Honeywell

T6571
Modulating Digital Thermostats

XE111 SERIES

PRODUCT SPECIFICATION SHEET

APPLICATION

The T6571 Digital Thermostats are designed to provide Proportional-Integral (PI) modulating control in zoned commercial Heating, Ventilating, and Air Conditioning systems such as hydronic heating and/or cooling, pressure dependent VAV or by-pass box with or without terminal reheat.

The T6571 family provides modulating analog 4 to 20 mA or 2 to 10 Vdc control. Other available features include energy savings card key input, auto-detection of temperature sensor (remote sensor or internal sensor), and optional Celsius or Fahrenheit operation.

Heat/Cool[a] models are available with constant fan operation. Models are available with either a three-speed fan selector[b] switch with low, medium and high settings, or one-speed only. On models with system on/off switch, the fan can be powered off.

a: Heat/Cool models are available in 2005.

b: Three-speed fan switch models are available near end 2004.

FEATURES

- **Attractive modern styling with digital display makes this thermostat ideal for offices or hotels**
- **Digital display of room ambient temperature, with display of user selected setpoint on demand**
- **Push button adjustment of setpoint**
- **Switches allow manual control of system operation and fan speed**
- **Special energy savings mode – external input from window contact or hotel card-key overrides the temperature setting to installer defined heating and cooling temperatures**
- **Energy savings input can be configured normally open or normally closed**
- **Thermostat mounts directly onto a wall, a standard 65x65mm junction box (hole pitch 60mm) or a US 2x4inch horizontal junction box**
- **Installer setup mode allowing operating parameters to be changed**
- **°C or °F display selectable**
- **Ability to select energy savings setup cooling setpoint**
- **Ability to select energy savings setback heating temperature**
- **Ability to set maximum heating and minimum cooling setpoint limits**
- **EEPROM permanently retains user settings in the event of power loss**
- **Digital display shows unique icons when the thermostat is in cooling or heating mode, or when energy savings mode is active**
- **Capability to display temperature sensor failure for easier trouble-shooting**
- **Capability to auto-detect type of temperature sensor connected (internal or remote sensor) and base default sensor selection on installer defined parameters**
- **Operating voltage, 18 to 30 Vac, 50/60 Hz power input Fan speed control, 115/230 Vac, 50/60 Hz**
- **Provides modulating analog output of 4 to 20 mA or 2 to 10 Vdc, selectable using 2-way DIP switch.**
- **T6571 models are used with Series 70 direct-coupled damper actuators such as ML7161 or ML7984, or with valve actuators such as ML7420, ML7421, VC7930 or M7410.**

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SPECIFICATIONS

IMPORTANT

The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not exactly match the listed specifications. This product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.

Models : See Table 1

Setpoint range : 10 °C to 30°C

Input Voltage : 18 to 30 Vac, 50/60 Hz (Digital Thermostat)

: 115/230 Vac, 50/60 Hz (Fan)

Output Voltage : Modulating 4 to 20 mA, or 2 to 10 Vdc analog output.

Option of 4 to 20 mA or 2 to 10 Vdc output can be selected using 2-way DIP switch. Default setting: 4 to 20 mA.

Control Performance : P+I modulating algorithm applied to modulating control gives typical control to ±0.75°C at 22°C at 50% duty cycle

Operational life : Greater than 10,000 operations for all manually operated switches

Mounting : Mounts directly onto wall or wall-box - a standard 65x65mm junction box (hole pitch 60mm) or a US 2x4inch horizontal junction box. Mounting screws supplied

Wiring : 11 screw-in terminals per unit, capable of accepting 2 wires up to 1.5 mm^2 , 2 x 18AWG or 1 x 14AWG

Energy Savings Input : Dry contact rating 24Vdc, maximum contact resistance of 1000ohms

Enclosure : Plastic 3-piece housing (front cover, base, and wall-plate)

Dimensions : 94 x 122 x 37 mm (w x h x d)

