

T28 Fan Coil Thermostat

Application Requirements

The T28 thermostats control line voltage fan coil units and zone valves on heating, cooling, and a combination of heating and cooling equipment. The thermostats directly control one or two zone valves. Thermostats with fan switches require a two-gang switch box at least 2 1/2 in.-deep, or a 4 in. by 4 in. or larger junction box with a two-fixture plaster ring. For example, use Racco No. 230 or Appleton No.4SD1/2 two-gang switch box, plus plaster ring.

Thermostats without fan switches require a 2 in.-deep single, vertical switch box or a larger box with a single-fixture plaster ring. For example, use Racco No. 420 or Appleton No. 111 single switch box.

Note: The boxes and plaster rings are not included with the thermostat.

Installation

IMPORTANT: The T28 Series Thermostats are intended to control equipment under normal operating conditions. Where failure or malfunction of a T28 thermostat could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory systems) intended to warn of, or protect against, failure or malfunction of the T28 thermostat must be incorporated into and maintained as part of the control system.

Parts Included

- thermostat
- 2 No. 6 screws
- 2 fiber washers

Note: Plaster rings and switch box are not furnished.

Dimensions

Refer to Figure 1 and Figure 2 for detailed dimensions of the T28 Fan Coil Thermostat.

Mounting

Location Considerations

Mount the thermostat about 4 to 5 ft. (1.2 to 1.5 m) above the floor on an interior wall, where it can sense the average room temperature. Do not mount the thermostat where it may react to heat or cold from water pipes, windows, doors, lamps, sunlight, or other heat or cold sources.

On unit heater applications, place the thermostat below and behind the heater in the path of air entering the unit—not in the path of discharge air.

To mount the thermostat:

1. Install the switch box and plaster ring (when required). See Figure 3.
2. Remove the cooling anticipator resistor to prevent over-anticipation on 208/240 VAC installations. Carefully clip the left-hand resistor leads with diagonal cutters. See Figure 3.
3. Refer to *Wiring* section to make the necessary connections.
4. Loosen the cover screw at the bottom of the cover, swing the cover bottom out, and lift up to remove.
5. Fasten the thermostat to the switch box with the two captive screws in the baseplate.
6. Carefully remove the contact protector (insulation barrier). See Figure 3. Move the temperature setting lever from Cool to Warm to be sure the contact arm is free.
7. Reposition the cover, and tighten the cover screw.
8. Turn on the power supply.
9. Check the thermostat operation. Refer to the *Checkout* section.

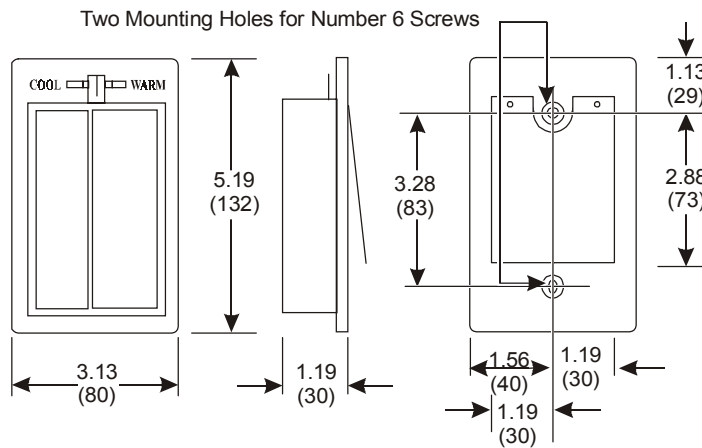


Figure 1: T28 Without Fan Switch, in. (mm)

