TEC20x6(H)-4 and TEC20x6H-4+PIR Series Wireless Thermostat Controllers with Dehumidification Capability, Fan Control, and Occupancy Sensing Capability

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Installation Instructions

Applications

The TEC Series Wireless Thermostat Controller System provides wireless networked control of Heating, Ventilating, and Air Conditioning (HVAC) equipment on a Building Automation System (BAS) that enables remote monitoring and programming. This TEC Series System integrates into a supervisory controller that uses BACnet® Internet Protocol (IP) or BACnet Master-Slave/Token-Passing (MS/TP) communications.

TEC20 Coordinators allow the supervisory controller to communicate with multiple TEC Wireless Thermostat Controllers. TEC20x6(H)-4 and TEC20x6H-4+PIR Series Wireless Thermostat Controllers control two- or four-pipe fan coils, cabinet unit heaters, or other equipment using on/off, floating, or proportional 0 to 10 VDC control input, three speeds of fan control, and dehumidification capability.

The TEC20x6H-4+PIR Series Thermostat Controllers have occupancy sensing capability built into the device. These devices maximize up to 30% energy savings in high-energy usage light commercial buildings, such as schools and hotels, during occupied times by using additional standby setpoints. See the *Occupancy Sensor Operation – TEC20x6H-4+PIR Series Thermostat Controllers* section for more information.

The wireless mesh network uses ZigBee™ technology to enable remote monitoring and programming and to enhance reliability by providing redundant transmission paths through other TEC Wireless Thermostat Controllers, creating a resilient, self-healing mesh network.

IMPORTANT: The TEC20x6(H)-4 and TEC20x6H-4+PIR Series Wireless Thermostat Controllers are intended to provide an input to equipment under normal operating conditions. Where failure or malfunction of the thermostat controller could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the thermostat controller.

North American Emissions Compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

RF Transmitters: Compliance Statement (Part 15.19)
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation.

Warning (Part 15.21)
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Johnson Controls

TEC20x6(H)-4 and TEC20x6H-4+PIR Series Wireless Thermostat Controllers with Dehumidification Capability, Fan Control, and Occupancy Sensing Capability   1

Canada

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

RF Transmitters: Industry Canada Statement
The term **IC** before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Le terme « IC » précédant le numéro d'accréditation/ inscription signifie simplement que le produit est conforme aux spécifications techniques d'Industrie Canada.

Installation

Location Considerations

Locate a thermostat controller:

- on a partitioning wall, approximately 1.5 m (5 ft) above the floor in a location of average temperature

- away from direct sunlight, radiant heat, outside walls, behind doors, air discharge grills, stairwells, or outside doors

- away from steam or water pipes, warm air stacks, unconditioned areas (not heated or cooled), or sources of electrical interference

  Note: Allow for vertical air circulation to the TEC20x6(H)-4 and TEC20x6H-4+PIR Series Thermostat Controllers.

For integrated Passive Infrared (PIR) models, make sure the thermostat controller is located centrally, where occupant movement is frequent.

Wireless Signal Transmission Range

Line-of-sight transmission ranges between a TEC20 Coordinator and a TEC Wireless Thermostat Controller (or between TEC Wireless Thermostat Controllers) can be less than the recommended distances shown in Table 1. The effective transmission range for indoor applications varies because of Radio Frequency (RF) signal absorption and reflection due to metal obstructions, walls (or floors), and furniture found in typical building interiors.

Table 1: Recommended Transmission Ranges

Type	Distance
Through Walls	10 m (32.8 ft)
Open Space	30 m (98.4 ft)

For detailed information on locating devices for optimum signal strength, refer to the *Wireless Metasys System Location Guide (LIT-12011294)*.

Installing the Thermostat Controller

Follow these steps to install the thermostat controller:

1. Use a Phillips-head screwdriver to remove the security screw if it is installed on the bottom of the thermostat controller cover.

    Note: Normally, the security screw is packaged separately in a plastic bag with the thermostat controller. Skip this step if the screw is not installed on the bottom of the cover.

2. Pull the bottom edge of the thermostat cover and open the thermostat as illustrated in Figure 1.

    Note: PIR Models have a wiring connection between the cover and the Printed Circuit Board (PCB). This connection allows for proper wiring of the occupancy sensor. Carefully remove the wiring connection from the PCB by pulling up on the connector block. **Do not attempt to remove the connector block by pulling on the wires**.
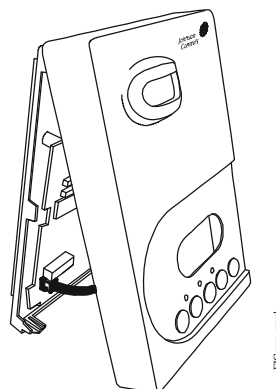

Figure 1: Removing the Cover

3. Carefully pull the locking tabs on the right side of the mounting base and unlock the PCB. Open the PCB to the left as illustrated in Figure 2.
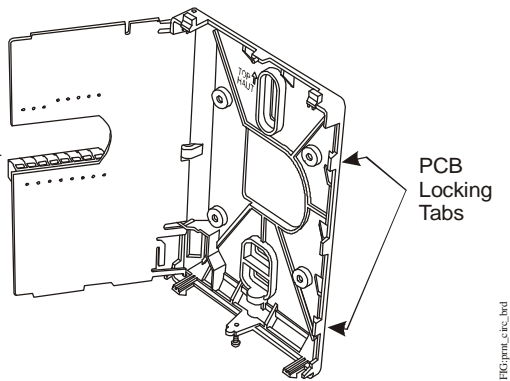

PCB Locking Tabs

Figure 2: Opening the PCB

4. Pull approximately 152 mm (6 in.) of wire from the wall and insert the wire through the hole in the mounting base.

5. Align the mounting base on the wall, and use the base as a template to mark the two mounting hole locations.

   Note: If you need to install the thermostat on an electrical junction box, use 2-1/2 x 4 in. (63 x 101 mm) square boxes with mud ring covers, and avoid smaller 1-1/2 x 4 in. (38 x 101 mm) square or 3 x 2 in. (76 x 51 mm) boxes. This procedure ensures you have enough space for cabling and end-of-line devices, if needed.

   Note: For surface-mount applications, use durable mounting hardware such as Molly bolt anchors that cannot be easily pulled out of the mounting surface.

6. Position the thermostat mounting base on the wall so that the arrow on the base points upward to indicate the top of the thermostat.

7. Secure the mounting base to the wall surface using two mounting screws as illustrated in Figure 3.

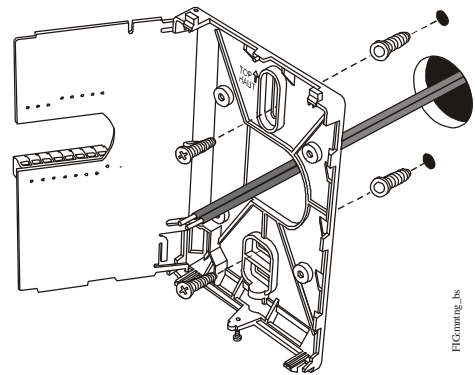   **Note:** Be careful not to overtighten the mounting screws.

Figure 3: Securing the Mounting Base to the Wall

8. Swing the PCB back to the right, and carefully snap it into the locking tabs on the mounting base.

9. Remove the screw terminal blocks that are attached to a disposable adhesive. Figure 4 illustrates the locations of the screw terminal blocks on the thermostat controller.
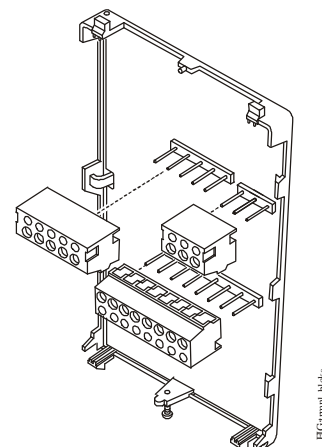

Figure 4: Removing the Screw Terminal Blocks

Wiring

⚠	**CAUTION: Risk of Electric Shock.** Disconnect the power supply before making electrical connections to avoid electric shock.

⚠	**CAUTION: Risk of Property Damage.** Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

IMPORTANT: Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the electrical ratings of the thermostat controller.

When replacing an existing thermostat controller, remove and label the wires to identify the terminal functions. When replacing a thermostat controller of the same model, simply remove the old screw terminal blocks and reinsert them onto the PCB of the replacement thermostat controller.

To wire the thermostat controller:

1. Strip the ends of each wire 6 mm (1/4 in.) and connect them to the appropriate screw terminals as indicated in Figure 5.

   Note: If multiple wires are inserted into the screw terminals, be sure to properly twist the wires together prior to inserting them into the screw terminals.

2. Carefully push any excess wire back into the wall.

   Note: Seal the hole in the wall with fireproof material to prevent drafts from affecting the ambient temperature readings.

3. Reinsert the screw terminal blocks onto the PCB.

   Note: If multiple wires are inserted into the terminals, be sure to properly twist the wires together prior to inserting them into the terminal connectors.