Environmental requirements : Operating temperature range 5 to 45°C
Shipping and storage temperature range -20 to 55°C
Humidity range 5 to 95% rh, non-condensing at 26 °C

Table 1. Model Specifications

	Model	Application	Fan Operation	Switches			Features		
				On / Off (SPST)	3-Speed Fan (SP3T)	Heat / Cool low volt (SPDT)	4 – 20 mA (2 – 10 Vdc) modulating analog output	Energy Savings Input	Sensor Auto-Detect
XE111 Series	T6571A1009	Cool	Constant	✓			✓	✓	✓
	T6571B1007[a]	Cool	Constant	✓	✓		✓	✓	✓
	T6571C1005[b]	Heat / Cool	Constant	✓	✓	✓	✓	✓	✓

a: T6571B1007(3-speed fan switch model) will be available near end 2004.
b: T6571C1005 (Heat/Cool model) will be available in 2005.
1. All T6571 models provide 4 – 20 mA or 2 – 10 Vdc (with maximum external resistor of 500 ohms) modulating analog output.

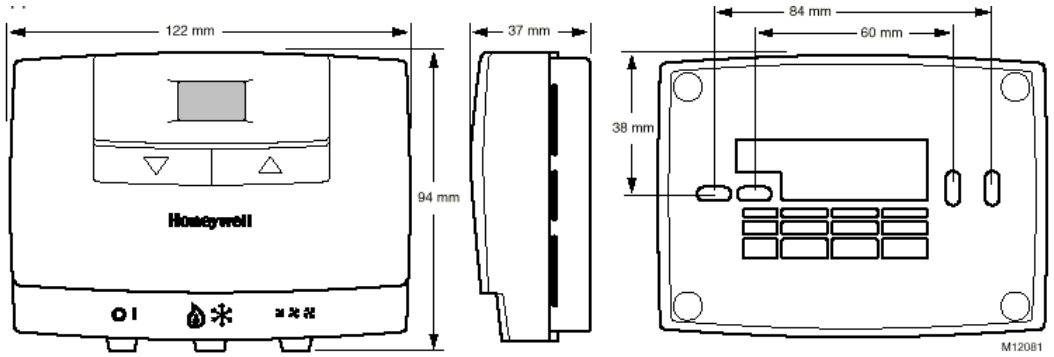
2. Remote sensor , T8109B1004 for all T6571 models to be purchased separately as accessory.

ORDERING INFORMATION

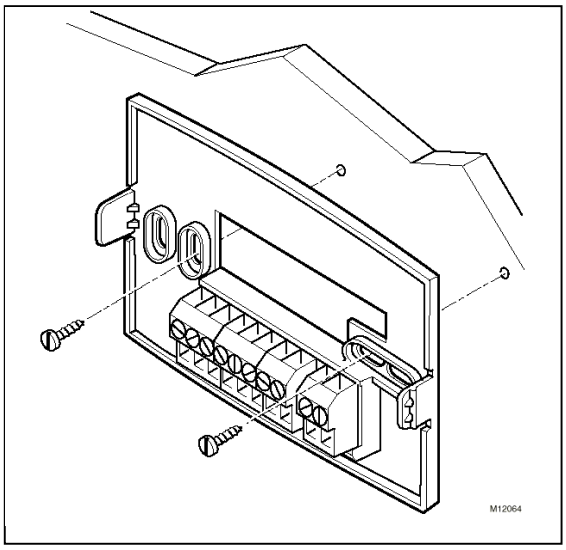
When purchasing replacement and modernization products from your wholesaler or distributor, refer to the price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone your local Honeywell Environmental Controls Sales Office.

