

# T3S/ T3H/ T4M/ T4L

## Digital switch setting type

### ■ Features

- Various size by DIN specification  
(W48×H48, W48×H96, W72×H72, W96×H96mm)
- Accuracy: F.S. ±0.5%(Except T3S)
- Free power: T3S Series



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

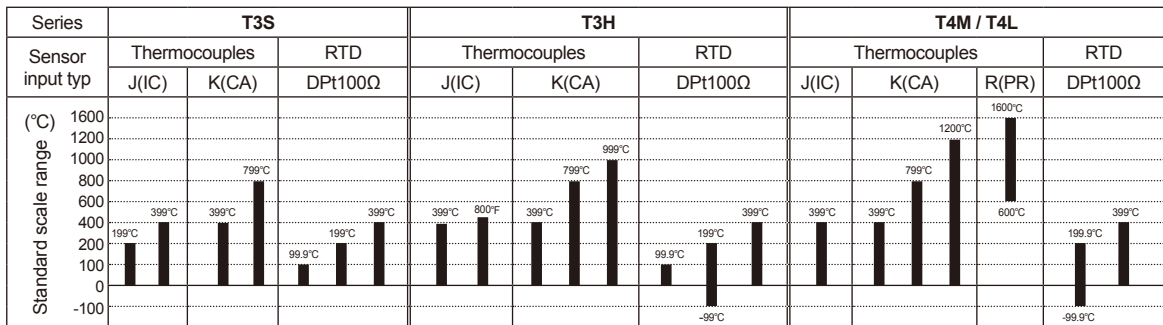
### ■ Ordering information

**T 3 S - B 4 R P 4 C**

|                |                          |                        |   |   |   |   |   |   |   |                   |             |                            |
|----------------|--------------------------|------------------------|---|---|---|---|---|---|---|-------------------|-------------|----------------------------|
| T              | 3                        | S                      | - | B | 4 | R | P | 4 | C | Unit              | C           | °C                         |
|                |                          |                        |   |   |   |   |   |   |   | F                 | °F          |                            |
|                |                          |                        |   |   |   |   |   |   |   | Temperature range | 0           | -99 to 199, -99.9 to 199.9 |
|                |                          |                        |   |   |   |   |   |   |   | 1                 | 0 to 99.9   |                            |
|                |                          |                        |   |   |   |   |   |   |   | 2                 | 0 to 199    |                            |
|                |                          |                        |   |   |   |   |   |   |   | 4                 | 0 to 399    |                            |
|                |                          |                        |   |   |   |   |   |   |   | 8                 | 0 to 799    |                            |
|                |                          |                        |   |   |   |   |   |   |   | A                 | 0 to 999    |                            |
|                |                          |                        |   |   |   |   |   |   |   | C                 | 0 to 1200   |                            |
|                |                          |                        |   |   |   |   |   |   |   | F                 | 600 to 1600 |                            |
|                |                          |                        |   |   |   |   |   |   |   | Sensor input type | P           | DPT100Ω                    |
|                |                          |                        |   |   |   |   |   |   |   | J                 | J(IC)       |                            |
|                |                          |                        |   |   |   |   |   |   |   | K                 | K(CA)       |                            |
| R              | R(PR)                    |                        |   |   |   |   |   |   |   |                   |             |                            |
| Control output | R                        | Relay output           |   |   |   |   |   |   |   |                   |             |                            |
| S              | SSR drive voltage output |                        |   |   |   |   |   |   |   |                   |             |                            |
| C              | Current output(DC4-20mA) |                        |   |   |   |   |   |   |   |                   |             |                            |
| Power supply   | 3                        | 110/220VAC 50/60Hz     |   |   |   |   |   |   |   |                   |             |                            |
| 4              | 100-240VAC 50/60Hz       |                        |   |   |   |   |   |   |   |                   |             |                            |
| Control method | B                        | ON/OFF, P control      |   |   |   |   |   |   |   |                   |             |                            |
| Size           | S                        | DIN W48×H48mm          |   |   |   |   |   |   |   |                   |             |                            |
| H              | DIN W48×H96mm            |                        |   |   |   |   |   |   |   |                   |             |                            |
| M              | DIN W72×H72mm            |                        |   |   |   |   |   |   |   |                   |             |                            |
| L              | DIN W96×H96mm            |                        |   |   |   |   |   |   |   |                   |             |                            |
| Digit          | 3                        | 999(3digit)            |   |   |   |   |   |   |   |                   |             |                            |
| 4              | 9999(4digit)             |                        |   |   |   |   |   |   |   |                   |             |                            |
| Item           | T                        | Temperature Controller |   |   |   |   |   |   |   |                   |             |                            |

※Refer to the H-89 about sensor temperature range for selection.

