



## MICROPROCESSOR TEMPERATURE CONTROLLERS



# PRODUCT INTRODUCTION

The microprocessor based Temperature Controller is a high quality and user friendly product that can satisfy the user. The temperature controller has complete functions and utilizes a microprocessor that enables it to deliver fast results. The temperature has enhanced features that is critical to the user and is expected to raise quality levels and to expand production performances.

The temperature controller can configure the optimum heat / cool control output model via interior software selection.

- Heating + Cooling
- Heating + Heating
- Cooling + Cooling

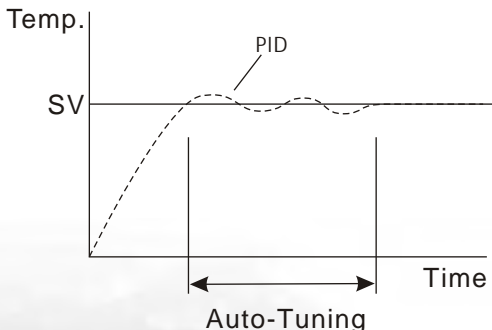
Furthermore, the temperature controller comes in various forms, e.g. Analog display, bargraph display, LED digital display. The controller provides a total solution for the user's requirements the user could be sure of the best technical services from the factory.

## APPLICATIONS

Temperature Control, Oven Temperature Control, Production Process Temperature Control, Heating and Cooling Systems Control, Injection machines Temperature Control, Compressor Machine Temperature Control, Dry Equipment Temperature Control, Incinerator Temperature Controls

## AUTO-TUNING

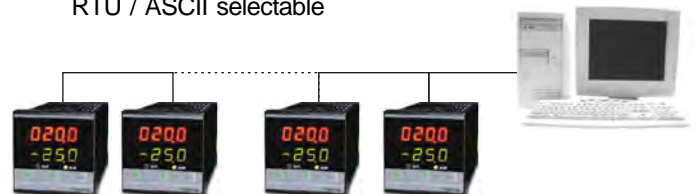
To activate the Auto-Tuning function, set AT to ON. Auto-Tuning will generate a new set of PID parameters based on the input signal and required control results. The new PID parameters will overwrite the existing parameters to ensure maximum efficiency and the shortest time needed to reach steady state.



## FEATURES

- Auto-Tuning function enables full automation of temperature control of the system accurately. Broad parameters range enables the controller to be applicable in a wide range of special environmental requirements.
- RS485 (Modbus)
- Input choice selectable by buttons
- Celcius / Farenheit display
- PID + Fuzzy + programmable module enables precise control in different working environments
- 8 segment temperature control enables the controller to be applied in long-term and complicated operations.
- Internally installed Auto-Zero and Auto-Span ensures no loss of accuracy over time
- Automatic detection of Sensor Break
- Digital filtering function filters unnecessary "noise" Offset input option eliminates system circuit deviation
- Switching power supply system
- 8 type alarm functions
- Time-proportional PID control

RS485(Modbus) communication protocol,  
RTU / ASCII selectable



# PT-□3□□ PROGRAMMABLE TEMPERATURE CONTROLLER

## PID Fuzzy



### SPECIFICATIONS:

<b>Power Supply:</b>	85~265VAC 50/60Hz
<b>Display:</b>	Upper row: (red) PT-□310: 4 digits 0.31" 7 segment PT-□320: 4 digits 0.36" 7 segment PT-□331: 4 digits 0.36" 7 segment PT-□340: 4 digits 0.56" 7 segment PT-□350: 4 digits 0.56" 7 segment Lower row: (green) PT-□320: 4 digits 0.28" 7 segment PT-□331: 4 digits 0.36" 7 segment PT-□340: 4 digits 0.36" 7 segment PT-□350: 4 digits 0.36" 7 segment
<b>Input Signal:</b>	Thermocouple: J, K, B, N, R, S, T, E RTD: PT100, JPT100 DC Voltage: 0 ~ 350mV
<b>Control Output:</b>	Output Relay 1: (resistive load) PT-□310: SPST-ON, 2A/250VAC PT-□320: SPST-ON, 3A/250VAC PT-□331: SPDT, 5A/250VAC PT-□340: SPST-ON, 3A/250VAC PT-□350: SPDT, 5A/250VAC Output Relay 2: (resistive load) PT-□331: SPST-ON, 5A/250VAC PT-□340: SPST-ON, 5A/250VAC PT-□350: SPST-ON, 5A/250VAC Voltage pulse output: (for SSR drive) NPN, 20mA at 12VDC Analog Output: 4~20mA, 2~10V DC (Allowable load resistive: Max. 600Ω)
<b>Alarm Relay:</b>	SPST-ON, 1A/250VAC (resistive load)
<b>Dwell Timer:</b>	00~99s
<b>Hysteresis:</b>	0~999.9°C (°F)
<b>Communication Interface:</b>	RS485 output
<b>Operating Conditions:</b>	0~50°C (20~85%RH)
<b>Control Output Cycle:</b>	0~999.9s
<b>Decimal Point:</b>	0~3 digits
<b>Digital Filter:</b>	10~100
<b>Control method:</b>	ON / OFF or PID(Auto Tuning)
<b>Input Offset:</b>	-199.9~999.9
<b>Fraction Value:</b>	0000~9999
<b>Settings Range:</b>	-1999~9999
<b>Accuracy:</b>	± 0.3% ± 1 digit
<b>Sampling Time:</b>	200ms
<b>Memory:</b>	EEPROM

