# TMP-SERIES

**DIGITAL TEMPERATURE CONTROLLER PID CONTROL FUNCTION**

PRIMUS

TMP-72

TMP-94

TMP-48

TMP-95

TMP-96

## SPECIFICATION

| Power Supply | | 100-250VAC |
|---|---|---|
| | | 10-24 VAC/VDC |
| Power Consumption | | 3 VA |
| Display | Process Value (PV) | 7-Segment 0.56 Inch 4 Digit |
| | Setting Value (SV) | 7-Segment 0.39 Inch 4 Digit |
| | Output & Alarm | 9 LED |
| Input | Thermocouple | K, J, R, T, N, S, E |
| | RTD | PT100 |
| | DC Current | 4-20 mA |
| | DC Voltage | 0-10 VDC , 0-100 mV |
| | Accuracy | ± 0.25 % FSR @ 25 ˚C |
| | Sampling Time | 0.5 Sec |
| Output | Relay | 5 A, 250 V, SPDT |
| | Alarm Relay | 3 A, 250 V, SPST |
| | SSD Driver | 0-10 VDC   Minimum 600Ω |
| | Voltage | 0-10 VDC   Minimum 1 KΩ |
| | Current | 4-20 mA.   Maximum 500Ω |
| Function Control | PID | ON/OFF |
| | Heating/Cooling | ON/OFF |
| | Cycle Time | 1 - 120 Sec. |
| | Hysteresis | 0 - 100 Fullscale |
| | Heater Break | 1- 30A AC |
| Communication | Protocol | MODBUS RTU |
| | Baud Rate | 1200, 2400, 4800, 9600, 19200 38400, 57600 |
| | Parity | None, Even, Odd |
| | Data Bit | 8 bit |
| | Stop Bit | 1, 2 |
| | Support Device Node | 127 |
| Ambient Operation | Temperature | -20 ˚C to 60 ˚C |
| | Humidity | <85% RH Non-Condensing |
| Ambient Storage | Temperature | -20 ˚C to 60 ˚C |
| | Humidity | <85% RH Non-Condensing |
| Protection Degree | Front Protection Rating | IP52 |
| | Case Protection Rating | IP30 |
| Installation | | Panel Mountng |
| Material | | ABS-V0 |
| Size/Weight | | Dimension Table. |

## DESCRIPTION

● TMP-Series is digital temperature or control controller shows 7-Segment 4 Digits.

● Receive Thermocouple, PT100, 4-20mA, 0-10 VDC input.

● ON/OFF, P, PD, PID Auto Tuning Control function.

● Relay, SSR 0-10 VDC, 4-20 mA, 0-10 VDC output.

● RS-485 Communication MODBUS RTU Protocol.

● Auto Tuning calculate PID automatic.

● Bar graph show % Output.

● Heater break function.

● Can choose Output to operate in Heating and Cooling mode.

## OPERATION

TMP-Series is digital temperature and process controller that can receive Input signal both thermocouple, PT100, 4-20 mA and 0-10 VDC by Thermocouple and PT100 can choose type K,J, R, T, N, S, E, PT100 and 0-100 mV by pressing Keypad Switch can control Heating system  is Output will be ON when value from measure lower than Setpoint or Cooling system is output will ON when value from measure more than Setpoint value. Controlling can choose ON/OFF, P, PD and PID which TMP-Series can calculate PID value by itself by pressing Auto Tuning device will leard system and set PID automatic it made system controlling has stability as require. ON/OFF control can set Hysterisis 0-100% Full Scale to define the time gap between ON and OFF.

TMP-Series can choose model that has 2 Output are Output 1 will has duty to be Heating and Output 2 will be Cooling by reference same Setpoint for more stable controlling such as Output 1 control Heater for heating and Output 2 control fan for heat ventilation except TMP-48 (48x48 mm.) no Output 2.

Heater Break is Heater break checking function by there are CT lasso at heater wire to measure current in case that no current flows through means Heater break and Alarm Heater Break will operate which made user knows heater break status.

