TRANE

Installation, Operation, and Maintenance

Wired Temperature Sensors

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Warnings, Cautions, and Notices

Warnings, cautions, and notices are provided in appropriate places throughout this document:

⚠ **WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE: Indicates a situation that may result in equipment or property-damage-only accidents.

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General Information

This section provides a description of the wired temperature sensors, as well as part numbers and dimensions.

Product Description

Note: *The information in this manual applies to both factory and field installed versions of Trane wired temperature sensors.*

Trane®wired temperature sensors are compatible with any Trane unit controller that uses a standard 10 kW temperature input. Temperature monitoring is standard on all models. Additional features are available on some models:

- Fan control
- System control
- Dual or single temperature setpoint control
- Occupancy (timed override) request function
- COMM module—Optional accessory that provides an RJ22 connection for a Trane service tool for system communication. Must be ordered separately.
- Hot/cold setpoint thumb wheel—Optional accessory allows selecting a temperature setpoint by color (red/blue for hot/cold) on thumbwheel, rather than by a number. Must be ordered separately.

The display sensor (p/n X13790886) has an LCD display and includes an RJ11 (RJ22 compatible) connection for a Trane service tool for system communication. The following features on this sensor are configurable:

- Temperature units: Fahrenheit (°F) or Celsius (°C)
- Temperature resolution: 1.0, 0.5, or 0.1 degrees
- Ability to display setpoint only (zone temperature does not display)
- Single, dual, or no setpoint
- System settings: auto, off, cool, heat, emergency heat
- Deadband (heat/cool setpoint offset for dual setpoint systems)
- Fan settings: high, medium, low, auto, off
- Occupancy (timed override request) function
- Lockable settings to protect against unauthorized use
- Service pin request

Part Numbers

The following table lists part numbers for each sensor type.

Sensor type	Features					Part number	BAYSENS	Global parts
	Setpoint	Fan control	System	Occupancy	LEDs			
Temperature sensors	Single	No	No	Yes	No	X1351152701	BAYSENS074A	SEN01447
	No			No		X1351152801	BAYSENS077A	SEN01448
	Single			No		X1351152901	BAYSENS075A	SEN01449
	No			Yes		X1351153001	BAYSENS073A	SEN01450
Temperature sensors with fan control	Single	Off/Auto	No	Yes	No	X1379084501	NA	SEN01521
	Single	Off/Run		Yes		X1379085101		SEN01527
	Single	Off/Auto/ Low/High		Yes		X1379084801		SEN01524
	Single	Off/Auto/ Low/Med/ High		No		X1379084101		SEN01517
	Single	Off/Auto/ Low/Med/ High		Yes		X1379084201		SEN01518
Temperature sensors with fan and system control	Dual	Auto/High	Cool/Off/Auto/ Heat/Em Heat	No	Yes (4)	X1379084701	BAYSENS109A	SEN01523
	Single	Auto/High	Cool/Off/Heat/ Em Heat	No	Yes (1)	X1379085201	BAYSENS107A	SEN01528
	Dual	Auto/High	Cool/Off/Auto/ Heat	No	No	X1379083701	BAYSENS108A	SEN01513
	Dual	Auto/High	Cool/Off/Auto/ Heat	No	Yes (4)	X1379084601	BAYSENS110A	SEN01522
	Single	Auto/High	Cool/Off/Heat	No	No	X1379083901	BAYSENS106A	SEN01515
	Single	Low/High	Cool/Off/Heat/ Fan	No	No	X1379085001	NA	SEN01526
Temperature sensor with LCD display(1)(2)	Single	No	No	Yes	No	X1379088601	NA	SEN01599
	Single	Off/On/ Auto/Low/ Med/High	No	No		X1379088604	NA	NA
	Dual	Auto/On	Cool/Off/Auto/ Heat/Em Heat	No		X1379088605	BAYSENS135A	NA

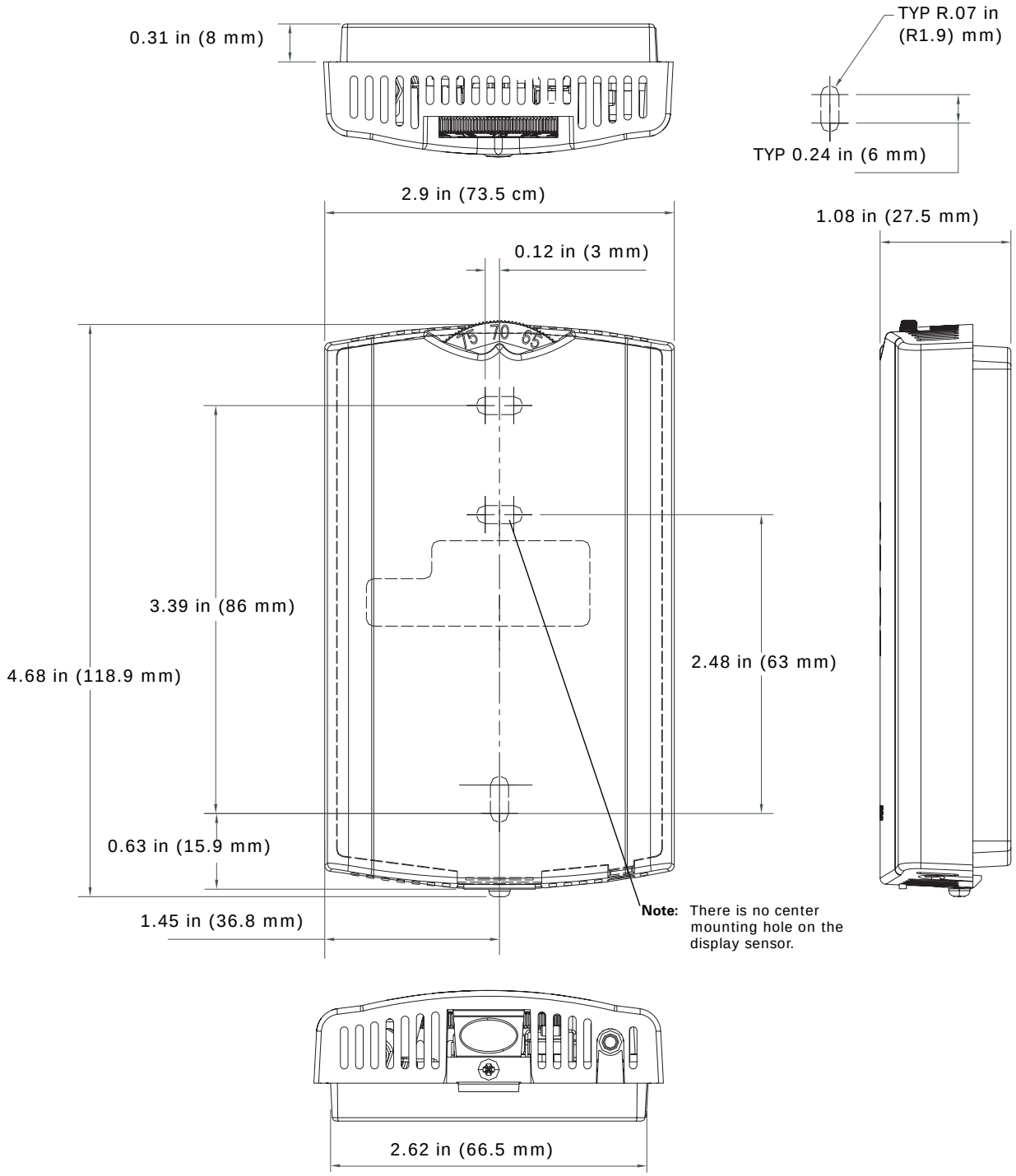
(1) These sensors can be field configured to match the applicable unit controller options.
(2) Unit controller inputs for system status, fan status, and service required are not available on this sensor. If replacing a BAYSENS031A or a BAYSENS035A sensor, and status indicators are required, replace with non-display sensor BAYSENS109A or BAYSENS110A.

The following table lists part numbers for optional accessories.

Accessory	Available for . . .	Part number	BAYSENS	Global parts
COMM module (box of 12)	All sensors other than the display sensor	X1365146702	BAYCOMM005A	CON01313
Setpoint thumb wheel: Hot/cold (box of 12)	Sensors with thumb wheels	X1316105702	NA	KNB00182

Dimensions

The following illustration provides specific dimension details. The dimensions are the same for all models.



Pre-Installation

This section provides the following pre-installation information:

- Location considerations
- Height requirements
- Mounting surfaces

Location Considerations

Placement of the sensor is critical to proper operation. When selecting a location, avoid the following:

- Areas of direct sunlight
- Areas in the direct airstream of air diffusers
- Exterior walls and other walls that have a temperature differential between the two sides
- Areas that are close to heat sources such as sunlight, appliances, concealed pipes, chimneys, or other heat-generating equipment
- Drafty areas
- Dead spots behind doors, projection screens, or corners
- Walls that are subject to high vibration
- Areas with high humidity
- High traffic areas (to reduce accidental damage or tampering)

Height Requirements

The recommended maximum mounting height is 54 inches from the bottom of the back plate to the floor. If a parallel approach by a person in a wheelchair is required, reduce the maximum height to 48 inches.

Note: *Consult section 4.27.3 of the 2002 ADA (Americans with Disability Act) guideline, and local building codes, for further details regarding wheelchair requirements.*

Mounting Surfaces

Using the hardware provided, mount the back plate to a flat surface such as sheetrock or plaster, or an electrical junction box. The sensor must be mounted plumb for accurate temperature control and to ensure proper air movement through the sensor.

- If mounting onto sheetrock or plaster, use the plastic threaded anchors (pre-drilling holes is not usually necessary) and the two M3.5 x 20 mm mounting screws.
- For mounting onto an electrical junction box, use the two 6-32 x 3/4 in. screws.

Installation and Configuration: Display Sensor

This section provides step-by-step installation instructions for the display sensor (see applicable part numbers for the temperature sensor with LCD display on p. p. 6). For installation of all other sensor models, see p. 17.

Read through the pre-installation information(p. 8) before proceeding with the installation.