4. Reattach the cover to the mounting base (top side first).

5. Use a Phillips-head screwdriver to reinstall the security screw on the bottom of the cover.

See Figure 5, Figure 6, Figure 7, and Table 2 for information on wiring the thermostat controllers.
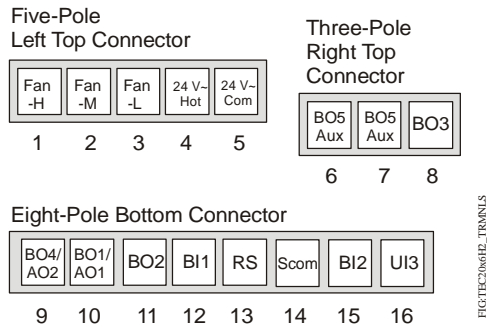
Five-Pole
Left Top Connector

Fan -H	Fan -M	Fan -L	24 V~ Hot	24 V~ Com
1	2	3	4	5

Three-Pole
Right Top
Connector

BO5 Aux	BO5 Aux	BO3
6	7	8

Eight-Pole Bottom Connector

BO4/ AO2	BO1/ AO1	BO2	BI1	RS	Scom	BI2	UI3
9	10	11	12	13	14	15	16

Figure 5: TEC20x6(H)-4 and TEC20x6H-4+PIR Series Thermostat Controller Terminals
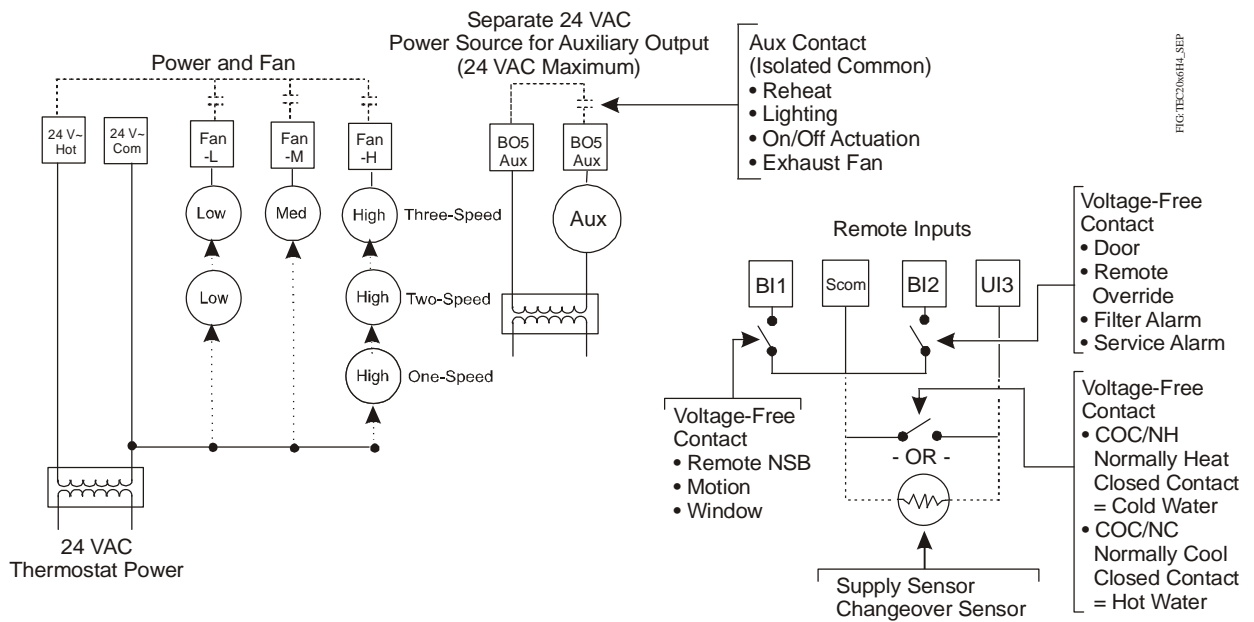

Figure 6: TEC20x6(H)-4 and TEC20x6H-4+PIR Series Thermostat Controller with Separate Power Source for Auxiliary Contact
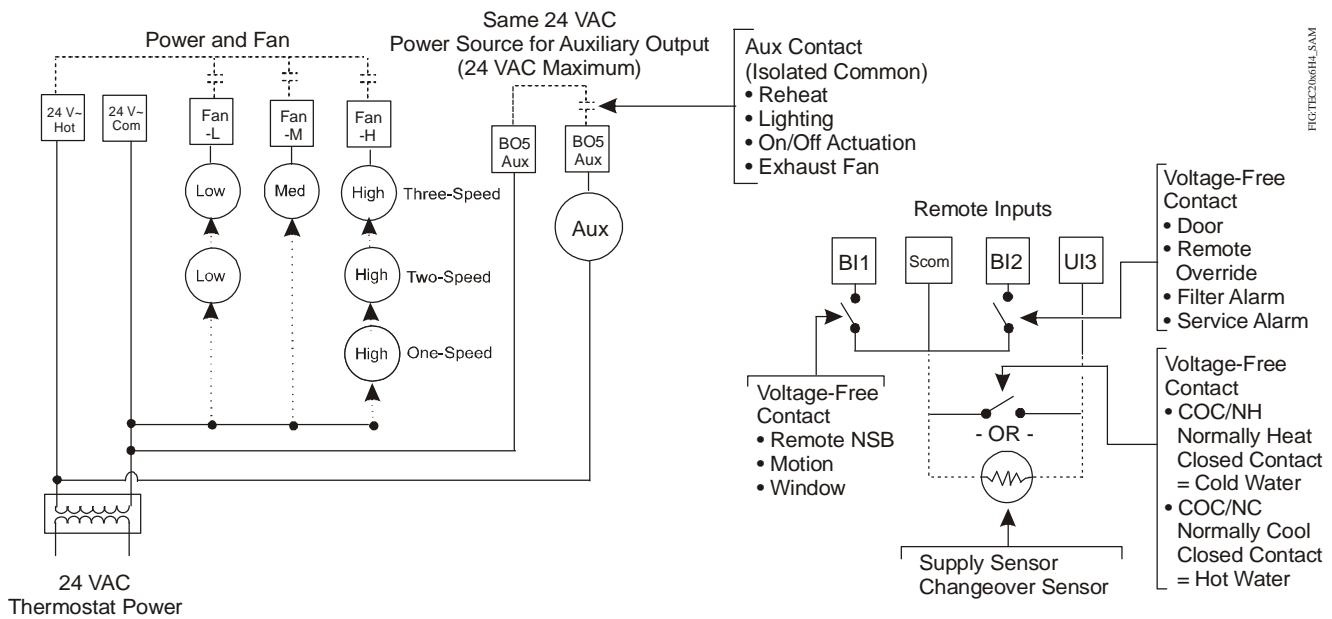
Figure 7: TEC20x6(H)-4 and TEC20x6H-4+PIR Series Thermostat Controller with Same Power Source for Auxiliary Contact

Table 2: TEC20x6(H)-4 and TEC20x6H-4+PIR Series Thermostat Controller Terminals

Terminal Number	Terminal Label by Model			Function
	TEC2016-4, TEC2016H-4, TEC2016H-4+PIR (On/Off Control)	TEC2026-4, TEC2026H-4, TEC2026H-4+PIR TEC2036-4, TEC2036H-4, TEC2036H-4+PIR (On/Off or Floating Control)	TEC2046-4, TEC2046H-4, TEC2046H-4+PIR, TEC2056-4, TEC2056H-4, TEC2056H-4+PIR (Proportional 0 to 10 VDC Control)	
1	Fan-H	Fan-H	Fan-H	Fan On – High
2	Fan-M	Fan-M	Fan-M	Fan On – Medium
3	Fan-L	Fan-L	Fan-L	Fan On – Low
4	24 V~ Hot	24 V~ Hot	24 V~ Hot	24 VAC from Transformer
5	24 V~ Com	24 V~ Com	24 V~ Com	24 VAC from Transformer (Common)
6	BO5 Aux	BO5 Aux	BO5 Aux	Auxiliary Binary Output
7	BO5 Aux	BO5 Aux	BO5 Aux	Auxiliary Binary Output
8	BO3	BO3	Blank	Open Heat
9	Blank	BO4	AO2	Close Heat
10	Blank	BO1	AO1	Open Cool
11	BO2	BO2	Blank	Close Cool
12	BI1	BI1	BI1	Configurable Binary Input 1
13	RS	RS	RS	Remote Sensor
14	Scom	Scom	Scom	Sensor Common
15	BI2	BI2	BI2	Configurable Binary Input 2
16	UI3	UI3	UI3	Configurable Universal Input 3

Sample Applications

Figure 8 through Figure 11 show sample applications
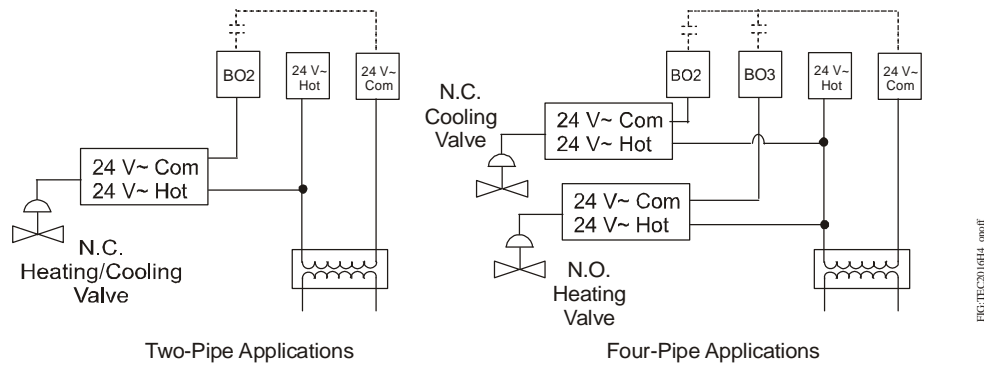for these thermostat controllers.

