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## **DELTA Temperature Controller**



# Temperature Controllers

## Features

### Many Sizes Available:

- From 48x24mm to 96x96mm, all panel sizes comply with international standards.

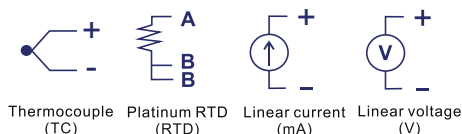
### Quality Assurance:

- All temperature controllers adopt isolated switching power supply.
- 100 ~ 240VAC input power supply, applicable in all the countries in the world.
- CE, UL and C-Tick certified



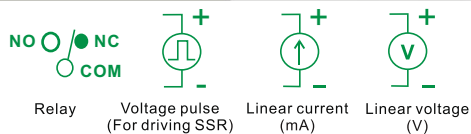
### Supports Various Sensors:

- Built-in various sensor input modes: Thermocouple, platinum RTD or linear voltage/current.



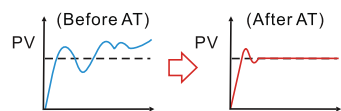
### Various Output Modes:

- Relay, voltage pulse, linear voltage, and current



### Stable Control:

- Built-in PID control function, with accurate auto-tuning (AT).
- PID parameters are automatically calculated, which enhances the stability of the system and accuracy of control.

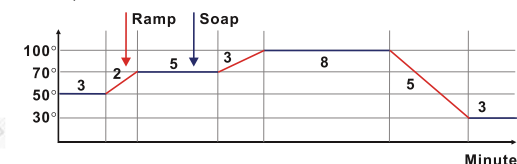


### Current Transformer (CT):

- CT can enable the off-line alarm and detects if the current is overloaded.

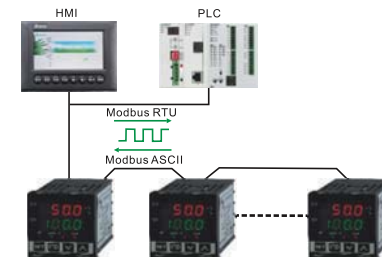
### Programmable Control:

- Max. 8 patterns available, with 8 steps in each pattern. No master controller is required for planning all kinds of temperature control curves.



### Communication:

- RS-485 communication interface, supporting Modbus ASCII/RTU communication



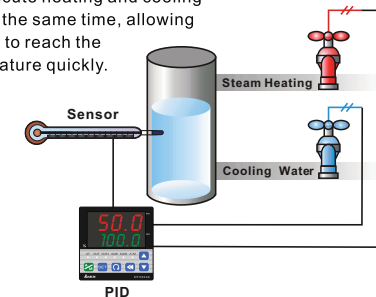
### Safety:

- The key-locking function and communication protection avoid malfunction.



### Dual Output Control:

- Able to execute heating and cooling controls at the same time, allowing the system to reach the set temperature quickly.



# Temperature Controllers

## Functions



### Standard Type

DTA is designed for practical applications, offering 3 most frequently adopted output types in the market. DTA is built in with many user-friendly functions and handy transmission structure, ensuring fast and stable data transmission.

Optional functions: RS-485 communication interface (Modbus ASCII/RTU, 2,400 ~ 38,400bps), CT (current transformer)



### Electrical Specification

Power supply	100 ~ 240VAC, 50/60Hz
Voltage range	85 ~ 110% rated voltage
Power consumption	5VA Max.
Display	2-line 7-segment LED display, PV: red; SV: green
Input temperature sensors	Thermocouple: K, J, T, E, N, R, S, B, U, L, TXK Platinum RTD: Pt100, JPt100
Display scale	0.1% full scale
Control methods	PID, ON/OFF, Manual
Output types	Relay: 250VAC, 5A, SPDT (DTA4848: SPST) Voltage pulse: 14VDC, Max. output current: 40mA Current: DC 4 ~ 20mA (Load resistance: < 600Ω)
Sampling rate	0.5 second
Communication	RS-485 digital communication, 2,400 ~ 38,400bps (optional)
Communication protocol	Modbus protocol, ASCII/RTU format (optional)
Vibration resistance	10 ~ 55Hz, 10m/s <sup>2</sup> for 10 mins in X, Y, Z direction
Shock resistance	Max. 300m/s <sup>2</sup> , 3 times in each of 3 axes, 6 directions
Ambient temperature	0 ~ 50°C
Storage temperature	-20 ~ +65°C
Altitude	< 2,000m
Ambient humidity	35 ~ 85% RH (non-condensing)
Waterproof Degree	IP66



### Advanced Type

Compared to DTA, DTB is added with linear voltage output and adopts dual-loop output control, able to execute heating and cooling controls at the same time in a temperature control system.

DTB series is built-in with RS-485 communication interface (Modbus ASCII/RTU, 2,400 ~ 38,400bps). The programmable PID control function allows DTB to set up 64 sets of temperature and control time.