Note: *Before installing a wired sensor, ensure that a wire access hole is available at the sensor location and the wire is accessible through the hole. The technician should assume that the wires are attached to the appropriate unit controller, that there is continuity between the sensor location and the controller, and that the wires are accurately labeled or identified by color.*

Mounting the Back Plate

⚠WARNING
Hazardous voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

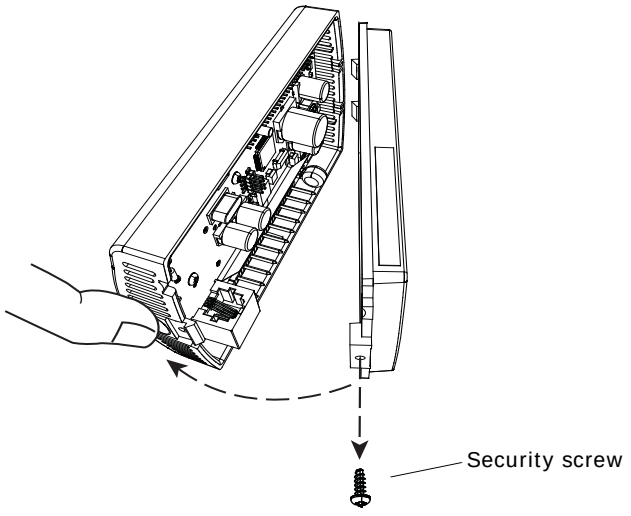
NOTICE
Equipment damage!

Applying excessive voltage to the sensor will permanently damage it.

Note: *Refer to the illustration below when installing the sensor.*

1. Shut off power to the unit controller.
2. Remove the cover by firmly pressing the thumb tab at the bottom of the cover and pulling the cover away from the back plate.

   Note: *If present, remove the security screw before removing the cover.*



3. Feed the wires through the opening in the back plate.
4. Hold the back plate against the mounting surface and mark the screw locations.
5. Secure the back plate to the mounting surface using the included hardware.

Wiring the Sensor

⚠WARNING

Hazardous voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

NOTICE

Equipment damage!

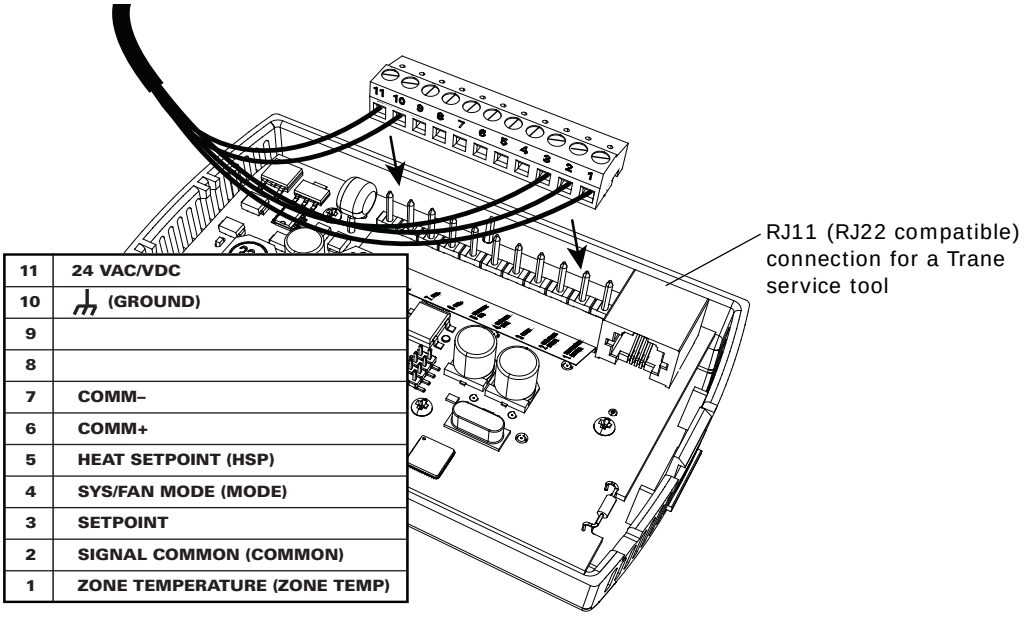
Applying excessive voltage to the sensor will permanently damage it.

To wire the sensor to the unit controller:

1. Ensure that the wires are connected to the appropriate terminals at the unit controller.
2. Insert each wire into the appropriate location in the terminal block (see the table in Figure 1). Tighten the terminal screw.

   Note: *The wire connections can be made while the terminal block is either on the circuit board, or removed from it.*
3. Perform a pull test to ensure that the wires are properly connected.
4. If the terminal block was removed from the circuit board, attach it to the pins inside the sensor cover (Figure 1).

Figure 1. Attaching the terminal block to the pins on the circuit board



11	24 VAC/VDC
10	⏚ (GROUND)
9	
8	
7	COMM–
6	COMM+
5	HEAT SETPOINT (HSP)
4	SYS/FAN MODE (MODE)
3	SETPOINT
2	SIGNAL COMMON (COMMON)
1	ZONE TEMPERATURE (ZONE TEMP)

5. Push the excess wire into the wall cavity and plug it with nonflammable insulation to prevent drafts from affecting the sensor.

   Important: *Do not coil excess wire inside the back plate.*

Configuring the Display Sensor

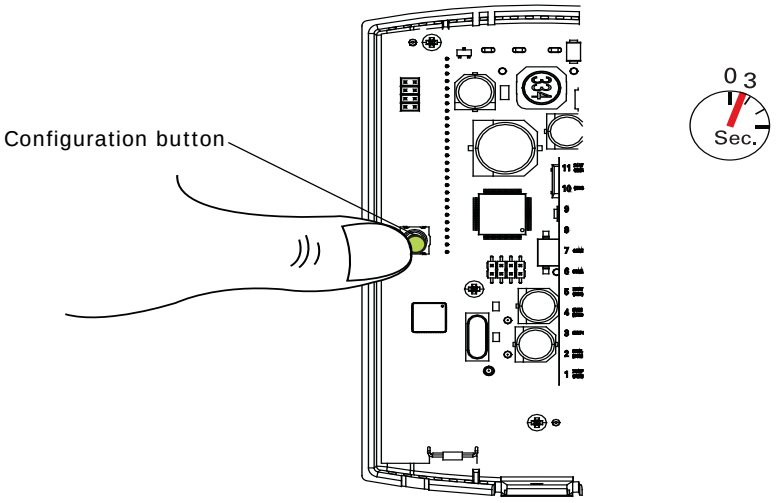
The configuration of the display sensor determines which system features can be accessed and changes can be made by the tenant (for example, changes to cooling/heating mode, setpoint, or fan speed. Verify system and associated unit features before configuring the sensor.

The building owner or operator may choose to limit tenant access to certain features. This can be done through configuration. Or, if a sensor is configured to match all controllable features of the associated equipment, the locking feature can be used to restrict the tenant from making changes.

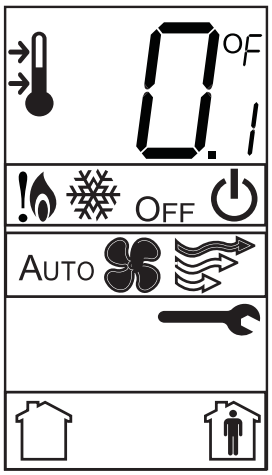
Configuration Procedure

To configure settings on the sensor, follow this procedure in the order presented.

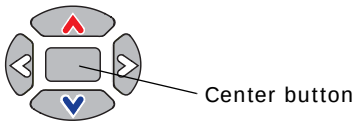
1. Press the configuration button for 3 seconds.



The display will change to configuration mode. When the sensor is in configuration mode, a wrench symbol appears on the display and the menus are separated by lines, as illustrated below.

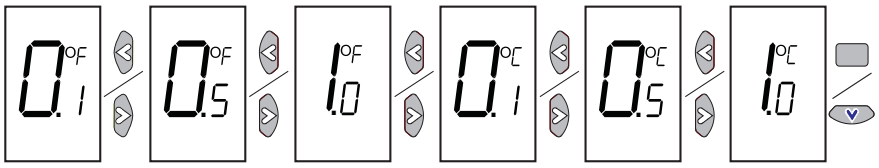
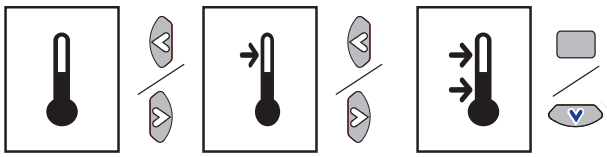
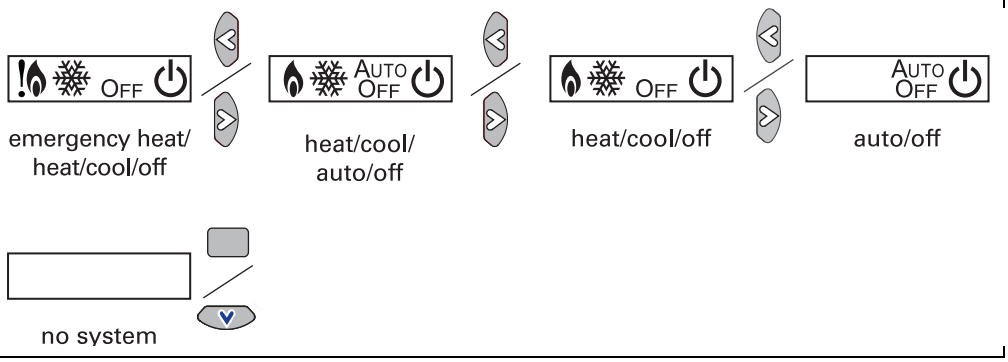


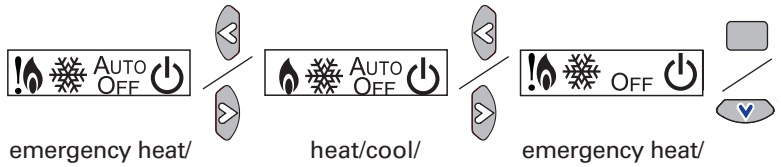
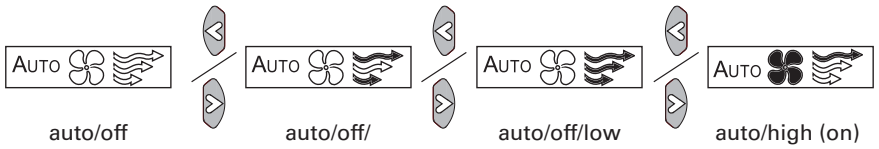
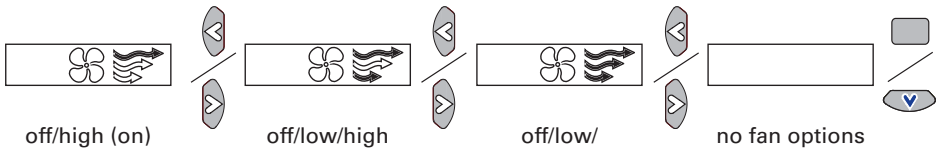
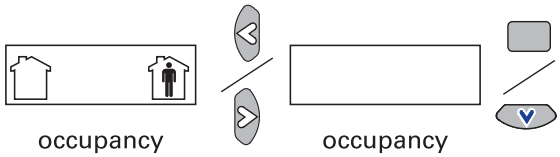
1. Press the center button on the keypad to begin the configuration process.