Figure 8: Wiring TEC2016(H)-4 and TEC2016H-4+PIR Thermostat Controllers for On/Off Control
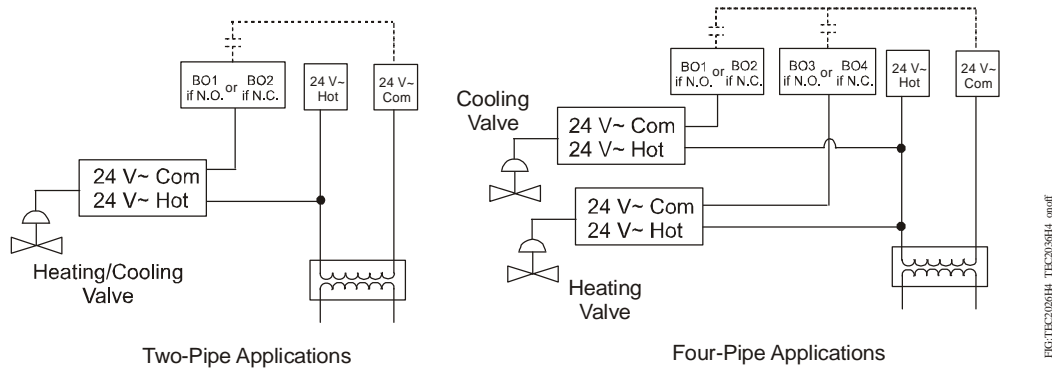

**Figure 9: Wiring TEC2026(H)-4, TEC2026H-4+PIR, TEC2036(H)-4, and TEC2036H-4+PIR
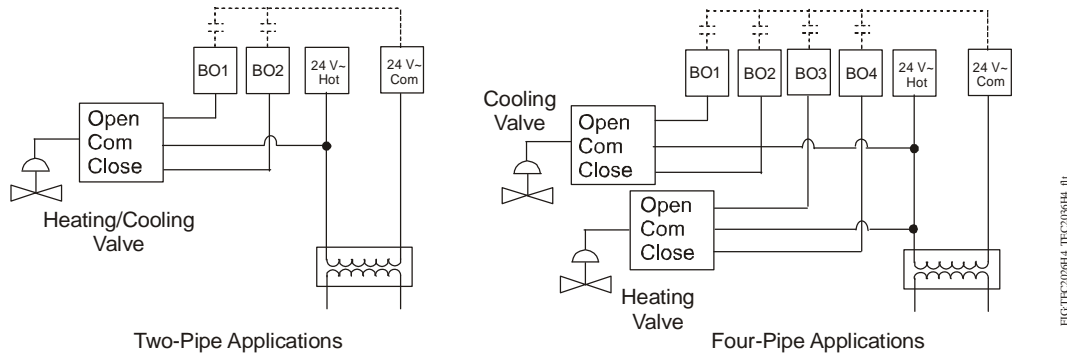Thermostat Controllers for On/Off Control**

**Figure 10: Wiring TEC2026(H)-4, TEC2026H-4+PIR, TEC2036(H)-4, and TEC2036H-4+PIR
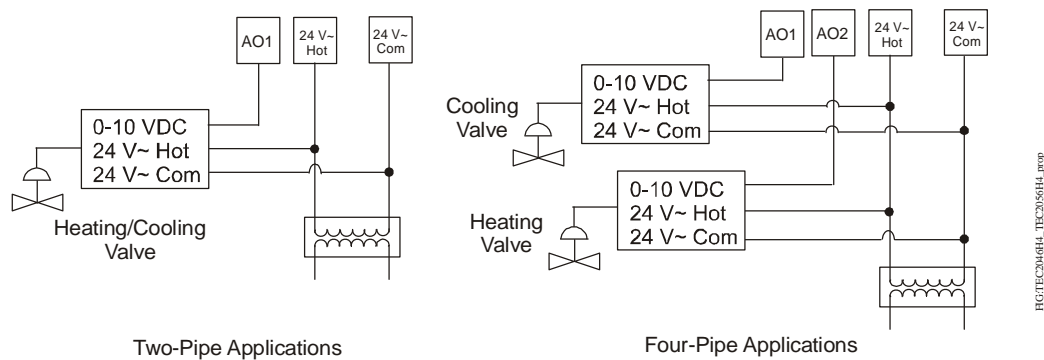Thermostat Controllers for Floating Control**

Two-Pipe Applications | Four-Pipe Applications

Figure 11: Wiring TEC2046(H)-4, TEC2046H-4+PIR, TEC2056(H)-4, and TEC2056H-4+PIR Thermostat Controllers for Proportional Control
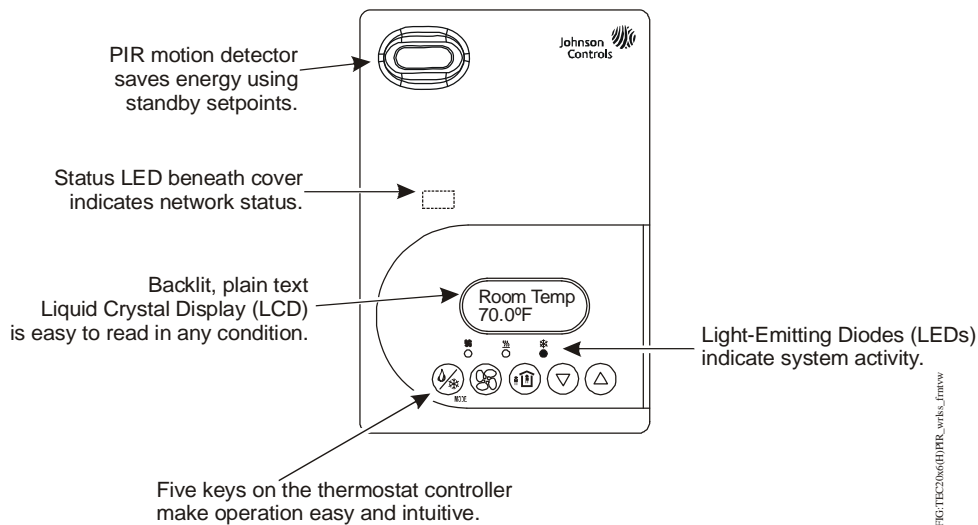
Setup and Adjustments

PIR motion detector saves energy using standby setpoints.

Status LED beneath cover indicates network status.

Backlit, plain text Liquid Crystal Display (LCD) is easy to read in any condition.

Room Temp 70.0ºF

Light-Emitting Diodes (LEDs) indicate system activity.

Five keys on the thermostat controller make operation easy and intuitive.

Figure 12: Front Cover (TEC20x6H-4+PIR Model Shown)

Thermostat Controller User Interface Keys

The user interface consists of keys on the front cover (Figure 12). The function of each key is as follows:

- **MODE** key toggles among the system modes available, as defined by selecting the appropriate operation sequence in the Installer Configuration Menu (Off, Heat, Cool, Auto).

- **FAN** key toggles among the fan modes available, as defined by selecting the appropriate fan menu options defined in the Installer Configuration Menu (Low, Med, High, Auto).

- **OVERRIDE** key (commercial models) overrides the unoccupied mode to occupied at the local user interface for the specified TOccTime. (TOccTime is defined by selecting the appropriate time period in the Installer Configuration Menu.)

If one of the binary inputs is configured to operate as a remote override contact, this **OVERRIDE** function is disabled. The **OVERRIDE** key also allows access to the Installer Configuration Menu. (See the *Configuring the Thermostat Controller* section.)

- **°C/°F** key (hospitality models) changes the temperature scale to either Celsius or Fahrenheit and allows access to the Installer Configuration Menu. (See the *Configuring the Thermostat Controller* section.)

  Note: For hospitality models, binary inputs can override from the unoccupied mode to occupied mode.

- **UP/DOWN** arrow keys change the configuration parameters and activate a setpoint adjustment.

Light-Emitting Diodes (LEDs)

Three LEDs are included to indicate the fan status, call for heat, or call for cooling:

- The fan LED 🌀 is on when the fan is on.

- The heat LED 〰️ is on when heating is on.

- The cool LED ❄️ is on when cooling is on.

The Status LED, located beneath the cover, flashes at 5-second intervals to provide indication of the network status of the thermostat controller. See Table 3.

Table 3: Status LED

Flashes per 5-Second Interval	Condition Indicated
1	Power On
2	Power On, Communicating
3	Power On, Communicating, Found Wireless Network
4	Power On, Communicating, Found Wireless Network, Communicating with TEC20 Coordinator

Integrated PIR Sensor – TEC20x6H-4+PIR Series Thermostat Controllers

The integrated PIR sensor allows for automatic switching between fully adjustable Occupied and Stand-By temperature setpoints without user interaction. This feature generates incremental energy savings during scheduled occupied periods while the space is unoccupied.

Backlit Liquid Crystal Display (LCD)

The thermostat controller includes a 2-line, 8-character backlit display. Low-level backlighting is present during normal operation, and it brightens when any user interface key is pressed. The backlight returns to low level when the thermostat controller is left unattended for 45 seconds.

Status Display Menu

The Status Display Menu displays during normal operation. This menu scrolls through several parameters:

- Room Temperature

- Room Temperature and Humidity (TEC2036-4, TEC2036H-4, TEC2036H-4+PIR, TEC2056-4, TEC2056H-4, and TEC2056H-4+PIR models)

    Note: For models with dehumidification capability, the default setting is no humidity reading on the display (**%RH disp** parameter is set to **off**.) The **%RH disp** parameter must be set to **on** to display the current humidity reading.

- System Mode

- Occupancy Status (Occupied/Unoccupied/Override)

- Applicable Alarms – The backlight lights up as an alarm condition is displayed.

Note: An option is available within the Installer Configuration Menu to lock out the scrolling display and show only the Room Temperature parameter.

Dehumidification Operation – TEC2036(H)-4 and TEC2056(H)-4 Thermostat Models

Upon detection of room humidity above the adjustable humidity setpoint as sensed by the integral humidity sensor, dehumidification activates.

Note: Dehumidification operation functions only in the Cooling mode; dehumidification operation does not function in either the Off or the Heating mode.

Note: A central network command can globally lock out dehumidification operation to all thermostats.