DIMENSIONS



INSTALLATION



Location

The XE111 Series thermostat is the temperature control element in the fan-coil or air-conditioning system, and must be located about 1.5m above the floor in a position with good air circulation at room temperature. Do not mount it where it could be affected by :-

- draughts or dead spots behind doors or in corners
- hot or cold air from ducts
- radiant heat from the sun or appliances
- unheated (uncooled) areas such as an outside wall behind the thermostat
- concealed pipes or chimneys

Mounting the thermostat

Any XE111 Series thermostat can be directly mounted on the wall or horizontally on either a 65x65mm standard junction box or a 2x4inch US junction box (see diagram). Mounting screws are supplied for both alternatives.

IMPORTANT

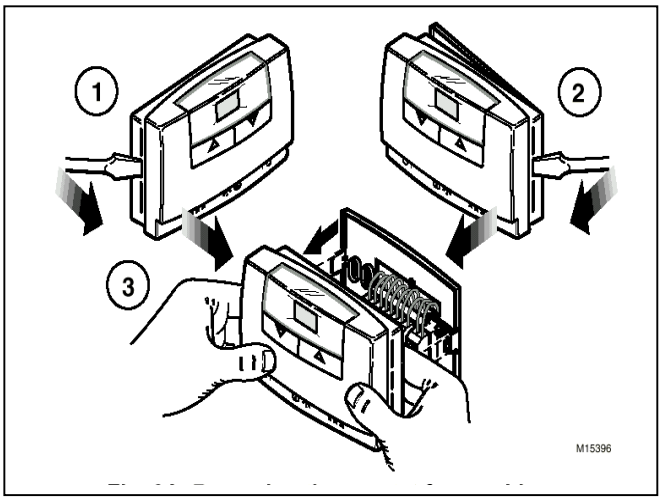
The installer must be a trained service engineer
Disconnect the power supply before beginning installation

2. Locate the wall-plate in the mounting position, insert the mounting screws through the appropriate holes, and screw into position.
3. Complete the wiring (see later).
4. Attach the thermostat to the wall-plate as follows :
5. Locate the 2 centre side holes on the back of the thermostat
6. Align the holes with the 2 side tabs on the wall-plate
7. Press down firmly and snap the thermostat into place

Removing the thermostat

If it becomes necessary to remove the thermostat from the wall-plate :

1. Pry the left side of the thermostat away from the base (see diagram below).
2. Pry the right side of the thermostat away from the wall-plate.
3. Use both hands to pull the thermostat straight away from the wall-plate.
4. NOTE - Improper removal of the thermostat from the wall-plate may damage the device.

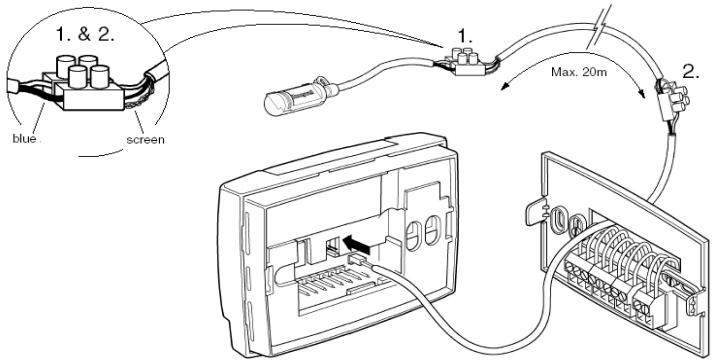


Connecting the remote sensor

To connect the remote sensor, follow the instructions as illustrated in the figure below.

NOTE:

To extend the sensor cable, up to a maximum of 20m, use only screened cable. The sensor connections are polarity sensitive, so be sure to connect the screen wire to the sensor blue wire, as shown in the figure below.



WIRING

IMPORTANT

Use a 1.5mm gauge maximum wire for wiring the T6571 Thermostats.

⚠ CAUTION

Electrical Shock Hazard.
Can electrical shock or equipment damage.
Disconnect power supply before beginning wiring.

The standard wiring access is via a hole in the centre of the thermostat wall-plate. There is also a single breakout on top of the thermostat for surface wiring from above.

