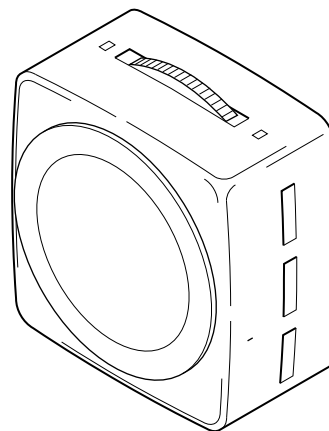


**Pneumatic Room Thermostats**  
**General Instructions**

## Application

The 2212-41x Series Pneumatic Room Thermostats are designed for proportional control of pneumatic devices and actuators in environmental control systems. These two-pipe thermostats incorporate a highly sensitive bimetal thermostatic element and a pilot operated relay with pneumatic feedback for accuracy and stability over the entire operating range.

These thermostats have a serrated thumb wheel for setpoint adjustment. Models are also available with preassembled internal dial stops. Thermostat covers are available in various styles to meet particular requirements. Cover options include models with a setpoint scale and a thermometer, a setpoint scale only, a thermometer only, or blank. An external setpoint adjustment cover is available on some models, or can be field-installed on covers where desired.



Full Dial Cover Shown  
(Covers must be ordered separately except as noted.)

## Features

- Factory-calibrated, stainless steel ball-in-seat provides pneumatic feedback for stable, linear operation.
- Easy-to-use throttling range adjustment and recalibration.
- Adjustable (patented) bimetal shows actual throttling range in both °F and °C. Adjustable 2 to 12 °F (1 to 6.7 °C).
- Leak-proof, self-closing branch gauge tap.

## SPECIFICATIONS

**Action:** Proportional.

**Setpoint Range:** 55 to 85 °F (13 to 29 °C), except as noted in model chart (Table-1).

**Throttling Range:** 2 to 12 °F, adjustable.

**Supply Air Pressure:** 20 psig.

**Maximum Air Pressure:** 30 psig.

**Main Air Consumption:** 15 scim.

**Calibration Point:** 9 psig branch line pressure when ambient equals setpoint (factory-set).

**Setpoint Adjustment:** Serrated thumbwheel.

**Construction:**

**Mechanical Components,** Die cast aluminum, stainless steel, and glass-filled nylon.

**Diaphragm,** Fabric-reinforced Neoprene.

**Air Lines,** Connect to thermostat nipples with spring-reinforced plastic tubes.

**Branch Connections,** Equipped with internal filters.

**Environment**

**Humidity:** 5 to 95% relative humidity, non-condensing.

**Locations:** NEMA Type 1.

## ORDERING DATA

**Table-1 Model Chart — Thermostats.**

Wholesale Number	Replaces Model	Action	Description
2212-118	T18-301	Direct	Includes (2) 1/4" x 3/16" barbed couplings, 20-693 tubing, 20-714 wall plate, 20-711 mounting plate, and mounting screws.
2212-128 <sup>a</sup>	T18-3011		
2212-301 <sup>b</sup>	T18-305		
2212-302 <sup>c</sup>	T18-306		
2212-119	T19-301	Reverse	
2212-129 <sup>a</sup>	T19-3011		
2212-303 <sup>b</sup>	T19-305		
2212-304 <sup>c</sup>	T19-306		

<sup>a</sup> These models include factory-installed 20-712 dial stop kits.

<sup>b</sup> Temperature range, 35 to 65 °F.

<sup>c</sup> Temperature range, 75 to 105 °F.

**Table-2 Model Chart — Thermostat Replacement Kits.**

Wholesale Number	Replaces Model	Action	Description
2212-418	T18-301	Direct	Includes thermostat, 20-714 wall plate, 20-042 mounting plate, mounting screws, 20-693 tubing and 2890-011 convertible cover.
2212-419	T19-301	Reverse	

**Table-3 Model Chart — Uni-Kits®.**

Wholesale Number	Replaces Model	Action	Description
2212-518 <sup>a</sup>	T18-3011	Direct	Includes thermostat with stops, 21-933 full dial cover with blank cover conversion, and 22-022 conversion kit.
2212-519 <sup>a</sup>	T19-3011	Reverse	
2212-618	T18-301	Direct	Includes thermostat, 22-1033 full dial cover with blank cover conversion, and 22-023 conversion kit.
2212-619	T19-301	Reverse	

<sup>a</sup> These models include factory-installed 20-712 dial stop kits.