## Temperature range for each sensor



※In case input sensor is R(PR) type, it is not available to perform correct control under 600°C.

## Specifications

| Series                  | T3S   | T3H  | T4M  | T4L   |
|-------------------------|---|--|--|---|
| Power supply            | 100-240VAC 50/60Hz  |  | 110/220VAC 50/60Hz   |   |
| Allowable voltage range | 90 to 110% of power supply  |  |  |   |
| Power consumption       | Max. 5VA  |  | Max. 3VA   |   |
| Display method          | 7 Segment(red) LED method   |  |  |   |
| Character size(W×H)     | 4.0×8.0mm   |  | 6.0×10.0mm   | 7.2×9.8mm<br>9.5×14.2mm   |
| Display accuracy        | F.S. ±1% rdg ±1digit  |  | F.S. ±0.5% rdg ±1digit   |   |
| Setting type            | Digital setting   |  |  |   |
| Setting accuracy        | F.S. ±1%  |  | F.S. ±0.5%   |   |
| Sensor input            | Thermocouples: K(CA), J(IC), R(PR) / RTD: DPT100Ω<br>※There is no R(PR) in T3S, T3H Series.   |  |  |   |
| Input line resistance   | Thermocouples: Max. 100Ω / RTD: Allowable line resistance max. 5Ω per a wire  |  |  |   |
| Control method          | ON/OFF control  | Hysteresis: F.S. 0.5% ±0.2% fixed  |  | Hysteresis: F.S. 0.2 to 3% variable                             |
|                         | P control   | Proportional band: F.S. ±3% fixed<br>Period: 20sec. fixed  |  | Proportional band: F.S. 1 to 10% variable, Period: 20sec. fixed |
| RESET adjuster range    | F.S. ±3% variable(revision of control deviation)  |  |  |   |
| Control output          | <ul style="list-style-type: none"> <li>Relay output : 250VAC 2A 1c</li> <li>SSR drive voltage output : 12VDC ±3V 20mA Max.</li> <li>Current output : DC4-20mA (load 600Ω Max.)</li> </ul> |  | <ul style="list-style-type: none"> <li>Relay output: 250VAC 3A 1c</li> <li>SSR output: 24VDC ±3V 20mA Max.</li> <li>Current output: DC4-20mA (load 600Ω Max.)</li> </ul> |   |
| Self-diagnosis          | Built-in burn out function (cut off output when sensor is disconnected)   |  |  |   |
| Insulation resistance   | Min. 100MΩ (at 500VDC megger)   |  |  |   |
| Dielectric strength     | 2,000VAC 50/60Hz for 1 min.   |  |  |   |
| Noise resistance        | ±1kV the square wave noise(pulse width: 1μs) by the noise simulator   |  |  |   |
| Vibration               | Mechanical  | 0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour |  |   |
|                         | Malfunction   | 0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min. |  |   |
| Shock                   | Mechanical  | 300m/s²(approx. 30G) in each of X, Y, Z directions for 3 times                                   |  |   |
|                         | Malfunction   | 100m/s²(approx. 10G) in each of X, Y, Z directions for 3 times                                   |  |   |
| Relay life cycle        | Mechanical  | Min. 10,000,000 operations   |  |   |
|                         | Electrical  | Min. 100,000 operations(250VAC 3A at resistive load)   |  |   |
| Environment             | Ambient temperature   | -10 to 50°C, storage:-25 to 65°C   |  |   |
|                         | Ambient humidity  | 35 to 85%RH, storage: 35 to 85%RH  |  |   |
| Unit weight             | Approx. 196g  | Approx. 496g   | Approx. 399g   | Approx. 468g  |

※F.S. is same with sensor measuring temperature range.

Ex) In case of measurement temperature range is from -99.9 to 199.9°C, Full scale is 299.8.

※Environment resistance is rated at no freezing or condensation.

