Wave Touchscreen

Programmable Thermostat

Contents

APPLICATION

The Wave touchscreen programmable thermostat delivers universal system compatibility, precise comfort control and easy 7-day programming. The Wave provides temperature control for gas, oil, electric, and heat pumps for up to 3 heat/2 cool systems.

FEATURES

- Large, clear display with backlight allows for easy reading, even in the dark
- Temperature and set temperature are displayed
- Intuitive touchscreen interface makes setup effortless
- Sophisticated appearance with an ergonomic design
- Capacitance touchscreen interaction
- Compressor protection

SPECIFICATIONS

Temperature Setting Range

Heating: 41°F to 120°F (5°C to 49°C)

Cooling: 43°F to 122°F (6°C to 50°C)

Operating Ambient Temperature

32°F to 122°F (0°C to 50°C)

Shipping Temperature

14°F to 140°F (-10°C to 60°C)

Operating Relative Humidity (Non-condensing)

IRS–1: 5% to 95%

ORS-1: 5% to 95%

Humidity Display Range

0% to 99%

Clock Accuracy

+/- 2 minute per month

Cool Indication

Wave shows "Cool On" on the screen when Cool is activated

Heat Indication

Wave shows "Heat On" on the screen when Heat is activated

Auxiliary Heat Indication

Wave shows "Aux On" on the screen when Auxiliary Heat is activated

INSTALLATION

When Installing this Product...

- Read these instructions carefully. Failure to follow the instructions can damage the product or cause a hazardous condition.
- Check the ratings given in the instructions to make sure the product is suitable for your application.
- Installer must be a trained, experienced service technician.
- After completing installation, use these instructions for product operation.

Selecting Location

Install the thermostat about 5 feet (1.5m) above the floor in an area with good air circulation at average temperature. See Figure 4. Do not install the thermostat where it can be affected by:

- Drafts or dead spots behind doors and in corners.
- Hot or cold air from ducts.

- Radiant heat from sun or appliances
- Concealed pipes and chimneys.
- Unheated or uncooled areas such as an outside wall behind the thermostat.

Mounting Means

Mounts directly on the wall in the living space using mounting screws and anchors provided.

Dimensions

- Wave dimensions: see Figure 1.
- Wave back case: see Figure 2.
- Wave cover plate: see Figure 3.

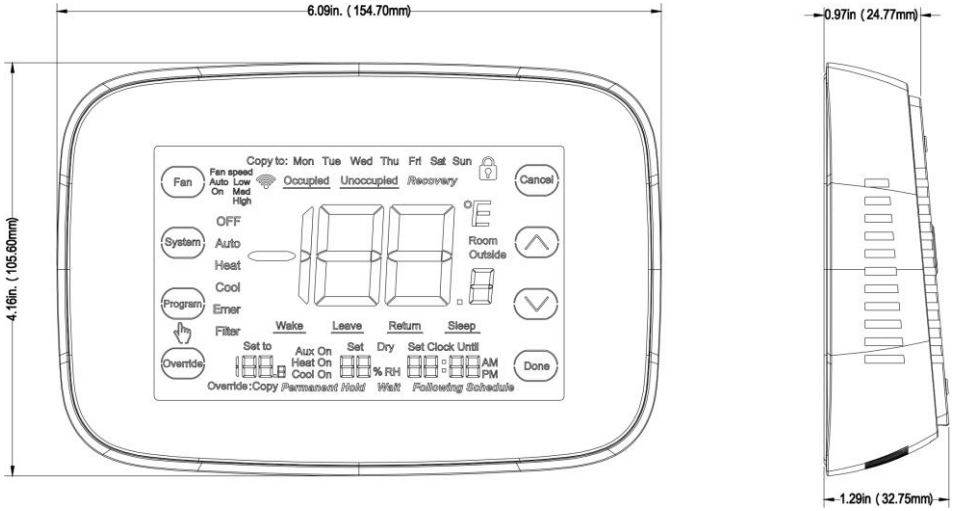


Figure 1. Wave dimensions in inches (mm)

