



2013/10/02

## *DTC* Series Digital Controller Instruction Sheet

Thank you very much for purchasing DELTA DTC Series Temperature Controller. Please read this instruction sheet before using your DTC series to ensure proper operation, and please keep this instruction sheet handy for quick reference.

### ■ Caution



#### **DANGER! Caution! Electric Shock!**

DTC series is an OPEN-TYPE device and therefore should be installed in an enclosure free of airborne dust, humidity, electric shock and vibration. The enclosure should prevent non-maintenance staff from operating the device (e.g. key or specific tools are required to open the enclosure) in case danger and damage on the device may occur.



#### **WARNING!**

1. Prevent dust or metallic debris from falling into the controller that will cause malfunction. DO NOT modify or disassemble the controller. DO NOT use extra terminals.
2. Do not install and/or use the controller in places subject to:  
(a) dust or corrosive gases and liquid (b) high humidity and high radiation (c) vibration and shock
3. Switch off the power when wiring or changing input sensors.
4. Be sure to use compensating wires that match the thermocouple types when extending or connecting the thermocouple wires.
5. Shorten the wire when wiring a platinum resistance thermometer (RTD) to the controller, and separate power cable from load wires to prevent interference and conductive influence.
6. Make sure the power cable and signals device are installed correctly before switching on the power of DTC; otherwise serious damage may occur.
7. DO NOT touch the terminals or repair the controller when the power is on to prevent electric shock.
8. Wait at least one minute after the power is off to allow the capacitor to discharge. DO NOT touch any internal circuit within this period.
9. DO NOT touch the internal terminals no matter the power is on or off.
10. DO NOT place other heating source (e.g. power supply) in parallel with DTC during the installation. Please keep proper space in between.

### ■ Model Name Explanation

DTC 1 2 3 4 5

|  |  |  |
|--|--|--|
| Series name  | DTC: Delta C series temperature controller   |  |
| <span style="border: 1px solid black; padding: 0 2px;">1</span> Controller position  | 1: First controller  | 2: Controller connected in parallel                            |
| <span style="border: 1px solid black; padding: 0 2px;">2</span> Auxiliary output groups  | 0: standard, 2 outputs, no auxiliary output<br>1: 1 auxiliary output. Not available now. | 2: 2 auxiliary outputs. Not available now                      |
| <span style="border: 1px solid black; padding: 0 2px;">3</span> <span style="border: 1px solid black; padding: 0 2px;">4</span> Optional | 00: Standard<br>01: CT input   | 02: EVENT input. Not available now                             |
| <span style="border: 1px solid black; padding: 0 2px;">5</span> Main output type   | R: Relay output SPST, 250VAC, 3A<br>V: Voltage pulse output 12V +10% ~ -20%              | C: Current output 4 ~ 20mA<br>L: Linear voltage output 0 ~ 10V |

(DTC1000/2000 model): DC24V input, 2 outputs, relay output for output 2, RS-485 communication.

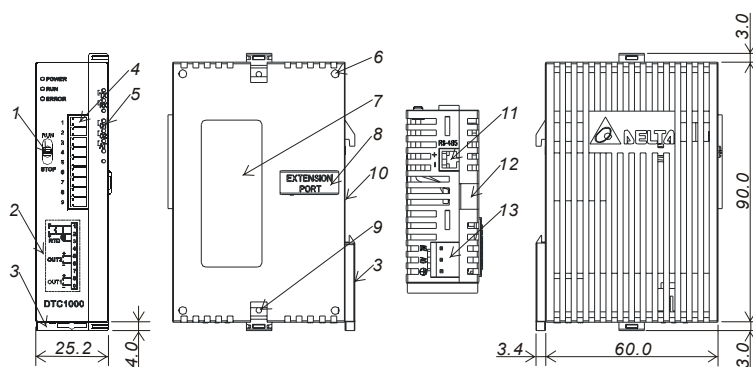
(DTC1001/2001 model): DC24V input, 1 output, 1 CT input, and RS-485 communication.