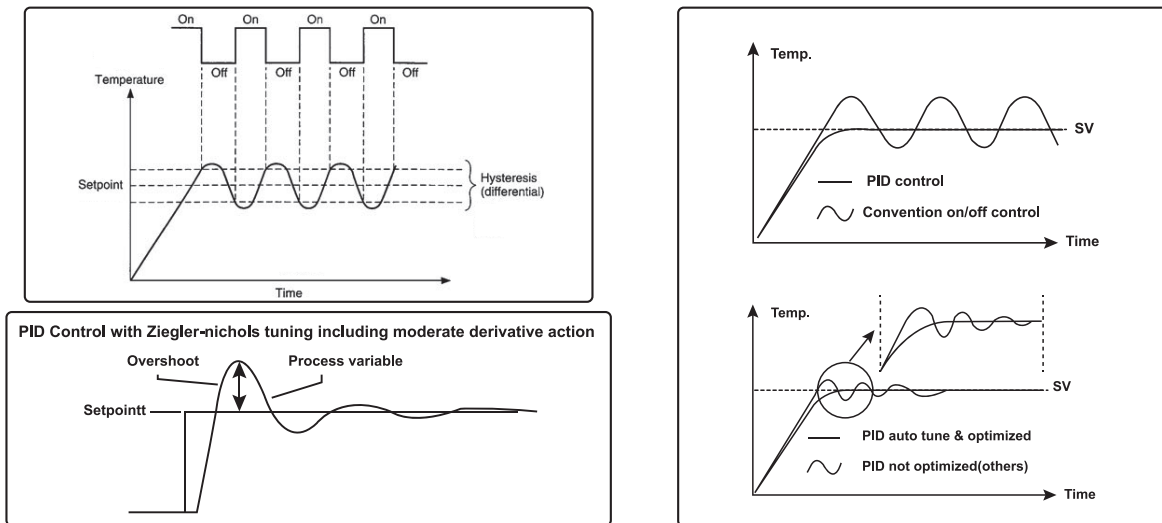Application   Suitable with plastic machine, packaging machine, Food Machine, Oven, Electronic Machine.

## DIMEMSION

Cut Panel
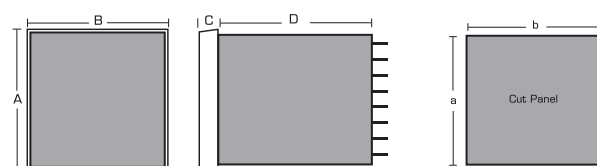
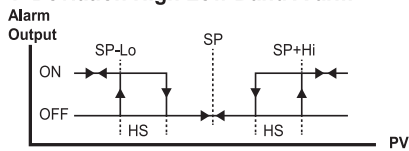| Type | A | B | C | D | a | b |
|---|---|---|---|---|---|---|
| TMP-48 | 48 | 48 | 10 | 80 | 45 | 45 |
| TMP-94 | 48 | 96 | 10 | 80 | 45 | 92 |
| TMP-72 | 72 | 72 | 10 | 80 | 68 | 68 |
| TMP-95 | 96 | 48 | 10 | 80 | 92 | 45 |
| TMP-96 | 96 | 96 | 10 | 80 | 92 | 92 |
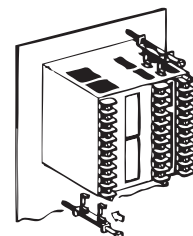
## Operation Graph