**Table-4 Covers.**

Wholesale Number	Replaces Model	Color	Material	Dial Markings	Setpoint Adjustment	Thermometer
21-923	C1-42	Satin Chrome	Metal	55 to 85 °F	Yes	No
22-923	C1-46		Plastic			
22-823	C1-47	Beige				
22-1023	C1-48	Euro-white				
21-928 <sup>a</sup>	C2-42	Satin Chrome	Metal	Blank	Concealed	
22-928 <sup>a</sup>	C2-46		Plastic			
22-828 <sup>a</sup>	C2-47	Beige				
22-1028 <sup>a</sup>	C2-48	Euro-white				
21-933	C3-42	Satin Chrome	Metal	55 to 85 °F	Yes	Yes (External)
22-933	C3-46		Plastic			
22-833	C3-47	Beige				
22-1033	C3-48	Euro-white				
21-939 <sup>a</sup>	C4-42	Satin Chrome	Metal	55 to 85 °F	Concealed	
22-939 <sup>a</sup>	C4-46		Plastic			
22-839 <sup>a</sup>	C4-47	Beige				
22-1039 <sup>a</sup>	C4-48	Euro-white				
21-943	C5-42	Satin Chrome	Metal	Cooler - Warmer	Yes	No
22-943	C5-46		Plastic			
22-843	C5-47	Beige				
22-1043	C5-48	Euro-white				
21-948	C6-42	Satin Chrome	Metal			
22-948	C6-46		Plastic			
22-848	C6-47	Beige				
22-1048	C6-48	Euro-white				

**Table-4 Covers. (Continued)**

Wholesale Number	Replaces Model	Color	Material	Dial Markings	Setpoint Adjustment	Thermometer
21-957 <sup>a</sup>	C11-42	Satin Chrome	Metal	None	Concealed	Yes (External)
22-957 <sup>a</sup>	C11-46		Plastic			
22-857 <sup>a</sup>	C11-47	Beige				
22-1057 <sup>a</sup>	C11-48	Euro-white				
21-960 <sup>a</sup>	C14-42	Satin Chrome	Metal	Blank	Concealed	Yes (Internal)
22-960 <sup>a</sup>	C14-46		Plastic			
22-860 <sup>a</sup>	C14-47	Beige				
22-1060 <sup>a</sup>	C14-48	Euro-white				
2890-010 <sup>a</sup>	Kit	Satin Chrome	Metal	55 to 85 °F or Blank  10 to 30 °C or Blank	Yes or Concealed	No
2890-011 <sup>a</sup>	Kit		Plastic			
2890-012 <sup>a</sup>	Kit	Beige				
2890-013 <sup>a</sup>	Kit	Euro-white				

<sup>a</sup> Thermostat covers with concealed setpoint adjustment, and thermostat cover kits include setpoint adjustment cover 21-800 (black) or 21-801 (Euro-white).

**Table-5 Accessories.**

Wholesale Number	Replaces Model	Description
20-695	10-15	Aspirating box, satin finish
20-707	10-53	Metal thermostat guard
20-712	10-59	Internal stop kit
20-715	10-62	Clear cover thermostat guard
20-850	—	Thermostat mounting plate
20-881	N2-4	Thermostat calibration wrench
21-473	10-73	Drywall mounting bracket
21-800	10-72	Setpoint adjustment cover (black)
21-801	10-81-48	Setpoint adjustment cover (Euro-white)
21-876	10-76	Opaque cover thermostat guard
22-022	—	Thermostat conversion kit
22-023	—	Thermostat conversion kit
22-138	MCS-GA	Branch tap gauge adaptor
900-002	—	Thermostat calibration kit

## TYPICAL APPLICATIONS (Piping Diagram)

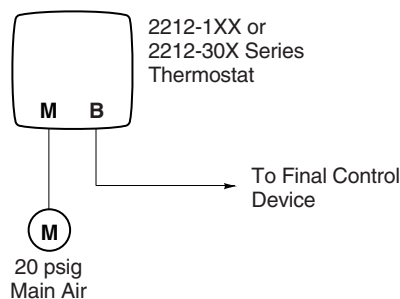


Figure-1 Typical Application.

## INSTALLATION

### Inspection

Inspect the package for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the package and inspect the device for obvious damage. Return damaged products.