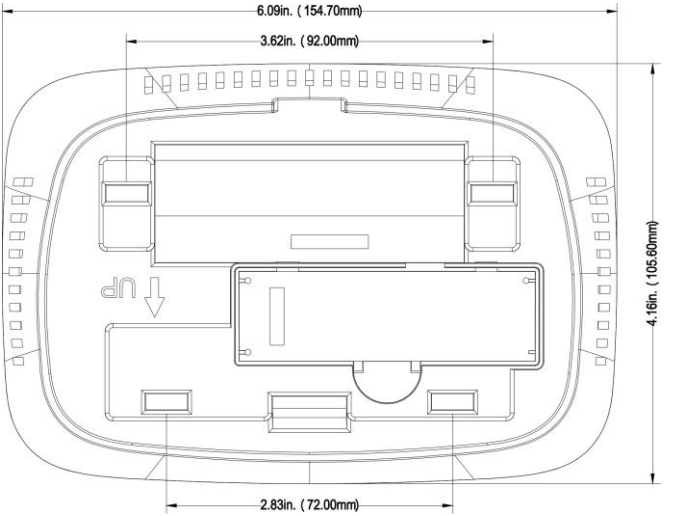


Figure 2. Wave back case dimensions in inches (mm)

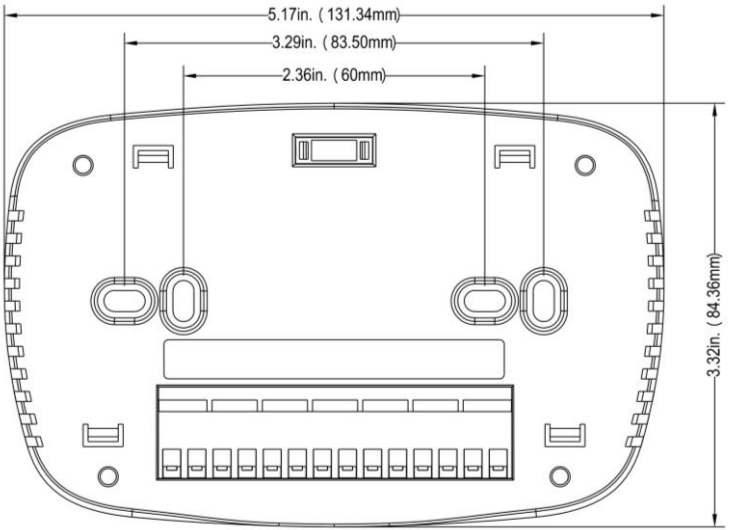


Figure 3. Wave cover plate dimensions in inches (mm)

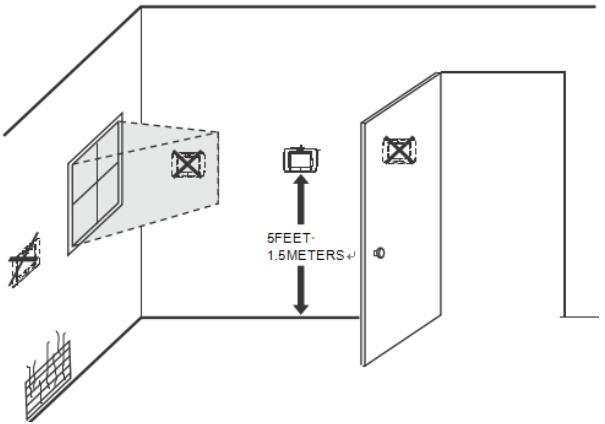


Figure 4. Selecting thermostat location

Installing Wall Plate

⚠ CAUTION

Electrical hazard can cause electrical shock or equipment damage.

Disconnect power before wiring.

The thermostat can be mounted horizontally on the wall.

1. Position and level the wall plate (for appearance only).
2. Use a pencil to mark the mounting holes.
3. Remove the wall plate from the wall and drill two holes in the wall as marked. If necessary, use the provided anchors by gently tapping them into the drilled holes until flush with the wall.
4. Position the wall plate over the holes, pulling wires through the wiring opening. See Figure 5.
5. Insert the mounting screws into the holes and tighten.