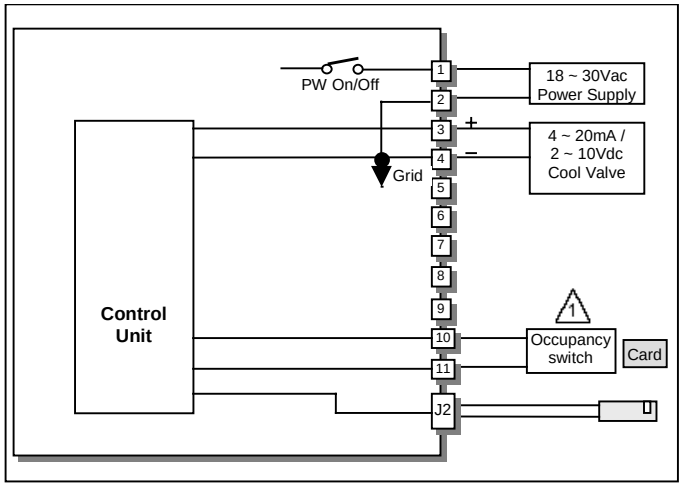
Wire the thermostat as follows:

1. Wire the subbase through the center entrance hole.

   NOTE: Wiring terminals are straight-in screw type and are designed to accept two 1.5 mm wires per terminal.

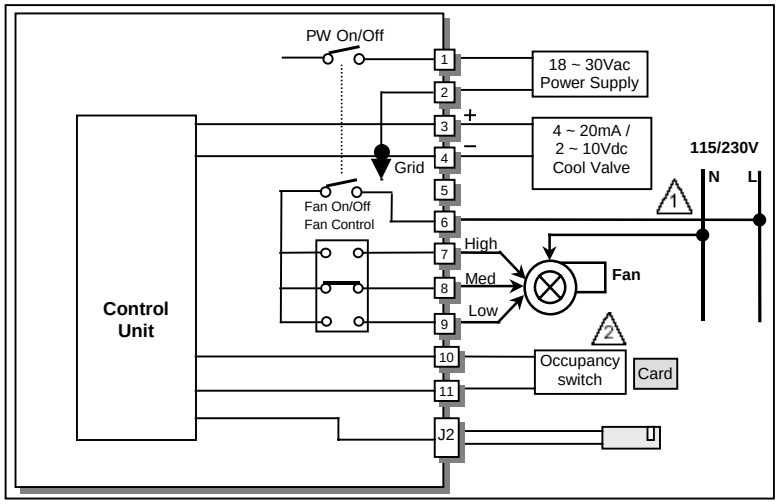
2. When wiring is complete, attach the thermostat to the subbase:
   - **a.** Locate the two center side holes on the back of the thermostat.
   - **b.** Align the holes with the two side tabs on the subbase.
   - **c.** Press down firmly and snap the thermostat into place.

Refer to Fig. 1 through 3 for typical wiring diagrams.



1 CONTACT CLOSURE AT TERMINALS 10,11 RETURNS THERMOSTAT TO ENERGY SAVINGS SETTING.

Fig. 1. T6571A1009 wiring diagram with cooling operation

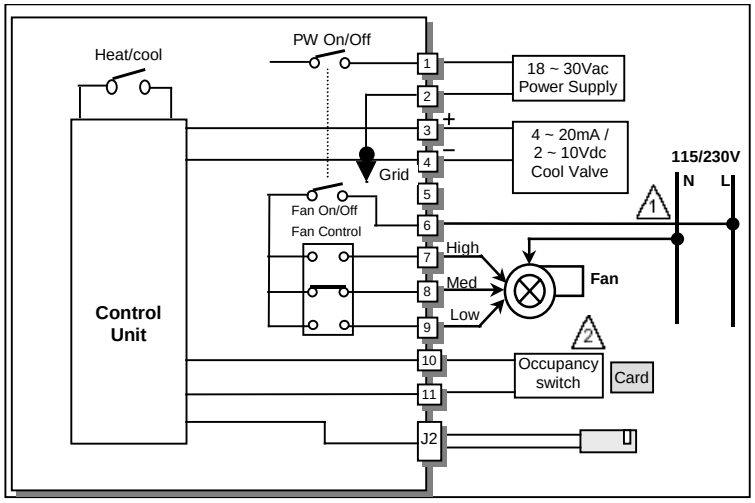


1 PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 CONTACT CLOSURE AT TERMINALS 10,11 RETURNS THERMOSTAT TO ENERGY SAVINGS SETTING.