Optional functions:

- CT (current transformer), output by alarm.
- EVENT function, switching between 2 SVs by using PLC or switches.
- Valve models are able to adjust the openness of valve depending on the SV.



### Electrical Specification

Power supply	100 ~ 240VAC, 50/60Hz
Voltage range	85 ~ 110% rated voltage
Power consumption	< 5VA
Display	2-line 7-segment LED display, 4 digits available, PV: red, SV: green
Input temperature sensors	Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK Platinum RTD: Pt100, JPt100 Analog input: 0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, 0 ~ 50mA
Display scale	1 digit after decimal point, or no decimal point
Control methods	PID, programmable PID, ON/OFF, Manual
Output types	Relay: SPDT (DTB4848/4824: SPST), Max. load: 250VAC, Resistive load: 5A Voltage pulse: 14VDC, Max. output current: 40mA Current: DC 4 ~ 20mA (Load resistance: < 600Ω) Analog voltage: 0 ~ 10V
Sampling rate	Analog input: 0.15 second, Thermocouple or platinum RTD: 0.4 second
Communication	RS-485 digital communication, 2,400 ~ 38,400bps
Communication protocol	Modbus protocol, ASCII/RTU format
Vibration resistance	10 ~ 55Hz, 10m/s <sup>2</sup> for 10 mins in X, Y, Z direction
Shock resistance	Max. 300m/s <sup>2</sup> , 3 times in each of 3 axes, 6 directions
Ambient temperature	0 ~ 50°C
Storage temperature	-20 ~ +65°C
Altitude	< 2,000m
Ambient humidity	35 ~ 80% RH (non-condensing)
Waterproof Degree	IP66



# Temperature Controllers



## DTC Modular Type

DTC features modular and wire-saving structure, able to monitor many temperature points by parallel and modular extension. The user is able to set up the suitable output method according to the actual demand. The built-in password protection prevents inadequate operation or malicious damages from staff. DTC series is built-in with RS-485 communication interface (Modbus ASCII/RTU, 2,400 ~ 38,400bps). The programmable PID control function allows DTC to set up 64 sets of temperature and control time. DTC also supports 3 levels of password protection, synchronous communication protocol and auto ID setup.



### Electrical Specification

Power supply	24V, isolated switching power supply
Voltage range	90 ~ 110% rated voltage
Power consumption	3W + 3W x number of DTC2000 controllers connected in parallel (Max. 7)
Input temperature sensors	Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
	Platinum RTD: Pt100, JPt100
	Linear current: 0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, 0 ~ 50mV
Control methods	PID, programmable PID, ON/OFF, Manual
Output types	Relay: SPST, Max. load: 250VAC, Resistive load: 3A
	Voltage pulse: 12VDC, Max. output current: 40mA
	Current: DC 4 ~ 20mA (Load resistance: < 500Ω)
	Analog voltage: 0 ~ 10V (Load resistance: > 1,000Ω)
Sampling rate	Analog input: 0.15 second, Thermocouple or platinum RTD: 0.4 second
Communication	RS-485 digital communication, 2,400 ~ 38,400bps
Communication protocol	Modbus protocol, ASCII/RTU format
Vibration resistance	10 ~ 55Hz, 10m/s <sup>2</sup> for 10 mins in X, Y, Z direction
Shock resistance	Max. 300m/s <sup>2</sup> , 3 times in each of 3 axes, 6 directions
Ambient temperature	0 ~ 50°C
Storage temperature	-20 ~ +65°C
Altitude	< 2,000m
Ambient humidity	35 ~ 85% RH (non-condensing)

## DTD Economical Type

DTD series offers PID, programmable PID, ON/OFF and Manual control modes and supports 1 alarm output with 8 alarm modes, which reduces the cost but enhances the functions. The programmable PID control function allows DTD to set up 8 sets of temperature and control time.



### Electrical Specification

Power supply	100 ~ 240VAC, 50/60Hz
Voltage range	85 ~ 110% rated voltage
Power consumption	6VA Max.
Display	7-segment LED display, PV: red, SV: green
Input temperature sensors	Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
	Platinum RTD: Pt100, JPt100      Copper resistance: Cu50
	Current: 0 ~ 20mA, 4 ~ 20mA      Voltage: 0 ~ 5V, 0 ~ 10V, 0 ~ 70mV
Display scale	K2, J2, T2, Pt100-2, JPt100, Cu50: 0.1°, Others: 1°
Control methods	PID, programmable PID, ON/OFF, Manual
Output types	Relay: 250VAC, 5A, SPST
	Voltage pulse: 14VDC, Max. output current: 40mA
Sampling rate	0.4 second (analog input and sensor input)
Vibration resistance	10 ~ 55Hz, 10m/s <sup>2</sup> for 10 mins in X, Y, Z direction
Shock resistance	Max. 300m/s <sup>2</sup> , 3 times in each of 3 axes, 6 directions
Ambient temperature	0 ~ 50°C
Storage temperature	-20 ~ +65°C
Altitude	< 2,000m
Ambient humidity	35 ~ 85% RH (non-condensing)
Waterproof Degree	IP66