### PRODUCT APPLICATION:

Temperature Control, Oven Temperature Control, Production Process Temperature Control, Heating and Cooling Systems Control, Injection machines Temperature Control, Compressor Machine Temperature Control, Dry Equipment Temperature Control, Incinerator Temperature Controls

### FEATURES:

- Standard RS485(Modbus) communication protocol, RTU / ASCII selectable
- Input selection by buttons
- Celcius / Farenheit switching display
- Percentage display / output of various parameters
- 8 segment temperature control enables the controller to be applied in long-term and complicated operations.
- Internally installed Auto-Zero and Auto-Span ensures no loss of accuracy over time
- Alarm delay function eliminates false alarm due to transient changes in process
- Alarm delay function suitable in systems with large temperature changes, protecting heating / cooling systems
- Output delay function eliminates constant ON/OFF switching when input signal is close to pre-set value
- Setting parameters defined to prevent human error
- Automatic detection Sensor Break
- Digital filtering function filters unnecessary "noise" Settings input defined in levels
- Offset input option eliminates system circuit deviation
- Switching Power Supply
- 8 type alarm functions
- Time-proportional PID control

# ALARM MODE / TEMPERATURE RANGE

## ALARM MODE SETTING:

All can with Hysteresis and de-energized function for ON/OFF control

▲ : sv    △ : Alarm Setting Value  
 ↓ : Hysteresis Setting Value

### Deviation high alarm (TYPE 1)



### Deviation high/low alarm (TYPE 5)



### Deviation high alarm (TYPE 2)



### Band alarm (TYPE 6)



### Deviation low alarm (TYPE 3)



### Process high alarm (TYPE 7)



### Deviation low alarm (TYPE 4)



### Process low alarm (TYPE 8)



## TEMPERATURE SENSORS RANGE:

INPUT TYPE	RANGE	ACCURACY
K TYPE	-200~1370°C	0.3%±1 digit
J TYPE	-210~1200°C	0.3%±1 digit
R TYPE	-50~1760°C	0.3%±1 digit
S TYPE	-50~1760°C	0.3%±1 digit
B TYPE	250~1820°C	±8°C±1 digit
E TYPE	-200~1000°C	0.3%±1 digit
N TYPE	-200~1300°C	0.3%±1 digit
T TYPE	-200~400°C	±2°C±1 digit
PT100	-200~850°C	0.3%±1 digit
JPT100	-200~850°C	0.3%±1 digit
DC	0~350mV	0.3%±1 digit

Type R and S ±9°C for 0 to 500°C

Type B accuracy is not guaranteed for 0 to 400°C

## ORDERING INFORMATION:

PT -  3   - S     -

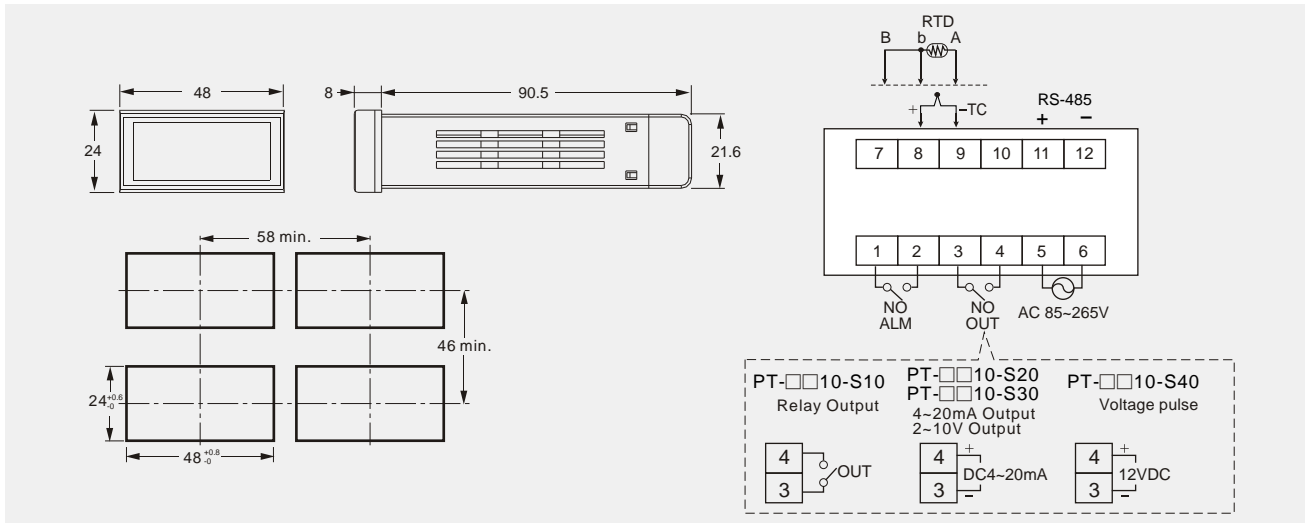
Function	6---PID 7---PID+FUZZY 8---PID+FUZZY+8 Segment control
Type	10---48x24 20---48x48 31---48x96
Control Output (1)	0---None 1---Relay Output 2---4~20mA DC 3---2~10V DC 4---NPN, 20mA at 12V DC
Control Output (2)	0---None 1---Relay Output 2---4~20mA DC 3---2~10V DC 4---NPN, 20mA at 12V DC ※PT-□320, □310 series only Output (1), code is "0"
Alarm Output	0---None 1---1 2---2 (Only PT-□331, PT-□340, PT-□350 series)
Analog Retransmit	0---None 1---4~20mA DC 2---2~10V DC
Communication	0---None 1---RS485

