ON/OFF Control	Hysteresis: 2℃ fixed		
	PID Control	Control period: Relay output - 20 sec. / SSR drive 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 X, Y, Z direction 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℃, storage: -20 to 60℃		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Insulation type		Double insulation or reinforced insulation (mark: ▣, dielectric strength between the measuring input part and the power part: 2kV)		
Approval		CE cᴿᵁus		
Weight [2]		Approx. 112g (approx. 74g)	Approx. 176g (approx. 114g)	Approx. 237g (approx. 152g)

※1: Out of room temperature range: Below 100℃ model is F.S. ±4% , Over 100℃ model is F.S. ±3%
※2: The weight includes packaging. The weight in parentheses is for unit only.
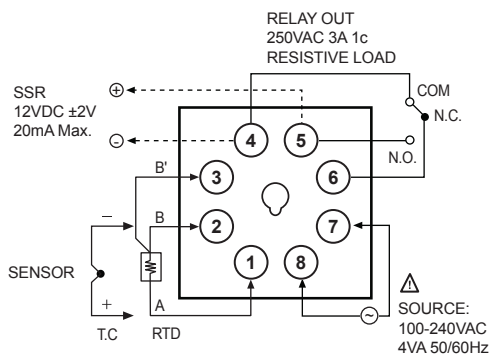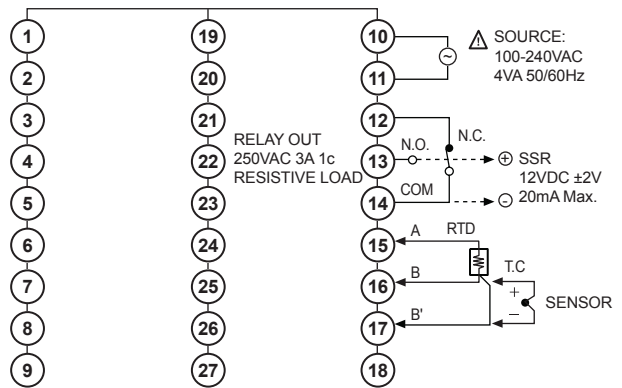※Environment resistance is rated at no freezing or condensation.

■ Connections ※RTD: DPt100Ω (3-wire type)   ※Thermocouple: K (CA), J (IC)

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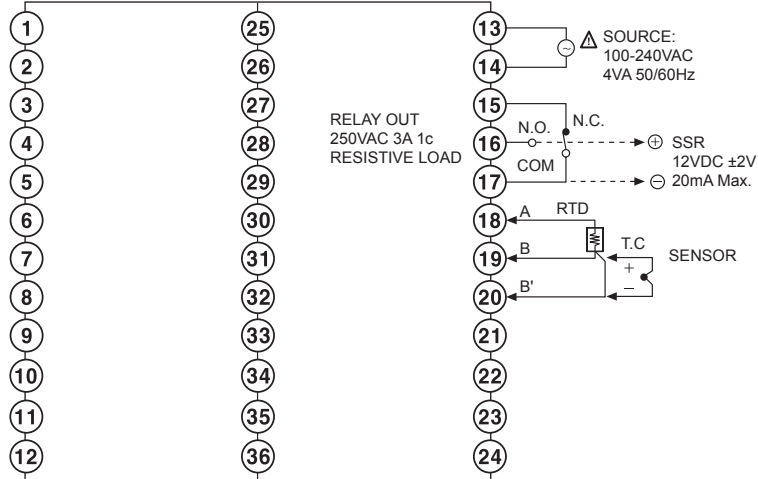(※Socket (PG-08, PS-08 (N)) is sold separately)