# Temperature Controllers



## Multi-Channel Modular Type

DTE series is a multi-channel modular type temperature controller. DTE10T supports 8 thermocouple and DTE10P 6 platinum RTD inputs. DTE series is installed on DIN rail, and each channel operates independently. DTE series offers many optional output modules (relay, voltage pulse, current and linear current). The built-in RS-485 2-wire communication allows transmission speed of up to 115,200bps. The programmable PID control function allows DTE to set up 64 sets of temperature and control time. Maximum 7 DTC2000 controllers are extendable to DTE, and DTE supports the same synchronous communication protocol and auto ID setup which DTC supports.



## Electrical Specification

Power supply	24VDC, isolated switching power supply
Voltage range	90 ~ 110% rated voltage
Power consumption	Max. 10W + 3W + 3W x number of DTC2000 controllers connected in parallel (Max. 7)
Input temperature sensors	Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK Platinum RTD: Pt100, JPt100      Copper resistance: Cu50
Control methods	PID, programmable PID, ON/OFF, Manual
Output types	Relay: SPST, Max. load: 250VAC, Resistive load: 3A Voltage pulse: 24VDC, Max. output current: 40mA Current: DC 4~20mA (Load resistance: < 500Ω) Analog voltage: 0 ~ 10V (Load resistance: > 1,000Ω)
Sampling rate	Thermocouple or platinum RTD: 1.0 second/all inputs
Communication	RS-485 digital communication, 2,400 ~ 115,200bps
Communication protocol	Modbus protocol, ASCII/RTU format
Vibration resistance	10 ~ 55Hz, 10m/s <sup>2</sup> for 10 mins in X, Y, Z direction
Shock resistance	Max. 300m/s <sup>2</sup> , 3 times in each of 3 axes, 6 directions
Ambient temperature	0 ~ 50°C
Storage temperature	-20 ~ +65°C
Altitude	< 2,000m
Ambient humidity	35 ~ 85% RH (non-condensing)



## Valve Type

DTV series is designed for electronic valve applications. It is user-friendly and easy to use. DTV is built-in with Modbus communication, which allows handier data collection.

DTV also features:

- Auto/manual mode switching by a single key.
- "Left" key makes the parameter setting faster.
- Real-time output percentage display, for the user to acquire the openness of the valve.
- 2 alarm outputs, 17 alarm modes.
- RS-485 communication interface for DTV to monitor and collect data from other temperature controllers on the network.



## Electrical Specification

Power supply	100 ~ 240VAC, 50/60Hz
Voltage range	85 ~ 110% rated voltage
Power consumption	< 5VA
Display	2-line 7-segment LED display, 4-bit or 2-bit valve openness display available PV: red, SV & openness of valve: green
Input temperature sensors	Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK Platinum RTD: Pt100, JPt100 Analog input: 0 ~ 5v, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, 0 ~ 50mA
Display scale	1 digit after decimal point, or no decimal point
Control methods	PID, programmable PID, ON/OFF, Manual
Output types	Relay: SPST, Max. load: 250VAC, Resistive load: 5A
Sampling rate	Analog input: 0.15 second, Thermocouple or platinum RTD: 0.4 second
Communication	RS-485 digital communication, 2,400 ~ 38,400bps
Communication protocol	Modbus protocol, ASCII/RTU format
Vibration resistance	10 ~ 55Hz, 10m/s <sup>2</sup> for 10 mins in X, Y, Z direction
Shock resistance	Max. 300m/s <sup>2</sup> , 3 times in each of 3 axes, 6 directions
Ambient temperature	0 ~ 50°C
Storage temperature	-20 ~ +65°C
Altitude	< 2,000m
Ambient humidity	35 ~ 80% RH (non-condensing)
Waterproof Degree	IP66

# Temperature Controllers

## Ordering Information

**DTA**

1 2 3 4 5 6 - 7

Series Name	DTA : Delta A series temperature controller	
Panel Size (W x H)	4848 : 1/16 DIN W48 x H48 mm 4896 : 1/8 DIN W48 x H96 mm 9696 : 1/4 DIN W96 x H96 mm	7272 : W72 x H72 mm 9648 : W96 x H48 mm
Output	R : Relay, SPST (4848: SPST), 250VAC, 5A V : Voltage pulse, 14V +10% ~ -20% (Max. 40mA) C : Current, 4~20mA	
Communication (Optional)	0 : N/A	1 : RS-485 communication
CT (Optional)	0 : N/A	T : With CT (only DTA7272R0)