Fig. 2. T6571B1007 wiring diagram with cooling operation and 3-speed fan

Note: This model is available near end of 2004.



1 PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

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Fig. 3. T6571C1005 wiring diagram with heat/cool operation and 3-speed fan

Note: This model is available in 2005.

⚠ ***NOTE***

Wrong wiring will damage the thermostat!

When the 24Vac power supply is shared with external 4~20mA device, make sure the power supply is not short-circuited to COMMON GROUND in the thermostat.

Operation

Control

Proportional + Integral Control

On the T6571 thermostats, the main output of the thermostat is modulating PI analog (4 to 20 mA or 2 to 10 Vdc). This signal uses a variable mA signal for the control of analog damper actuator and analog valve actuator.

The T6571 thermostats maintain the space temperatures within 0.75°C of the setpoint. This control performance accuracy provides improved occupant comfort and energy savings.

Switches

Fan Switch

/ / (Low/Medium/High):

Fan speed switch on three-speed models allows selection of three different settings. One-speed fan models with a system on/off switch can be switched off.

System Switch

O / I (Off/On):

Fan-Coil equipment is powered off or on. When in the O position, power supply is cut-off from the temperature controller and the connected valve will be closed.

Heat/Cool Switch

/ (Heat/Cool):

Thermostat switches between heat setpoint and cool setpoint. Fan-coil equipment provides heating and cooling.

DIP Switch

On/Off:

A two-way DIP switch allows selection of modulating analog output between 4 to 20 mA and 20 to 10 Vdc.

The various output options possible are illustrated in the table below.

SW6-1	SW6-2	Thermostat Output
OFF	OFF	No Output / Open
ON	OFF	2 ~ 10 Vdc
OFF	ON	4 ~ 20 mA
ON	ON	Not Allowed

Operating Modes

T6571 has 2 main operating modes, *Comfort Mode* and *Energy Savings Mode*, and also has an *OFF Mode* selected by the on/off switch.

Comfort Mode

This is the normal operating mode where the T6571 controls to the setpoint selected by the user.

On initial switch on, or after the On / Off switch has been activated the user setpoint will return to the default value. The control action will be determined by either the default settings or the installer set parameters if the defaults have been altered.

Energy Savings Mode

Energy savings mode is activated by a special input from a card Key, occupancy switch or window contact switch. If the signal via input terminals 10 and 11 is calling for energy savings mode, then the XE111 will control to user/installer defined setback setpoints for increased energy savings. The display will show a **$** symbol to indicate when this mode is active.

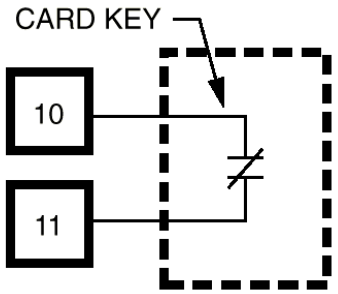
For example, if the user setpoint is 21°C and the Energy Savings Mode setpoint for cooling (*unoccupied cooling setpoint*) has been set to 28°C, then XE111 will control to 28°C when the input signal activates the economy mode.

The energy savings mode input can be configured within the *installer setup mode* to be activated either a short circuit (default) or open circuit signal.

The default *Energy Savings Mode* setpoints are shown in the table below.