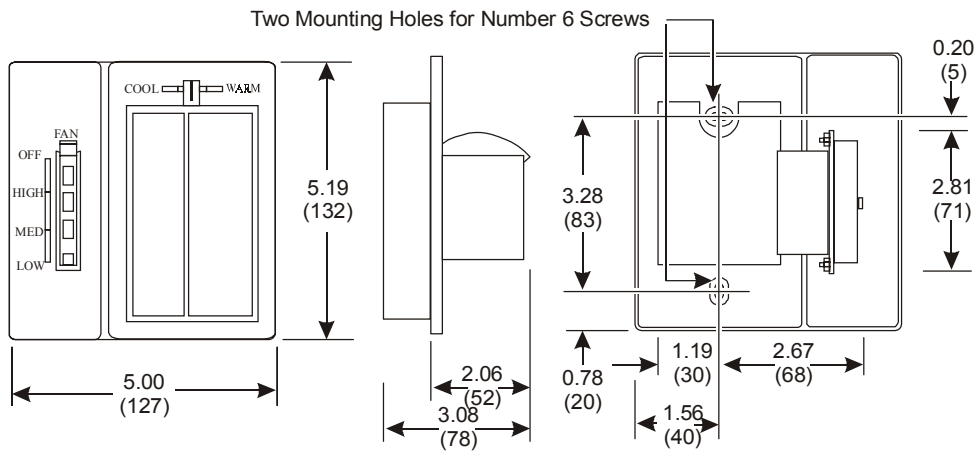


Figure 2: T28 with Fan Switch, in. (mm)

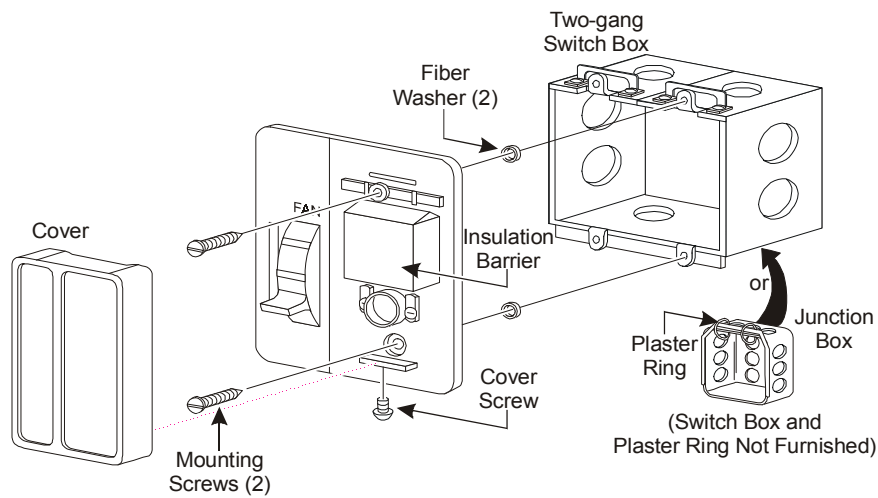


Figure 3: Mounting the T28 to an Outlet Box, in. (mm)

Wiring

Make wiring connections using wire nuts or other approved solderless connectors. See wiring diagrams for proper connections.



WARNING: Risk of Electrical Shock.

Disconnect the electrical power supply before making the wiring connections to avoid possible electrical shock or damage to the equipment. On multiple circuit units, more than one circuit may have to be disconnected.

Cooling

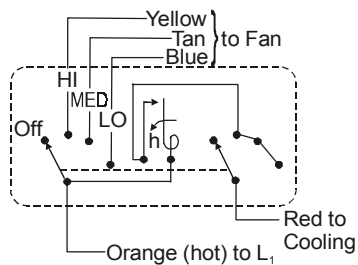


Figure 4: T28BD Cooling Thermostat with "Off-HI-MED-LO" Fan Switch

Heating-Cooling

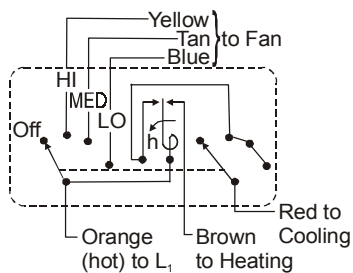


Figure 5: T28CD Heating-Cooling Thermostat with "Off-HI-MED-LO" Fan Switch

Sequenced Heating-Cooling

Note: Sequenced heating-cooling models have a deadband allowing automatic changeover on three-pipe or four-pipe systems.