2. Configure the sensor options in the order shown in the table.

- Press or to scroll to the next selection (as illustrated).
- Press or to move to the next menu (as illustrated).

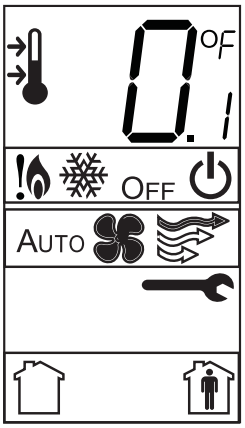
Setting	Configuration options
Temperature • Choose Fahrenheit or Celsius • Choose the degree resolution (whole degrees, half degrees, or tenths of degrees)	
Setpoint	 no single dual setpoint
Deadband (available for dual setpoint system only) **Note:** Deadband refers to the minimum difference between the heating and cooling setpoints.	 heat/cool setpoint offset 2°F – 10.8°F, 1.1°C – 6°C
System **a) Single setpoint**	 emergency heat/ heat/cool/off heat/cool/ auto/off heat/cool/off auto/off no system

Setting	Configuration options
System (continued) **b) Dual setpoint**	 emergency heat/ heat/cool/auto/off heat/cool/ auto/off emergency heat/ heat/cool/off
c) No setpoint	 no system options enabled
Fan **Note:** Not all fan options are available for all systems.	 auto/off auto/off/ low/high auto/off/low med/high auto/high (on)  off/high (on) off/low/high off/low/ med/high no fan options enabled
Occupancy (timed override)	 occupancy enabled occupancy disabled

1. Review the display to ensure that you have selected the correct configuration options.

   The example shows a display that has been configured for:

   - Dual setpoint
   - Temperature units (Fahrenheit)
   - Temperature resolution to tenths of a degree
   - System settings: Emergency Heat, Heat, Cool, Off
   - Fan settings: Auto or On
   - Occupied/unoccupied option enabled



2. To return the display to operating mode, press the configuration button (see step 1, p. 11).

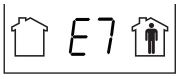
   Note: *The sensor will revert to operating mode if no buttons are pressed for 10 minutes.*

   The following example shows a configured display in operating mode.

Display shows the following:

- Temperature units (Fahrenheit)
- Temperature resolution to tenths of a degree
- System setting: Cooling
- Fan setting: Auto
- Occupied/unoccupied option enabled

If an error code exists, it appears at the bottom of the display between the occupancy symbols, as shown below. See "Error codes," p. 28, for error code definitions.

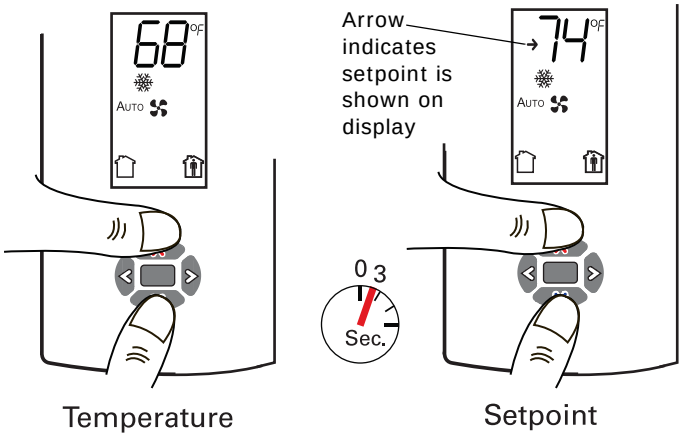


Optional Configuration Features

Displaying Setpoint or Temperature

You can configure the sensor to display either the temperature (default) or setpoint. To select either option:

1. Verify that the sensor is in operating mode and at the home screen.
2. Press the up and down arrows for 3 seconds. The arrow indicates setpoint display, as shown in the illustration.



Locking or Unlocking Settings

You can lock or unlock the setpoint, system, or fan setting to prevent changes.

To lock or unlock a setting:

1. Verify that the sensor is in operating mode and at the home screen.
2. Choose a setting to lock or unlock:
   - Select the setpoint by pressing the up or down arrow.

Setpoint

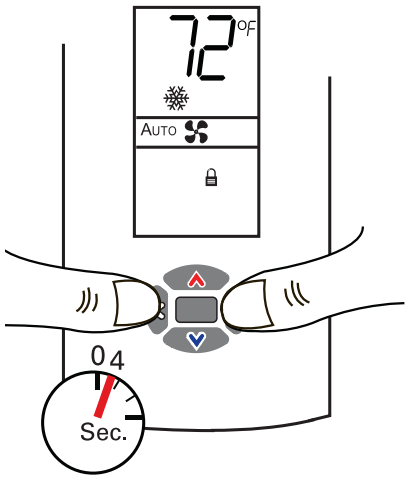
   - Select the system menu by pressing the center button. Use the left or right arrow to choose the setting.

System menu

   - From the system menu press the down arrow to select the fan menu. Use the left or right arrow to choose the setting.

Fan menu

3. Press the left and right arrows for 4 seconds. The lock symbol will appear on the display to indicate that the setting has been locked.

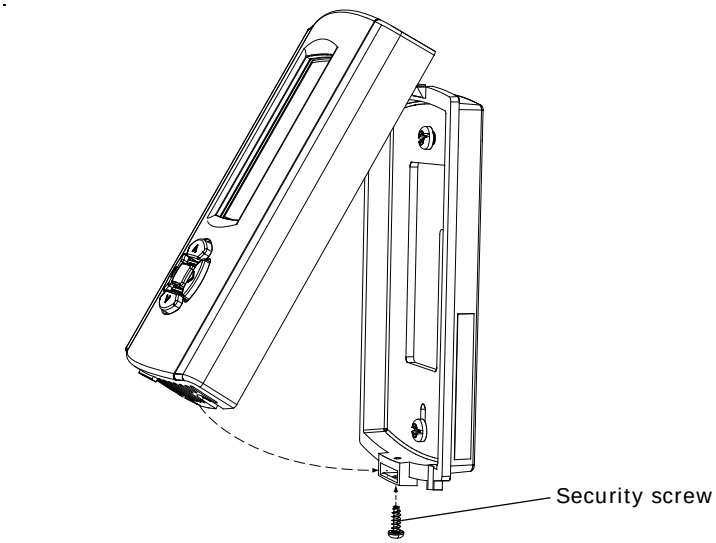


Note: *If you try to access a feature that is locked, the locked symbol appears on the display. If you press a keypad button to try change a locked setting, the locked symbol flashes.*

Replacing the Cover

To replace the cover:

1. Hook the cover over the top of the back plate. Apply light pressure to the bottom of the cover until it snaps in place.
2. Secure the cover by installing the security screw into the bottom of the cover.



Installation: All Models Other Than the Display Sensor

This section provides step-by-step installation instructions for all sensor models other than the display sensor. (For installation of the display sensor, see p. 9.) Read through the pre-installation information before proceeding with the installation.

Note: *Before installing a wired sensor, ensure that a wire access hole is available at the sensor location and the wire is accessible through the hole. The technician should assume that the wires are attached to the appropriate unit controller, that there is continuity between the location and the controller, and that the wires are accurately labeled or identified by color.*

Mounting the Back Plate

⚠WARNING
Hazardous voltage!

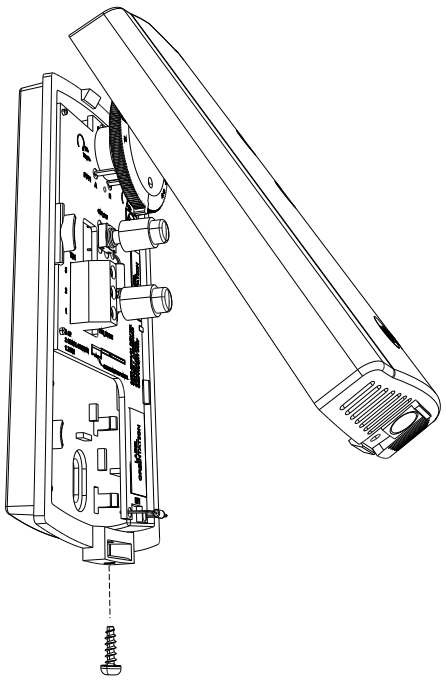
Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

NOTICE
Equipment damage!

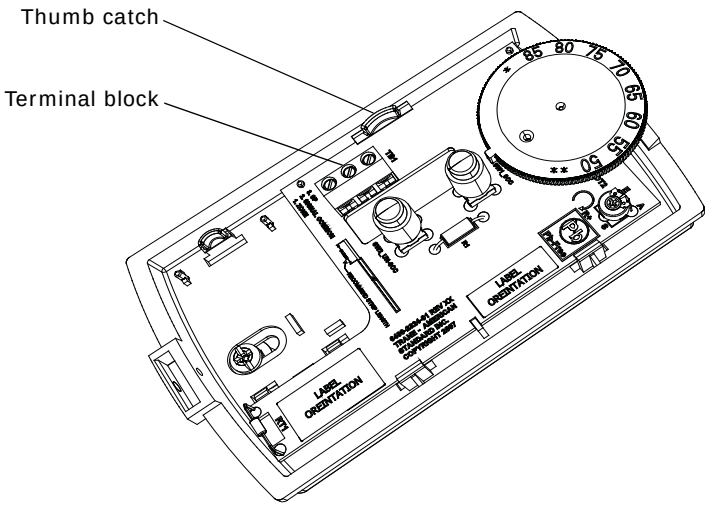
Applying excessive voltage to the sensor will permanently damage it.

1. Shut off power to the unit controller.
2. Remove the cover by firmly pressing the thumb tab at the bottom of the cover and pulling the cover away from the back plate.

