# DIN Rail Mounting PID Temperature/ Process Controller DTP40 with Comms Option

DIN rail mounting dual display 4 digit PID process/ temperature controller with auto-tuning.

- Multi-input selectable
- One alarm standard
- PID controller or transmitter modes
- PID with Auto-tune, PD or on/off modes
- RS485 Communication option with IMO/Modbus
- Heater Burnout alarm option
- Compact size - 22.5mm wide
- Conforms to UL/CSA & CE

## Options and ordering codes

**DTP40A** - **R** / **M** **C5** **240AC**

DTP40A: DIN rail mounting controller with one alarm

M: Multi-sensor Input

| | |
|---|---|
| Relay output | **R** |
| Signal Voltage for SSR | **S** |
| Analogue Current 4-20mA | **A** |
| Analogue Voltage 0 – 10V | **V** |

| | |
|---|---|
| **240AC** | 100-240VAC supply |
| **24VAC** | 24VAC/DC supply |

| | |
|---|---|
| **W(5A)** | Heater burnout Alarm 5A rated |
| **W(10A)** | Heater burnout alarm 10A rated |
| **C5** | RS485 serial communications |

Note: For DC current output type [Option: W] cannot be added

## Input ranges

| Input type | | Scale | |
|---|---|---|---|
| Thermocouple | K | 0 to 1370°C | 0 to 2500°F |
| | | 0 to 400°C | 0 to 750°F |
| | J | 0 to 1000°C | 0 to 1800°F |
| | R | 0 to 1760°C | 0 to 3200°F |
| | S | 0 to 1760°C | 0 to 3200°F |
| | B | 0 to 1820°C | 0 to 3300°F |
| | E | 0 to 800°C | 0 to 1500°F |
| | T | -199.9 to 400.0°C | -199.9 to 750.0°F |
| | N | 0 to 1300°C | 0 to 2300°F |
| | PL-II | 0 to 1390°C | 0 to 2500°F |
| | C (W/Re5-26) | 0 to 2315°C | 0 to 4200°F |
| RTD | Pt100 | -200 to 850°C | -300 to 1500°F |
| | | -199.9 to 850.0°C | -199.9 to 999.9°F |
| | JPt100 | -200 to 500°C | -300 to 900°F |
| | | -199.9 to 500.0°C | -199.9 to 900.0°F |
| DC | 4 to 20mA DC | -1999 to 9999□-199.9 to 999.9<br>-19.99 to 99.99□-1.999 to 9.999 | |
| | 0 to 20mA DC | | |
| DC | 0 to 1V DC | | |
| | 0 to 10V DC | | |
| | 1 to 5V DC | | |

- As for DC input, scaling and decimal point place change are possible.
- As for DC current input, shunt resistor 50Ω is needed as an external device.

IMO

## Specification

**Display**
PV [Red 4 digits, Character size: 7.5 x 4.1mm (H x W)],
SV [Green 4 digits, Character size: 7.5 x 4.1mm (H x W)]

**Input: Thermocouple**
External resistance: 100Ω or less (However, for B input: 40Ω or less)

**Input: RTD**
3-wire system (Allowable input wire resistance per wire: 10Ω or less)

**Input: DC Current**
Input impedance: 50Ω (Connect shunt resistor 50Ω between input terminals.)
Allowable input current: 50mA or less (When shunt resistor 50Ω is used)

**Input: DC Voltage (0-1V)**
Input impedance: 1MΩ or greater
Allowable input voltage: 5V or less
Allowable signal source resistance: 2kΩ or less

**Input: DC Voltage (0-5V, 1-5V, 0-10V)**
Input impedance: 100kΩ or greater
Allowable input voltage: 15V or less
Allowable signal source resistance: 100Ω or less

**Accuracy: Thermocouple** (Setting • Indicating)
Within ±0.2% of each input span ±1 digit or ±2°C (4°F) whichever is greater
However, R or S input 0 to 200°C (0 to 400°F): Within ±6°C(12°F), B input 0 to 300°C (0 to 600°F): Accuracy is not guaranteed. K, J, E, and N input less than 0°C (32°F): Within ±0.4% of each input span ±1 digit

**Accuracy: RTD** (Setting • Indicating)
Within ±0.1% of each input span ±1 digit or ±1°C (2°F) whichever is greater

**Accuracy: DC Current & V** (Setting • Indicating)
Within ±0.2% of each input span ±1 digit

**Input sampling period** 0.25 seconds

**Output: Relay types**
SPNO/NC: 3A 250V AC Resistive load, 1A Inductive load cosφ=0.4

**Output: signal voltage types**
12VDC +2VDC/-0VDC, Max. 40mA (Short-circuit protected)

**Output: analogue current** 4 to 20mA DC Load resistance: Max. 550Ω

**Output: analogue voltage** 0-10VDC – Output impedance 500Ω

**Control action**
User selectable: PID (with auto-tuning function), PI, PD (with manual reset function), P (with manual reset function), ON/OFF