### ■ Function & Specification

|                   |  |
|-------------------|--|
| Power supply      | DC24V. Isolated switching power  |
| Voltage range     | Rated voltage: 90% ~ 110%  |
| Power consumption | Rated 24 VDC, Max. 24 W combined, 3W + 3W x number of DTC2000 controllers (Max. 7) |
| Input sensors     | Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK                                    |

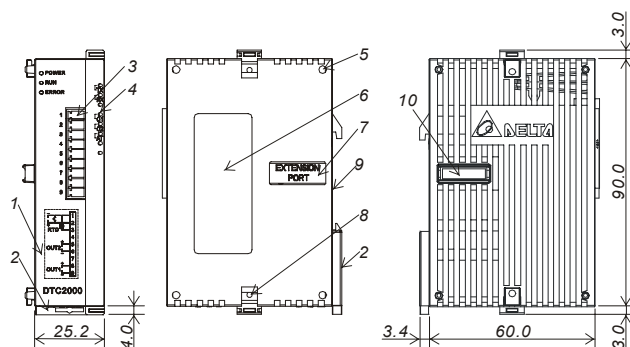
|                        |  |
|------------------------|--|
|                        | Platinum RTD: Pt100, JPt100  |
|                        | Linear DC input: 0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, 0 ~ 50mV   |
| Sampling rate          | Analog input: 0.15 sec. Thermocouple or platinum RTD: 0.4 sec.   |
| Control method         | PID , programmable PID, Manual, ON/OFF   |
| Output types           | Relay: SPST, Max. load 250VAC, 3A resistive load   |
|                        | Voltage pulse: 12VDC, Max. output current: 40mA  |
|                        | Current: DC 4 ~ 20mA (Load resistance: < 500Ω)   |
|                        | Analog voltage: 0 ~ 10V (Load resistance: > 1,000Ω)  |
| Output function        | Control output, alarm output, proportional output<br>Proportional output is available only when output 1 is linear voltage/current output. |
| Alarm                  | 13 alarm modes   |
| Communication          | RS-485 digital communication, 2,400bps ~ 38,400bps   |
| Communication protocol | Modbus protocol, ASCII/RTU format  |
| Internal connection    | Internal terminals available to transmit 24V power supply and communication signals  |
| Vibration resistance   | 10 ~ 55Hz, 10m/s <sup>2</sup> for 10mins, each in X, Y and Z direction   |
| Shock resistance       | Max. 300m/s <sup>2</sup> , 3 times in each 3 axes, 6 directions  |
| Ambient temperature    | 0 ~ 50 °C  |
| Storage temperature    | -20 ~ +65 °C   |
| Altitude               | < 2,000m   |
| Ambient humidity       | 35% ~ 85% RH (non-condensing)  |
| Pollution degree       | 2  |

## ■ Product Profile & Outline



### DTC1000/1001 R/V/C/L

- |    |                           |
|----|---------------------------|
| 1  | RUN/STOP switch           |
| 2  | Wiring and Model name     |
| 3  | DIN rail clip             |
| 4  | I/O terminals             |
| 5  | LED indicators            |
| 6  | Mounting hole             |
| 7  | Specification label       |
| 8  | Extension port            |
| 9  | Extension clip            |
| 10 | DIN rail                  |
| 11 | RS-485 communication port |
| 12 | Extension clip            |
| 13 | DC power input            |



### DTC2000/2001 R/V/C/L

- |    |                       |
|----|-----------------------|
| 1  | Wiring and Model name |
| 2  | DIN rail clip         |
| 3  | I/O terminals         |
| 4  | LED indicators        |
| 5  | Mounting hole         |
| 6  | Specification label   |
| 7  | Extension port        |
| 8  | Extension clip        |
| 9  | DIN rail              |
| 10 | Extension port        |