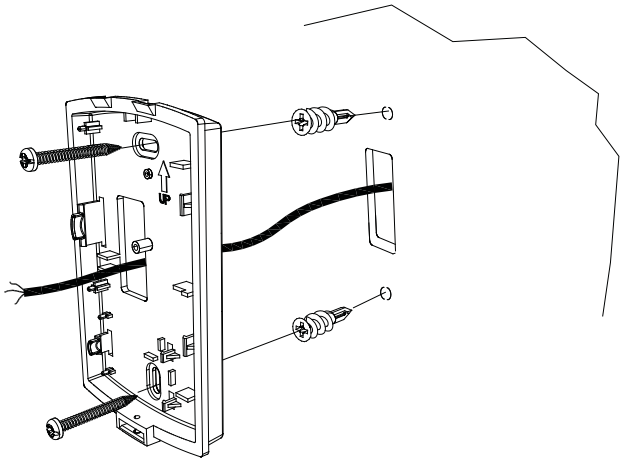
   Note: *If present, remove the security screw before removing the cover.*



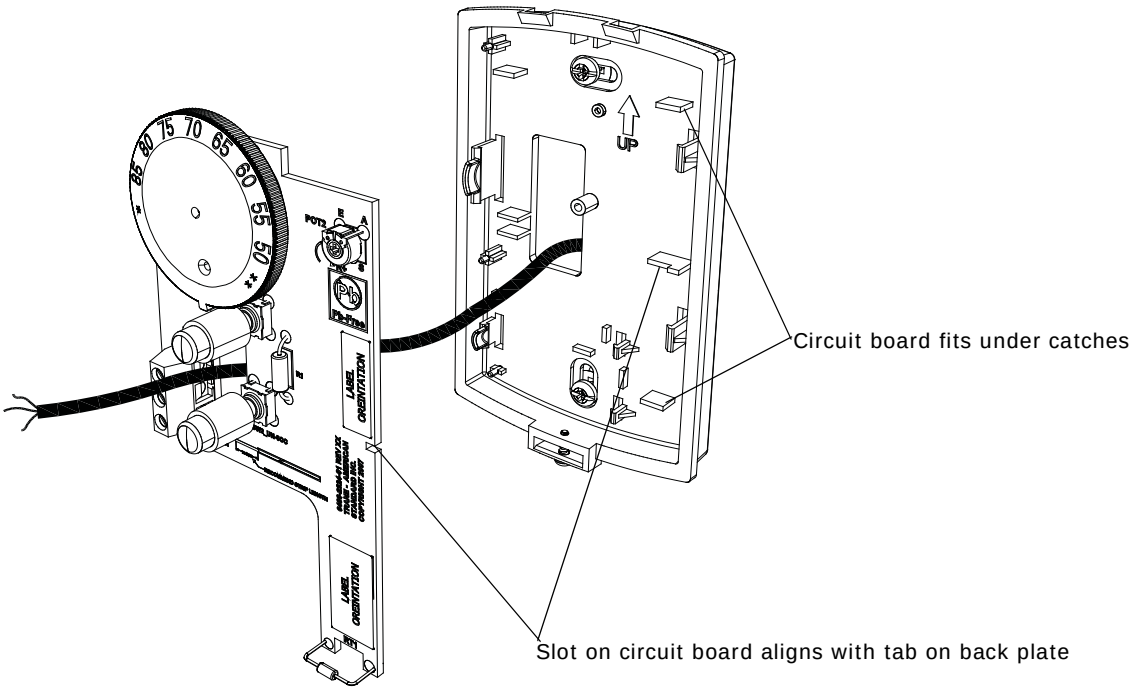
3. Remove the circuit board by pressing the thumb catch on the left side of the board. Use the terminal block to lift the circuit board from the back plate.



4. Feed the wires through the opening in the back plate.
5. Hold the back plate against the mounting surface and mark the screw locations.
6. Secure the back plate to the mounting surface using the included hardware.



7. Feed the wires through the opening in the circuit board.
8. Replace the circuit board by sliding the right side of the board under the two catches on the right side of the back plate, while aligning slot on board with tab on back plate. Press firmly on the left side of the circuit board to snap it into place.

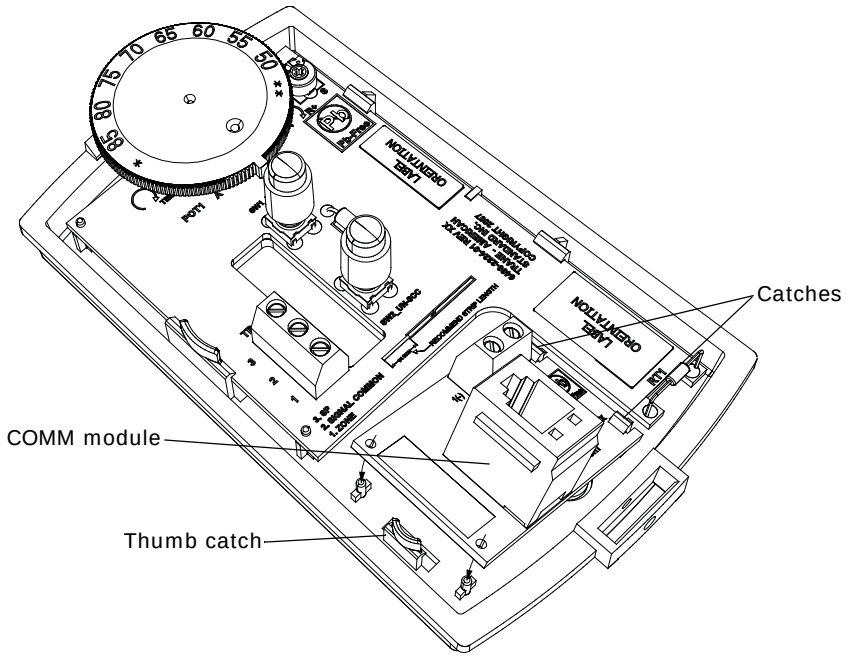

UP
Circuit board fits under catches
Slot on circuit board aligns with tab on back plate

Installing the COMM Module (optional)

An optional COMM module is available that provides a local RJ22 connection to a Trane service tool for maintenance use. It must be ordered separately.

Install the COMM module before wiring the sensor:

1. Slide the two cutouts on the right side of the COMM module into the two keys on the back plate.
2. Press firmly on the left side of the COMM module board until it snaps into place.



Changing the Setpoint Thumb Wheel (optional)

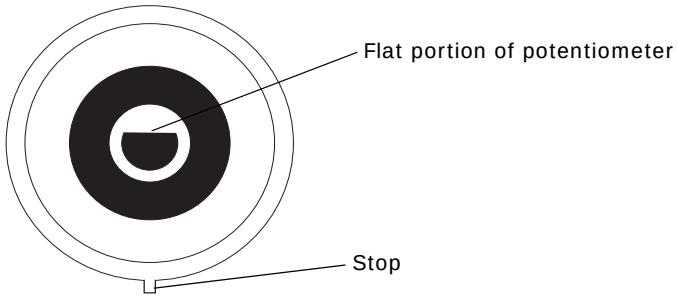
Sensors with temperature setpoint control have pre-installed Fahrenheit setpoint thumb wheels. A Celsius setpoint thumb wheel is included with these sensors. An optional hot/cold setpoint thumbwheel can be ordered separately.

To change the thumb wheel:

1. Remove the cover by firmly pressing the thumb tab at the bottom of the cover and pulling the cover away from the back plate.

   Note: *If present, remove the security screw before removing the cover.*

2. Remove the existing thumb wheel by pulling it straight out while holding the circuit board securely onto the back plate.
3. Rotate the replacement thumb wheel until the stop is opposite the flat portion of the potentiometer. Push down on the thumb wheel until the ribs touch the potentiometer. After it is inserted, the thumb wheel should turn freely.



Wiring the Sensor

⚠WARNING
Hazardous voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

NOTICE
Equipment damage!

Applying excessive voltage to the sensor will permanently damage it.

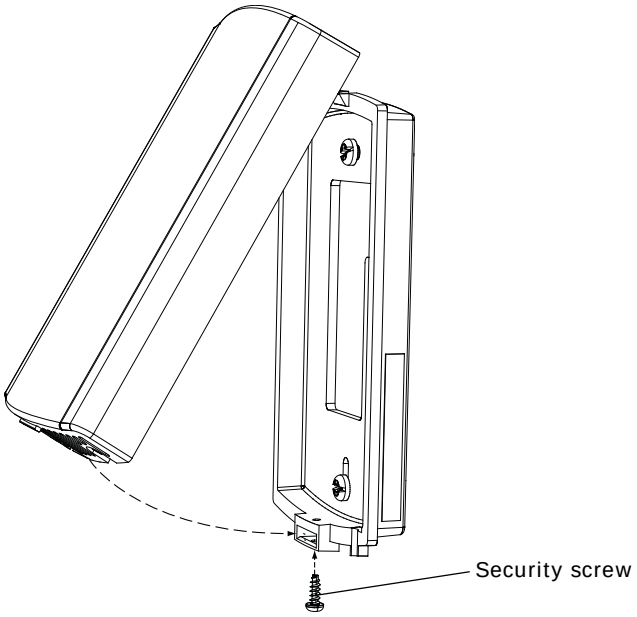
To wire the sensor, use the appropriate diagram illustrated in"Wiring Diagrams," p. 33.

Note: *Strip 1/4 inch of insulation from wires before connecting them to the terminal block.*

Replacing the Cover

To replace the cover:

1. Hook the cover over the top of the back plate. Apply light pressure to the bottom of the cover until it snaps in place.
2. Secure the cover by installing the security screw into the bottom of the cover.



Operation

This section describes sensor operations.

Changing Temperature Settings

To change temperature settings:

- For sensors with temperature setpoint thumb wheels (located on top of the sensor), rotate the thumb wheel to the desired temperature setting.

  Note: *If you need to change or replace a thumb wheel, see "Changing the Setpoint Thumb Wheel (optional)," p. 21.*

- For sensors with dual temperature sliders (located on the right front of the sensor): Slide the blue (*cool*) slider to the desired maximum temperature setting. Slide the red (*heat*) slider to the desired minimum temperature setting.
- For the display sensor, see "Changing Temperature Settings," p. 27 and "Changing Heating and Cooling Temperature Settings (dual setpoint systems only)," p. 27.

Changing System Settings

To change system settings:

- For sensors with system thumb wheels (located on the upper left side), rotate the thumb wheel to the desired setting.
- For the display sensor, see "Changing System Settings," p. 28.

Notes:

- *Not all sensor models have all system setting options.*
- *The effect of setting changes are dependent on the unit controller. See specific unit controller manual for details.*

Changing Fan Settings

To change fan settings:

- For sensors with fan thumb wheels (located on the lower left side), rotate the thumb wheel to the desired setting.
- For the display sensor, see "Changing Fan Settings," p. 28.