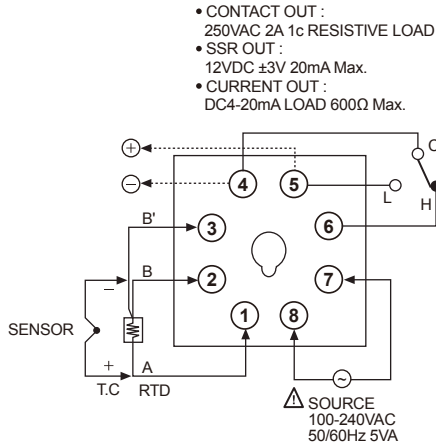
(A) Photo electric sensor  
(B) Fiber optic sensor  
(C) Door/Area sensor  
(D) Proximity sensor  
(E) Pressure sensor  
(F) Rotary encoder  
(G) Connector/Socket  
(H) Temp. controller  
(I) SSR/Power controller  
(J) Counter  
(K) Timer  
(L) Panel meter  
(M) Tacho/Speed/Pulse meter  
(N) Display 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

# T3S/ T3H/ T4M/ T4L

## Connections

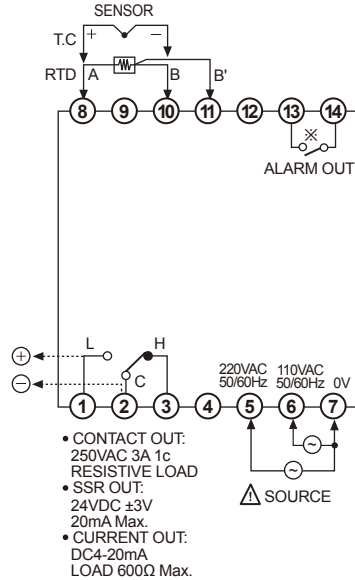
※RTD: DPT100Ω (3-wire type) ※Thermocouple: K, J, R

### ● T3S

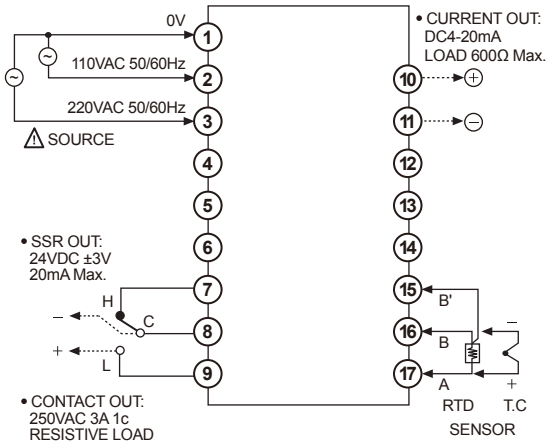


### ● T4M

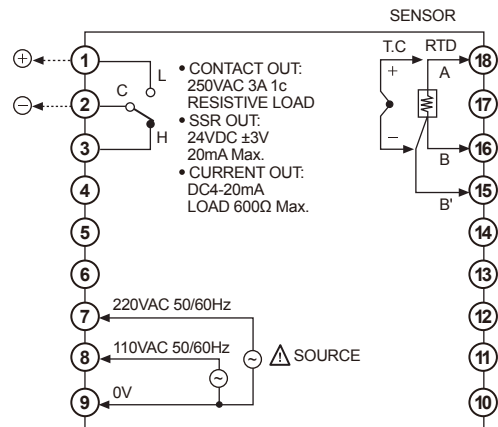
※Although T4M has an alarm terminal, it does not work since it uses the same case with T4MA.



### ● T3H



### ● T4L

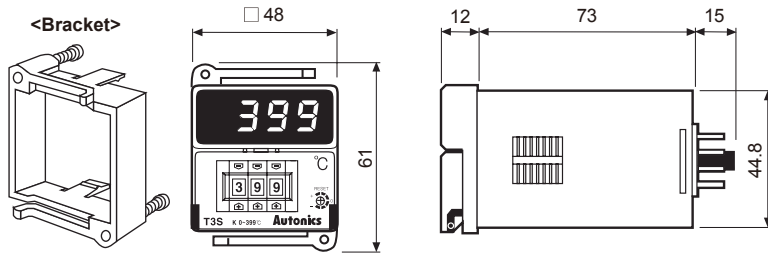


# Standard type

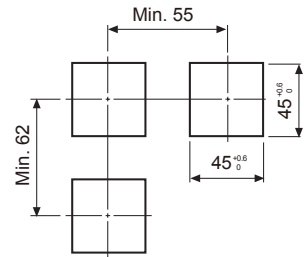
## ■ Dimensions

(unit: mm)

