DTC24 Series
Duct-Mount Temperature Controllers with PI Control Outputs

Features

- For air duct mounting only
- Available with ºC temperature scale dial only
- Selectable P or PI function
- Single or dual 3-wire floating or 2-10/0-10 VDC outputs
- Selectable 2-10 or 0-10 VDC output
- Integral time: selectable at 0, 120, 1200 or 1800 s
- Proportional band: selectable at 1, 3, 5 or 10 K
- Selectable 2 or 3 K deadband for dual-output models
- Seasonal changeover sensor available with auto changeover capability

General

The DTC24 Series microprocessor-based duct-mount temperature controllers provide 2-10/0-10 VDC proportional outputs or 3-wire floating outputs and are designed for use in 2-pipe or 4-pipe air handling units and a variety of heating and cooling applications controlled by water valves and air dampers.

The microprocessor combines a proportional plus integral (PI) algorithm with advanced adaptive control logic. The proportional component of the algorithm adjusts the control output in response to changes in the measured temperature. The integral component of the algorithm adjusts the control output to eliminate offset (difference between the set point and the actual temperature). This provides precise and stable control under various system capacity and varying load conditions without the need for tuning or calibrating the control algorithm in the field.

Mounting

The temperature controller can be surface mounted directly, with its probe inserted inside, on an air duct. Two self-tapping mounting screws are included.

Ordering

To order, specify complete model number.

Specifications

Product Model Number	DTC24-T1	Single 3-wire floating, cool only or heat only
	DTC24-T2	Dual 3-wire floating, auto cool/heat changeover with selectable deadband
	DTC24-A1	Single 2-10/0-10 VDC output, cool only or heat only
	DTC24-A2	Dual 2-10/0-10 VDC outputs, auto cool/heat changeover with selectable deadband
Power Requirements	24 V ±15%, 50/60 Hz	
Power Consumption	1 VA @ 24 VAC	
3-Wire On-Off or Floating Output Ratings	20 VA @24 VAC	
0-10 VDC Control Signal Load	Minimum 100 kΩ Impedance	
Temperature Set Point Range	0-30 °C	
Deadband of Dual-Output Models	Selectable at 2 K or 3 K between cooling Mode and heating Mode, factory set at 3 K	
Proportional Band	Selectable at 1, 3, 5 or 10 K, factory setting 5 K	
Integral Time	Selectable at 0, 120, 1200 or 1800 s, factory setting 1200 s. Setting = 0 means integral time being turned off (P output only).	
Sampling Time	10 s	
Sensing Element	NTC thermistor, 10 kΩ @ 25 °C	
Body Material	Self-extinguishing, Molded ABS	
Finish	Off White and Dark Grey Color	
Ambient/Storage Temperature Limits	0 to 50 °C / -30 to 50 °C, 10% to 90% RH Non-condensing	
Connections	Non-removable Terminal Blocks	
Power and Control Wires	Wire size 1 mm^2 or 18 AWG solid copper recommended	
Sensor Wires	22 or 24 AWG twisted shielded pair double-insulated cable	
Agency Approval	CE Mark Compliant to EMC Directive pending	
Shipping Weight	0.3 kg (0.66 lb)	
Dimensions	See Figure 1: Dimensions in mm	

The performance specifications above are nominal and subject to tolerances and application variables of generally acceptable industry standards. The Manufacturer shall not be liable for damages resulting from misapplication or misuse of its products.

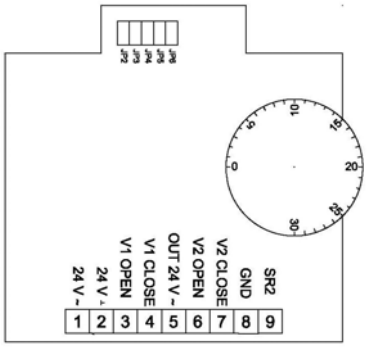
Application Notes

- On a single-output unit, connecting a shunting wire between terminals for seasonal changeover sensor forces the unit to go into heating mode.
- On a single-output unit, connecting a TE10-1 changeover sensor will automatically switch the unit between cooling and heating mode. When the sensor temperature exceeds 30ºC, the controller enters into heating mode.
- On a dual-output unit, the main output is always associated with the cooling controlled device and the secondary output with the heating controlled device.
- The seasonal changeover sensor should be wrapped around the supply water pipe when associated with a water system. When the changeover sensor temperature exceeds 30 ºC, the controller enters into heating mode.
- When using the seasonal changeover sensor, run the wires away from any electric motors or power wiring. Failure to do so may result in poor thermostat performance due to electrical noise.
- 22 or 24 AWG twisted shielded pair double-insulated cable is recommended as seasonal changeover sensor wiring and its length must not exceed 25 m.
- Do not bundle and run power wiring and seasonal changeover sensor wiring in the same conduit.
- It is highly recommended that the 24 VAC power supply is interlocked to the air-conditioning system so that the controller is shut down when the air-conditioning system is turned off.