Notes:

- *Not all sensor models have all fan setting options.*
- *The effect of setting changes are dependent on the unit controller. See specific unit controller manual for details.*

Selecting Temporary Occupancy (Timed Override)

Temporary occupancy (timed override) is available on some sensors. Temporary occupancy can be selected to adjust temperature, fan, or heat/cool settings after the system has changed to unoccupied mode. System control will revert to unoccupied after a pre-determined time period.

Note: *Not all systems support the occupancy function.*

Sensors with Occupied/Unoccupied buttons

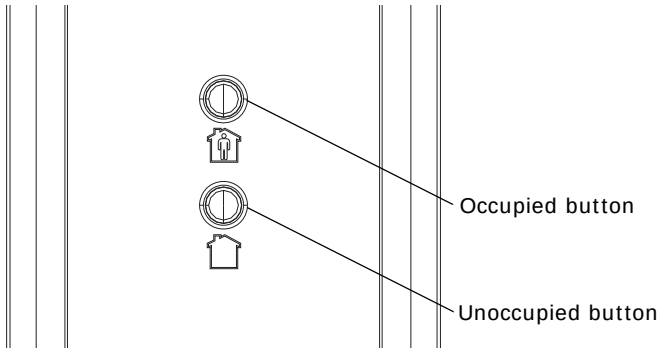
To select temporary occupancy, press the Occupied button (Figure 2) for 0.2–6 seconds. The following occurs:

- Space temperature output is driven to 10 Ω (nominal).
- The output generates for 4 seconds.

To cancel temporary occupancy, press the Unoccupied button (Figure 2) for 0.2–6 seconds. The following occurs:

- Space temperature output is driven to 1330 Ω (nominal).
- The output generates for 4 seconds.

Figure 2. Locations of Occupied button and Unoccupied buttons



Display Sensors

To select and cancel temporary occupancy, see “Requesting Temporary Occupancy,” p. 28.

Service Pin Request

Some sensor models can communicate a service pin request to their connected unit controller.

Sensors with Occupied/Unoccupied Buttons

To initiate a service pin request, press the Occupied button (Figure 2, p. 24) for 10–25 seconds. The following occurs:

- Space temperature output is driven to 10 Ω (nominal).
- The output generates for 15 seconds.

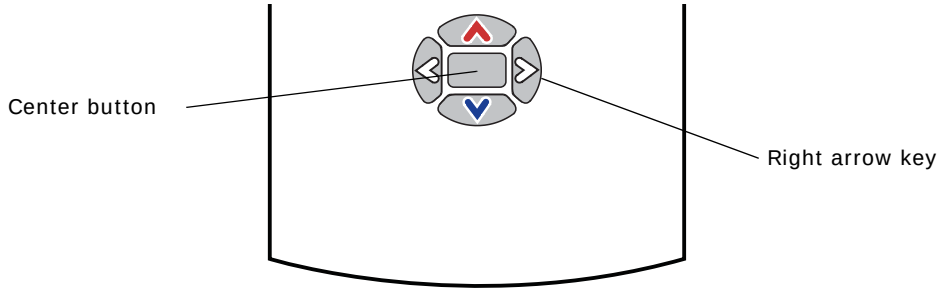
Display Sensor

To initiate a service pin request, the sensor must be configured to support occupancy and must be in operating mode (see "Configuring the Display Sensor," p. 11).

To initiate a service pin request:

1. With the sensor in operating mode, navigate to the occupancy menu.
2. Press the right arrow on the keypad (Figure 3). The occupied symbol remains on the screen; the unoccupied symbol leaves the screen.
3. Press and hold the center button for 10 seconds. The following occurs:
   - The wrench symbol appears.
   - A service pin request is initiated.
   - Space temperature output is driven to 10 Ω (nominal).
   - The output generates for 15 seconds.
   - After 15 seconds, the wrench symbol disappears.

Figure 3. Location of keys for service pin request



Star(*)/Double Star(**) Function

The star/double star function is available on sensor models with thumb wheels and on the display sensor.

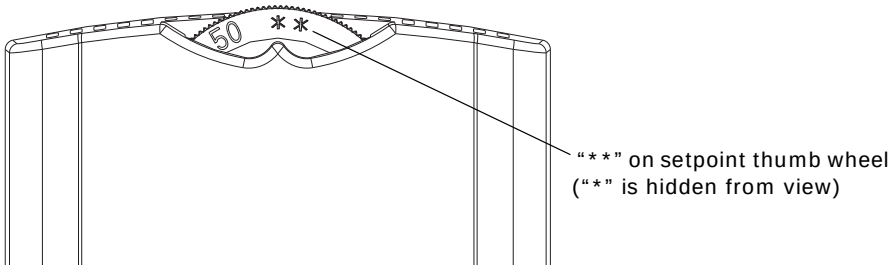
Note: *Consult the appropriate unit controller documentation for information about this function.*

Sensors with Thumb Wheels

Turning the thumb wheel clockwise makes the star(*) visible; turning it counter-clockwise makes the double star(**) visible (see Figure 4).

- Star(*): A value of 95°F (35°C) is communicated.
- Double star(**): A value of 44.6°F (7°C) is communicated.

Figure 4. Star/Double star on thumb wheel



Display Sensor

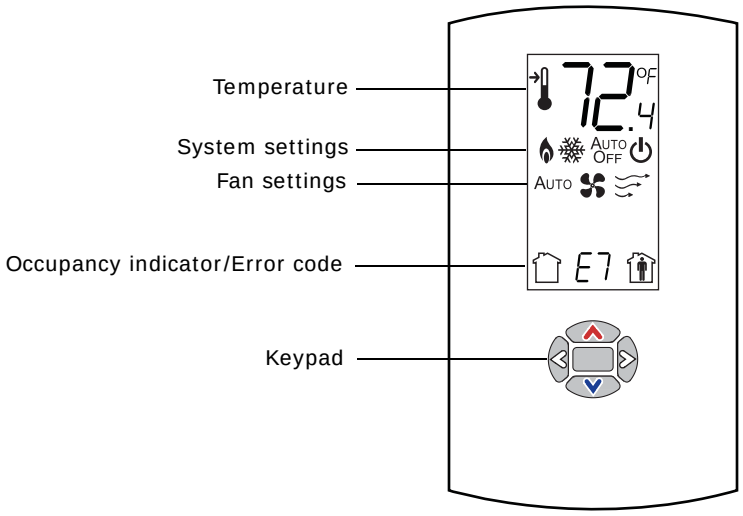
The display sensor supports the star(*) and double star(**) functions if the sensor is configured for single setpoint operation. Press the up or down arrow on the keypad to display the star(*) or double star(**), respectively, on the sensor display.

- If the setpoint is increased one increment above 89.6°F (32°C), the star (*) appears. A value of 95°F (35°C) is communicated.
- If the setpoint is decreased one increment below 50°F (10°C), the double star(**) appears. A value of 44.6°F (7°C) is communicated.

Display Sensor Operation

This section describes display sensor operation. Figure 5 shows an example of a display sensor that has been configured and is in operating mode.

Figure 5. Display sensor in operating mode



Changing Temperature Settings

72.4 °F	This symbol shows the current room temperature, or your temperature setting, while you are making an adjustment.
	When you select a setpoint, this symbol appears.

1. To increase the room temperature, press ⌃.
   To decrease the room temperature, press ⌄.
2. To confirm, press ▭ or wait 5 seconds. The display will return to the home screen.

Changing Heating and Cooling Temperature Settings (dual setpoint systems only)

	Some systems allow you to select both heating and cooling room temperature settings. If your system has this option, this symbol appears when you adjust the temperature setting.
	When you adjust the cooling setting, the top arrow and snowflake flash.
	When you adjust the heating setting, the bottom arrow and flame flash.

1. Press ⌃ or ⌄ to select the heating/cooling setting.
2. If in cooling mode, press ‹ to change to heating mode. If in heating mode, press › to change to cooling mode.
3. Press ⌃ or ⌄ to select the heating/cooling setting.
4. To confirm, press ▭ or wait 5 seconds. The home screen will appear.

Note: *The heat/cool setpoint offset (deadband) chosen during configuration will apply.*

Changing System Settings

	Indicates that the system is in cooling mode.
	Indicates that the system is in heating mode.
	Indicates emergency heat. It is used by facility operators or service technicians only.
AUTO	Indicates that the system automatically switches between heating and cooling as needed.
OFF	Indicates that the system is Off.

1. From the home screen, press . The system setting menu appears.
2. Press or to choose the desired system setting.
3. When the symbol for the desired setting appears, confirm your choice by
   - Pressing (the home screen will appear), or
   - Pressing or (the next menu will appear), or
   - Waiting 5 seconds.

Changing Fan Settings

AUTO	Indicates that the fan will operate as needed to reach the selected temperature.
	Indicates that the fan setting is On. The number of arrows indicates fan speed (3: high, 2: medium, 1: low). The example shown indicates a fan on high speed. Not all systems offer all three speeds.
	Indicates fan is Off.

1. From the home screen, activate the fan setting menu by pressing and then .
2. Press or to choose the desired fan setting.
3. When the symbol for the desired setting appears, confirm your choice by
   - Pressing (the home screen will appear), or
   - Pressing or (the next menu will appear), or
   - Waiting 5 seconds.

Requesting Temporary Occupancy

	Select to request occupancy
	Select to cancel occupancy

- If you need heating or cooling after normal business hours, you can "request" temporary occupancy by pressing and holding it for 2 seconds. The occupied symbol remains on the screen and the unoccupied symbol disappears. After 30 seconds, the unoccupied symbol will re-appear. The system will remain in occupied mode for a pre-determined period.
- To cancel temporary occupancy, press and hold for 2 seconds. The unoccupied symbol will remain on the screen and the occupied symbol will disappear. After 30 seconds the occupied symbol will re-appear. (Cancellation can be made at any time during the temporary occupancy period.)

Error codes

	Main processor error	Replace sensor.
	Software version conflict	Replace sensor.
	Communication error	Replace sensor.
	Temperature input outside valid operating range (32°F–122°F [0°C–50°C])	Replace sensor if space temperature is within valid range.

Lock Symbol

	Indicates that the keypad is locked	The lock symbol appears if you try to adjust a setting that cannot be changed.

Maintenance and Troubleshooting

This section describes sensor features that can be used for maintenance and troubleshooting.

