

Duct and Immersion Electric Thermostats General Instructions

Application

For line voltage on-off control of media temperatures in ducts, tanks, liquid lines, pipes, etc.

Specifications

- Setpoint Dial Range:** See Tables 1 and 2.
- Sensing Element:** Helical bimetal.
- Differential:** See Tables 1 and 2.
- Shipping Ambient Temperature Limits:** -40 to 160°F (-40 to 71°C).
- Electrical Switch:** See Tables 1 and 2.
- Connections:** Coded terminals.
- Cover:** Beige painted steel case with 1/2" conduit opening.
- Locations:** NEMA Type 1 indoor only.
- Mounting:** In any position on any surface not subject to excessive vibration. For immersion mounting AT-223 will be required. Extension mounting bracket (provided) is required by UL for duct installation of TA-3434 and TC-3413.

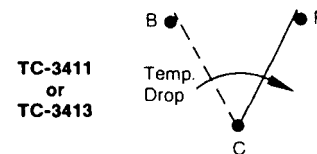
Dimensions:

Case, 5-3/8" high x 3-1/2" wide x 1-7/8" deep (136 mm x 89 mm x 48 mm).

Element, 1/2" diameter x 7-1/2" insertion length, overall length 9-3/8" (131 mm x 191 mm x 238 mm).

ACCESSORIES

AT-223 Brass bulb well (see below)



TA-343X opens circuit on rise of temperature above setpoint.
TA-3441 opens circuit on drop of temperature below setpoint.

Figure-1 Switch Action and Terminal Identification.

Table-1 Specifications.

Part Number	Device Type	Functional Setpoint Dial Range °F (°C) ^a	Sensor Ambient °F (°C)		Differential °F (°C)	Switch Type	Voltage	Full Load Amps	Locked Rotor Amps	Pilot Duty (VA)
			Min.	Max.						
TA-3432	High temp. manual reset	75 to 135 (23 to 57)	-25 (-32)	235 (113)	Fixed ^b 10 (5)	SPST opens on temp. rise	120	16	96	720
							240	8	48	
TA-3433	High temp. manual reset	100 to 160 (38 to 71)	0 (-18)	260 (127)	Fixed ^b 5 (3)	SPST opens on temp. rise	120	16	96	720
							240	8	48	
TA-3434	High temp. manual reset	120 to 240 (49 to 116)	20 (-7)	300 (149)	Fixed ^b 10 (5)	SPST opens on temp. rise	120	16	96	720
							240	8	48	
TA-3441	Low temp. manual reset	35 to 59 (1.7 to 15)	-40 (-40)	159 (71)	Fixed ^c 10 (5)	SPST opens on temp. drop	120	16	96	720
							240	8	48	

^a Units dual marked °F and °C.

^b Reset cannot be accomplished until the sensed temperature is at least 5°F (3°C) below setpoint.

^c Reset cannot be accomplished until the sensed temperature is at least 5°F (3°C) above setpoint.

Table-2 Specifications for Obsolete Models.

Part Number	Device Type	Functional Setpoint Dial Range °F (°C) ^a	Sensor Ambient °F (°C)		Differential °F (°C)	Switch Type	Voltage	Full Load Amps	Locked Rotor Amps	Pilot Duty (VA)
			Min.	Max.						
TC-3411 ^b	Low temp. automatic reset	0 to 120 (-18 to 49)	-40 (-40)	220 (104)	Adj. 2 to 8 (1 to 4) Factory set 2 (1)	SPDT	120	3.8	22.8	125
							240	1.9	11.4	
TC-3413 ^b	High temp. automatic reset	120 to 240 (49 to 116)	20 (-7)	300 (149)	Adj. 2 to 8 (1 to 4) Factory set 2 (1)	SPDT	120	3.8	22.8	1254
							240	1.9	11.4	

^a Units dual marked °F and °C.

^b TC-3411 and TC-3413 are not CSA certified.

AT-223 BRASS BULB WELL



Construction: Brass.

Connection: 3/4" MNPT.

Dimensions: 7-1/2" (191 mm) insertion length.

PRE-INSTALLATION

Inspection

Inspect the carton for damage. If damaged, notify the appropriate carrier immediately. Inspect the device for obvious damage. Return damaged products.

Required Installation Items

- Wiring diagrams
- Tools (not provided):
VOM (volt-ohm meter)
Appropriate screwdriver for mounting screws and terminal connections
- Appropriate drill and drill bit for mounting screws
- Appropriate accessories
- Mounting screws:
(3) #8 x 3/4 sheet metal, provided with extension mounting bracket with TA-3434 and TC-3413
(2) #8-32 x 3/8" round head, provided for all models

INSTALLATION

Caution:

1. Installer must be a qualified, experienced technician.
2. Make all connections in accordance with the wiring diagram, and in accordance with national and local electrical codes. Use copper conductors only.
3. Do not exceed ratings of the device.

Mounting

The thermostats may be mounted in any position. The sensitive helical bimetal element may be mounted in ducts or, with optional bulb well, in liquid lines, pipes, tanks, etc.

Duct Installation

1. Cut a 3/4" (19 mm) diameter hole in the duct where the thermostat is to be located.
2. Remove the cover and carefully insert the bimetal in the duct opening. Mark position for the two mounting screws provided and punch or drill holes.
3. Partially insert screws.
4. Insert the bimetal element; rotate the thermostat housing counterclockwise to engage screw heads in key hole slots.
5. Straighten thermostat housing and tighten mounting screws securely.
6. Make electrical connections and replace thermostat cover.