### Requirements

- Tools (not provided):
  - Appropriate screwdriver for mounting the thermostat
  - 20-881 Thermostat calibration and cover screw wrench (or 1/16" and 1/4" hex wrenches)
- Training: Installer must be a qualified, experienced technician
- Appropriate accessories
- Piping diagrams

### Location

#### Caution:

- Do not locate the thermostat near sources of heat or cold, such as lamps, motors, sunlight, or concealed ducts or pipes. Doing so will affect the accuracy of the thermostat.
- Avoid installing the thermostat on outside walls. If such a location is necessary, mount the thermostat on an insulated back plate (accessory item).
- Mount thermostats *only after the wall surfaces have been finished*.

Locate the thermostat where it will be exposed to an unrestricted circulation of air, which represents the average temperature of the controlled space.

# Mounting

## Standard Mounting Options

1. Mount the thermostat according to the applicable figure (Figure-2 through Figure-9). See Figure-11 for mounting dimensions.

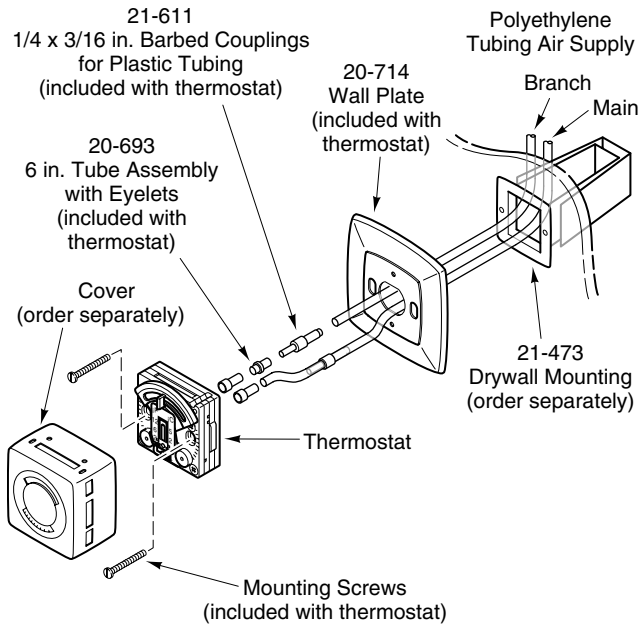


Figure-2 Flush Mounting of Thermostat, Using Drywall Mounting Bracket.

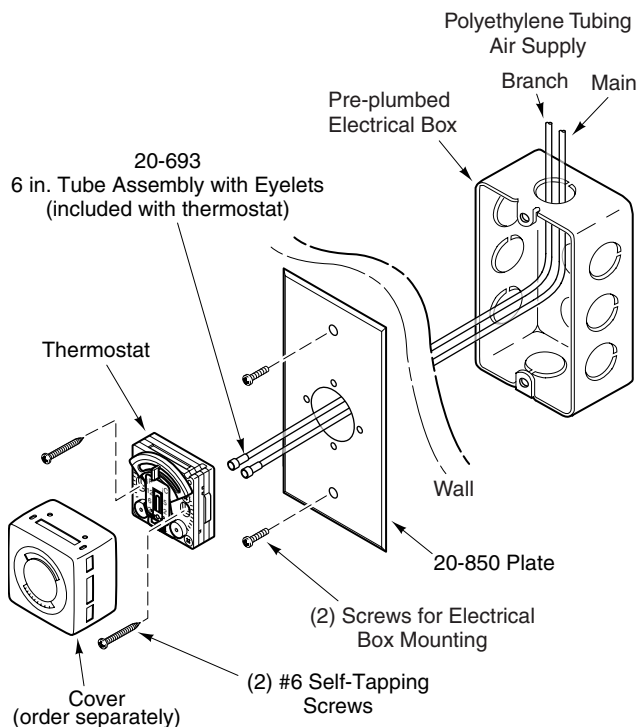


Figure-3 Flush Mounting of Thermostat, Using 20-850 Plate and Pre-Plumbed Electrical Box.