Figure 1: Jumper Settings and Locations

3-Wire Floating Controller

Function Description	Jumper Number		Jumper Setting	Factory Setting
Proportional band	JP2	JP3	00: 1 K	
	JP2	JP3	01: 3 K	
	JP2	JP3	10: 5K	√
	JP2	JP3	11: 10 K	
Integral time	JP4	JP5	00: 0 s (P only)	
	JP4	JP5	01: 120 s	
	JP4	JP5	10: 1200 s	√
	JP4	JP5	11: 1800 s	
Deadband (for 4-pipe models only)	JP6		0: 2 K	
			1: 3 K	√
Notes: 0 = jumper removed 1 = jumper inserted				



0-10 VDC Proportional Controller

Function Description	Jumper Number		Jumper Setting	Factory Setting
Output voltage	JP1		0: 0-10 VDC	√
	JP1		1: 2-10 VDC	
Proportional band	JP2	JP3	00: 1 K	
	JP2	JP3	01: 3 K	
	JP2	JP3	10: 5 K	√
	JP2	JP3	11: 10 K	
Integral time	JP4	JP5	00: 0 s (P only)	
	JP4	JP5	01: 120 s	
	JP4	JP5	10: 1200 s	√
	JP4	JP5	11: 1800 s	
Deadband (for 4-pipe models only)	JP6		0: 2 K	
			1: 3 K	√
Notes: 0 = jumper removed 1 = jumper inserted				

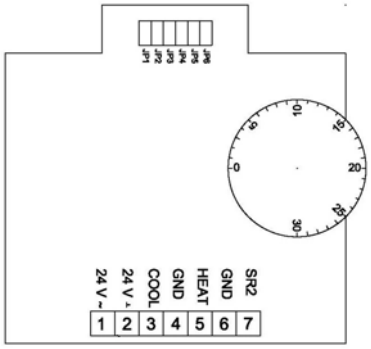


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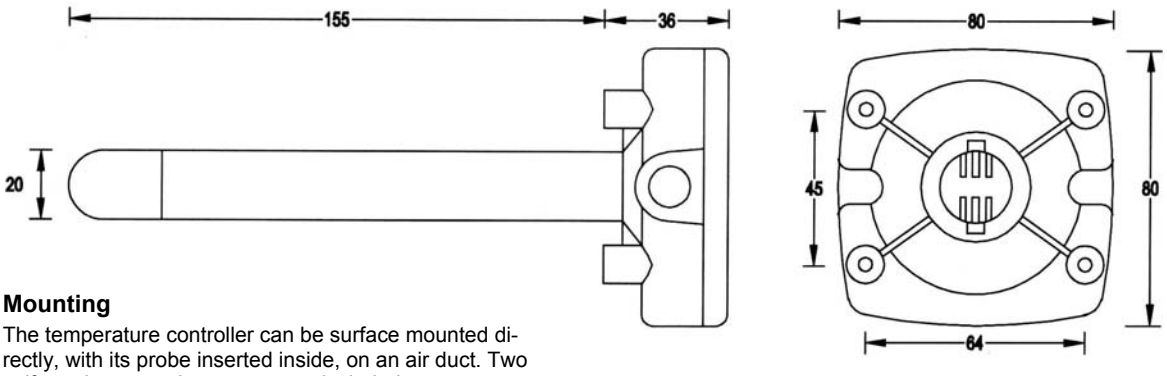
Figure 2: Dimensions in mm and Mounting

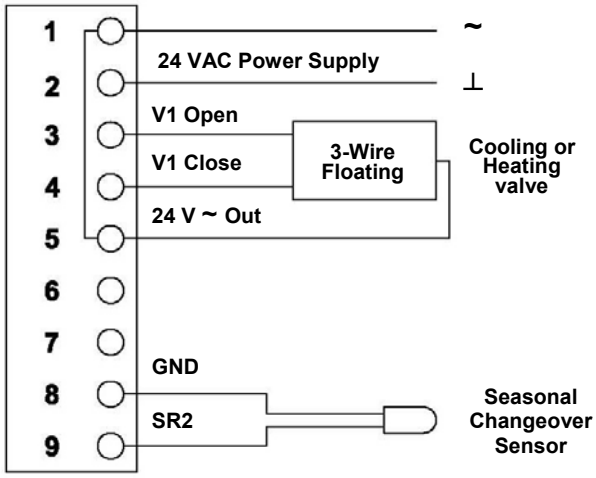


Mounting

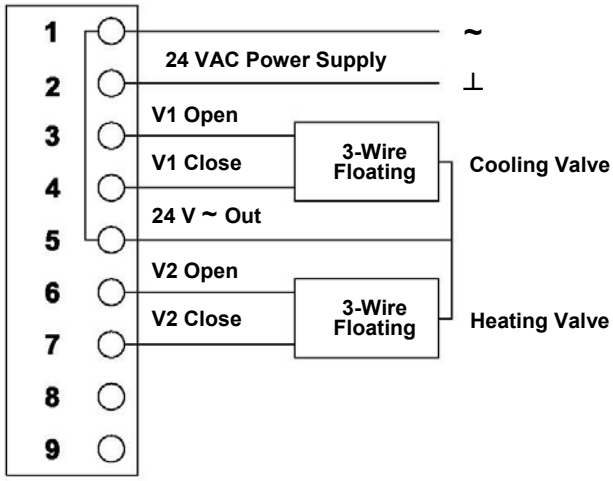
The temperature controller can be surface mounted directly, with its probe inserted inside, on an air duct. Two self-tapping mounting screws are included.

Figure 3: Wiring Diagrams

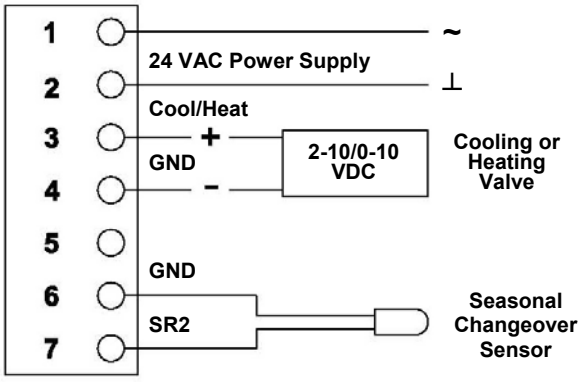
Single 3-Wire Floating Output Controller



Dual 3-Wire Floating Outputs Controller



Single 2-10/0-10 VDC Output Proportional Controller



Dual 2-10/0-10 VDC Outputs Proportional Controller