Analog Non-Indication Type PID Temperature Controllers

TA Series

INSTRUCTION MANUAL

TCD230033AA

Autonics

Thank you for choosing our Autonics product.
Read and understand the instruction manual and manual thoroughly before using the product.
For your safety, read and follow the below safety considerations before using.
For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
Keep this instruction manual in a place where you can find easily.
The specifications, dimensions, etc are subject to change without notice for product improvement Some models may be discontinued without notice.
Follow Autonics website for the latest information.

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death

01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.(e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in personal injury, economic loss or fire.
02. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.
Failure to follow this instruction may result in explosion or fire.
03. Install on a device panel to use.
Failure to follow this instruction may result in electric shock.
04. Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire or electric shock.
05. Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.
06. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire or electric shock.

⚠ Caution Failure to follow instructions may result in injury or product damage

01. When connecting the power input and relay output, use AWG 20 (0.50 mm^2) cable or over and tighten the terminal screw with a tightening torque of 0.74 to 0.90 N·m. When connecting the sensor input and communication cable without dedicated cable, use AWG 28 to 16 cable and tighten the terminal screw with a tightening torque of 0.74 to 0.90 N·m.
Failure to follow this instruction may result in fire or malfunction due to contact failure.
02. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage
03. Use a dry cloth to clean the unit, and do not use water or organic solvent.
Failure to follow this instruction may result in fire or electric shock.
04. Keep the product away from metal chip, dust, and wire residue which flow into the unit.
Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Check the polarity of the terminals before wiring the temperature sensor. For RTD temperature sensor, wire it as 3-wire type, using cables in same thickness and length. For thermocouple (TC) temperature sensor, use the designated compensation wire for extending wire.
- Keep away from high voltage lines or power lines to prevent inductive noise. In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line. Do not use near the equipment which generates strong magnetic force or high frequency noise.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Do not use the unit for other purpose (e.g. voltmeter, ammeter), but temperature controller.
- Make a required space around the unit for radiation of heat. For accurate temperature measurement, warm up the unit over 20 min after turning on the power.
- Make sure that power supply voltage reaches to the rated voltage within 2 sec after supplying power.
- Do not wire to terminals which are not used.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude Max. 2,000 m
  - Pollution degree 2
  - Installation category II

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website .

T A ❶ - ❷ ❸ ❹ ❺ ❻ ❼

❶ Size
S: DIN W 48 × H 48 mm (8 pin plug type)
M: DIN W 72 × H 72 mm
L: DIN W 96 × H 96 mm

❷ Control method
B: ON/OFF / Proportional

❸ Power supply
4: 100-240 VAC~

❹ Control output
R: Relay
S: SSR drive

❺ Input sensor
K: K(CA)
J: J(IC)
P: DPt100 Ω

❻ Temperature range for each sensor
Refer to 'Input Type and Using Range'.

❼ Temperature unit
C: Celsius (°C)
F: Fahrenheit (°F)

Input Type and Using Range

PN	Input type		Using range (°C)	Using range (°F)
1	Thermocouple	K(CA)	0 ~ 100	32 ~ 212
2			0 ~ 200	32 ~ 392
4			0 ~ 400	32 ~ 752
6			0 ~ 600	32 ~ 1,112
8			0 ~ 800	32 ~ 1,472
C			0 ~ 1,200	32 ~ 2,192
2		J(IC)	0 ~ 200	32 ~ 392
3			0 ~ 300	32 ~ 572
4			0 ~ 400	32 ~ 752
0	RTD	DPt100Ω	-50 ~ 100	-58 ~ 212
1			0 ~ 100	32 ~ 212
2			0 ~ 200	32 ~ 392
4			0 ~ 400	32 ~ 752

Product Components

- Product (+ bracket)
- Instruction manual

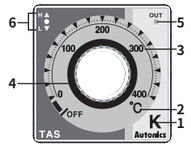
Sold Separately

- 8-pin controller socket: PG-08, PS-08(N)
- Terminal protection cover: RMA / RLA-COVER

Specifications

Series		TA Series
Power supply		100 - 240 VAC~ 50/60 Hz
Permissible voltage range		90 to 110 % of rated voltage
Power consumption		≤ 4 VA
Sampling period		100 ms
Input specification		• RTD: DPt100Ω (allowable line resistance per a wire: ≤5 Ω) • Thermocouple: K (CA), J (IC)
Control output	Relay	250 VAC~ 3 A, 30 VDC⎓ 1 A 1c
	SSR	12 VDC⎓ ±2 V, ≤ 20 mA
Display type		PV deviation, Error display (red, green), LED type
Setting method		Front dial
Setting accuracy		• At room temperature (23 °C ±5 °C) Over 100 °C model: F.S.±2%, below 100 °C model: F.S.±3% • Out of room temperature range Over 100 °C model: F.S.±3%, below 100 °C model: F.S.±4%
Control type	ON/OFF	Hysteresis: 2°C (fixed)
	PID Control	Control cycle: relay output 20 sec / SSR drive output 2 sec
Relay life cycle	Mechanical	≥ 10,000,000 operations (18,000 operations/time)
	Electrical	≥ 100,000 operations (900 operations/time)
Dielectric strength		Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours
Insulation resistance		≥ 100 MΩ (500 VDC⎓ megger)
Noise immunity		Square shaped noise (pulse width: 1 μs) by noise simulator ±2 kV R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Insulation type		Double or reinforced insulation (mark: ⊟, dielectric strength between the measuring input part and the power part: 2 kV)
Certification		CE UKCA cULus EAC
Unit weight (packaged)		• TAS: ≈ 69 g (≈ 107 g) • TAL: ≈ 147 g (≈ 232 g) • TAM: ≈ 109 g (≈ 171 g)

Unit Descriptions



1. Input type of sensor
Temperature can be set within the input range of sensor. Refer to 'Input Type and Using Range'.
2. Temperature unit display
3. Temperature range display
4. SV (setting value) dial
When changing SV, it is applied after 2 sec for the stable input.
5. Control output Indicator (OUT)
Turns ON when control output is ON (relay /SSR drive).
6. Deviation indicator
Displays deviation of PV (present value) based on SV.