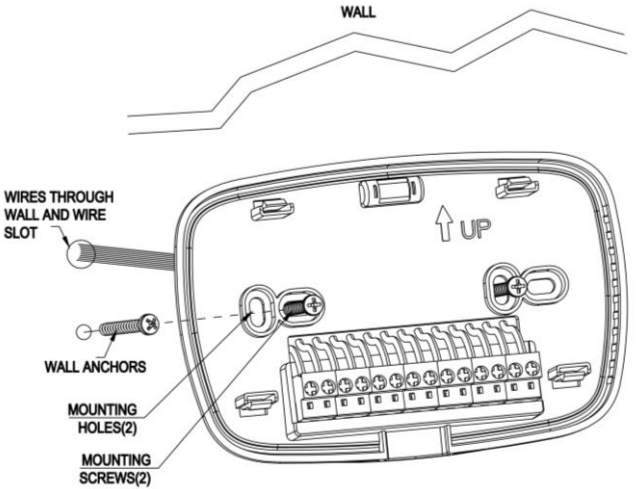


Figure 5. Mounting wall plate

WIRING

All wiring must comply with local electrical codes and ordinances.

- See Table 1 and Figure 6 for terminal designation descriptions.
- Insert wires in the terminal block under the loosened screw. See Figure 7.
- Securely tighten each screw.
- Push excess wire back into the hole.
- Plug the hole with nonflammable insulation to prevent drafts from affecting the thermostat.

Table 1. Terminal Designation Descriptions

Terminal Designation	Description
RC (see Note 1)	Power for cooling - connect to secondary side of cooling system transformer
R (see Note 1)	Power for heating - connect to secondary side of heating system transformer
C (see Note 2)	Common wire from secondary side of heating system transformer
Y1	Compressor contactor
G1	Fan relay or low fan speed
Y2/G2	Second stage cooling or medium fan speed
O/B/W1 (see Note 3)	Changeover valve for heat pump systems or heat relay
W2/AUX/G3	Auxiliary heat relay for heat pump systems, 2nd stage heat relay, high fan speed
E	Emergency heat relay for heat pump systems
L (see note 4)	Equipment monitor for heat pump systems
S1, S2	External temperature sensor

NOTES

1. If used in single-transformer system, leave metal jumper wire in place between RC and R. In two-transformer system, remove metal jumper wire between RC and R.
2. In a two-transformer system, connect the common from the secondary side of the heating system transformer.
3. If thermostat is configured for a heat pump system, configure changeover valve for cool or heat.
4. L terminal is an input port as system monitor.

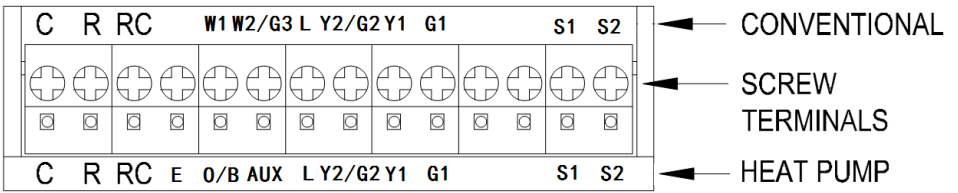


Figure 6. Terminal identifications for system

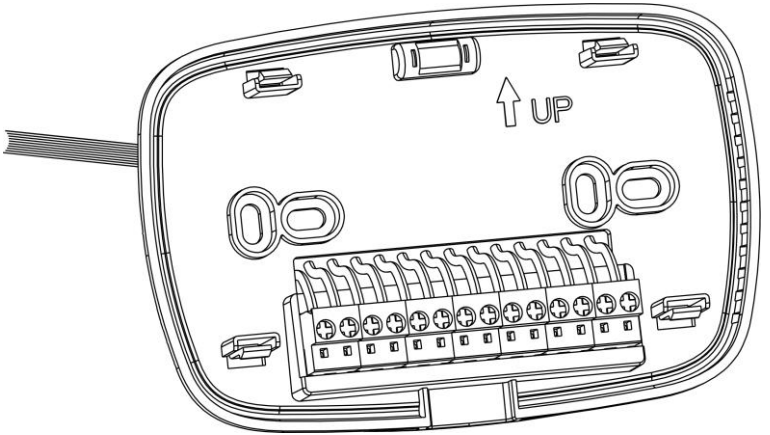
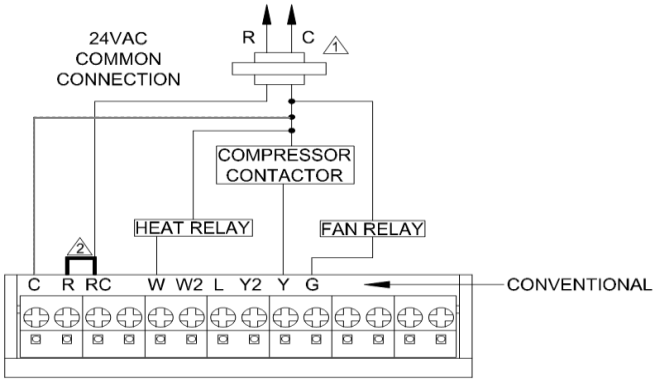