● TAM

Analog Setting Non-Indicating Type, PID Control

■ Connections

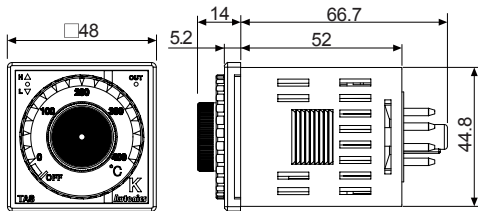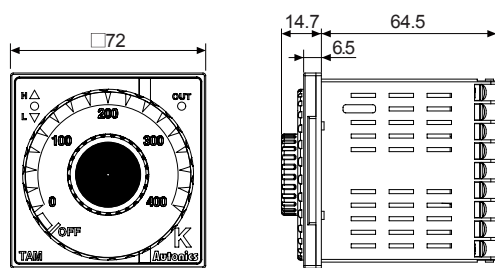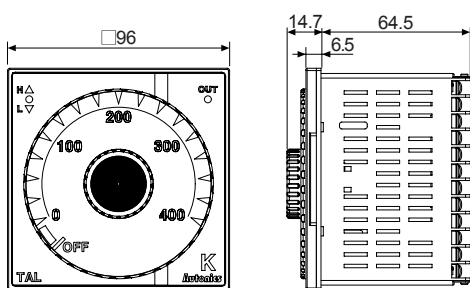※RTD: DPt100Ω (3-wire type)　※Thermocouple: K (CA), J (IC)

● TAL

RELAY OUT 250VAC 3A 1c RESISTIVE LOAD

⚠ SOURCE: 100-240VAC 4VA 50/60Hz

N.O.　N.C.
16 — COM
→ ⊕ SSR 12VDC ±2V
→ ⊖ 20mA Max.

18 A — RTD
19 B
20 B'
T.C — SENSOR + −

■ Dimensions

(unit: mm)

● TAS

● TAM

● TAL

● Panel cut-out
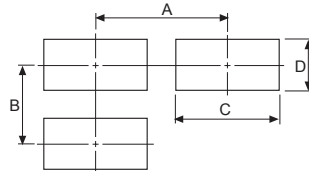
Series	Size A	B	C	D
TAS	Min. 65	Min. 65	$45^{+0.6}_{0}$	$45^{+0.6}_{0}$
TAM	Min. 90	Min. 90	$68^{+0.7}_{0}$	$68^{+0.7}_{0}$
TAL	Min. 115	Min. 115	$92^{+0.8}_{0}$	$92^{+0.8}_{0}$

● Bracket

• TAS
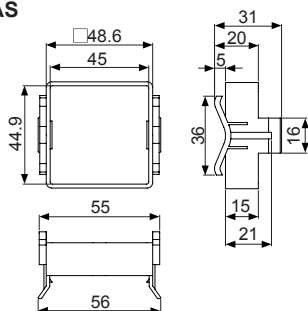
• TAM, TAL
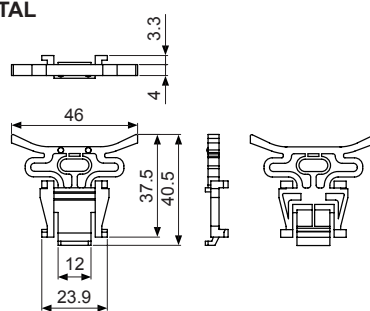
TA Series

● **Terminal cover (sold separately)**
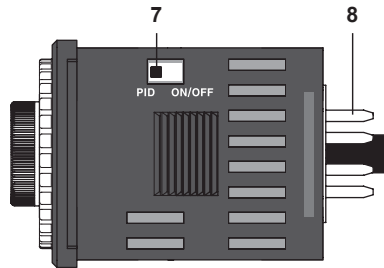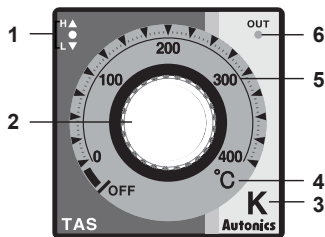
(unit: mm)
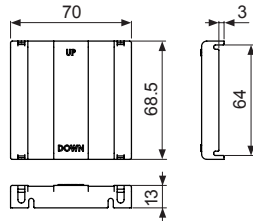
● **RMA-COVER**
(72×72mm)
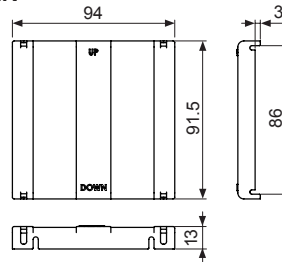
● **RLA-COVER**
(96×96mm)