**Proportional band** (P) 0.0 to 110.0%

**Integral time** (I) 0 to 1000 seconds

**Derivative time** (D) 0 to 300 seconds

**Proportional cycle** 1 to 120 seconds (Not available for DC current output type)

**ARW** 0 to 100%

**Hysteresis**
Thermocouple and RTD: 0.1 to 100.0°C (°F )
DC current and DC voltage: 1 to 1000

**Alarm** (A1)
Open collector, Control capacity: 24Vdc 0.1A Max.

**Alarms action**
ON/OFF action, Hysteresis 0.1 to 100.0°C (°F) (1 to 1000 analogues)

**Alarm Functions** Alarm Function and NO/NC can be selected by key operation.

- **No alarm**
- **High limit alarm** (Deviation setting)
  Setting range: -(Input span) to Input span
- **Low limit alarm** (Deviation setting)
  Setting range: -(Input span) to Input span
- **High/Low limits alarm** (Deviation setting)
  Setting range: 0 to Input span
- **High/Low limit range alarm** (Deviation setting)
  Setting range: 0 to Input span
- **Process high alarm**
  Setting range: Input range low limit value to Input range high limit value
- **Process low alarm**
  Setting range: Input range low limit value to Input range high limit value
- **High limit alarm w/standby** (Deviation setting)
  Setting range: -(Input span) to Input span
- **Low limit alarm w/standby** (Deviation setting)
  Setting range: -(Input span) to Input span
- **High/Low limits alarm w/standby** (Deviation setting)
  Setting range: 0 to Input span

The negative low limit value is -199.9 or -1999 and the positive high limit value is 999.9 or 9999

**Supply voltage**
85 to 264VAC 50/60Hz (100 to 240VAC +10% -15%), 20 to 28VDC/AC 50/60Hz

**Power consumption** Approx. 6VA

**Insulation resistance** >10MΩ at 500VDC

**Dielectric strength**
1.5kV AC for 1min between input terminal and ground terminal, between input terminal and power terminal, between power terminal and ground terminal, between output terminal and ground terminal, between output terminal and power terminal

**Ambient temperature** 0 to 50°C

**Ambient humidity** 35 to 85%RH (No condensation)

**Mounting** DIN rail mounting

**External dimension** 22.5(W) x 75(H) x 100(D)mm

**Weight** Approx. 150g

**Case material** Light grey flame resisting resin

**Standard functions**
Sensor correction, Setting value LOCK, Power failure countermeasure, Self diagnosis, Automatic cold junction temperature compensation (Only thermocouple), Sensor burnout alarm, Input burnout.

## Optional features

### Heater burnout alarm [W]

This function watches the heater current with a CT (current transformer), and detects the burnout.

Heater rated current must be selected from 5A, 10A, 20A and 50A.

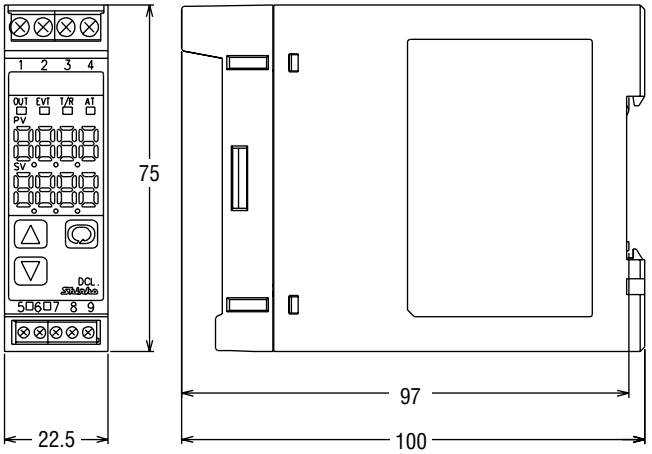
The heater burnout alarm will use the alarm 1 output