LEDs

Some sensor models have LEDs. They are located on the front cover and convey the following information:

	Service LED (red)	The red service LED indicates that service is needed. • The LED may blink or stay on solid, depending on the unit controller
	Cool LED (green)	The green cool LED indicates that the system is in cooling mode. • Stays on solid during normal cooling operation • Blinks to indicate a cooling system failure
	Heat LED (green)	The green heat LED indicates that the system is in heating mode. • Stays on solid during normal heating operation • Blinks to indicate a heating system failure
	System LED (green)	The green system LED indicates the state of the system. • Stays on solid to during normal operation • Blinks to indicate that the system is in Test mode

Error Codes (Display Sensor)

For an explanation of error codes that can appear on the display, see “Error codes,” p. 28.

Display Sensor: Output Values—Failure and Default Modes of Operation

The following table provides output values for failure and default modes of operation, which can be used for troubleshooting.

Situation	Zone temperature output	Zone setpoint output	Heating setpoint output	Fan/System output
Sensor has no power.	Open	Open	Open	Open
Thermistor in sensor has failed to either open or close.	Open	Normal value (See Table 1)	Normal value (See Table 1)	N/A
Setpoint potentiometer has failed to either open or close.	Normal value (See Table 1)	Open	Open	N/A

Measuring Output Resistance

Measure output resistance as follows, according to sensor type.

Display Sensors

For display sensors, measure the outputs for zone temperature, setpoints, heat setpoint, and system/fan mode as described:

1. Ensure that the GROUND (terminal 10) and the SIGNAL COMMON (terminal 2) wires are grounded to the transformer.
2. To measure zone temperature resistance, disconnect the ZONE TEMP (terminal 1) wire from the sensor. Measure between the ZONE TEMP (terminal 1) and SIGNAL COMMON (terminal 2). Compare resistance measurements to those in Table 1.
3. To measure setpoint resistance:
   - For single setpoint systems, disconnect the SETPOINT (terminal 3) wire from the sensor. Measure between the SETPOINT (terminal 3) and the SIGNAL COMMON (terminal 2). Compare resistance measurements to those in Table 1.
   - For dual setpoints systems, disconnect the HEAT SETPOINT (terminal 5) wire from the sensor. Measure between the HEAT SETPOINT (terminal 5) and the SIGNAL COMMON (terminal 2). Compare resistance measurements to those in Table 1.
4. To measure the system/fan mode resistance, disconnect the SYS/FAN MODE (terminal 4) wire from the sensor. Measure between the SYS/FAN MODE (terminal 4) and the SIGNAL COMMON (terminal 2). Compare resistance measurements to those in Table 2.

Notice:

Potential Equipment Damage!

Because the output circuits are not electrically powered, resistance can be measured without risk of damage to the volt-ohm meter. However, damage to the volt-ohm meter could potentially result if terminal 11 (24 VAC/VDC) is inadvertently contacted.

All Models Other Than the Display Sensor

For all other wired sensors, measure the outputs for temperature and setpoints and, if applicable, the system/fan mode and heat setpoint:

1. To measure zone temperature resistance, measure between SIGNAL COMMON (terminal 2) and ZONE TEMP (terminal 1). Compare resistance measurements to those in Table 1.
2. To measure setpoint resistance:
   - For single setpoint systems, measure between SIGNAL COMMON (terminal 2) and SETPOINT (terminal 3).
   - For dual setpoint system, measure between SIGNAL COMMON (terminal 2) and CSP (terminal 3), and between SIGNAL COMMON (terminal 2) and HSP (terminal 5).

   Compare resistance measurements to those in Table 1.
3. To measure the system/fan mode resistance, measure between SIGNAL COMMON (terminal 2) and MODE (SYS/FAN SWITCH) (terminal 4). Compare resistance measurements to those in Table 2.

   Note: *The output circuits are not electrically powered; consequently, resistance can be measured without risk of damage to the volt-ohm meter.*

Table 1. Resistance measurements for zone temperature and setpoints

Zone or setpoint temperature	Nominal zone temperature output resistance	Nominal setpoint and heating setpoint output resistance
* *	NA	938 Ω
55°F (12.8°C)	17.47 kΩ	792 Ω
60°F (15.6°C)	15.3 kΩ	695 Ω
65°F (18.3°C)	13.5 kΩ	597 Ω
70°F (21.1°C)	11.9 kΩ	500 Ω
75°F (23.9°C)	10.5 kΩ	403 Ω
80°F (26.7°C	9.3 kΩ	305 Ω
85°F (29.4°C)	8.25 kΩ	208 Ω
*	NA	49 Ω

Notes:
1. Sensors are calibrated at 70°F (21.1ºC).
2. Single setpoint systems: Varies ±28 Ω at 70°F (21.1ºC); varies ±128 Ω at endpoints of scale 55ºF (12.8ºC) and 85ºF (29.4ºC). Dual setpoint systems: Cooling setpoint varies ±10 Ω at 70ºF (21.1ºC); varies at ±110 Ω at endpoints of scale. Heating setpoint varies ±20 Ω at 70ºF (21.1ºC); varies at ±120 Ω at endpoints of scale.

Table 2. Resistance measurements for fan and system modes

Fan mode	System mode	Nominal output resistance
Auto or invalid	Emergency heat	35,000 Ω
Auto or invalid	Heat	19,480 Ω
Auto or invalid	Auto	7680 Ω
Auto or invalid	Off	2320 Ω
Auto or invalid	Cool	4870 Ω
On	Emergency heat	43,450 Ω
On	Heat	27,930 Ω
On	Auto	16,130 Ω
On	Off	10,770 Ω
On	Cool	13,320 Ω
High	Invalid (fan control only)	16,130 Ω
Med	Invalid (fan control only)	13,320 Ω
Low	Invalid (fan control only)	10,770 Ω
Auto	Invalid (fan control only)	2320 Ω
Off	Invalid (fan control only)	4870 Ω

Cleaning the Sensor

NOTICE

Equipment damage!

Spraying glass cleaner or any other solution directly on the sensor may damage it.

You can clean the sensor by applying glass cleaner to a soft, non-abrasive cloth, and gently wiping the face, including the buttons and LCD display. Use of a pre-moistened towelette designed for lens or screen cleaning is also acceptable.

Avoid inadvertent pressing buttons on sensors that have them or the keypad on the display sensor, as this may result in an unwanted timed override or settings change.

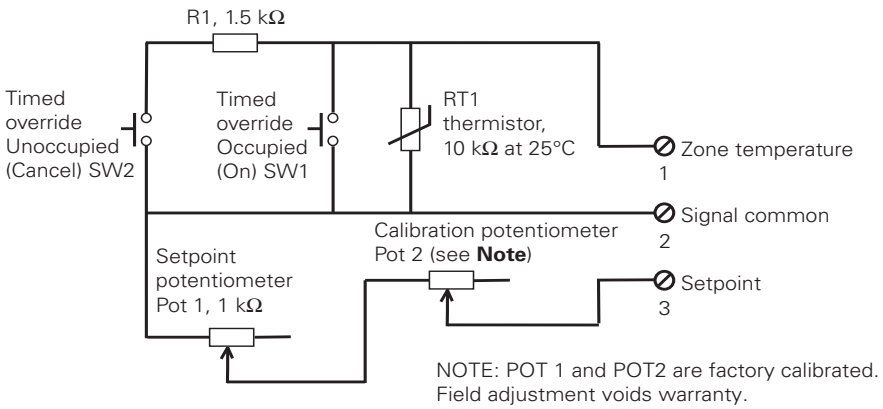
Replacing the Thumb Wheel

If you need to replace a setpoint thumb wheel, see "Changing the Setpoint Thumb Wheel (optional)," p. 21.

Wiring Diagrams

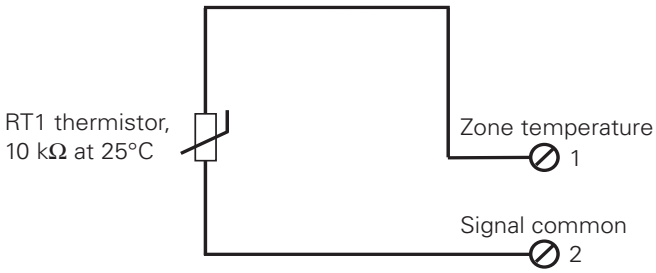
Each wiring diagram is identified by sensor part number (see "Part Numbers," p. 6 for reference.) For wiring information for the display sensor, see Figure 1, p. 10.

X1351152701



Dwg. source: 3270 3435 B

X1351152801



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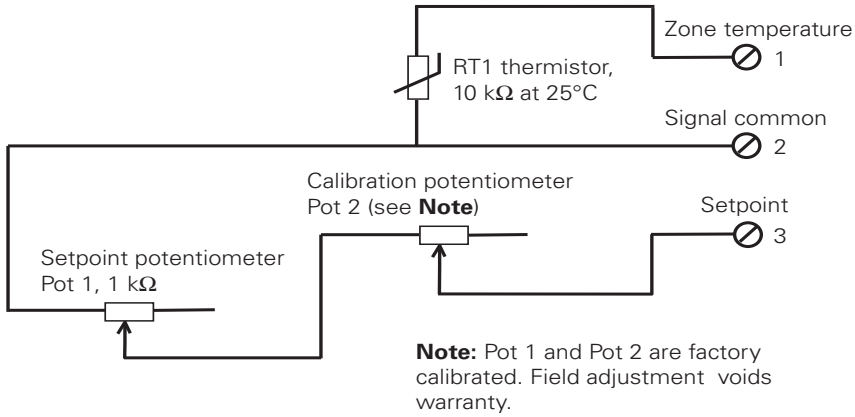
X1351152901



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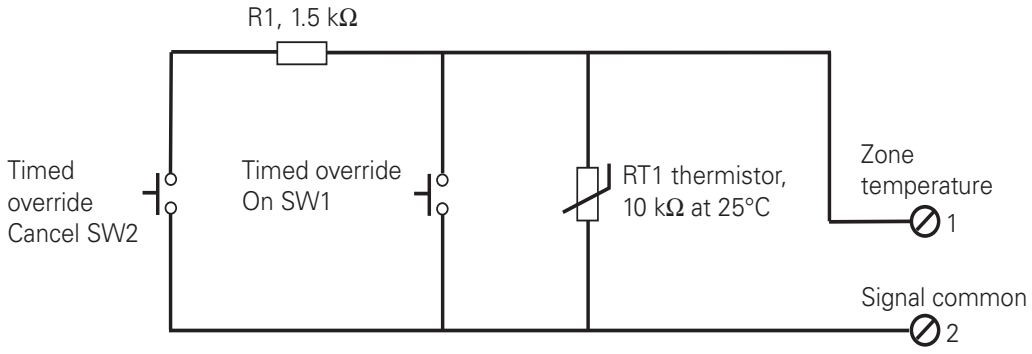

