

DELTA Temperature Controller DTB Series User Manual



B Series Temperature Controller User Manual

1 **Precaution**

⚠ DANGER! Caution! Electric Shock!

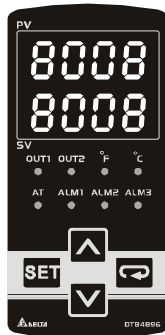
1. Do not touch the AC terminals while the power is supplied to the controller to prevent an electric shock.
2. Make sure power is disconnected while checking the unit inside.
3. The symbol indicates that this Delta B Series Temperature Controller is protected throughout by DOUBLE INSULATION or REINFORCED INSULATION (equivalent to Class II of IEC 536).

⚠ WARNING!

This controller is an open-type temperature controller. Make sure to evaluate any dangerous application in which a serious human injury or serious property damage may occur.

1. Always use recommended solder-less terminals: Fork terminal with isolation (M3 screw, width is 7.0mm (6.0mm for DTB 4824), hole diameter 3.2mm). Screw size: M3 x 6.5 (With 6.8 x 6.8 square washer). Screw size for DTB4824: M3 x 4.5 (With 6.0 x 6.0 square washer). Recommended tightening torque: 0.4 N.m (4kgf.cm). Applicable wire: Solid/twisted wire of 2 mm², 12AWG to 24AWG. Please be sure to tighten them properly.
2. Do not allow dust or foreign objects to fall inside the controller to prevent it from malfunctioning.
3. Never modify or disassemble the controller.
4. Do not connect anything to the "No used" terminals.
5. Make sure all wires are connected to the correct polarity of terminals.
6. 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. (d) High voltage and high frequency.
7. Must turn power off when wiring and changing a temperature sensor.
8. Be sure to use compensating wires that match the thermocouple types when extending or connecting the thermocouple wires.
9. Please use wires with resistance when extending or connecting a platinum resistance thermometer (RTD).
10. Please keep the wire as short as possible when wiring a platinum resistance thermometer (RTD) to the controller and please route power wires as far as possible from load wires to prevent interference and induced noise.
11. This controller is an open-type unit and must be placed in an enclosure away from high temperature, humidity, dripping water, corrosive materials, airborne dust and electric shock or vibration.
12. Make sure power cables and signals from instruments are all installed properly before energizing the controller, otherwise serious damage may occur.
13. Please do not touch the terminals in the controller or try to repair the controller when power is applied to prevent an electric shock.
14. Wait at least one minute after power is disconnected to allow capacitors to discharge, and please do not touch any internal circuit within this period.
15. Do not use acid or alkaline liquids for cleaning. Please use a soft, dry cloth to clean the controller.
16. This instrument is not furnished with a power switch or fuse. Therefore, if a fuse or power switch is required, install the protection close to the instrument. Recommended fuse rating: Rated voltage 250 V, Rated current 1 A. Fuse type: Time-lag fuse
17. This controller does not provide overcurrent protection. Use of this product requires that suitable overcurrent protection device(s) must be added to ensure compliance with all relevant electrical standards and codes. (Rated 250 V, 15 Amps max). A suitable disconnecting device should be provided near the controller in the end-use installation.

2 **Display, LED and Pushbuttons**



PV Display : to display the process value or parameter type.

SV Display : to display the set point, parameter operation read value, manipulated variable or set value of the parameter.

AT : Auto-tuning LED, flashes when the Auto-tuning operation is ON.

OUT1/OUT2 : Output LED, lights when the output is ON.

SET : **Function key**. Press this key to select the desired function mode and confirm a setting value.

Mode key. Press this key to set parameters within function mode.

°C, °F : **Temperature unit LED**. °C : Celsius °F : Fahrenheit

ALM1 ~ ALM3 : Alarm output LED, lights when ALM1/ALM2/ALM3 is ON.

Down key. Press this key to decrease values displayed on the SV display. Hold down this key to speed up the decrements.

Up key. Press this key to increase values displayed on the SV display. Hold down this key to speed up the incremental action.