**DTB**

1 2 3 4 5 6 7

Series Name	DTB : Delta B series temperature controller	
Panel Size (W x H)	4824 : 1/32 DIN W48 x H24 mm 4848 : 1/16 DIN W48 x H48 mm	4896 : 1/8 DIN W48 x H96 mm 9696 : 1/4 DIN W96 x H96 mm
Output 1	R : Relay, SPDT (4824/4848: SPST), 250VAC, 5A V : Voltage pulse: 14V +10% ~ -20% C : DC current: 4 ~ 20mA L : Linear voltage: 0 ~ 5V, 0 ~ 10VDC	
Output 2	R : Relay, SPDT (4824/4848: SPST), 250VAC, 5A V : Voltage pulse: 14V +10% ~ -20%	
Optional Function	0 : Without CT, without EVENT input T : With CT, without EVENT input E : Without CT, with EVENT input V : Valve control	

\*DTB4824 has no optional function and no extra alarm output. Output 2 can be set to alarm output.

\*DTB4848 has only 1 optional alarm output. Output 2 can be set to the 2" alarm output.

\*DTB9696 has optional valve control function. Model name: DTB9696RRV.

**DTC**

1 2 3 4 5

Series Name	DTC : Delta C series temperature controller	
Controller Type	1 : Main unit 2 : Extension unit	
Number of Auxiliary Outputs	0 : Standard 2 outputs, no auxiliary output	
Optional Function	00 : Standard function 01 : With CT input	
Output	R : Relay, SPST, 250VAC, 3A V : Voltage pulse, 12V +10% ~ -20% C : Current, 4 ~ 20mA L : Linear voltage, 0 ~ 10V	

**DTD**

1 2 3 4 5 0

Series Name	DTD : Delta D series temperature controller	
Panel Size (W x H)	4848 : 1/16 DIN W48 x H48 mm 4896 : 1/8 DIN W48 x H96 mm	
Output	R : Relay, SPST, 250VAC, 5A V : Voltage pulse, 14V +10% ~ -20% (Max. 40mA)	
Optional Function	0 : N/A	

**DTE**

1 2 3

Series Name	DTE : Delta E series temperature controller	
Controller Type	1 : Main unit 2 : Accessory	
Optional Function	0T : 4-channel TC (main unit, accessory) 0P : 4-channel PT (main unit, accessory) 0V : 4 channels of voltage pulse output 0C : 4 channels of linear current output 0R : 4 channels of relay output 0L : 4 channels of linear voltage output 0D : 4 digital inputs & 4 digital outputs CT : 4 channels of current transformers DS : Display & setup module	

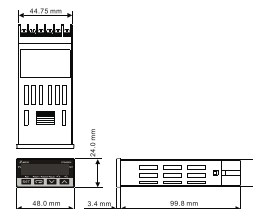
**DTV**

1 2 3 4 5

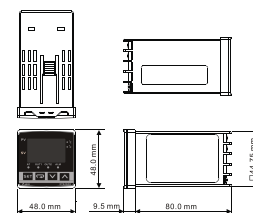
Series Name	DTV : Delta V series temperature controller	
Panel Size (W x H)	4896 : 1/8 DIN W48 x H96 mm 9696 : 1/4 DIN W96 x H96 mm	
Output	R : Relay, SPDT, 250VAC, 5A	

## Dimensions

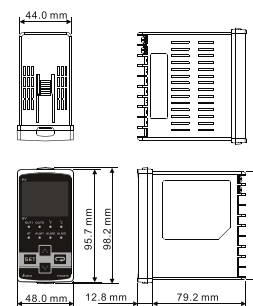
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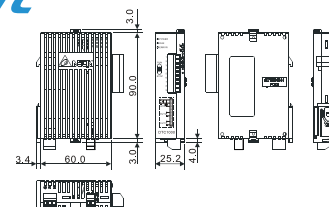
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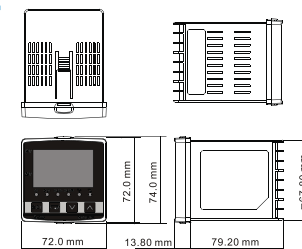
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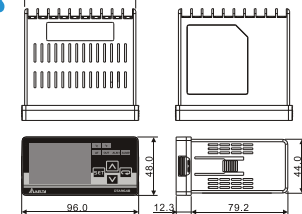
**DTC**



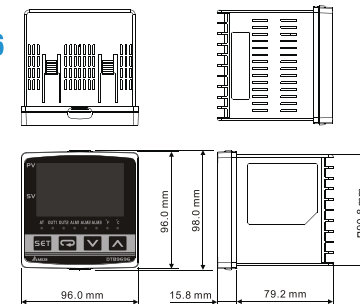
**7272**



**9648**



**9696**



**DTE**