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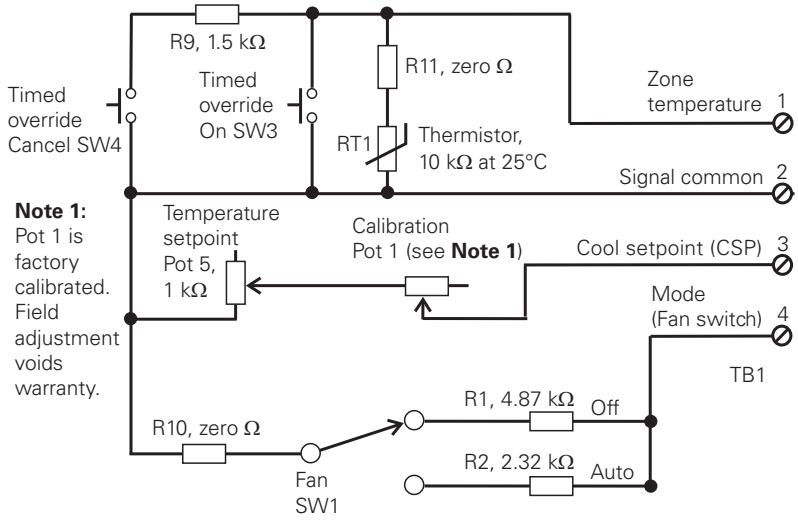
Temperature sensors with fan control

X1379084501



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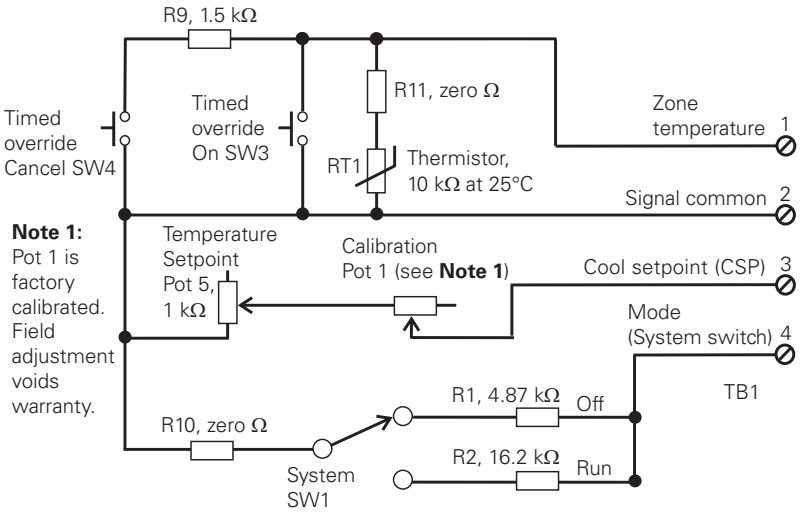
X1379085101



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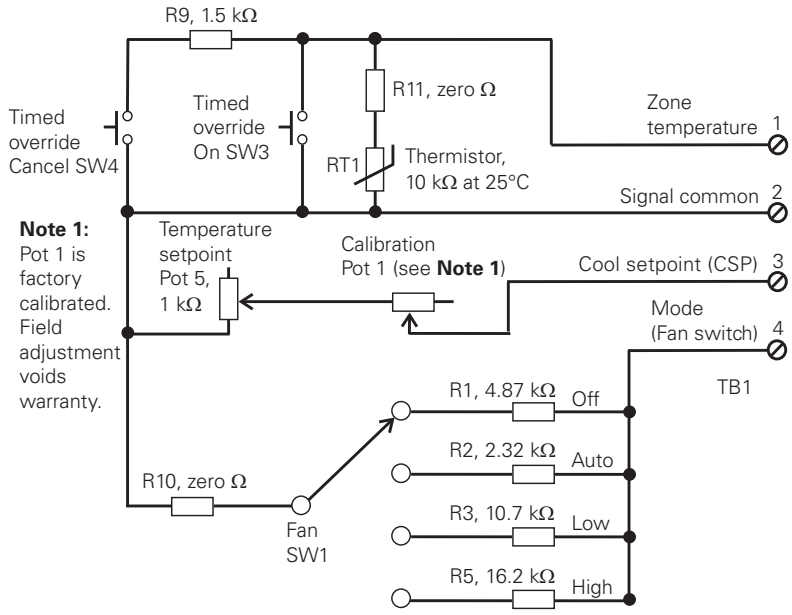
X1379084801



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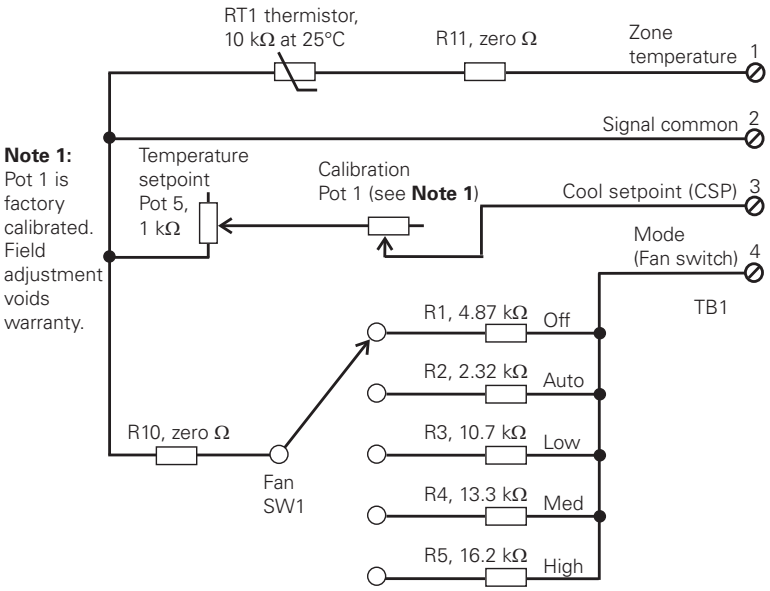
Wiring Diagrams

X1379084101



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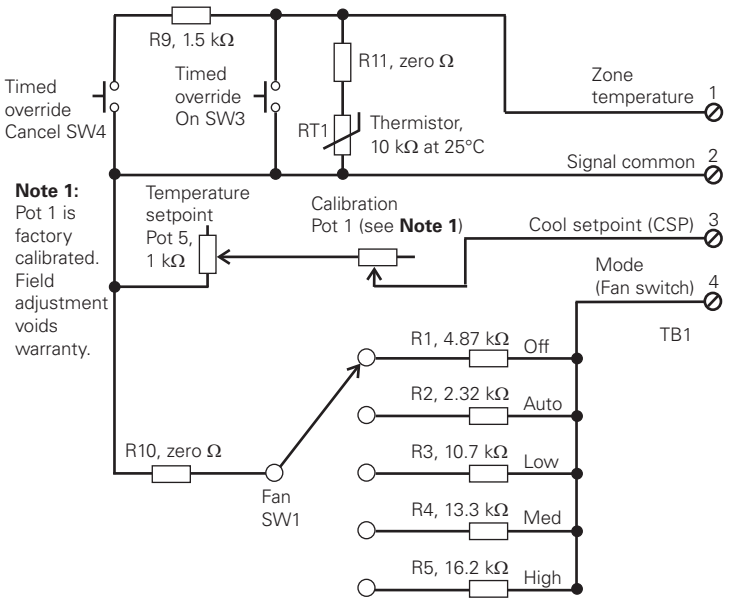
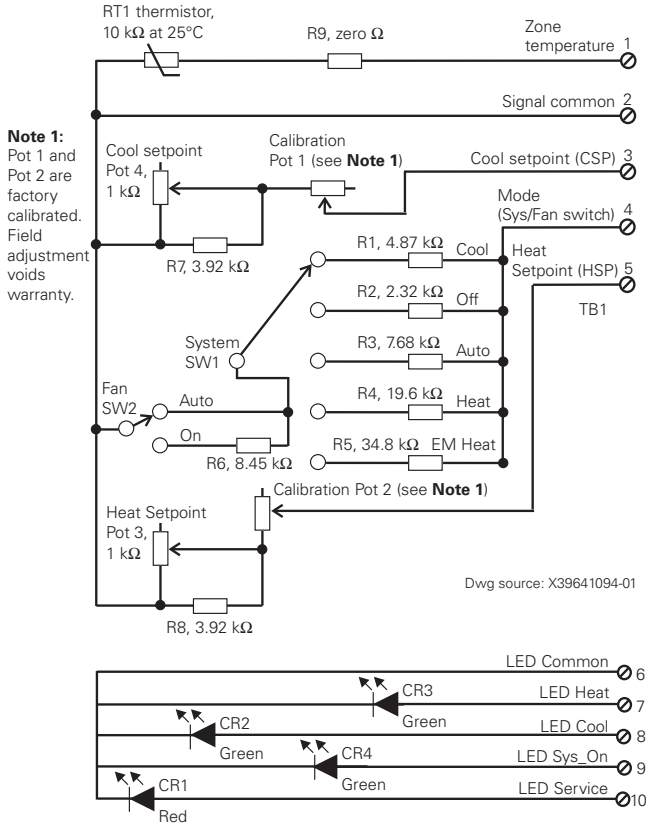
X1379084201