Duct Installation with Extension Mounting Bracket

See Figure 2.

Caution: Extension mounting bracket is required for duct installation by UL on units where the control range exceeds 180°F (82°C) (typically TC-3413 and TA-3434).

1. Cut a 3/4" (19 mm) diameter hole in the duct where the thermostat is to be located.
2. Use the extension bracket as a template to mark position for three mounting holes.
3. Punch or drill holes for the extension bracket.
4. Secure the extension bracket to the duct with the three (3) #8 x 3/4" screws provided.
5. Partially thread the two #8-32 x 3/8" round head screws provided into the extension bracket.
6. Remove the cover from the thermostat.
7. Insert the bimetal element into the hole in the duct; rotate the thermostat housing counterclockwise to engage screw heads in key hole slots.

8. Straighten thermostat housing and tighten mounting screws securely.
9. Make electrical connections and replace thermostat cover.

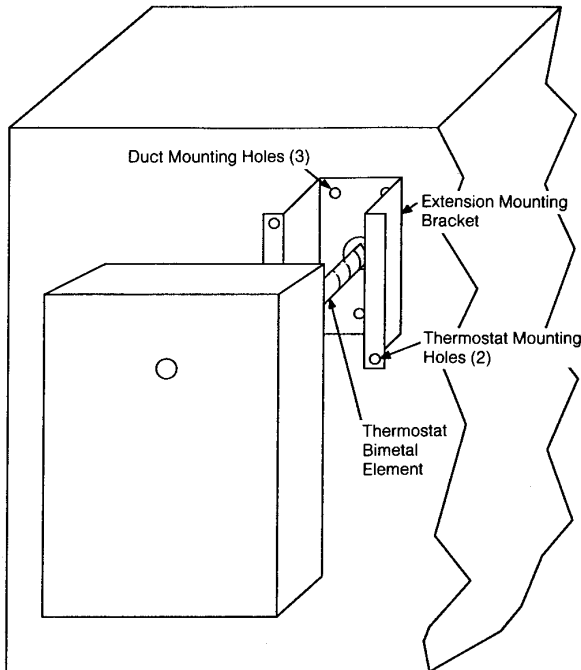


Figure-2 Duct Installation with Extension Mounting Bracket, TA-3434 and TC-3413 Only.

Immersion Installation

1. The AT-223 bulb well (purchased separately) positions the thermostat mechanism housing 2" (51 mm) away from pipe or tank wall to allow for insulation.
2. Insert the bulb well in pipe line or tank where it will be exposed to a representative temperature of the medium being controlled. The bulb well is furnished with a mounting bushing threaded for standard 3/4" pipe fittings.
3. Remove cover, using care when handling bimetal element, and insert element in bulb well.
4. Note that cutout of mounting flange on bulb well must be at the top. This cutout allows clearance for scale setting lock screw. Insert mounting screws provided through keyhole slot in thermostat housing to engage corresponding holes in bulb well mounting flange. Align thermostat and tighten mounting screws securely.
5. Make electrical connections and replace thermostat cover.

WIRING

Terminals are located under thermostat cover. Knockouts for 1/2" conduit connectors at top of case.

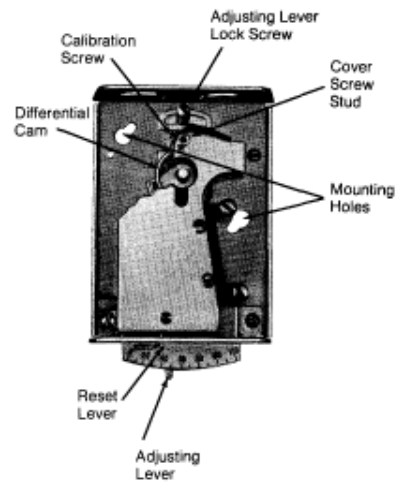
See Figure 1 for switch action and terminal identification.

ADJUSTMENTS

See Figure 3.

Setpoint

The lever setting determines the setpoint of the thermostat. The lever can be locked in place by tightening the dial setting lock screw to prevent unauthorized resetting of thermostat control point.



Differential

To increase the differential, bend the switch actuating cam up, using a narrow screwdriver. A 1/32" (1 mm) upward bend at the left end of the cam increases the differential approximately 2°F (1°C).

CHECKOUT

While media temperature is in the scale range of unit, determine the media temperature, then move the scale slider above and below the media setting and verify internal switch action using a VOM.

CALIBRATION

The thermostats are factory calibrated and should not require further attention. However, if a thermostat requires calibration, proceed as follows:

1. Set the temperature lever to correspond to actual temperature of medium being controlled. Use an accurate thermometer and allow both thermometer and thermostat to settle out for approximately ten minutes.
2. Turn off power to thermostat and then remove thermostat cover.
3. Insert a narrow blade screwdriver from upper left-hand corner and turn calibrating screw clockwise to lower control point temperature, and counterclockwise to raise control point temperature. Turn the calibrating screw either to the right or to the left (clockwise or counterclockwise) as required until the switch clicks.
4. Rotate the calibrating screw in the opposite direction until the switch clicks again.
5. Set calibrating screw halfway between point where switch clicks [one full turn of calibrating screw represents approximately 10°F (6°C)].
6. Re-install all electrical connections and replace thermostat cover.

MAINTENANCE

Regular maintenance of the total system is recommended to assure sustained optimum performance.

FIELD REPAIR

Do not field repair the thermostat. If the system is not operating correctly and the reason is traced to the thermostat, it should be replaced.

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