## Alarm Function

**1. Deviation High Low Band Alarm**



**2. Deviation High Alarm**
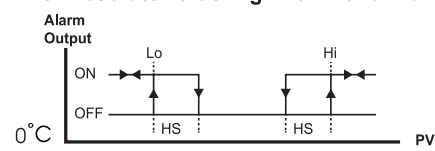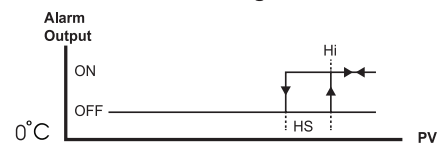


**3. Deviation Low Alarm**



**4. Deviation High Low Range Alarm**



**5. Absolute value High Low Band Alarm**
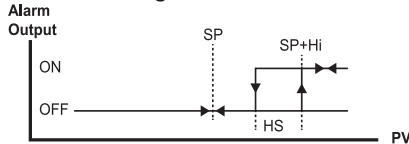


**6. Absolute value High Alarm**
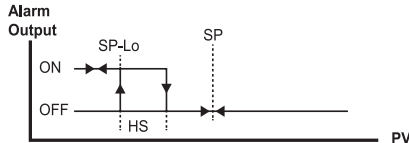


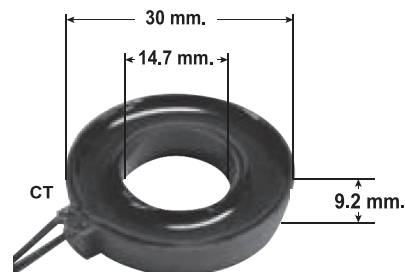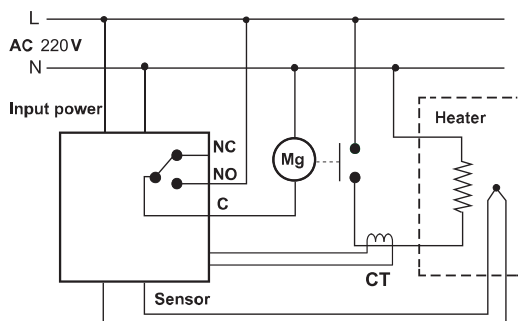**7. Absolute value Low Alarm**
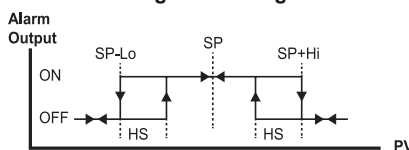


**8. Absolute value High Low Range Alarm**
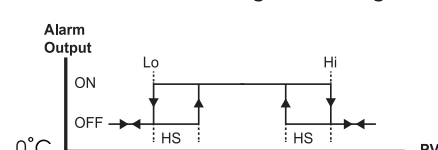


## Wiring Diagram for Break Hearter



Current Transformer
Maximum 30 A.

## Input Table

### Select input sensors and setting range

| Input Type | Setting Range / Display Range | |
|---|---|---|
| | Non-decimal point | Decimal point |
| Thermocouple Type K | -200 ~1372 °C | -199.9~999.9 °C |
| | -328~2501 °F | -199.9~999.9 °F |
| Thermocouple Type J | -200 ~1200 °C | -199.9~999.9 °C |
| | -328~2192 °F | -199.9~999.9 °F |
| Thermocouple Type R | -50~1768 °C | - |
| | -58~3214 °F | - |
| Thermocouple Type T | -200~400 °C | -199.9~400.0 °C |
| | -328~752 °F | -199.9~752.0 °F |
| Thermocouple Type N | -200~1300 °C | -199.9~999.9 °C |
| | -328~2372 °F | -199.9~999.9 °F |
| Thermocouple Type S | -50~1768 °C | - |
| | -58~3214 °F | - |
| Thermocouple Type E | -200~1000 °C | -199.9~999.9 °C |
| | -328~1832 °F | -199.9~999.9 °F |
| DC 0-100 mV | -1999 ~9999 | -199.9~999.9 |
| | | -19.99~99.99 |
| | | -1.999~9.999 |
| Pt 100 | -200~850 °C | -199.9~850.0 °C |
| | -328~1526 °F | -199.9~999.9 °F |
| DC 4-20mA | -1999 ~9999 | -199.9~999.9 |
| | | -19.99~99.99 |
| | | -1.999~9.999 |
| DC 0-10V | -1999 ~9999 | -199.9~999.9 |
| | | -19.99~99.99 |
| | | -1.999~9.999 |