3 **Ordering Information**

DTB 1234 56 7

DTB Series	DTB : Delta B Series Temperature Controller
1 2 3 4 Panel Size (WxH)	4824: 1/32 DIN W48 x H24mm; 4848: 1/16 DIN W48 x H48mm; 4896: 1/8 DIN W48 x H96mm; 9696: 1/4 DIN W96 x H96mm
5 1st Output Group Selection	R: Relay output, SPDT (SPST: 1/16 DIN and 1/32 DIN size), 250VAC, 5A V: Voltage pulse output, 14V +10%~ -20% (Max. 40mA) C: DC current output, 4 ~ 20mA; L: Linear voltage output, 0~5V, 0~10Vdc
6 2nd Output Group Selection	R: Relay output, SPDT (SPST: 1/16 DIN and 1/32 DIN size), 250VAC, 5A V: Voltage pulse output, 14V +10%~ -20% (Max. 40mA)
7 EVENT Inputs / CT function (Optional)	None: No EVENT input, No CT (Current transformer); E: EVENT input is provided, No CT (Current transformer) T: CT (Current transformer) is provided, No EVENT input; V: Valve control.

Note 1: DTB4824 series: no optional function provided and no extra alarm output supported, but user can set 2nd output as alarm mode.

Note 2: DTB4848 series: only one alarm output when optional function supported, but user can set 2nd output as 2nd alarm output.

Note 3: "Valve control" with feedback selection is only available for DTB9696RRV.

Input Voltage	100 to 240VAC 50/60Hz
Operation Voltage Range	85% to 110% of rated voltage
Power Consumption	5VA max.
Memory Protection	EEPROM 4K bit (non-volatile memory (number of writes: 100,000))
Display Method	2 line x 4 character 7-segment LED display Process value(PV): Red color, Set point(SV): Green color
Sensor Type	Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK 3-wire Platinum RTD: Pt100, JPt100 Analog input: 0~5V, 0~10V, 0~ 20 m A, 4~20 m A, 0~50mV
Control Mode	PID, ON/OFF, Manual or PID program control (Ramp/Soak control)
Control Output	Relay output: SPDT (SPST: 1/16 DIN and 1/32 DIN size), Max. load 250VAC, 5A resistive load Voltage pulse output: DC 14V, Max. output current 40mA Current output: DC 4 ~ 20m A output (Load resistance: Max. 600Ω) Linear voltage output: 0~5V, 0~10V
Display Accuracy	0 or 1 digit to the right of the decimal point (selectable)
Sampling Rate	Analog input: 150 msec/ per scan Thermocouple or Platinum RTD: 400 msec/per scan
RS-485 Communication	MODBUS ASCII / RTU communication protocol
Vibration Resistance	10 to 55Hz, 10m/s ² for 10min, each in X, Y and Z directions
Shock Resistance	Max. 300m/ s ² , 3 times in each 3 axes, 6 directions
Ambient Temperature	0 °C to +50 °C
Storage Temperature	-20 °C to +65 °C
Altitude	2000m or less
Relative Humidity	35% to 80% (non-condensing)

Input Temperature Sensor Type	Register Value	LED Display	Temperature Range
0~50mV Analog Input	17	0.00	-999 ~ 9999
4~20mA Analog Input	16	0.04	-999 ~ 9999
0~20mA Analog Input	15	0.00	-999 ~ 9999
0V~10V Analog Input	14	0.10	-999 ~ 9999
0V~5V Analog Input	13	0.5	-999 ~ 9999
Platinum Resistance (Pt100)	12	Pt	-200 ~ 600°C
Platinum Resistance (JPt100)	11	JPt	-20 ~ 400°C
Thermocouple TXK type	10	TXK	-200 ~ 800°C
Thermocouple U type	9	U	-200 ~ 500°C
Thermocouple L type	8	L	-200 ~ 850°C
Thermocouple B type	7	B	100 ~ 1800°C
Thermocouple S type	6	S	0 ~ 1700°C
Thermocouple R type	5	R	0 ~ 1700°C
Thermocouple N type	4	N	-200 ~ 1300°C
Thermocouple E type	3	E	0 ~ 600°C
Thermocouple T type	2	T	-200 ~ 400°C
Thermocouple J type	1	J	-100 ~ 1200°C
Thermocouple K type	0	K	-200 ~ 1300°C

Note 1 : An external 250Ω precision resistor should be connected when the current input is selected as the input temperature sensor type..

Note 2 : **5P** (Operation mode) must be set if user wish to specify decimal point position. Except for the thermocouple B, S, R type, the decimal point positions of all the other thermocouple type input sensors can be set.

The default range of analog input is -999 ~ 9999. For example, when a 0~20mA analog input is selected as the input temperature sensor type, -999 indicates 0mA and 9999 indicates 20mA. If change the input range to 0 ~ 2000, then 0 indicates 0mA and 2000 indicates 20mA. One display scale is equal to 0.01mA.