Energy Savings Mode - Setpoints				
	Heating Setpoint		*Cooling Setpoint*	
Description	*Default*	*Range*	*Default*	*Range*
°C Scale	18°C	10-18°C	25°C	25-30°C
°F Scale	65°F	50-65°F	77°F	77-90°F

The wiring connections are shown below for the example of a card key input.



Off Mode

If the system switch is set to the Off position, power will be removed from the T6571 electronics and output terminals, and the display will go blank. The thermostat will reboot when power is restored with the On/off switch.

Please note – this ON/OFF switch is a functional switch and should not be used as an isolating switch.

Startup

On first powering up, or after the ON/OFF switch has been set to *ON*, the T6571 undergoes a startup and self-checking sequence. Firstly all the segments on the LCD display are illuminated to check the display. Next a number appears to indicate the software version. The final check is a check of the sensor. The symbol OS will appear to indicate the on-board sensor is connected. When the thermostat is set to auto-detect the sensor, Sr indicates the remote sensor is connected. If the thermostat is set to remote sensor mode, rS indicates the remote sensor is selected. On completion of the startup sequence, after approximately 5 seconds, T6571 will resume normal control in either *Comfort* or *Economy* Mode.

On initial power on, the temperature setpoint defaults are as shown in the following table. The current setpoint is stored in EEPROM, and if the T6571 is switched off, then on again, it will resume control at the last known setpoint.

Power Up Default Setpoints				
	Comfort Setpoint		Energy Savings Setpoint	
	°C Scale	°F Scale	°C Scale	°F Scale
Heating	20	68	18	65
Cooling	22	73	25	77

Additional Switches

Fan Speed Switch (SP3T line voltage)
Where supplied, the fan switch allows the selection of 3 different settings - low, medium, or high.

System Heat/Cool Switch (SPST low voltage)
Where supplied, this switch signals the microprocessor to operate in either heating or cooling mode. In heating mode the cooling function is disabled, and in cooling mode the heating function is disabled.

User Programming Modes

Temperature (Comfort) Setpoint

The temperature setpoint can be adjusted between 10°C and 30°C in steps of 0.5°C by using the ▼ and ▲ keys. If °F operation is set within the *installer setup mode* (see later) the range will be 50°F to 90°F, adjustable in 1°F steps.

Display

The measured room temperature is normally displayed (unless configured otherwise in the *installer setup mode*) and the first press of the ▲ or ▼ keys will switch to displaying the user setpoint. If no key is pressed for 5 seconds, the display will return to showing the room temperature.

When the thermostat is in cooling mode, this will be indicated by a ✳ symbol, whereas in the heating mode, the thermostat will display a ♦ symbol.

INSTALLER SETUP MODE

The T6571 thermostats allow many of its operating parameters to be adjusted via an *Installer Setup Mode*. For ease of programming, each operating parameter has a 2 letter identifier code, which is shown on the display during the *Installer Setup Mode* programming sequence. A description of these is shown in the table below.

Settable Parameters

Parameter	*ID*	*Description*
Temperature Scale	**tS**	Allows selection of either °C or °F scale.
Unoccupied Cooling Setpoint	**uC**	Allows unoccupied cooling setpoint to be programmed, for energy savings.
Unoccupied Heating Setpoint	**uH**	Allows unoccupied heating setpoint to be programmed, for energy savings
Minimum Cooling Setpoint	**CL**	Sets the minimum allowable cooling setpoint.
Maximum Heating Setpoint	**HL**	Sets the maximum allowable heating setpoint.
Configuration of Energy Savings Input	**ES**	Allows the energy savings mode to be activated by a choice of either contact closure or contact opening
Display of Room Temperature	**rt**	Allows the installer to restrict the displayed temperature to setpoint only. If this parameter is selected the unit will always display the setpoint temperature.
Select Temperature Sensor	**SS**	Allows selection of temperature sensor to either internal, external or auto-detect. The default is auto-detect.