\* Please call for customized specifications

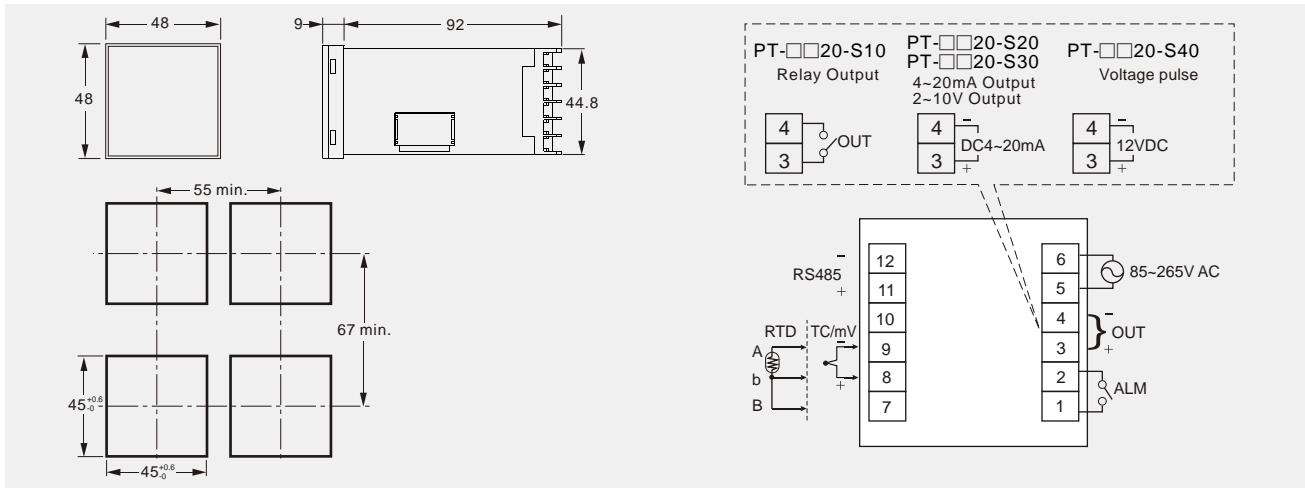
# DIMENSION / PANEL CUTOUT & WIRING DIAGRAM

## DIMENSION / PANEL CUTOUT & WIRING DIAGRAM

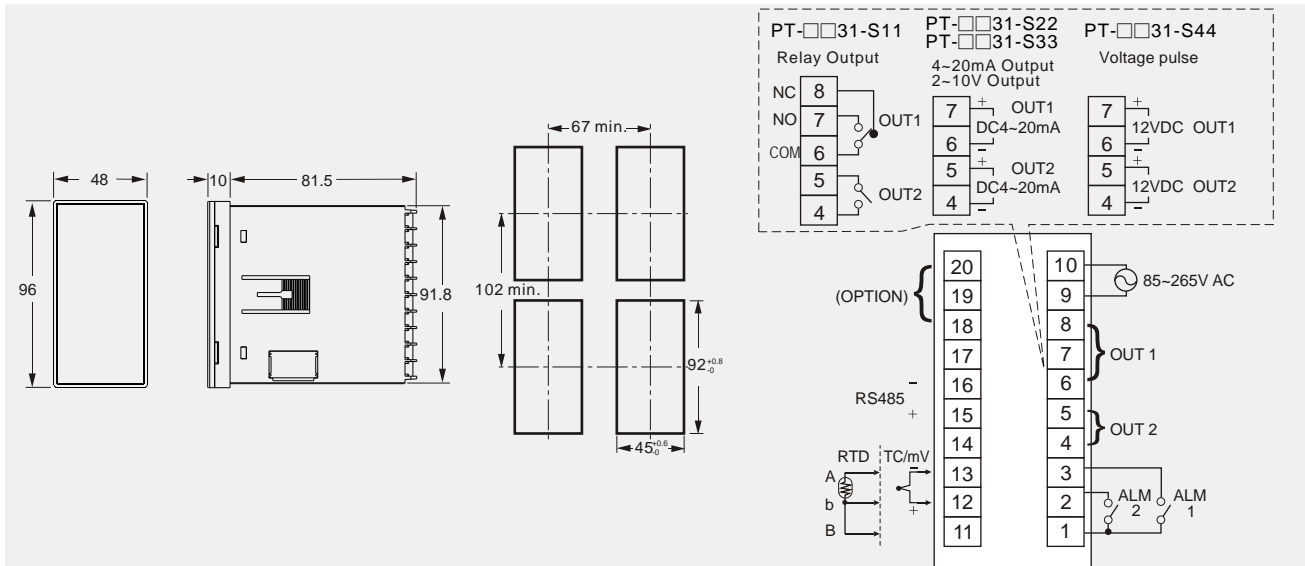
PT-□□10 : 48mm(H) x 24mm(W) x 98.5mm(D)