Dwg source: X39641089-01

Temperature sensors with fan and system control

X1379084701



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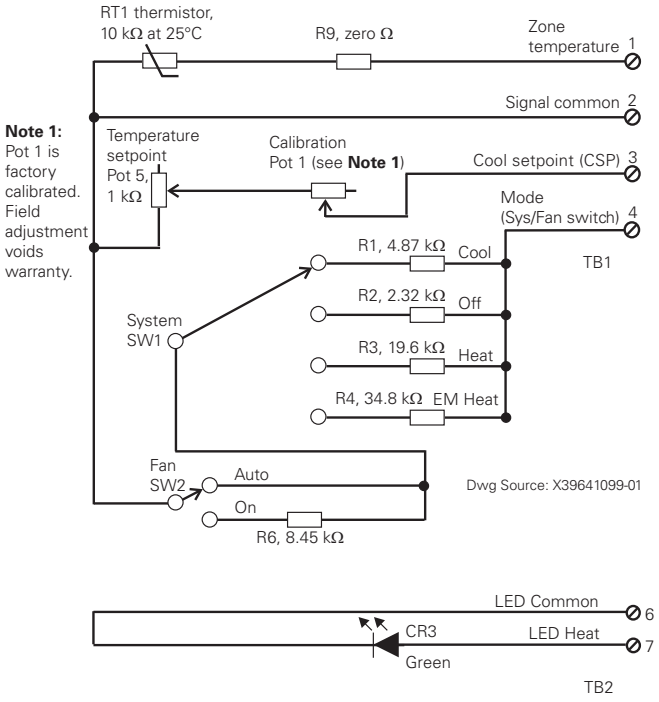
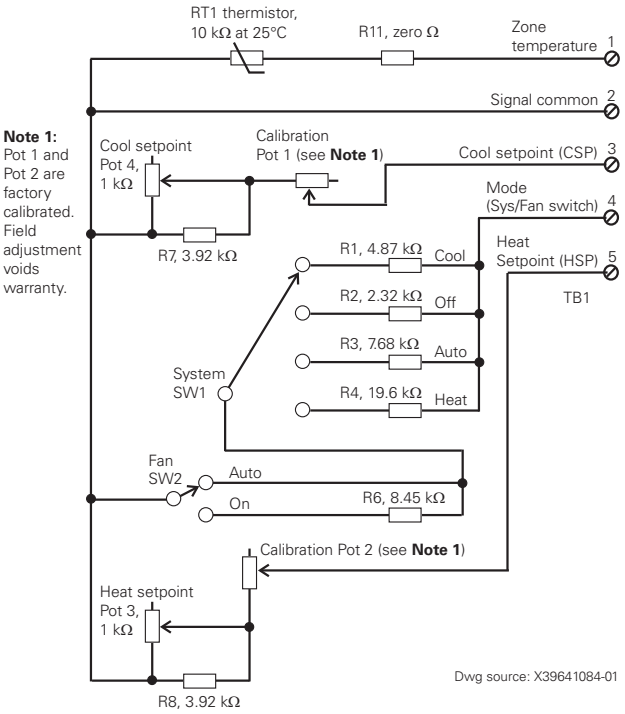


Wiring Diagrams

X1379083701



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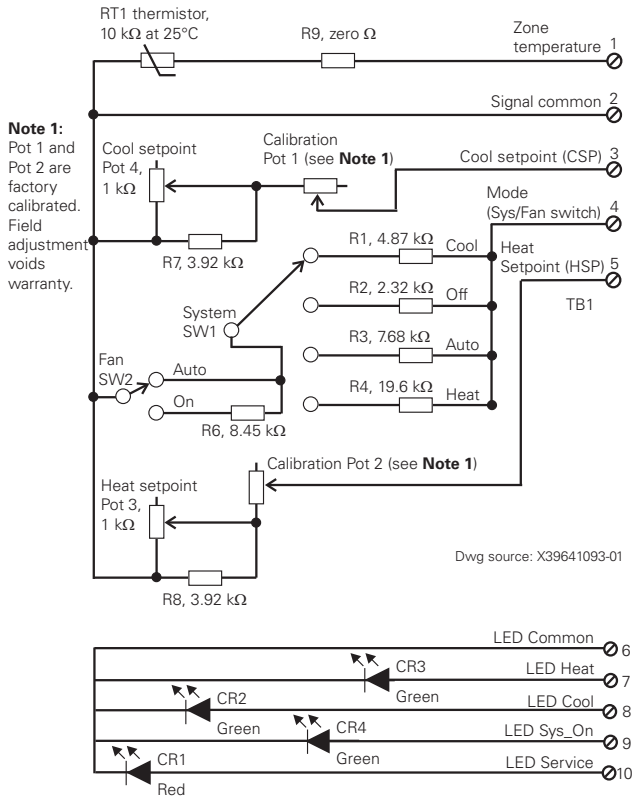

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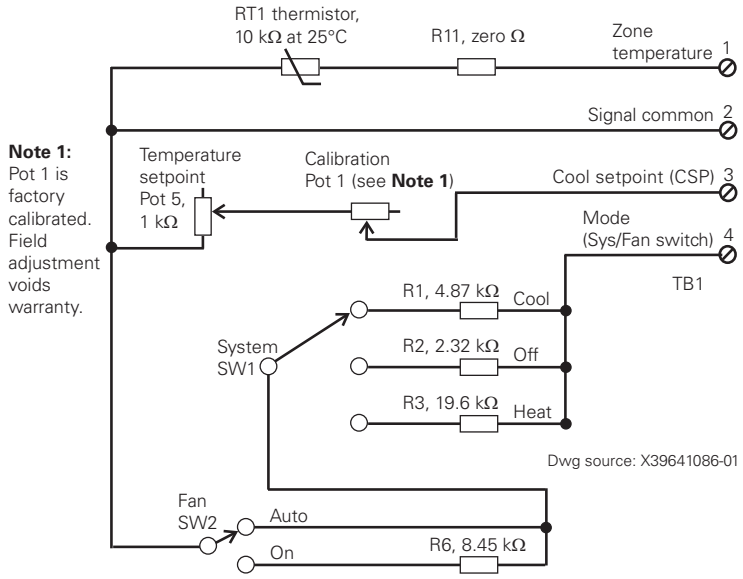

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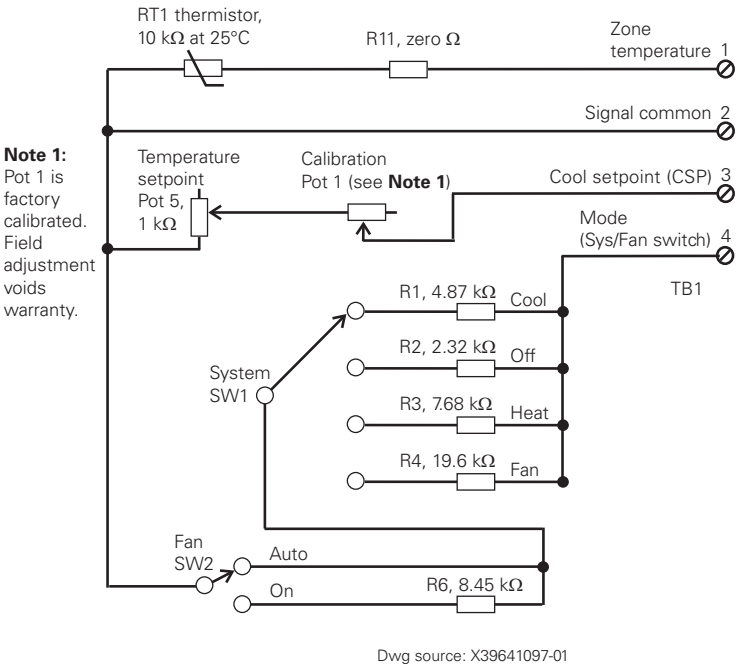
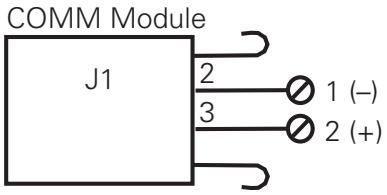


Optional COMM module

X1365146702



Specifications and Agency Compliance

Specifications

Sensor operating temperature	From 32°F to 122°F (0°C to 50°C)
Storage temperature	From -40°F to 185°F (-40°C to 85°C)
Storage/operating humidity range	5% to 95% relative humidity (RH), noncondensing
Thermistor accuracy	0.2°C at 25°C, 1%
Setpoint functional range	Display sensor: 50°F to 89.6°F (10°C to 32°C) All other sensors: 45°F to 95°F (7.2°C to 35°C)
Setpoint markings	Setpoint thumb wheel: • 50°F to 85°F (in 5°F increments) and *, ** • 10°C to 29°C (in 3°C increments) and *, ** Dual setpoint slider: • 50 to 85ºF (stamped every 5ºF) • 10 to 29ºC (stamped every 3ºC)
Housing material	Polycarbonate/ABS blend, UV protected, UL 94-5VA flammability rating, suitable for application in a plenum
Mounting	Fits a standard 2 in. by 4 in. junction box (vertical mount only). Mounting holes are spaced 3.2 in. (83 mm) apart on vertical center line. Includes mounting screws for junction box and wall anchors for sheetrock walls. Overall dimensions: 2.9 in (74 mm) by 4.7 in. (119 mm)
Resolution (display sensor)	0.125ºF over a range of 60 to 80ºF (15.6 to 26.7°C); 0.25ºF when outside this range
Accuracy (display sensor)	0.5°F over a range of 55 to 85°F (12.8 to 29.4ºC)
Power consumption (display sensor)	<1 VA

Agency Compliance

- United States:
  - UL listed: 94, 5 VA Flammability rating; 916, Energy management equipment
  - FCC Part 15, Subpart B
- Canada:
  - CUL listed: 916, Energy management equipment
- Europe:
  - CE marked

CE Declaration of Conformity

Manufacturer: Trane, 4833 White Bear Parkway, Saint Paul, MN 55103, USA

Product: Wired display sensor

Model number: X1379088601, X1379088604, X1379088605

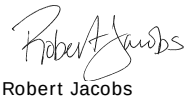
The manufacturer hereby declares that the product conforms to the following:

Electromagnetic Emission:
Council Directive 89/336/EEC)
EN61326-1:2006, Class B limit
Radiated EN55011:2006, Class B limit
Conducted EN55011:2006, Class B limit
Harmonic EN61000-3-2, Class A limit
Flicker EN61000-3-3:1995+A1:2001+A2:2006

Electromagnetic Immunity for Industrial
by Council Directive 89/336/EEC
EN61326-1:2006
EN61000-2:2006, ±4.0 kV by contact, ±8.0 kV by air
EN61000-4-3:2006, 10.0 V/m
EN61000-4-4:2006, ±1.0 kV signal lines, ±2.0 kV ac power lines
EN61000-4-5:2006, ±1.0 kV signal lines, ±2.0 kV ac power lines
EN61000-4-6:2006, 3 V
EN61000-4-11:2006

Date of issue: October 14, 2008

European Contact:
Societé Trane (Epinal, France)
1, rue des Ameriques, B.P. 6
F-88191 Golbey Cedex, France
Phone: (33) 329.31.73.00
Fax: (33) 329.81.24.98

Design/Compliance Engineer:

Robert Jacobs

www.trane.com

For more information, contact your local Trane office or e-mail us at comfort@trane.com

Literature Order Number	BAS-SVX10C-EN
Date	December 2008
Supersedes	BAS-SVX10B-EN (March 2008)

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.