### ● T3S

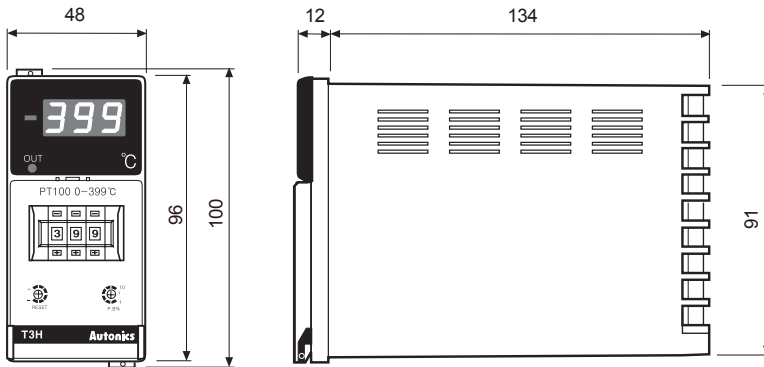


### ● Panel cut-out

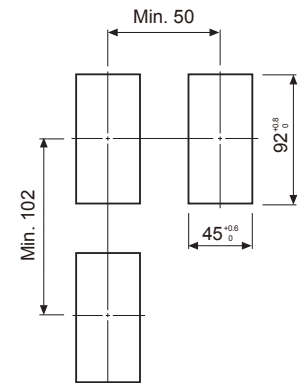


※Socket: PG-08, PS-08(sold separately)

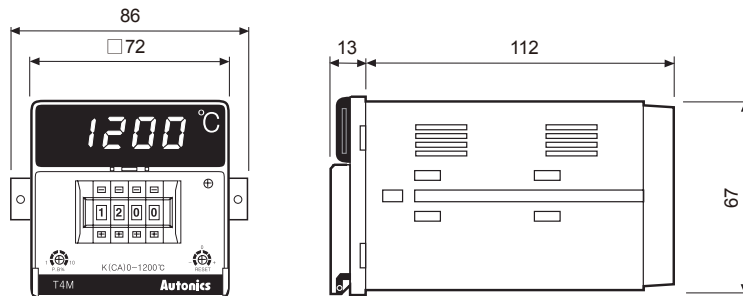
### ● T3H



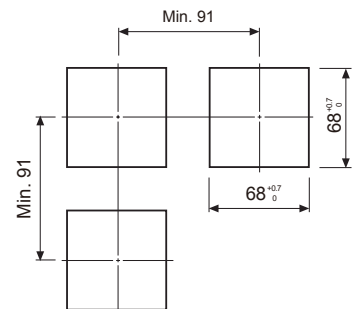
### ● Panel cut-out



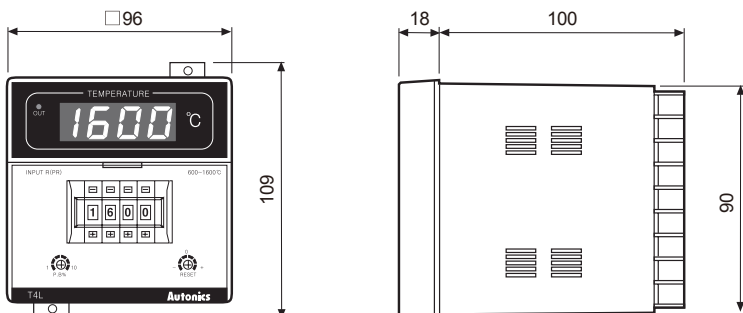
### ● T4M



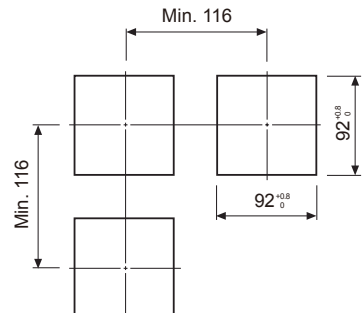
### ● Panel cut-out



### ● T4L



### ● Panel cut-out

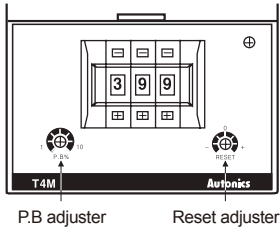


|     |                                  |
|-----|----------------------------------|
| (A) | Photo electric sensor            |
| (B) | Fiber optic sensor               |
| (C) | Door/Area sensor                 |
| (D) | Proximity sensor                 |
| (E) | Pressure sensor                  |
| (F) | Rotary encoder                   |
| (G) | Connector/Socket                 |
| (H) | Temp. controller                 |
| (I) | SSR/Power controller             |
| (J) | Counter                          |
| (K) | Timer                            |
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| (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                            |