PT-□□20 : 48mm(H) x 48mm(W) x 101mm(D)



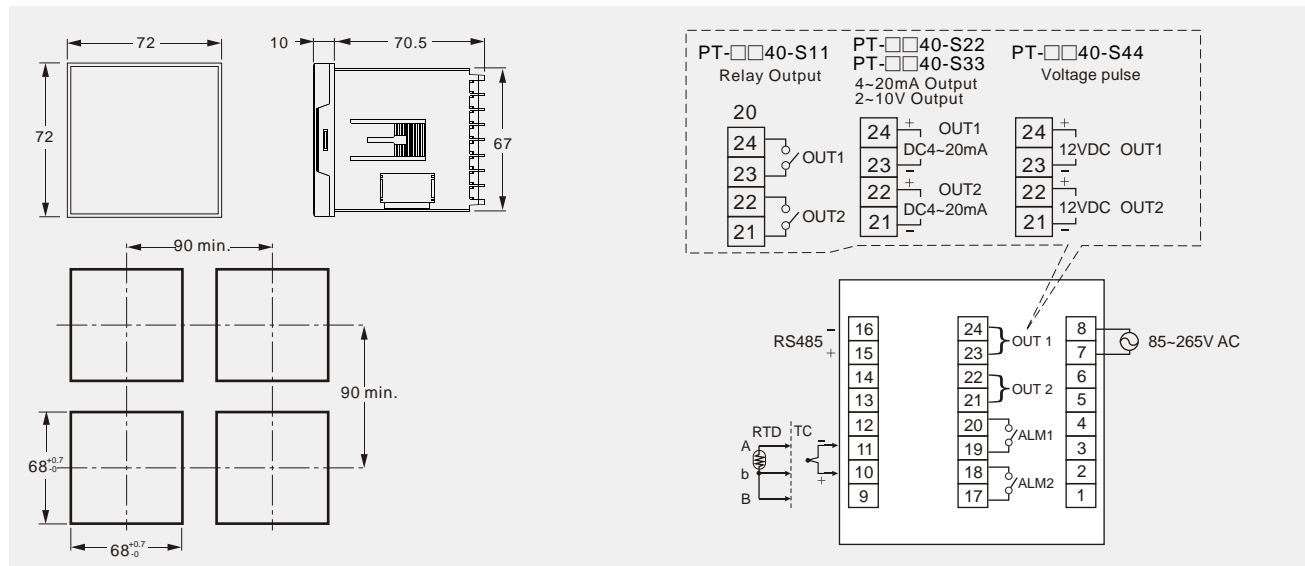
PT-□□31 : 48mm(H) x 96mm(W) x 91.5mm(D)



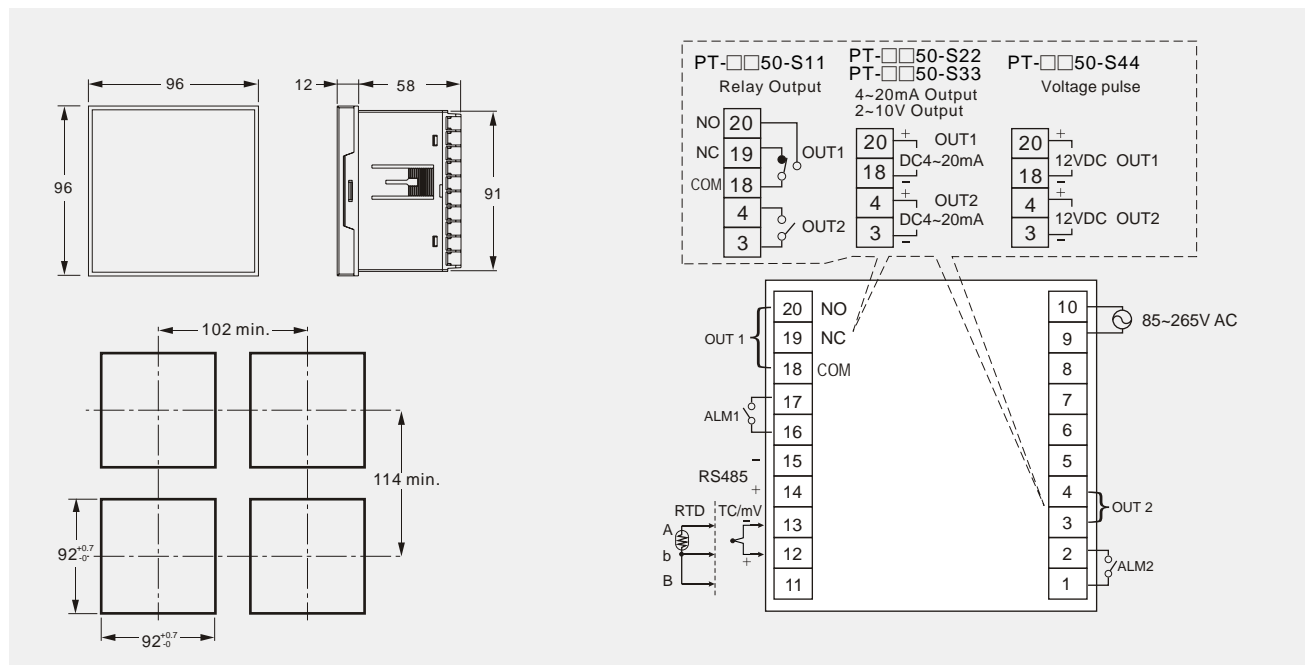
# DIMENSION / PANEL CUTOUT & WIRING DIAGRAM