If the room temperature resides in the deadband between the Heating and Cooling setpoint:

- the thermostat forces the fan to low speed

- the chilled water valve opens to the specified maximum value set by **CoolMax**

- the thermostat stages Heating to maintain the room temperature at the Cooling setpoint, as sensed by the thermostat

If the room temperature falls below the current Heating setpoint, the thermostat disables dehumidification operation.

If the thermostat is in Cooling demand:

- the chilled water valve opens to 100%
- the thermostat stages Heating to maintain the room temperature at the Cooling setpoint, as sensed by the thermostat

If the thermostat is in Cooling demand and the room temperature rises 2F°/1C° above the Cooling setpoint, the thermostat automatically disables dehumidification operation. Likewise, if the thermostat is in Cooling demand and the room temperature falls below the current Heating setpoint, the thermostat disables dehumidification operation.

Occupancy Sensor Operation – TEC20x6H-4+PIR Series Thermostat Controllers

A TEC20x6H-4+PIR Series Thermostat Controller–or a TEC20x6(H)-4 Series Thermostat Controller equipped with a PIR accessory cover–provides advanced occupancy logic.

Note: The PIR strategy is an occupied strategy. If the thermostat controller is programmed to be Unoccupied, the PIR function does not have an effect on the occupancy strategy.

The thermostat controller automatically switches occupancy levels from Occupied to Stand-By and Unoccupied as required, when local movement is sensed.

Occupancy sensing is enabled only if a PIR cover is installed on the thermostat controller (PIR models) or if a remote input is configured as a remote PIR sensor (**MotionNO** or **MotionNC**).

PIR Warm-Up Period

When a PIR cover is used and a thermostat controller is powered up, there is a 1-minute warm-up period before any local movement can be detected and acknowledged by the PIR sensing device. The local status LEDs for the PIR function are not active, and the sensor is in Stand-By mode for the 1-minute period. The PIR functionality and local movement status LEDs are activated after the 1-minute warm-up period has elapsed after the initial powering of the thermostat controller. If movement is present, the mode changes to Occupied.

PIR Diagnostic LEDs

The diagnostic LEDs inside the PIR lens brighten when movement is detected within the first 30 minutes after powerup. The LEDs do not light up or brighten after the initial 30-minute period.

Setpoints

The Stand-By setpoints are under the same limitations and restrictions as the Occupied and Unoccupied setpoints. Stand-By setpoints reside between the corresponding Occupied and Unoccupied setpoint values.

The installer must be certain that the difference between the Stand-By and Occupied values can be recovered within a timely fashion to ensure occupancy comfort. In addition, the difference between the two values must be large enough to warrant maximum energy savings.

Hotel and lodging applications can benefit from the addition of an entry door switch wired to one of the binary inputs of the thermostat controller. When a door contact is used and configured, the Stand-By timer and its configuration are no longer active or used. The occupancy toggle between Occupied and Stand-By is then dictated by both the door contact and the PIR sensing device used. If movements are detected by the PIR sensor and the door is closed, the room is considered occupied. The thermostat controller switches back to Stand-By mode only if the door switch toggles open/closed. Motion is ignored when the door switch indicates an open door.

PIR occupancy functionality is dictated by both the Stand-By timer and Unoccupied timer configuration value and movements present in the area.

Unoccupied Timer Disable

It might be preferable for the local area to stay out of Unoccupied mode and always stay at the Stand-By occupancy level when no activity is present. In instances when areas always need to be on Stand-By status, ready to respond to demand at any given point in time, we recommend disabling the Unoccupied timer. When the local PIR occupancy routine is running at the thermostat controller, the zone drifts into Unoccupied mode when the Unoccupied timer is set above its factory default value of 0.0 hours.

For more information on occupancy sensor operation, refer to the *TEC2x45-4, TEC2xx6(H)-4, TEC2xx6H-4+PIR, and TEC2xx7-4 Series Thermostat Controllers Application Note (LIT-12011594).*
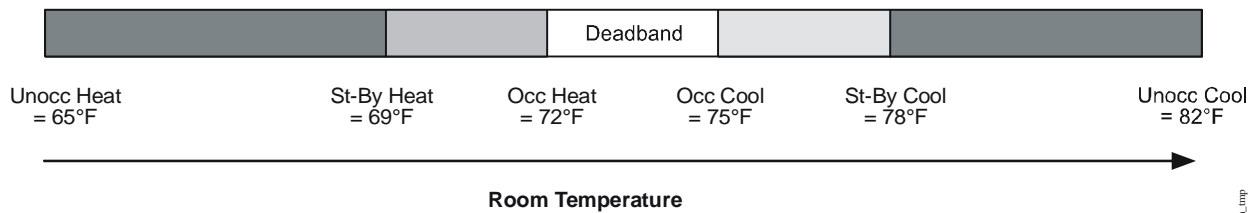
Figure 13: Increasing Room Temperature Setpoints
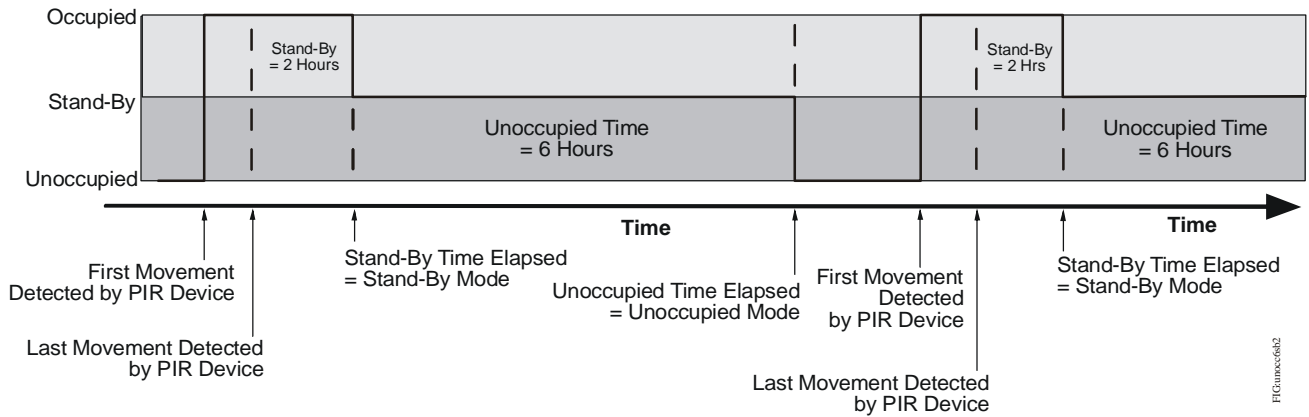
Figure 14: Unoccupied Timer Set to 6 Hours and Stand-By Timer Set to 2 Hours
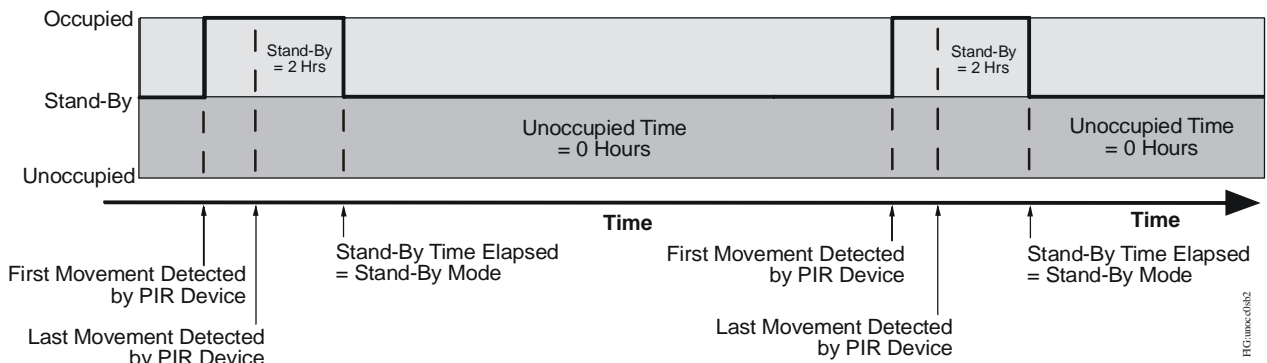
Figure 15: Unoccupied Timer Set to 0 Hours and Stand-by Timer Set to 2 Hours

Configuring the Thermostat Controller

The thermostat controller ships from the factory with default settings for all configurable parameters. The default settings are shown in Table 6. To reconfigure the parameters, follow the steps in this section.

1. To access the Installer Configuration Menu, press and hold the center key for approximately 8 seconds.

   Note: If the **Password** parameter is configured, Password 0 appears on the thermostat controller display indicating that the configured password is required to proceed.

Use the **UP/DOWN** arrow keys to indicate the configured password, then press the **MODE** key to proceed through the Installer Configuration Menu parameters.

2. Once the Installer Configuration Menu begins, press and release the center key to scroll through the parameters listed in Table 6.

3. When the desired parameter is displayed, use the **UP/DOWN** arrow keys to choose the desired selection option.

4. Press and release the center key to continue scrolling through the parameters.

Note: Pressing the **FAN** key during configuration restarts the list of displayed parameters at the first parameter listed in Table 6.

When the thermostat controller is in the Installer Configuration Menu and left unattended for approximately 8 seconds, the thermostat controller reverts to the Status Display Menu.

Configuring Inputs BI1, BI2, and UI3

When BI1 and BI2 are configured for an alarm condition, an alarm condition displays locally when the input closes. An alarm message is included on the scrolling Status Display Menu and when the message is displayed, the backlight momentarily lights up.

The UI3 input provides changeover of hot/cold water switching or supply air temperature monitoring at the thermostat controller.

Each input can be configured to the Selection Options included in Table 6.

Configuring the Sequence of Operation (SeqOpera)

Choose the appropriate sequence of operation. The modes presented are user-dependent on the sequence of operation selected. For two-pipe applications using a changeover sensor, choose the selection option **(0): Cooling Only**. Changeover occurs between **Cooling Only** and **Heating Only**. See Figure 16 through Figure 21 for sequence of operation examples.