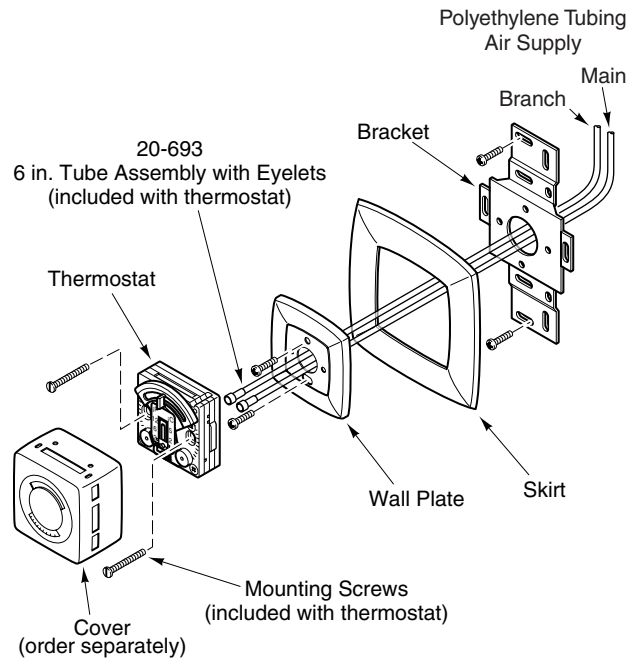


Figure-4 Thermostat Mounted with 22-022 Conversion Kit, Using Wall Plate and Skirt, to Replace Competitive Thermostats.

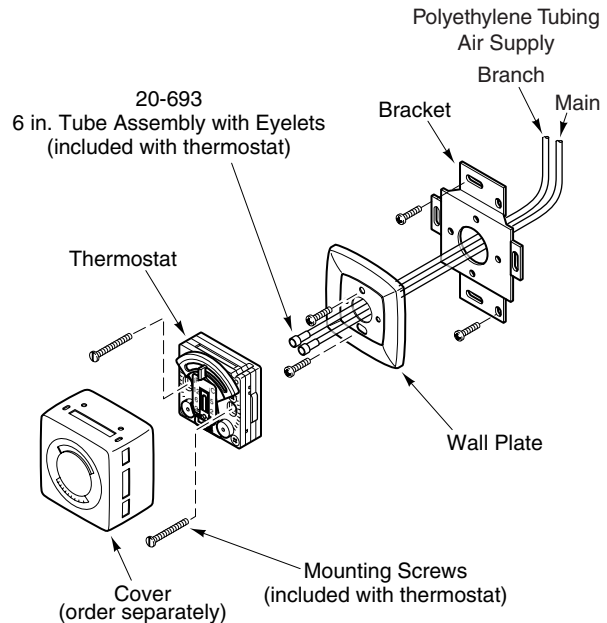
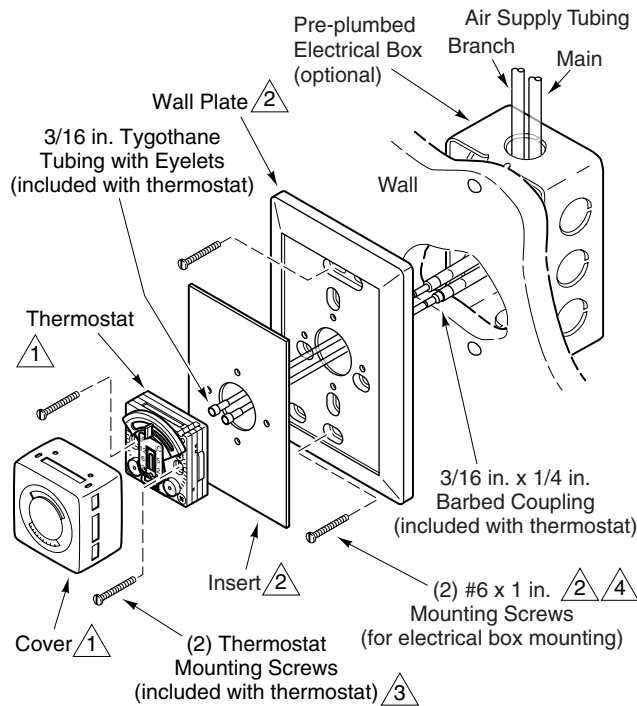


Figure-5 Thermostat Mounted with 22-022 Conversion Kit, Using Wall Plate Only, to Replace Competitive Thermostats.



- 1 The pneumatic thermostat replacement kits 2212-618 and 2212-619 include a thermostat, a 22-1033 Euro-white cover, and a 22-023 thermostat conversion kit.
- 2 Provided in the 22-023 thermostat conversion kit.
- 3 Optionally, the thermostat may be mounted with the #6 x 1 in. self-tapping screws provided in the 22-023 kit.
- 4 Use the #8 x 1 in. mounting screws provided in the 22-023 kit when mounting the wall plate directly to the wall, without an electrical box.