## DIMENSION / PANEL CUTOUT & WIRING DIAGRAM

PT-□□40 : 72mm(H) x 72mm(W) x 80.5mm(D)



PT-□□50 : 96mm(H) x 96mm(W) x 70mm(D)



# PT-32□□ TEMPERATURE CONTROLLER



**PT-3231**  
(48x96)



**PT-3240**  
(72x72)



**PT-3250**  
(96x96)

**PATENT PENDING**

## PRODUCT APPLICATION:

Temperature Control, Oven Temperature Control, Production Process Temperature Control, Heating and Cooling Systems Control, Injection machines Temperature Control, Compressor Machine Temperature Control, Dry Equipment Temperature Control, Incinerator Temperature Controls

## FEATURES:

- Pushbutton setpoints input, user-friendly
- ON-OFF control
- Bargraph design display shows clear and accurate readings. (User defined custom bargraph available)

## SPECIFICATIONS:

- Power Supply:** 110V/220V AC ± 10% 50/60Hz
- Display:** LED bargraph
- Input Signal:** Thermocouple: J, K  
RTD: PT100
- Control method:** Relay ON/OFF
- Relay Output:** SPDT, 3A/250VAC (resistive load)
- Temperature Range:** 0~399°C  
(Max. 799°C / 999°F by order)
- Operating Conditions:** 0 ~ 50°C (20 ~ 85%RH)
- Cold junction compensation:** ± 0.1 °C/°C
- Accuracy:** ± 2% FS
- ON-OFF Hysteresis:** 1% of span
- EFT Immunity Burst:** Max. 4000V

## ORDERING INFORMATION:

PT 3 2 □ □ - C □

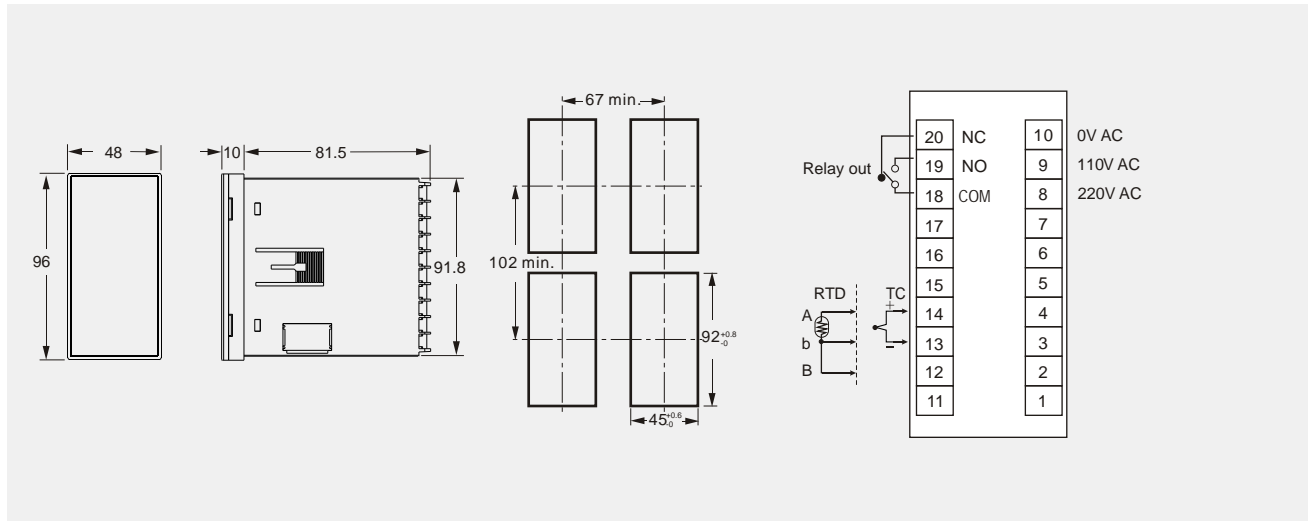
Type	31---48x96 40---72x72 50---96x96
Input	0---J 1---K 2---PT100