Table 4: Selection Options for Sequence of Operation in Two-Pipe Applications

Selection Option	Control Curve	Terminal Numbers Used (See Table 2 and Figure 5.)		
		On/Off Control	**Floating Control**	**Proportional 0 to 10 VDC Control**
(0): Cooling Only	See Figure 16.	**10:** Normally Open (N.O.) Cooling **11:** Normally Closed (N.C.) Cooling	**10:** Open Cooling **11:** Closed Cooling	**10:** Proportional Cooling
(1): Heating Only	See Figure 17.	**10:** N.O. Heating **11:** N.C. Heating	**10:** Open Heating **11:** Closed Heating	**10:** Proportional Heating
(2): Cooling with Reheat	See Figure 18.	**6 and 7:** Reheat **10:** N.O. Cooling **11:** N.C. Cooling	**6 and 7:** Reheat **10:** Open Cooling **11:** Closed Cooling	**6 and 7:** Reheat **10:** Proportional Cooling
(3): Heating with Reheat	See Figure 19.	**6 and 7:** Reheat **10:** N.O. Heating **11:** N.C. Heating	**6 and 7:** Reheat **10:** Open Heating **11:** Closed Heating	**6 and 7:** Reheat **10:** Proportional Heating

Table 5: Selection Options for Sequence of Operation in Four-Pipe Applications

Selection Option	Control Curve	Terminal Numbers Used (See Table 2 and Figure 5.)		
		On/Off Control	**Floating Control**	**Proportional 0 to 10 VDC Control**
(0): Cooling Only	See Figure 16.	**10:** N.O. Cooling **11:** N.C. Cooling	**10:** Open Cooling **11:** Closed Cooling	**10:** Proportional Cooling
(1): Heating Only	See Figure 17.	**8:** N.O. Heating **9:** N.C. Heating	**8:** Open Heating **9:** Closed Heating	**9:** Proportional Heating
(2): Cooling with Reheat	See Figure 18.	**6 and 7:** Reheat **10:** N.O. Cooling **11:** N.C. Cooling	**6 and 7:** Reheat **10:** Open Cooling **11:** Closed Cooling	**6 and 7:** Reheat **10:** Proportional Cooling
(3): Heating with Reheat	See Figure 19.	**6 and 7:** Reheat **8:** N.O. Heating **9:** N.C. Heating	**6 and 7:** Reheat **8:** Open Heating **9:** Closed Heating	**6 and 7:** Reheat **9:** Proportional Heating
(4): Cool/Heat Four-Pipe	See Figure 20.	**8:** N.O. Heating **9:** N.C. Heating **10:** N.O. Cooling **11:** N.C. Cooling	**8:** Open Heating **9:** Closed Heating **10:** Open Cooling **11:** Closed Cooling	**9:** Proportional Heating **10:** Proportional Cooling
(5): Cool/Heat Four-Pipe and Reheat	See Figure 21.	**6 and 7:** Reheat **8:** N.O. Heating **9:** N.C. Heating **10:** N.O. Cooling **11:** N.C. Cooling	**6 and 7:** Reheat **8:** Open Heating **9:** Closed Heating **10:** Open Cooling **11:** Closed Cooling	**6 and 7:** Reheat **9:** Proportional Heating **10:** Proportional Cooling

Cooling Setpoint

Device Opened

Device Closed

On/Off, Floating, or Proportional Output

Temperature Increase
(Increments of 1F°/0.5C°)

Figure 16: Cooling Only

Heating Setpoint

Device Opened

On/Off, Floating, or Proportional Output

Device Closed

Temperature Increase
(Increments of 1F°/0.5C°)

Figure 17: Heating Only

On/Off, Floating, or Proportional Outputs ——— Heating Output

———— Cooling Output

Heating Setpoint   Cooling Setpoint

Deadband

On

On   Reheat   Off

Off

Device Opened

Device Closed

Temperature Increase
(Increments of 1F°/0.5C°)
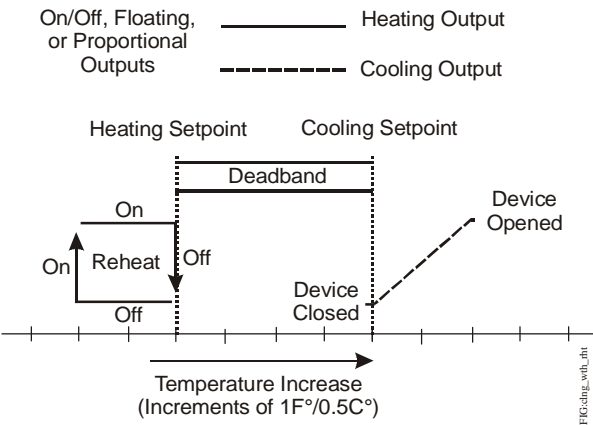
Figure 18: Cooling with Reheat

On

On   Reheat   Off

Off

100%

0%

On/Off, Floating, or Proportional Output

Temperature Increase
(Increments of 1F°/0.5C°)

Figure 19: Heating with Reheat

On/Off, Floating, or Proportional Outputs ——— Heating Output

———— Cooling Output

Heating Setpoint   Cooling Setpoint

Deadband

Device Opened

Device Closed   Device Closed

Device Opened

Temperature Increase
(Increments of 1F°/0.5C°)
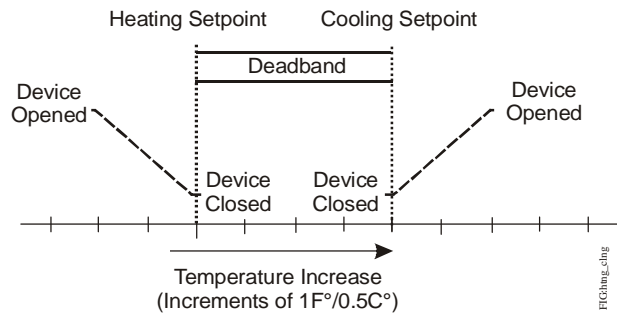
Figure 20: Heating/Cooling When Out1Conf = 4.0
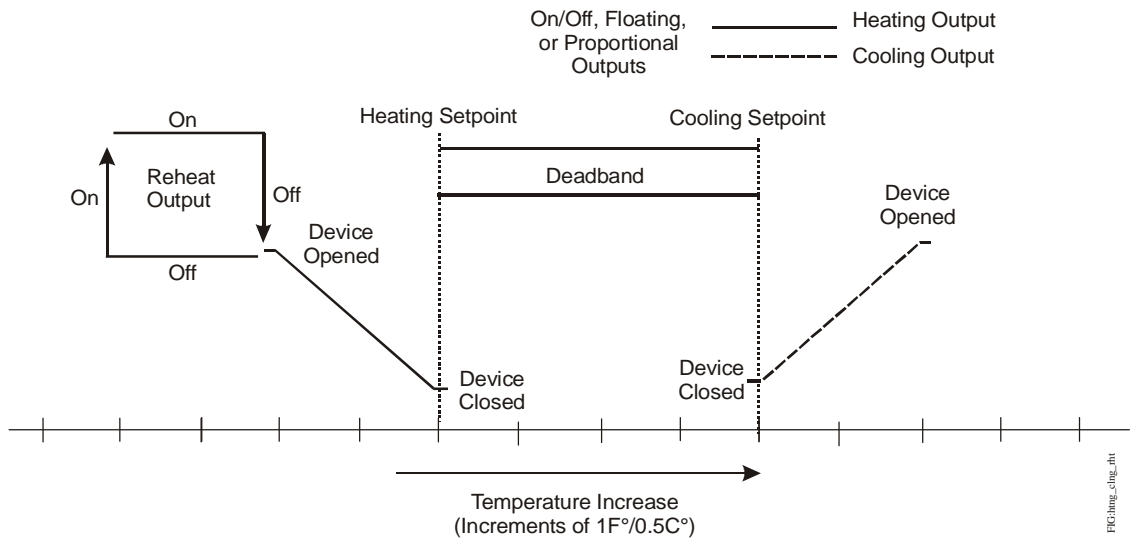
Figure 21: Heating/Cooling with Reheat, Four-Pipe Applications

Configuring Automatic Fan Speed

Use the **Fan Menu** parameter in the Installer Configuration menu to set the available Fan Mode options. Use the **FAN** key to select the desired Fan Mode option.

When selection option **(2): Low-Med-High-Auto** is chosen in the **Fan Menu** parameter, the fan operates as shown in Figure 22. When selection option **(3): Low-High-Auto** is chosen in the **Fan Menu** parameter, the fan operates at only the low and high settings, ignoring the medium setting (Figure 22). This operation applies to the occupied mode when the fan is set to **Auto**.

Figure 22: Low-Med-High-Auto and Low-High-Auto Fan Operation

Configuring the Wireless Mesh Network Settings

Use the following process to configure the wireless mesh network.

1. Select a **PAN ID** and **Channel**. Use these same values for every TEC Wireless Thermostat Controller (and the associated TEC20 Coordinator) on the same wireless mesh network. See Table 6.

2. Select a **Com Address** for each TEC Wireless Thermostat Controller (1 to 254). This address must be unique to each TEC Wireless Thermostat Controller on the same wireless network (that is, unique to the **PAN ID**/**Channel** combination). See Table 6.