Figure-6 Thermostat Mounted with 22-023 Thermostat Conversion Kit.

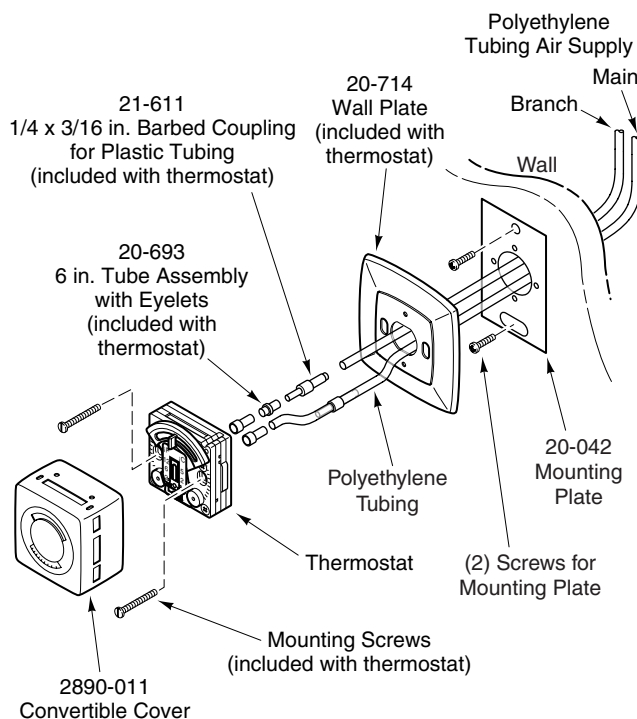


Figure-7 Thermostat Mounted with 2212-400 Series Kit.

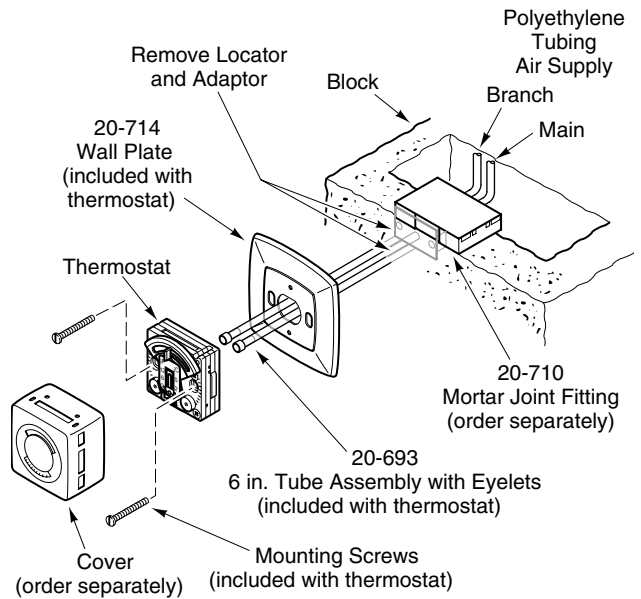


Figure-8 Thermostat Installation Using Pipehead in Masonry Wall.

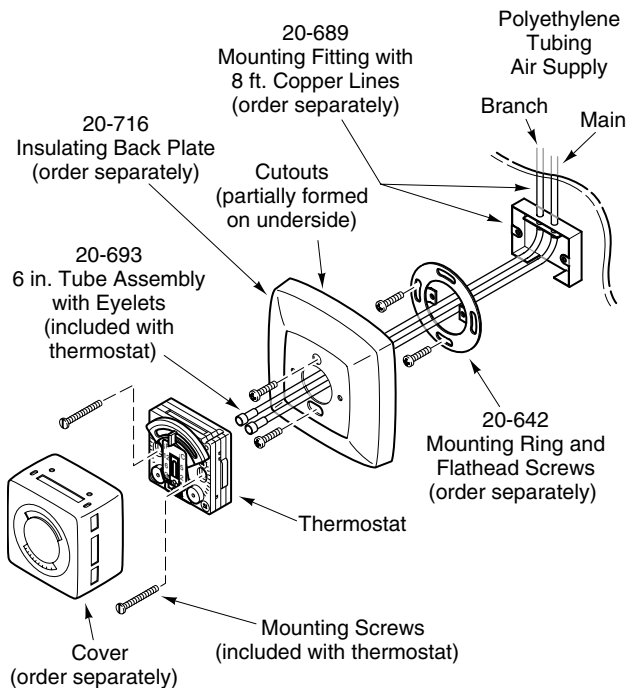


Figure-9 Surface Mounting of Thermostat, Pipehead Application.