\* Please call for customized specifications

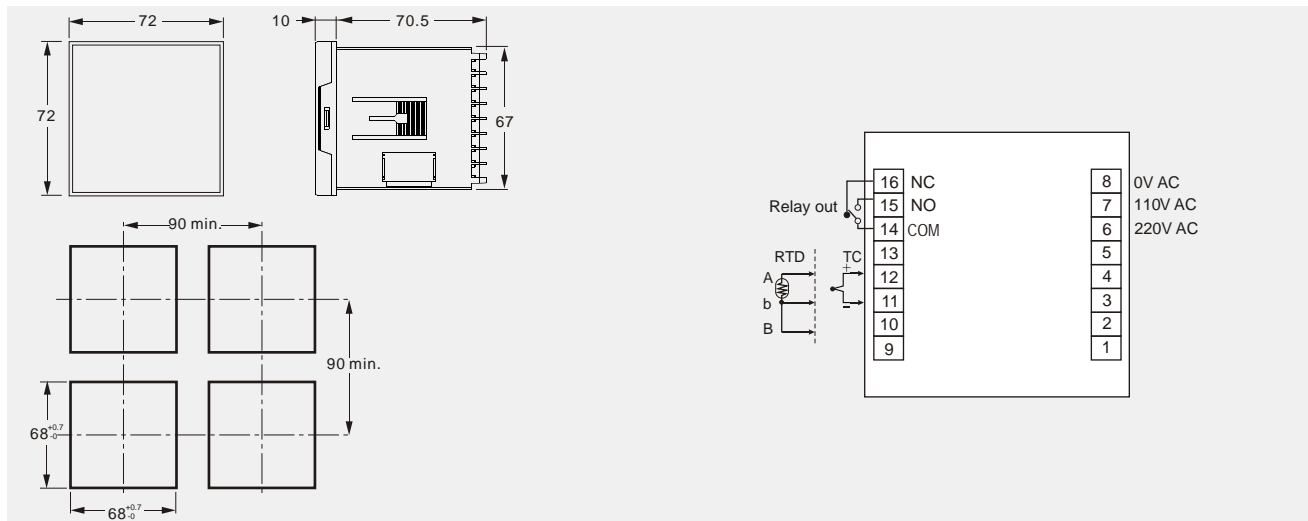
# DIMENSION / PANEL CUTOUT & WIRING DIAGRAM

## DIMENSION / PANEL CUTOUT & WIRING DIAGRAM

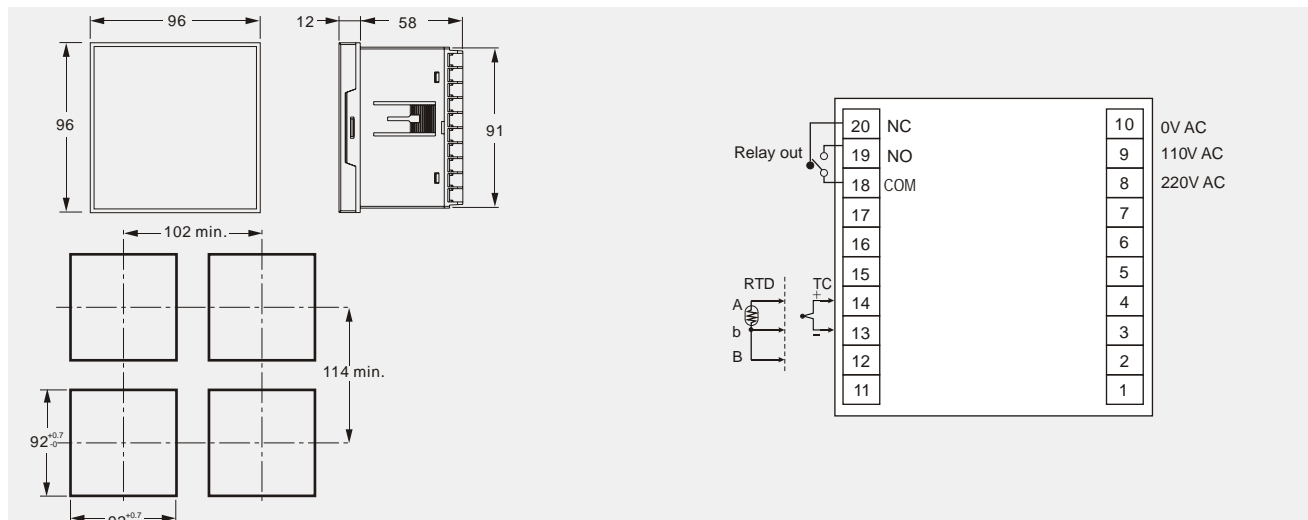
PT-3231 : 48mm(H) x 96mm(W) x 91.5mm(D)



PT-3240 : 72mm(H) x 72mm(W) x 80.5mm(D)



PT-3250 : 96mm(H) x 96mm(W) x 70mm(D)



# PT-22□□ TEMPERATURE CONTROLLER



**PT-2231**  
(48x96)



**PT-2240**  
(72x72)



**PT-2250**  
(96x96)

## PRODUCT APPLICATION:

Temperature Control, Oven Temperature Control, Production Process Temperature Control, Heating and Cooling Systems Control, Injection machines Temperature Control, Compressor Machine Temperature Control, Dry Equipment Temperature Control, Incinerator Temperature Controls

## FEATURES:

- Pushbutton setpoints input, user-friendly
- Digital display
- ON-OFF control
- Switching power supply