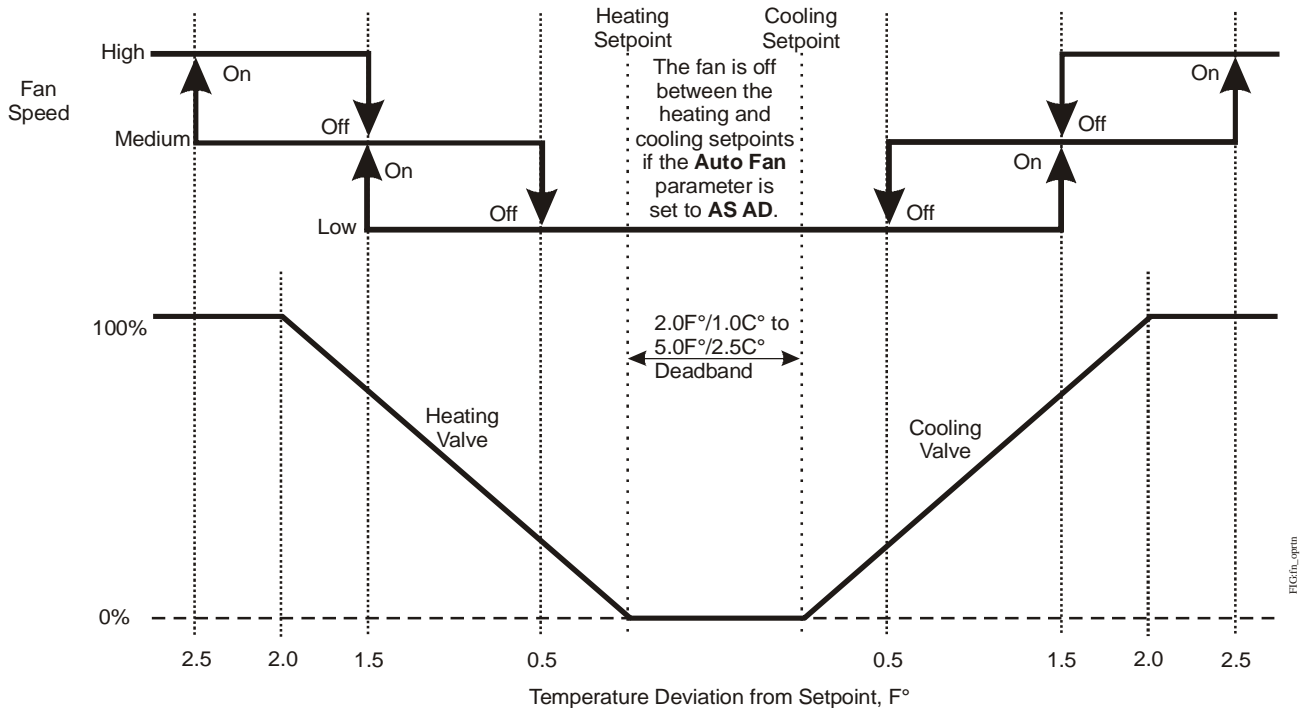After configuring the wireless mesh network settings, refer to the *TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System Technical Bulletin (LIT-12011596)* for directions on integrating the TEC Wireless Thermostat Controllers and TEC20 Coordinator with a supervisory controller.

Dehumidification (TEC2036[H]-4, TEC2036H-4+PIR, TEC2056[H]-4, and TEC2056H-4+PIR Models Only)

Upon detection of room humidity above the adjustable humidity setpoint as sensed by the integral humidity sensor, dehumidification activates.

Note: Dehumidification operation functions only in the Cooling mode; dehumidification operation does not function in either the Off or the Heating mode.

Note: A central network command can globally lock out dehumidification operation to all thermostat controllers.

If the room temperature resides in the deadband between the Heating and Cooling setpoint:

- the thermostat controller forces the fan to low speed
- the chilled water valve opens to the specified maximum value set by **CoolMax**
- the thermostat controller stages Heating to maintain the room temperature at the Cooling setpoint, as sensed by the thermostat controller

If the room temperature falls below the current Heating setpoint, the thermostat controller disables dehumidification operation.

If the thermostat controller is in Cooling demand:

- the chilled water valve opens to 100%
- the thermostat controller stages Heating to maintain the room temperature at the Cooling setpoint, as sensed by the thermostat controller

If the thermostat controller is in Cooling demand and the room temperature rises 2F°/1C° above the Cooling setpoint, the thermostat controller automatically disables dehumidification operation. Likewise, if the thermostat controller is in Cooling demand and the room temperature falls below the current Heating setpoint, the thermostat controller disables dehumidification operation.

Table 6: Installer Configuration Menu (Part 1 of 8)

Parameter Appearing on Display	Description and Default	Selection Options
Pswrd	Sets the protective access password to prevent unauthorized access to the Installer Configuration Menu. Default: **0** **Note:** The default setting does not lock out access to the Installer Configuration Menu.	Range: **0** to **1,000**
Com addr	Wireless address at the thermostat controller; Default: **254**	Range: **000** to **254** Addresses of each item on the wireless bus must be uniquely numbered, increasing from 1. **Note:** Setting this parameter to 0 disables the function.
PAN ID	Sets the Personal Area Network Identification (PAN ID) of the wireless network. All devices on a network must have the same PAN ID setting to communicate with each other. Default: **0**	Range: **0** to **500** **Note:** Setting this parameter to 0 disables the function.

Table 6: Installer Configuration Menu (Part 2 of 8)

Parameter Appearing on Display	Description and Default	Selection Options
Channel	Sets the mesh network channel the device uses for communication. Only devices using the same mesh network channel can communicate with each other. Default: **10**	Range: **11** to **26** **Note:** Setting this parameter to 10 disables the function.
GET FROM	Parameter not available at this time.	N/A
BI1	Configuration of Binary Input 1. Default: **None**	**(None):** No function is associated with an input. **(Rem NSB):** Remote Night Setback (NSB) via a time clock input, an occupancy sensor, or from a voltage-free contact. Contact open = Occupied; contact closed = Unoccupied. **(MotionNO*):** Temporary occupancy request via a motion detector input. Contact open = Unoccupied. When the contact closes, the thermostat controller goes into the occupied mode for a specified TOccTime. Once the TOccTime begins, the thermostat controller remains in the occupied mode if the contact is open, until the TOccTime expires. **(MotionNC*):** Temporary occupancy request via a motion detector input. Contact closed = Unoccupied. When the contact opens, the thermostat controller goes into the occupied mode for a specified TOccTime. Once the TOccTime begins, the thermostat controller remains in the occupied mode if the contact is closed, until the TOccTime expires. **(Window):** Cancels the heating or cooling action when a window is open. The fan operation is only affected if the Fan Menu parameter is set to (4): On-Auto and Auto is the selected fan mode. A window alarm appears, indicating that the window needs to be closed to resume heating or cooling. *These settings disable any local override function.
BI2	Configuration of Binary Input 2. Default: **None**	**(None):** No function is associated with an input. **(Door Dry):** Door contact only has an effect if BI1 is set to **MotionNO** or **MotionNC.** (See the **BI1** parameter earlier in this table.) The occupancy is now dictated via BI1 and BI2. Any motion detected sets the zone to Occupied status. The zone remains permanently in occupied mode until the door contact switch opens momentarily. The thermostat then enters stand-by mode. If more movements are detected, the occupied mode resumes. While the door is opened, any movements detected by the remote PIR sensor or the PIR accessory cover are ignored. Use a Normally Closed contact switching device. Contact opened = Door opened, Contact closed = Door closed. **(RemOVR):** Temporary occupancy request via a remote input. This override function is controlled by a manual remote occupancy override. When enabled, this condition disables the override capability of the thermostat controller. **(Filter):** A Filter alarm is displayed. This alarm can be connected to a differential pressure switch that monitors a filter. **(Service):** A Service alarm is displayed on the thermostat controller when the input is energized. This input can be tied into the air conditioning unit control card, which provides an alarm should there be a malfunction.

Table 6: Installer Configuration Menu (Part 3 of 8)

Parameter Appearing on Display	Description and Default	Selection Options
UI3	Configuration of Universal Input 3. Default: **None**	**(None):** No function is associated with an input. **(COC/NH):** Changeover Contact/Normally Heat: A dry contact input is used to signal seasonal hot/cold water changeover. The contact closes when cold water is present. Valid only for two-pipe systems. **(COC/NC):** Changeover Contact/Normally Cool: A dry contact input is used to signal seasonal hot/cold water changeover. The contact closes when hot water is present. Valid only for two-pipe systems. **(COS):** Changeover Analog Sensor: Used for hot/cold water changeover switching. Valid only for two-pipe systems. **Note:** Choose the selection option **(0): Cooling Only** for the **SeqOpera** parameter to allow changeover to occur between **Cooling Only** and **Heating Only**. The changeover sensor does not operate in **Cooling and Reheat, Heating and Reheat**, or **Cool/Heat Four-Pipe and Reheat** applications. **(SS):** Supply Air Sensor Monitoring **Note:** If **UI3** is set to **None**, **COC/NH**, or **COC/NC**, then **UI3 Status** is available as a point for integration and **Supply Temperature** is not available as a point for integration. If **UI3** is set to **COS** or **SS**, then **Supply Temperature** is available as a point for integration and **UI3 Status** is not available as a point for integration.
MenuScro	Gives the option of having the display continuously scroll the parameters. Default: **on**	**(off):** The scroll is inactive. **(on):** The scroll is active.
AutoMode	Enables the Auto function (if Option 2 is chosen in the **SeqOpera** parameter) to be visible within the **MODE** key menu. (The **MODE** key is the key at the far left of the thermostat controller cover.) Default: **on**	**(on):** The Auto function is active (Off-Auto-Heat-Cool). Provides automatic changeover between heating and cooling. **(off):** The auto function is inactive (Off-Heat-Cool).
C or F	Provides temperature scale options for display. Default: **°F**	**(°C):** Celsius scale **(°F):** Fahrenheit scale
%RH disp	Displays the current humidity reading (TEC2036-2, TEC2036H-2, TEC2056-2, and TEC2056H-2 models). Default: **off**	**(on):** Displays the current humidity reading in% RH. **(off):** Does not display the current humidity reading.
Lockout	Selectable Lockout Levels for limiting end user keypad interaction. Default: **0**	(see table below)