Programming the Parameters

The installer setup mode is accessed by reducing the setpoint to 10°C (50°F), waiting until the room temperature is displayed, and then pressing the ▼ and ▲ keys simultaneously for 3 seconds. *If the installer set-up has previously been entered and the Minimum Cooling Setpoint increased above 10°C, the installer set-up mode can be accessed by reducing the setpoint to the new value before pressing the two buttons.*

The first parameter identifier will be displayed at this point and the parameter value can be changed by pressing the ▲ key. The first press displays the default value and any subsequent press alters the value. The values will wrap around. To select the parameter value and move to the next parameter the ▼ is pressed. After the final parameter is selected a further press of the ▼ key exits from programming mode.

The programming mode can be re-entered by pressing the ▲ and▼ keys together. If no key is pressed for 15 minutes installer set-up mode will be exited.

Parameter Values

Each parameter has a ***default*** value that is used when the T6571 is first powered up. This value can be changed from within the Installer Setup Mode, and once changed it will be stored in EEPROM so it is not lost in the event of power failure.s

If the user wishes to restore the parameters to the default values, this can be done by changing the temperature scale **tS** from °C to °F and back again.

Choice of Parameters

Description	***Default***		***Range***	
Temperature Scale	°C		°C / °F	
	°C Scale		**°F Scale**	
Description	***Default***	***Range***	***Default***	***Range***
Unoccupied Cooling Setpoint	25	25...30	77	77...90
Unoccupied Heating Setpoint	18	10...18	65	50...65
Minimum Cooling Setpoint	10	10 - 30	50	50 - 90
Maximum Heating Setpoint	30	10 - 30	90	50 - 90
Configuration of Energy Savings Input	s/c (1) contact	s/c(1) or o/c (0) contact	s/c (1) contact	s/c (1) or o/c (0) contact
Display of Room Temperature	Display room temp.(1)	Display room temp. (1) or display setpoint only (0)	Display room temp.(1)	Display room temp. (1) or display setpoint only (0)
Select Temperature Sensor	Auto-Detect (0)	Auto-Detect (0), Internal Sensor (1) or External Sensor (2)	Auto-Detect (0)	Auto-Detect (0), Internal Sensor (1) or External Sensor (2)

Programming Example

To enter the installer setup mode:

1. Press ▼ to change the temperature setpoint to 10°C (50°F)
2. Wait until the room temperature is displayed.
3. Press and hold ▼ ▲ together until **tS** is displayed.
4. Press ▲ once to show the default Temperature Scale value.
5. Continue to press ▲ to show all possible values of this parameter in sequence.
6. When the desired value is displayed, it is selected by pressing ▼ once. This will also move to the next parameter, whose identifier will now be displayed.
7. Continue to use ▼ to move from one parameter to the next, and ▲ to alter the parameter value.
8. When the last parameter **SS** has been selected, a final press of ▼ will return the display to the normal operating mode.

CHECKOUT

Cooling

CAUTION

Equipment Damage Hazard.
Improper operation can cause compressor damage.

Do not operate cooling if outdoor temperature is below 50°F (10°C). Refer to manufacturer recommendations.

To avoid compressor damage, allow the compressor to remain off for five minutes before restarting.

On models with cool-only, or heat ( ) and cool ( ):

1. If the device has a system switch, slide it to I (on).
2. If the device has a heat/cool switch, slide it to ✻ (cool).
3. Press the ▼ key to lower the temperature setting several degrees below the room temperature. After approximately ten seconds, the cooling equipment will start.
4. Press the ▲ key to raise the temperature setting above the room temperature. The cooling equipment should shut down.

Heating

On models with heat ( ) and cool ( ):

1. If the device has a system switch, slide it to I (on).
2. Slide the heat/cool switch to (heat).
3. Press and hold the ▲ key to raise the temperature setting several degrees above the room temperature. After approximately ten seconds, the heating equipment should start.
4. Press the ▼ key to lower the temperature setting above the room temperature. The heating equipment should shut down.

Make certain all equipment responds to the thermostat.

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