# T3S/ T3H/ T4M/ T4L

## ■ Proper usage

### ◎ Using front adjuster

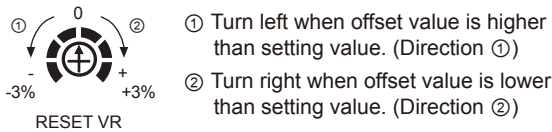


#### ● P.B adjuster

In case of ON/OFF control, set variable F.S. 0.2 to 3% of hysteresis and in case of P control, set variable F.S. 1 to 10% of hysteresis. However, hysteresis(F.S. 0.5%  $\pm$ 0.2%) and proportional band(F.S.  $\pm$ 3%) are fixed in T3S.

#### ● Reset adjuster

It corrects offset can be occurred by P control and has F.S.  $\pm$ 3% of adjustable range. Do not operate the adjuster when it is used as ON/OFF control.

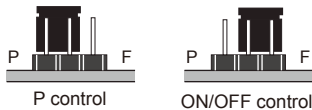


### ◎ Normal/Reverse operation

Reverse operation executes to output ON when process value is lower than setting value and it is used for heating. Normal operation runs conversely and is executed for cooling. (This item runs as a reverse operation)

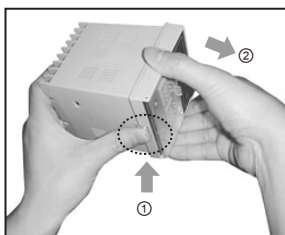
### ◎ How to select control mode

Factory specification is P control. When using ON/OFF control, transfer the switch of control method from P to F after detaching the case from its body. When control output is current output, P control is fixed, there is no switch Pin of control method.



### ◎ Case detachment

#### ● T4/T3H



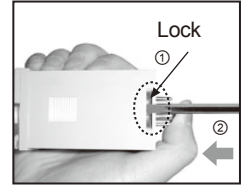
Pressing the front guide of Lock toward ① and squeeze and pull toward ②, it is detached.

#### ● T4M



Open the front guide, turn it toward ① and pull toward ②, it is detached.

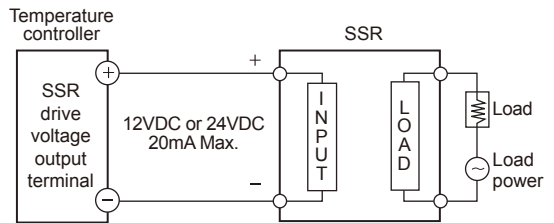
#### ● T3S



Pressing pin plug ①, raise it up with a driver as ② and it is detached.

### ◎ Application of temperature controller and load connection

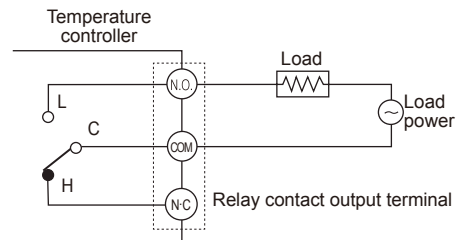
#### ● SSR drive voltage output connection



※When using voltage(for driving SSR) in the other purposes, do not over the range of the rated current.

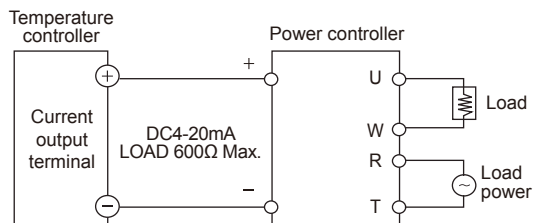
※Please aware that each Series has different voltage(for driving SSR).

#### ● Relay output connection



※Be aware that each model has different contact capacity of relay. When load capacity is high, please use sub relay, which has high contact capacity.

#### ● Current output connection



※The current value of DC4-20mA is available at lower than 600Ω of resistive load.

※Refer to the H-141 page for caution for using and simple error diagnosis.