Lockout Level	Function			
	Mode Setting	Fan Setting	Local Override	Occupied Temperature Setpoints
(0)	Access	Access	Access	Access
(1)	Access	Access	No Access	Access
(2)	No Access	No Access	Access	Access
(3)	No Access	No Access	No Access	Access
(4)	No Access	No Access	Access	No Access
(5)	No Access	No Access	No Access	No Access

Table 6: Installer Configuration Menu (Part 4 of 8)

Parameter Appearing on Display	Description and Default	Selection Options
Pipe No	Selectable number of pipes in the system. Default: **4.0 Pipes**	**(2.0 Pipes):** Limits the number of sequences of operation available from 0 to 3, and enables heat/cool operation from the same output. **(4.0 Pipes):** Allows access to all sequences of operation from 0 to 5, and enables heat/cool operation from different outputs.
CntrlTyp	Defines the control output for the type of valves used in the installation (TEC2026-2, TEC2026H-2, TEC2036-2, and TEC2036H-2 models). Default: **Floating**	**(On/Off):** For Normally Open (N.O.) or Normally Closed (N.C.) 24 VAC two-position valves. **(Floating):** For proportional three-wire control of 24 VAC floating valves.
SeqOpera	Determines the sequence of operation. Default: **1**	**(0):** Cooling Only (Off-Cool). The default is **Cool**. **(1):** Heating Only (Off-Heat). The default is **Heat**. **(2):** Cooling and Reheat (Off-Auto*-Heat-Cool). The default is **Auto**. **(3):** Heating and Reheat (Off-Heat). The default is **Heat**. **(4):** Cool/Heat Four-Pipe (Off-Auto*-Heat-Cool). The default is **Auto**. **(5):** Cool/Heat Four-Pipe and Reheat (Off-Auto*-Heat-Cool). The default is **Heat**. * Auto can be disabled with the **AutoMode** parameter. When Auto is disabled, the default for **(2)** and **(4)** is **Heat**. **Note:** Choose the selection option **(0): Cooling Only** when using a changeover sensor to allow changeover to occur between **Cooling Only** and **Heating Only**. Choose the selection option **(2): Cooling and Reheat** when using a changeover sensor to allow changeover to occur between **Cooling and Reheat** and **Heating and Reheat**.
Fan Menu	Sets the Fan Mode options. Default: **4**	**(0):** Low-Med-High: Three-speed configuration using three fan relays (L-M-H). The default is **High**. **(1):** Low-High: Two-speed configuration using two fan relays (L-H). The default is **High**. **(2):** Low-Med-High-Auto: Three-speed configuration with Auto Fan speed mode using three fan relays (L-M-H). The default is **High**. **(3):** Low-High-Auto: Two-speed configuration with Auto Fan speed mode using two fan relays (L-H). The default is **High**. **(4):** On-Auto: One-speed configuration, (H) Auto is for Fan on demand and On is for Fan on all the time. The default is **Auto**.
DHumiLCK	Locks out the dehumidification capability (TEC2036[H]-2, and TEC2056[H]-2 models). Default: **on**	**(off):** Dehumidification is locked out. **(on):** Dehumidification is allowed.
%RH set[1]	Sets the dehumidification setpoints (TEC2036[H]-2, and TEC2056[H]-2 models). This parameter can be used only if the dehumidification sequence is enabled. Default: **50.0% RH**	Range: **30.0** to **95.0% RH**
DehuHyst[1]	Sets the dehumidification hysteresis (deadband) (TEC2036[H]-2, and TEC2056[H]-2 models). This parameter can be used only if the dehumidification sequence is enabled. Default: **5.0% RH**	Range: **2.0** to **20.0% RH**

Table 6:   Installer Configuration Menu (Part 5 of 8)

Parameter Appearing on Display	Description and Default	Selection Options	
DehuCool[1]	Sets the maximum dehumidification cooling output (TEC2036[H]-2, and TEC2056[H]-2 models). This parameter can be used only if the dehumidification sequence is enabled. Default: **100%**	Range: **20.0** to **100.0%** **Note:** This parameter can be used to balance smaller reheat loads installed with regard to the capacity of the cooling coil.	
St-By TM	Sets stand-by timer value when used with occupancy sensor; time delay between moment where occupancy sensor detected the last movement in the area and the time which the thermostat stand-by mode and setpoints become active. Default: **0.5 hours**	Range: **0.5** to **24.0 hours**, in 0.5 hour increments	
Unocc TM	Sets Unoccupied Timer Value when used with occupancy sensor; time delay between the moment where the thermostat toggles to stand-by mode and the time which the thermostat unoccupied mode and setpoints become active. Default: **0.0** hours	**0.0 hours** or Factory Value: Setting this parameter to its default 0 value disables the occupied timer and prevents the thermostat from drifting from stand-by mode to unoccupied mode when occupancy sensor functions are used. Range: **0.0** to **24.0 hours** in 0.5 hour increments.	
St-By HT	Sets Stand-by heating setpoint when used with occupancy sensor; value is between occupied and unoccupied heating setpoints. Default: **69.0°F/20.6°C**	Range: **40.0°F/4.5°C** to **90.0°F/32.0°C**	**Note:** When adjusting the temperature, press the **UP/DOWN** arrow keys to change the temperature in 0.5F°/0.5C° increments; press and hold the **UP/DOWN** arrow keys to change the temperature in 5.0F°/5.0C° increments.
St-By CL	Sets Stand-by cooling setpoint limit when used with occupancy sensor; value is between occupied and unoccupied cooling setpoints. Default: **78.0°F/25.6°C**	Range: **54.0°F/12.0°C** to **100.0°F/37.5°C**	
Unocc HT	Sets the Unoccupied Heating setpoint value. Default: **62.0°F/16.5°C**	Range: **40.0°F/4.5°C** to **90.0°F/32.0°C**	
Unocc CL	Sets the Unoccupied Cooling setpoint value. Default: **80.0°F/26.5°C**	Range: **54.0°F/12.0°C** to **100.0°F/37.5°C**	
Heat max	Sets the Occupied and Unoccupied maximum Heating setpoint values. Default: **90.0°F/32.0°C**	Range: **40.0°F/4.5°C** to **90.0°F/32.0°C**	
Cool min	Sets the Occupied and Unoccupied minimum Cooling setpoint values. Default: **54.0°F/12.0°C**	Range: **54.0°F/12.0°C** to **100.0°F/37.5°C**	

Table 6: Installer Configuration Menu (Part 6 of 8)

Parameter Appearing on Display	Description and Default	Selection Options	
Pband	Proportional Band used by the PI temperature control loop of the thermostat. Pband is not converted with C or F scale and is always shown with a range of 3 to 10. Default: **3** (**3F°/1.7C°**)	**Value**	**F Scale Pband/C Scale Pband**
		3	3.0F°/1.7C°
		4	4.0F°/2.2C°
		5	5.0F°/2.8C°
		6	6.0F°/3.3C°
		7	7.0F°/3.9C°
		8	8.0F°/4.4C°
		9	9.0F°/5.0C°
		10	10.0F°/5.6C°
		Note: The use of a larger proportional band is not to use the thermostat as a discharge air controller device. The use of a larger proportional band can be used to solve issues for flawed HVAC design with basic sizing and thermostat location errors that cannot be worked around.	
Set type	Provides the option of temporarily changing the heating or cooling setpoint by pressing the **UP/DOWN** arrow keys. Default: **permnent**	**(temporar):** Local changes to the heating or cooling setpoints are temporary, and remain effective for the specified TOccTime. **(permnent):** Local changes to the heating or cooling setpoints are permanently stored in the thermostat controller memory.	
Spt Func	Determines the operation and usage of the local setpoint interface by the user. Default: **Dual Stp**	**(Attch Stp):** Single Occupied Setpoint Adjustment. The displayed setpoint is the setpoint from the last action taken by the thermostat controller, or the setpoint currently in use. Both the heating and cooling setpoints are changed simultaneously, while respecting the minimum configured deadband. If one setpoint is desired over the other, use the **MODE** key to toggle between the two setpoints. **(Dual Stp):** Dual Occupied Setpoint Adjustment. The displayed setpoint is the setpoint from the last action taken by the thermostat controller, or the setpoint currently in use. The heating and cooling setpoints can be separated individually, allowing the minimum configured deadband to expand. If one setpoint is desired over the other, use the **MODE** key to toggle between the two setpoints.	
TOccTime	Sets the duration of the Temporary Occupancy Time (when the thermostat controller is in the Unoccupied mode) when a Schedule Override Function is enabled using either the Main User Menu or BI1 or BI2 configured as a temporary override remote contact (RemOVR). Sets the effective duration of the Temporary heating or cooling setpoints set using the **UP/DOWN** arrow keys. Default: **2.0 hrs**	Range: **0.0** to **24.0 hrs** adjustable in 1-hour increments	
Deadband	Sets the minimum deadband between the heating and cooling setpoints. Default: **2.0F°/1.0C°**	Range: **2.0F°/1.0C°** to **5.0F°/2.5C°** (adjustable in 1.0F°/0.5C° increments)	

Table 6: Installer Configuration Menu (Part 7 of 8)