## SPECIFICATIONS:

- Power Supply:** 85~265V AC 50/60HZ
- Display:** 3 digit 7 segment
- Input Signal:** Thermocouple: J, K  
RTD: PT100
- Control method:** Relay ON/OFF
- Relay Output:** SPDT, 3A/250VAC  
(resistive load)
- Temperature Range:** 0~399°C  
(Max. 799°C / 999°F by order)
- Operating Conditions:** 0 ~ 50°C (20 ~ 85%RH)
- Cold junction compensation:** ±0.1 °C/°C
- Accuracy:** ±2% FS
- ON-OFF Hysteresis:** 1% of span
- EFT Immunity Burst:** Max. 4000V

## ORDERING INFORMATION:

P T 2 2 □ □ - S □

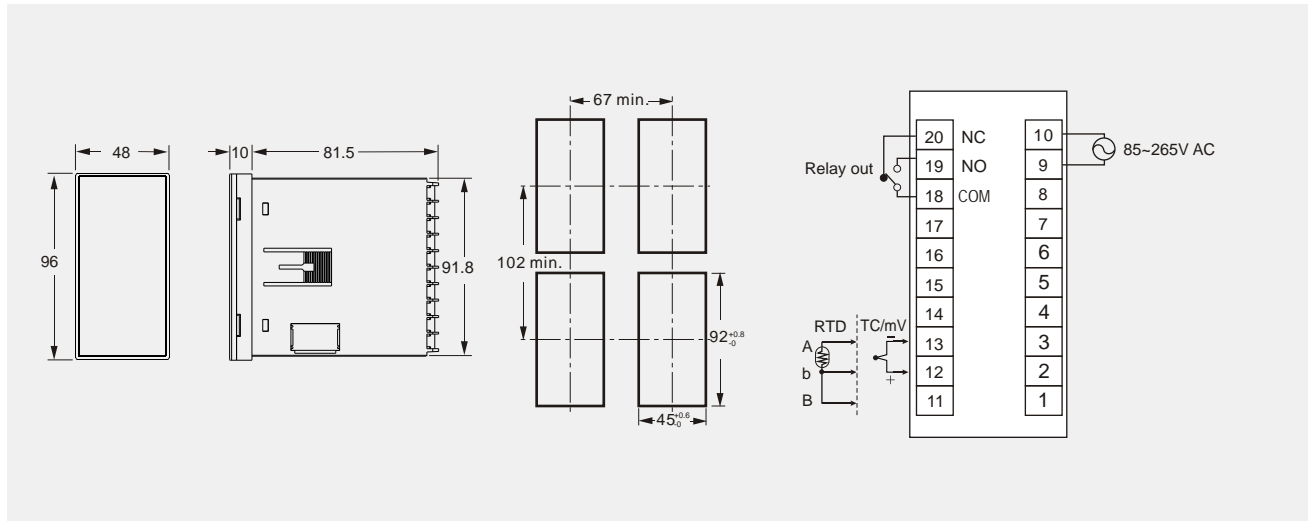
Type	31---48x96 40---72x72 50---96x96
Input	0---J 1---K 2---PT100

\* Please call for customized specifications

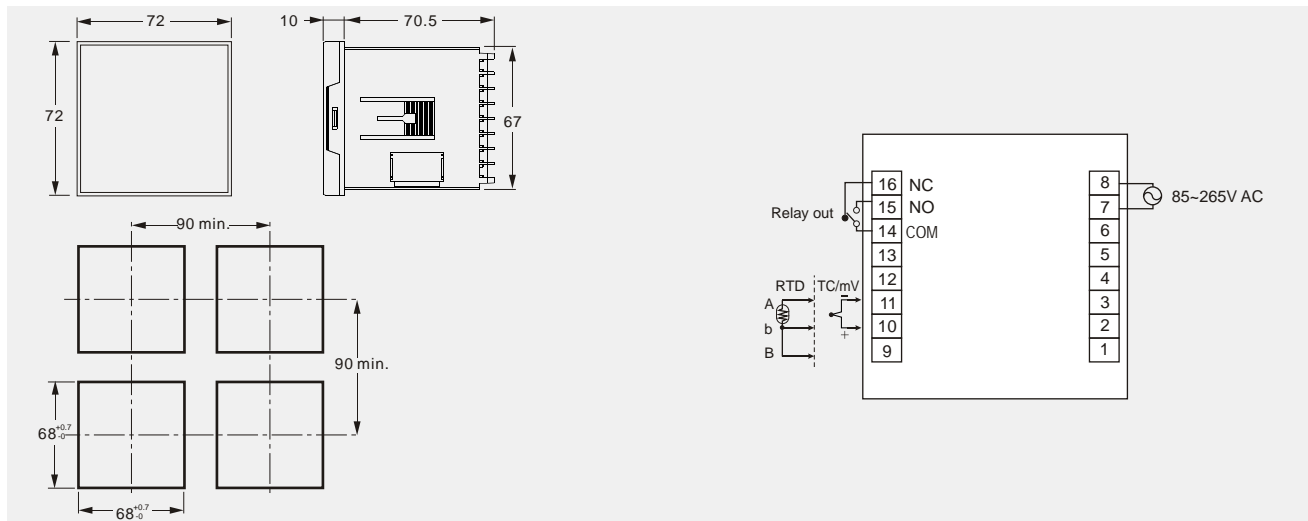
# DIMENSION / PANEL CUTOUT & WIRING DIAGRAM