Condition	▲ (Red)	● (Green)	▼ (Red)
Over 10 °C	ON	-	-
2 to 10 °C	ON	ON	-
Under ±2 °C (control output stop)	-	ON	-
-2 to -10 °C	-	ON	ON
Over -10 °C	-	-	ON

7. Control type selection switch
Select PID control (front part) or ON/OFF control (rear part) using switch.

TAS	Right side relative to front	PID ON/OFF
TAM TAL	Left side relative to the front	ON/OFF PID

Initial Display When Power is ON

When power is supplied, all indicators are turned ON for 2 sec. After turn OFF, it returns to RUN mode.

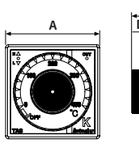
Errors

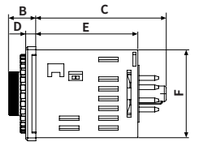
Indicator	Description	Troubleshooting
▲ + ● + ▼	Flashes when input sensor is disconnected or sensor is not connected.	Check input sensor status.
▲	Flashes when PV is higher than input range.[01]	When input is within the rated input range, this display disappears.
▼	Flashes when PV is lower than input range.[01]	

01) Be careful that when ▲ / ▼ error occurs, the control output may occur by recognizing the maximum or minimum input depending on the control type.

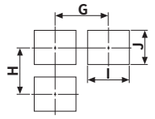
Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.





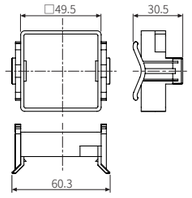
■ Panel cut-out



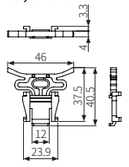
Series	Body						Panel cut-out			
	A	B	C	D	E	F	G	H	I	J
TAS	□48	14	66.7	5.2	52	44.8	≥ 65	≥ 65	$45^{+0.6}_{0}$	$45^{+0.6}_{0}$
TAM	□72	14.7	64.5	6.5	-	-	≥ 90	≥ 90	$68^{+0.7}_{0}$	$68^{+0.7}_{0}$
TAL	□96	14.7	64.5	6.5	-	-	≥ 115	≥ 115	$92^{+0.8}_{0}$	$92^{+0.8}_{0}$

■ Bracket

TAS Series

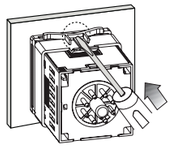


TAM, TAL Series

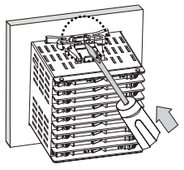


Installation Method

■ TAS Series



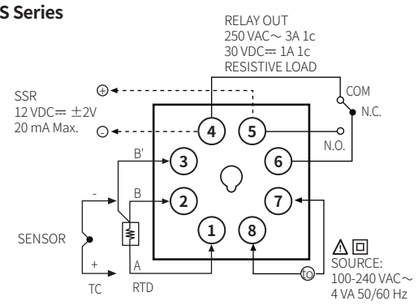
■ Other series



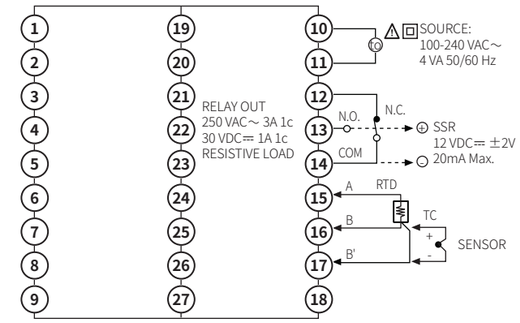
Insert the unit into a panel, fasten the bracket by pushing with a flathead screwdriver.

Connections

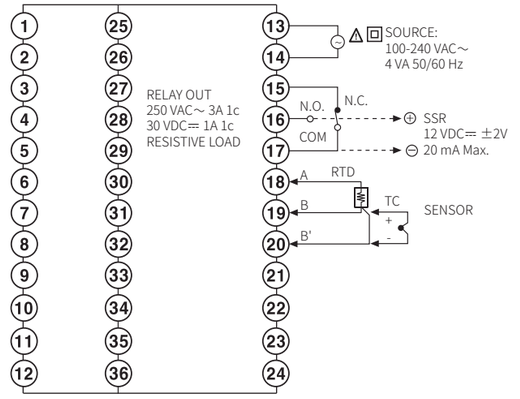
■ TAS Series



■ TAM Series

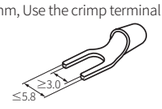


■ TAL Series

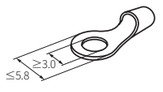


Crimp Terminal Specifications

- Unit: mm, Use the crimp terminal of follow shape.



Fork crimp terminal



Round crimp terminal

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