No Fan Selector

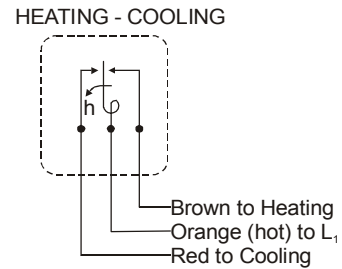


Figure 6: T28DA Sequenced Heating-Cooling Thermostat

Fan "OFF" Closes Cooling Valve

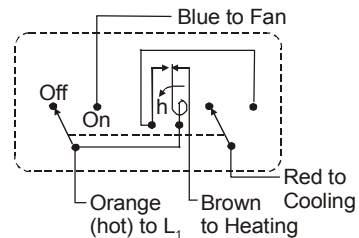
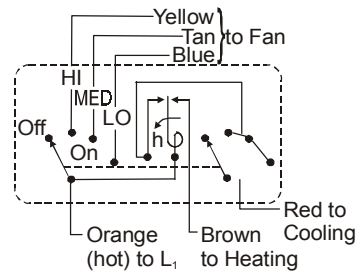


Figure 7: T28DB Sequenced Heating-Cooling Thermostat with "Off-On" Fan Switch



Note: Fan "OFF" Closes Heating and Cooling Valves

Figure 8: T28DD Sequenced Heating-Cooling Thermostat with "Off-HI-MED-LO" Fan Switch

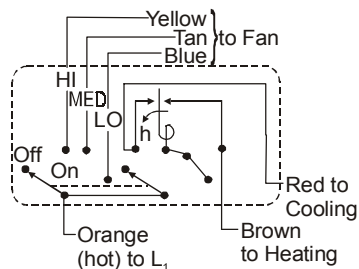


Figure 9: T28DG Sequenced Heating-Cooling Thermostat with "Off-HI-MED-LO" Fan Switch

Table 1: Electrical Ratings (In Amperes)

Thermostat (Pilot Duty)						
Volts, AC	Cooling		Heating		Fan Switch	
	Normal	Inrush	Normal	Inrush	Full Load	Locked Rotor
120	0.32	1.0	0.12	0.36	5.8	34.8
208	0.18	0.57	0.07	0.21	3.3	19.8
240	0.16	0.50	0.06	0.18	2.9	17.4

Setup and Adjustments

Calibration

If the thermostat has a thermometer in the cover, recalibrate the thermometer by following the steps below:

1. Remove the thermostat cover.
2. Place an accurate test thermometer and the cover side-by-side, allowing both the test thermometer and the cover thermometer to reach a stable temperature before adjusting.
3. Carefully turn the hex nut behind the insulator with a thin wrench until the pointer corresponds to the temperature indicated by the test thermometer.

Checkout

Before leaving the installation, observe at least three complete operating cycles to ensure that all components are functioning correctly. Follow the steps below:

1. Move the lever toward Warm to raise the temperature setting to check the heating cycle.
2. Move the lever toward Cool to lower the temperature setting to check the cooling cycle. The center of the scale is approximately 75°F (24°C).

Repairs and Replacement

Field repairs must not be made. For a replacement thermostat, contact the nearest Johnson Controls representative.

Technical Data

Product		T28 Fan Coil Thermostat
Range	Thermostat	55 to 95°F (12 to 35°C)
	Thermometer	55 to 85°F (12 to 30°C)
Nominal Operating Differential	Heating	0.6F° (0.3C°)
	Cooling	1F° (0.5C°) for typical 120 V Fan Coil Valve Loads
	Heating-Cooling	Models with Automatic Changeover (T28D) have a 6F° (3.3C°) Differential from Heating On to Cooling On
Adjustment		Cool to Warm
Contact Action		Snap-acting Bimetal-operated
Material and Finish	Baseplate	Cold Rolled Steel, Baked on Beige Paint
	Cover	Cold Rolled Steel, Baked on Ivory Paint
Thermometer		Bimetal Type for Accuracy and Clarity, may be Field Adjusted
Mounting	Without Fan Switch	Standard Outlet Box with Captive Screws
	With Fan Switch	Mounts to a Two-Gang Switch Box
Wiring Connections		Color Coded 18 AWG Wire Leads, 6 in. (152 mm) Long
Shipping Weight	Without Fan Switch	Individual Pack - 1.0 lb (0.45 kg)
		Overpack of 20 Units - 23.6 lb (10.7 kg)
	With Fan Switch	Individual Pack - 1.3 lb (0.59 kg)
		Overpack of 20 units - 29.5 lb (13.4 kg)
Agency Listings		UL Listed: File E6688, CCN XAPX

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



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Printed in U.S.A.
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