Parameter Appearing on Display	Description and Default	Selection Options			
Cal RS	Sets the desired room air sensor calibration (offset). The offset can be added to or subtracted from the actual displayed room temperature. Default: **0.0F°/0.0C°**	Range: **-5.0F°/-2.5C°** to **5.0F°/2.5C°** (adjustable in 1.0F°/0.5C° increments)			
Cal RH	Sets the desired humidity sensor calibration (offset). The offset can be added to or subtracted from the actual displayed room humidity (TEC2036-4, TEC2036H-4, TEC2036H-4+PIR, TEC2056-4, TEC2056H-4, and TEC2056H-4+PIR models). This parameter can be used only if the dehumidification sequence is enabled. Default: **0.0% RH**	Range: **-15.0% RH** to **15.0% RH** (adjustable in 1% RH increments)			
Aux cont	Determines the auxiliary contact function and configuration. Default: **0**	**(0)**	Not used, or used for reheat	If the sequence of operation is set to reheat (2, 3, or 5), ignore this parameter.	
		(1)	Auxiliary N.O.	**Occupied** = contact closed **Unoccupied** = contact open	The output aligns with occupancy.
		(2)	Auxiliary N.C.	**Occupied** = contact open **Unoccupied** = contact closed	
		(3*)	Do not use this selection option.		
		(4*)	Do not use this selection option.		
		(5)	Auxiliary On/Off control through the auxiliary network command. The output can be commanded through the network for any required auxiliary functions via a separate and dedicated network variable.		The output aligns with the secondary network occupancy command.
		* If option **(3)** or **(4)** is used, it functions like option **(1)** or **(2)**, respectively.			
Auto Fan	Affects the auto mode of operation for the following **Fan Menu** parameter selection options only: • **(2):** Low-Med-High-Auto • **(3):** Low-High-Auto Default: **AS**	**(AS AD):** The fan is on Auto during occupied periods. The Med and High speeds operate automatically on a temperature error from the setpoint. The Low speed operates Auto on demand. When there is no demand, the Low speed shuts down. The Low speed is only re-activated when there is a heating or cooling demand. **(AS):** The fan is always on during occupied periods. The fan is on Auto during unoccupied periods. The Low, Med, and High speeds operate automatically on a temperature error from the setpoint.			
FL time	Sets the maximum actuator stroke timing (floating **CntrlTyp** TEC2026-4, TEC2026H-4, TEC2026H-4+PIR, TEC2036-4, TEC2036H-4, and TEC2036H-4+PIR models). Default: **1.5 min**	Range: **0.5** to **9.0 min** (adjustable in 0.5 minute increments)			

Table 6: Installer Configuration Menu (Part 8 of 8)

Parameter Appearing on Display	Description and Default	Selection Options
Cph	Sets the maximum number of cycles per hour (TEC2016-4, TEC2016H-4, TEC2016H-4+PIR, and on/off **CntrlTyp** TEC2026-4, TEC2026H-4, TEC2026H-4+PIR, TEC2036-4, TEC2036H-4, and TEC2036H-4+PIR models). Default: **4**	Range: **3** to **8 cycles per hour**
RA/DA	Choice of reverse or direct acting analog output signal (TEC2046-4, TEC2046H-4, TEC2046H-4+PIR, TEC2056-4, TEC2056H-4, and TEC2056H-4+PIR models). Default: **DA**	**(RA):** Reverse acting, 0 to 100% = 10 to 0 VDC **(DA):** Direct acting, 0 to 100% = 0 to 10 VDC
Reheat	Sets the duty cycle time for reheat output (if Option 2, 3, or 5 is chosen in the **SeqOpera** parameter). Default: **0**	**(1):** 10 seconds (six cycles per minute), for various equipment with solid-state relays that withstand short duty cycles such as electric heat. **(0):** 15 minutes (four cycles per hour), for various equipment with mechanical relays or contactors controlling mechanical reheat systems.
UI3 dis	Displays the supply or changeover temperature when UI3 is configured as an analog input (supply sensor or changeover sensor). Default: **-40°F/-40°C**	Used as a diagnostic/service help to troubleshoot and diagnose sensor operation.

1. When adjusting the numeric value, press the **UP** or **DOWN** arrow key to change the value by single increments; press and hold the **UP** or **DOWN** arrow key to change the numeric value in increments of ten.

Troubleshooting

See Table 7 for display messaging. Refer to the *TEC20xx-4 and TEC20xx-4+PIR Series Wireless Thermostat Controller System Technical Bulletin (LIT-12011596)* for troubleshooting details.

Repair Information

If a TEC20x6(H)-4 or TEC20x6H-4+PIR Wireless Thermostat Controller fails to operate within its specifications, replace the unit. For a replacement thermostat controller, contact the nearest Johnson Controls® representative.

Accessories

All the accessories in Table 8 include mounting hardware; contact the nearest Johnson Controls representative to order any of these parts.

Review the technical specifications of the accessories prior to their use in an application.

Table 7: Display Messages

Display	Function
Service	Indicates that there is a service alarm in accordance with the programmable Binary Input (BI2).
Filter	Indicates that the filter(s) is dirty in accordance with the programmable Binary Input (BI2).
Window	Indicates that an outside window or door is open and has cancelled the thermostat controller heating or cooling action in accordance with the programmable Binary Input (BI1).

Table 8: Accessories (Order Separately)

Code Number	Description
SEN-600-1	Remote Indoor Air Temperature Sensor
SEN-600-4	Remote Indoor Air Temperature Sensor with Occupancy Override and LED
TE-6361M-1[1]	Duct Mount Air Temperature Sensor
TE-636S-1	Strap-Mount Temperature Sensor
TEC20-A-1	Replacement Antenna for TEC20 Coordinator
TEC20-RA-1[2]	Remote Antenna for TEC20 Coordinator
NPB-PWR[3]	DIN Rail Mount 24 VAC/DC Power Module for TEC20 Coordinator
TEC20-8X-1	120 VAC to 15 VDC Power Supply for TEC20 Coordinator
TEC20-9B-1	Replacement Battery Pack for TEC20 Coordinator
TEC-6-PIR[4]	Cover with Occupancy Sensor
TEC-6H-PIR[5]	Cover with Occupancy Sensor for Hospitality Models

1. Additional TE-636xx-x Series 10k ohm Johnson Controls Type II Thermistor Sensors are available; refer to the *TE-6300 Series Temperature Sensors Product Bulletin (LIT-216320)* for more details.
2. This antenna is used when the TEC Coordinator is installed inside a metal cabinet, or when a remote antenna is required by physical installation.
3. DIN Rail: Type NS35/7.5 (35 x 7.5 mm) and DIN rail end clips. Length of DIN rail depends on the number of DIN rail mounted options.
4. The TEC-6-PIR Accessory Cover can be used to replace the existing cover on a non-PIR TEC20x6-4 Series Thermostat Controller to provide occupancy sensing capability.
5. TEC-6H-PIR Accessory Cover can be used to replace the existing cover on a non-PIR TEC20x6H-4 Series Thermostat Controller to provide occupancy sensing capability.

Technical Specifications

TEC20x6(H)-4 and TEC20x6H-4+PIR Series Wireless Thermostat Controllers with Dehumidification Capability, Fan Control, and Occupancy Sensing Capability (Part 1 of 2)

Power Requirements	19 to 30 VAC, 50/60 Hz, 2 VA (Terminals 4 and 5) at 24 VAC Nominal, Class 2 or Safety Extra-Low Voltage (SELV)
Relay/Triac Contact Rating	**On/Off and Floating Control:** 19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush, Class 2 or SELV
Analog Output Rating	**Proportional Control:** 0 to 10 VDC into 2k ohm Resistance (Minimum)
Fan Relay Output Rating	19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush, Class 2 or SELV
Auxiliary Output Rating	**Triac Output:** 19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush
Binary Inputs	Voltage-Free Contacts across Terminal Scom to Terminals BI1, BI2, or UI3
Analog Inputs	Resistive Inputs (RS and UI3) for 10k ohm Johnson Controls Type II Negative Temperature Coefficient (NTC) Thermistor Sensors
Wire Size	18 AWG Maximum, 22 AWG Recommended
Recommended Transmission Range	**Through Walls:** 10 m (30 ft) **Line-of-Sight (Open Space):** 30 m (100 ft)
RF Band	Direct-Sequence Spread-Spectrum Transmission; 2.4 Ghz unlicensed band
Transmission Power	10 mW Maximum
Temperature Range	**Backlit Display:** -40.0°C/-40.0°F to 50.0°C/122.0°F in 0.5° increments **Heating Control:** 4.5°C/40.0°F to 32.0°C/90.0°F in 0.5° Increments **Cooling Control:** 12.0°C/54.0°F to 38.0°C/100.0°F in 0.5° Increments
Temperature Sensor Type	Local 10k ohm Negative Temperature Coefficient (NTC) Thermistor
Resolution	±0.1C°/±0.2F°

Control Accuracy	**Temperature:** ±0.5C°/±0.9F° at 21.0°C/70.0°F Typical Calibrated
	Humidity: ±5% RH from 20 to 80% RH at 10 to 32°C (50 to 90°F)
Minimum Deadband	1C° /2F° between Heating and Cooling
Ambient Conditions	**Operating:** 0 to 50°C (32 to 122°F); 95% RH Maximum, Noncondensing
	Storage: -30 to 50°C (-22 to 122°F); 95% RH Maximum, Noncondensing
Compliance (Pending)	**United States:** UL Listed, File E27734, CCN XAPX, Under UL 873, Temperature Indicating and Regulating Equipment FCC Compliant to Part 15.247 Regulations for Low Power Unlicensed Transmitters Transmitter FCC Identification: (pending)
	Canada: UL Listed, File E27734, CCN XAPX7, Under CAN/CSA C22.2 No. 24, Temperature Indicating and Regulating Equipment Industry Canada, ICES-003 Industry Canada (IC) Identification: (pending)
Dimensions (H x W x D)	125 x 86 x 29 mm (4-15/16 x 3-3/8 x 1-1/8 in.)
Shipping Weight	**TEC20x6(H)-4 Models:** 0.75 lb (0.34 kg) **TEC20x6H-4+PIR Models:** 0.77 lb (0.35 kg)

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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Capability, Fan Control, and Occupancy Sensing Capability

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