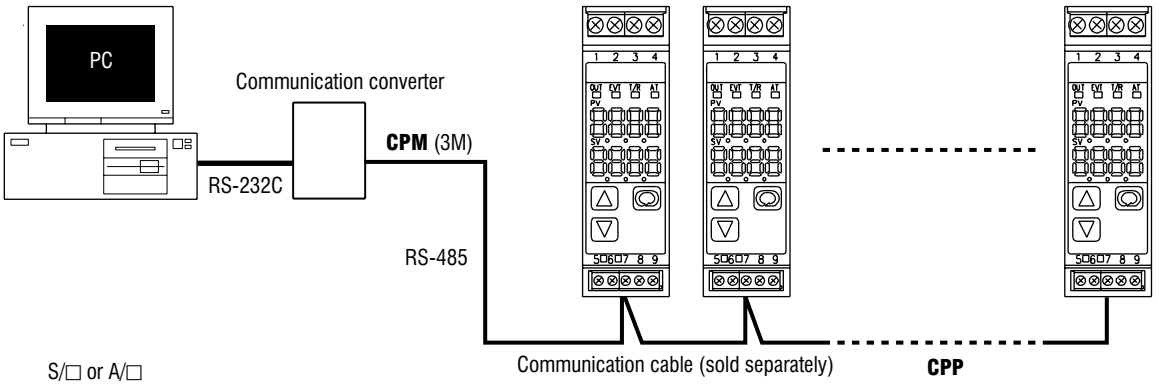
### Serial communication [C5]

Various setting status changing, reading and setting of the TP Series can be performed from external computer, HMI or PLC.

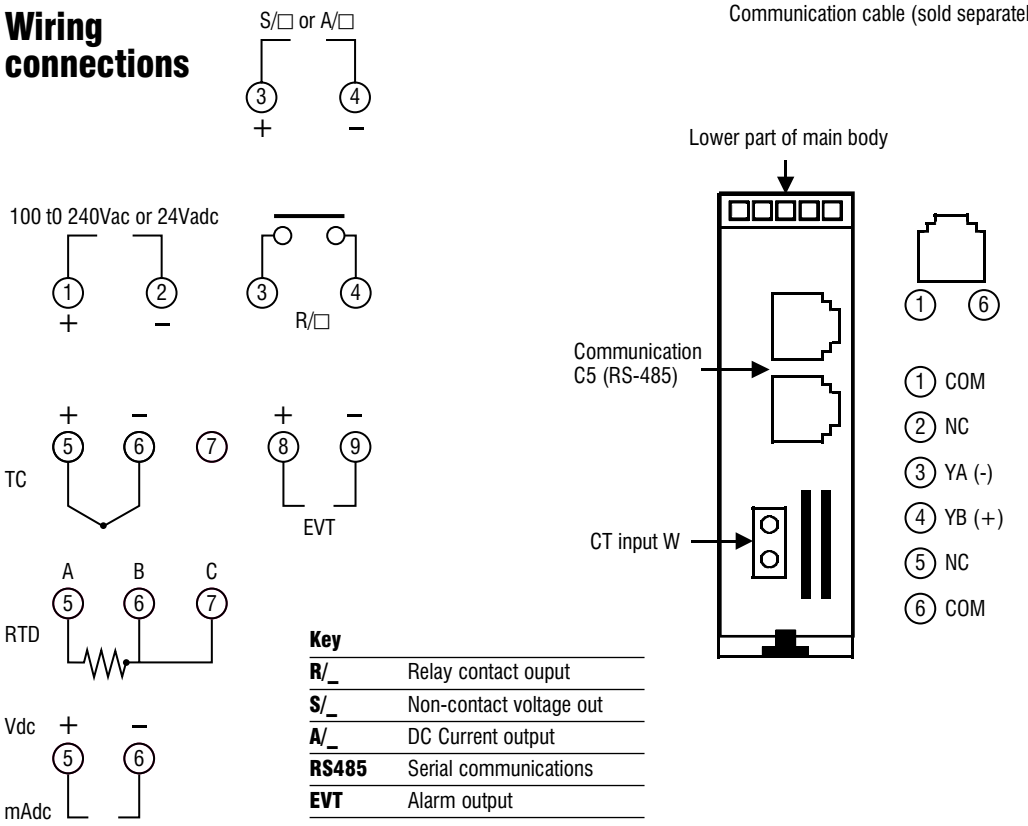
| |
|---|
| **Communication interface** Based on EIA, RS-485 |
| **Communication method** Half-duplex communication start-stop synchronous |
| **Data transfer rate** (2400/4800/9600/19200bps) Select by key operation |
| **Communication protocol** Based on IMO standard protocol or Modbus (Selectable by key operation) When Modbus is selected, RTU mode or ASCII mode can be selected by key operation. |
| **Number of connectable units** A maximum of 31 units per communication port |
| **Communication error detection** Parity check and Checksum |

## Dimensions mm




## Wiring connections




| Key | |
|---|---|
| **R/_** | Relay contact ouput |
| **S/_** | Non-contact voltage out |
| **A/_** | DC Current output |
| **RS485** | Serial communications |
| **EVT** | Alarm output |