## DIMENSION / PANEL CUTOUT & WIRING DIAGRAM

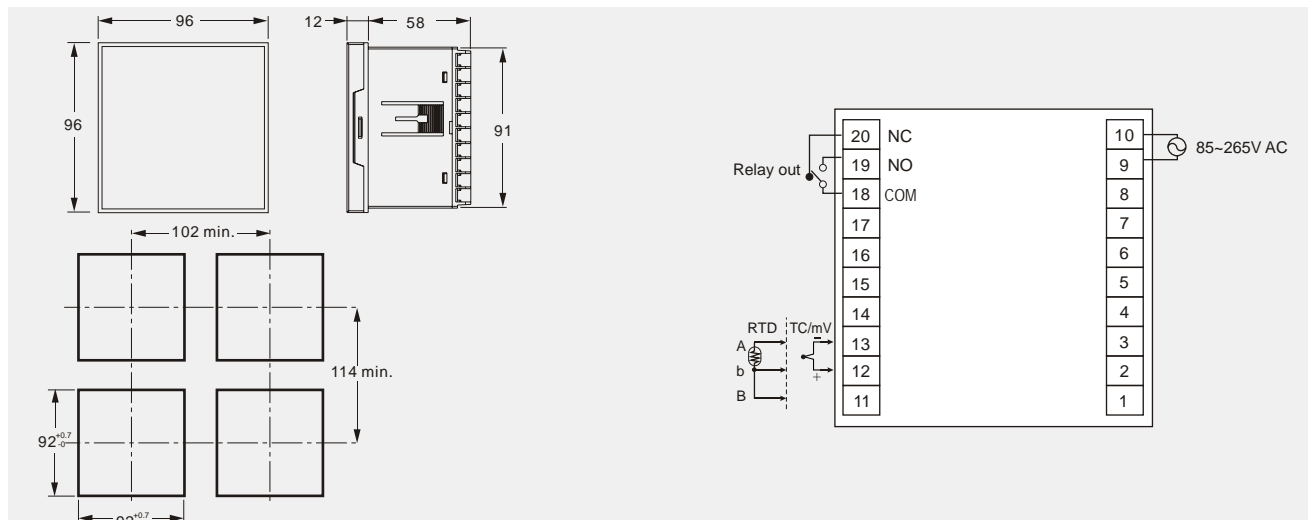
P T-2231 : 48mm(H) x 96mm(W) x 91.5mm(D)



PT-2240 : 72mm(H) x 72mm(W) x 80.5mm(D)



PT-2250 : 96mm(H) x 96mm(W) x 70mm(D)

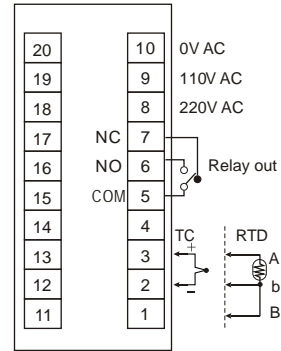


# PT-1231 TEMPERATURE CONTROLLER



**PT-1231**  
(48x96)

## WIRING:

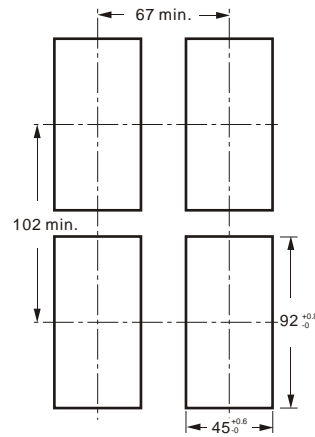
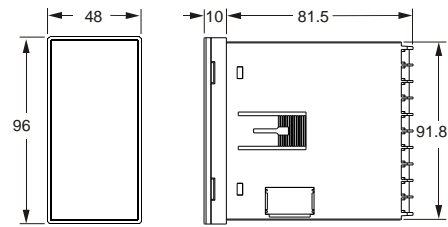


## FEATURES:

- VU display
- Pushbutton setpoints input, user-friendly
- ON-OFF control
- Low-cost, wide application

## DIMENSIONS/PANEL CUTOUT (Unit : mm)

**48 (W) x96 (H) x128.5 (D) DIN 1/16**



## SPECIFICATIONS:

<b>Power Supply:</b>	110V/220V AC $\pm 10\%$ 50/60Hz
<b>Display:</b>	VU
<b>Input Signal:</b>	Thermocouple: J, K RTD: PT100
<b>Control method:</b>	Relay ON/OFF
<b>Relay Output:</b>	SPDT, 3A/250VAC (resistive load)
<b>Temperature Range:</b>	0~399°C (Max. 799°C / 999°F by order)
<b>Operating Conditions:</b>	0 ~ 50°C (20 ~ 85%RH)
<b>Cold junction compensation:</b>	$\pm 0.1$ °C/°C
<b>Accuracy:</b>	$\pm 2\%$ FS
<b>ON-OFF Hysteresis:</b>	1% of span
<b>EFT Immunity Burst:</b>	Max. 4000V

## ORDERING INFORMATION:

**PT 1 2 3 1 - C**

Input	0---J 1---K 2---PT100
-------	-----------------------------

\* Please call for customized specifications