## Wiring Diagram



TMP-48

TMP-72

TMP-94

TMP-95

TMP-96
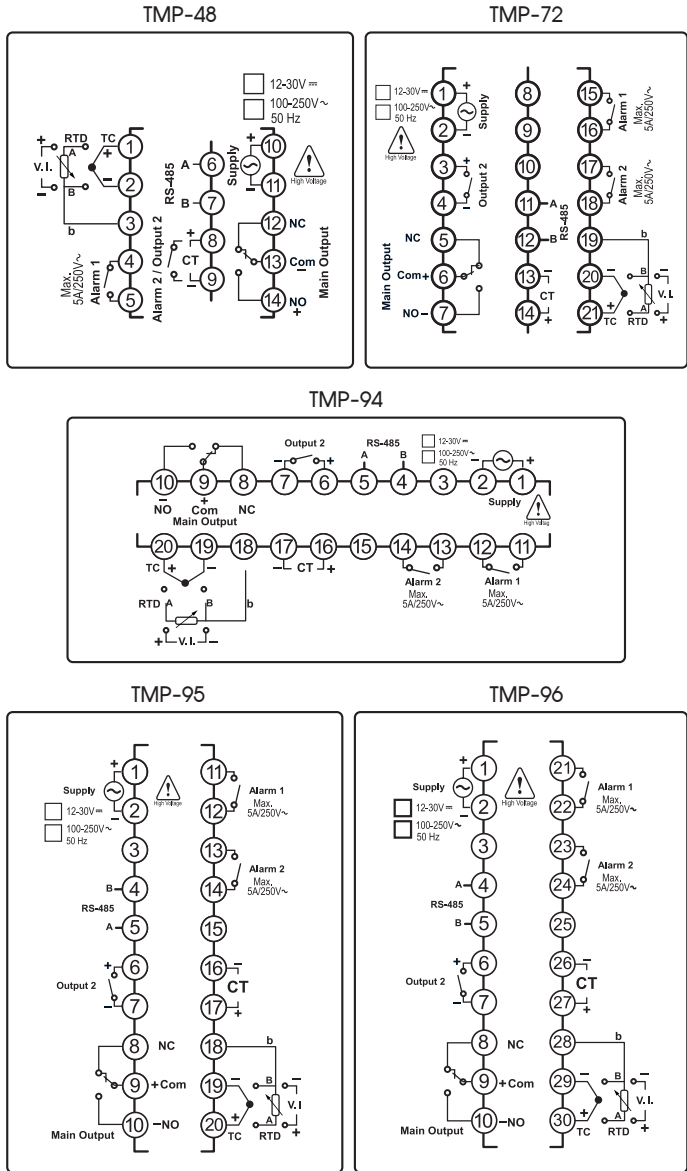
## Order Code

TMP - [SIZE] - [OUTPUT 1] - [OUTPUT 2] - A[OPTION] - [POWER SUPPLY]

| SIZE | |
|---|---|
| 48 | 48 x 48 mm. |
| 94 | 48 x 96 mm. |
| 72 | 72 x 72 mm. |
| 95 | 96 x 48 mm. |
| 96 | 96 x 96 mm. |

| OUTPUT 1 | |
|---|---|
| R | Relay Contact |
| P | SSR Drive 12 VDC |
| V | 0-10 VDC |
| I | 4-20mA |

| OUTPUT 2 | |
|---|---|
| N | None |
| R | Relay Contact |
| P | SSR Drive 12 VDC |
| V | 0-10 VDC |
| I | 4-20mA |

| OPTION | |
|---|---|
| B* | Alarm 2 |
| M | RS-485 |
| H* | Heater Break* |

| POWER SUPPLY | |
|---|---|
| NONE | 100-250 VAC |
| D | 10-30 VAC/VDC |

* ในรุ่น TMP-48 หากมี Output 2 จะไม่สามารถเลือก Option B, H ได้