▣ Unit 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)]

PV deviation temperature	Deviation indicator		PV deviation temperature	Deviation indicator	
Input sensor OPEN	▲+●+▼	indicators flash (every 0.5 sec.)	Less than or equal to ±2℃	●	indicator turns ON
Exceed max. input value	▲	indicator flashes (every 0.5 sec.)	More than -2℃ to less than or equal to -10℃	●+▼	indicators turn ON
More than 10℃	▲	indicator turns ON	More than -10℃	▼	indicator turns ON
More than 2℃ to less than or equal to 10℃	▲+●	indicators turn ON	Less than min. input value	▼	indicator flashes (every 0.5 sec.)

※This is the same as Fahrenheit (℉).
※**When power is on, all indicators light for 2 sec., then all indicators 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 (℃)	Temperature range (℉)
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
		8	0 to 800	32 to 1,472
		C	0 to 1,200	32 to 2,192
	J (IC)	2	0 to 200	32 to 392
		3	0 to 300	32 to 572
		4	0 to 400	32 to 752
RTD	DPt100Ω	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: Indicates temperature unit (℃, ℉) of set temperature (SV) and present value (PV).

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

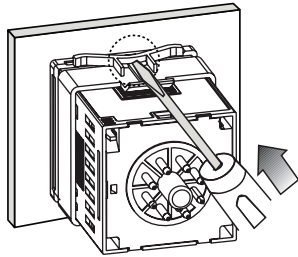**6. Control output indicator:** Turns ON when control output (Relay output/SSR drive output).

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

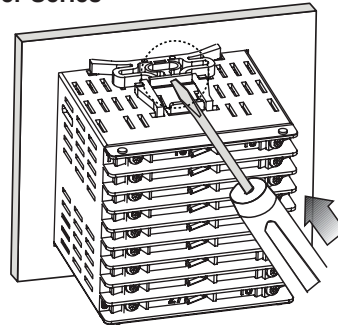**8. Terminal:** Terminals for external connections. For detail, refer to ▣ Connections.

Analog Setting Non-Indicating Type, PID Control

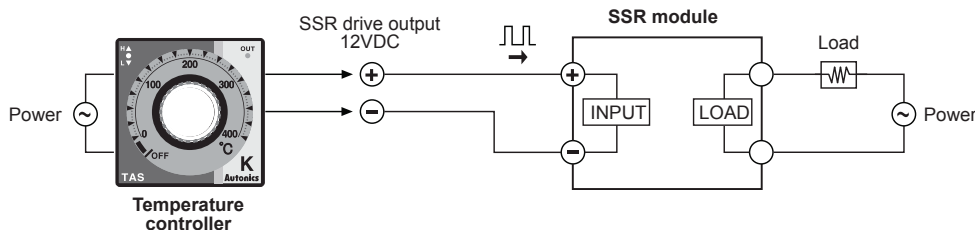## ◼ Mounting

● **TAS (48×48mm) Series**

● **Other Series**

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

◼ Functions

● **SSR drive 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 then setting temperature (SV).

※Hysteresis is fixed 2℃ during ON/OFF control.
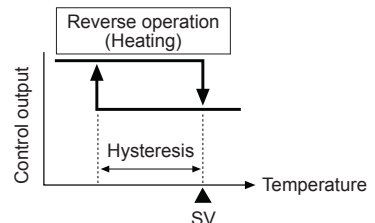
● **PID control**

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℃.

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

● **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 indicator in deviation indicator (●) will flash every 1 sec.

● **Error**

Error mark will flash (every 1 sec.) 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	▲＋●＋▼	indicators flash	If input sensor line is broken or sensor is not connected.
2	▲	indicator flashes	If measured sensor input is higher than temperature range.
3	▼	indicator flashes	If measured sensor input is lower than temperature range.