## Optional Mounting

Eliminate the pipehead fitting by using the 22-022 thermostat conversion kit and the included instructions, plus the following:

**1/4" Plastic Air Lines:** Install the 1/4" barbed couplings into the air lines. Connect the tube assembly to the 3/16" end of these couplings.

**1/4" Copper Air Lines:** Solder the barbed couplings into the copper lines. The tube assembly can then be connected to the 3/16" end of the couplings.

## CALIBRATION

### Calibration and Throttling Range Setting

The 2212 series thermostats are factory calibrated and are shipped with the throttling range set at 3 °F. They should not require calibration upon installation. However, if it is necessary, change the calibration or throttling range setting as follows:

1. Remove the thermostat cover, using a 20-881 thermostat wrench (1/4" hex wrench), and install a 22-138 branch tap gauge adaptor into the branch pressure tap hole (Figure-10).
2. Measure the ambient temperature with an accurate thermometer. This temperature *must be within the range of the thermostat*.
3. Move the setpoint adjustment to the measured ambient temperature, using the internal setpoint indicator.
4. Taking care not to breathe on, or place the hand near the bimetal, use a 20-881 thermostat wrench (1/16" hex wrench) to turn the calibration screw until the branch line pressure indicates 9 psig. Clockwise rotation increases the branch line pressure. Counterclockwise rotation lowers the branch line pressure.
5. Reinstall the thermostat cover and set the thermostat to the desired setpoint.

### Internal Stop Kit (Accessory)

The internal stop kit, model 20-712, consists of two screws and two nuts (Figure-10). Install this kit as follows:

1. Move the setpoint adjustment to one extreme limit.
2. Place a nut in the depression in the top plate and move the adjustment cam over the nut, to where the slot in the cam exposes the threads of the nut.
3. Thread a stop screw into the nut far enough to allow the stop to slide in the slot. Repeat on the other side.
4. Move the setpoint adjustment to the desired temperature, using the internal setpoint indicator.
5. Slide the stops to the desired limits and tighten both screws.

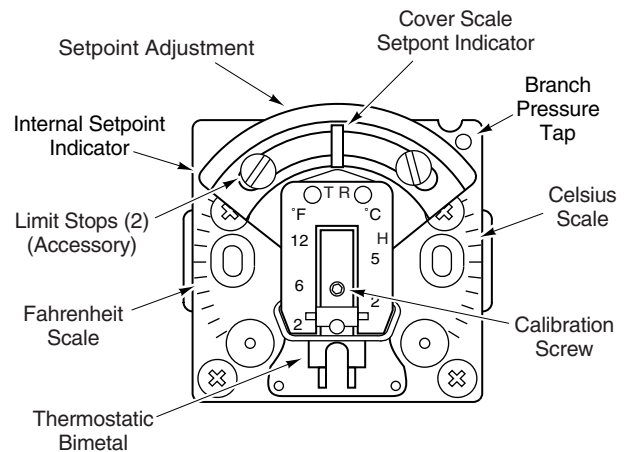


Figure-10 Thermostat Calibration Features and Limit Stop Accessory.

## MAINTENANCE

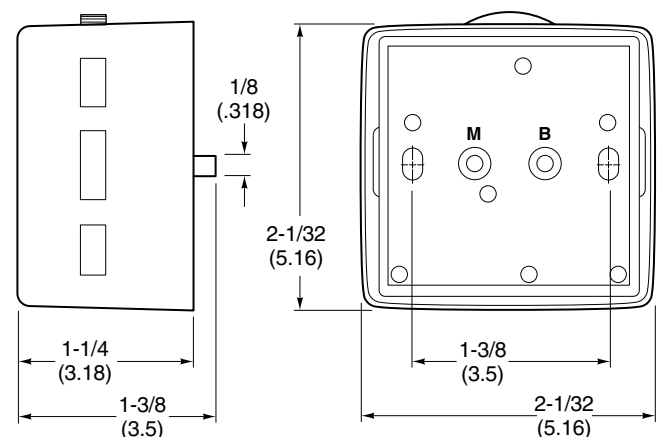
The thermostat requires no maintenance.

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

## FIELD REPAIR

None. Replace an inoperative thermostat with a functional unit.

## DIMENSIONAL DATA



Dimensions are in inches (mm).

Figure-11 Mounting Dimensions.



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