Figure 7. Inserting wires in terminal block

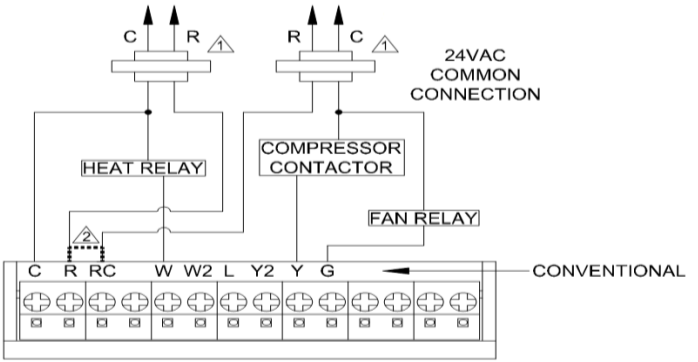
IMPORTANT: Use 18-gauge thermostat wire.



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2. FACTORY INSTALLED JUMPER.

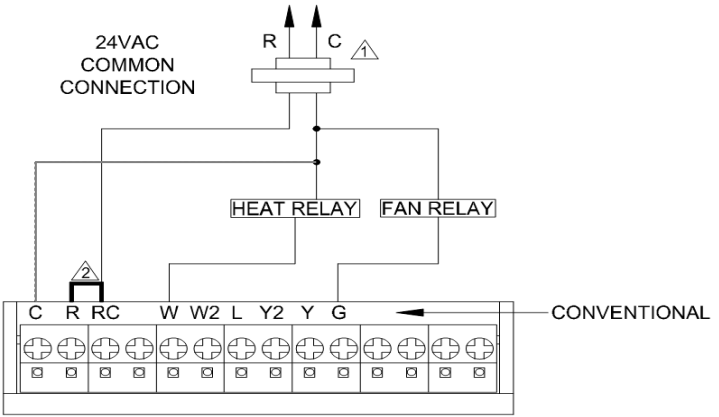
Figure 8. Typical hookup of conventional single-stage heat and cool system with single transformer (1H/1C conventional)



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2. FACTORY INSTALLED JUMPER.

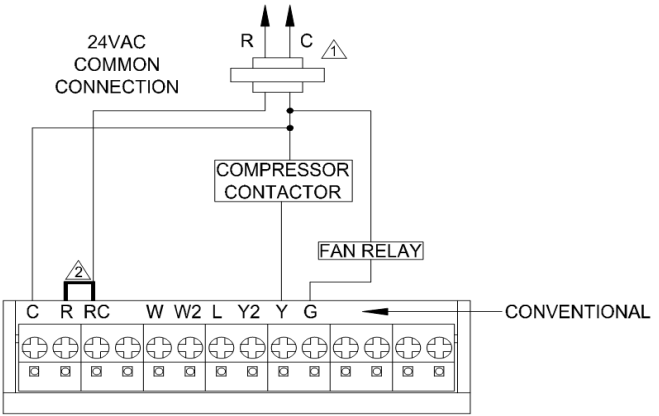
Figure 9. Typical hookup of conventional single-stage heat and cool system with two transformers (1H/1C conventional)



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2. FACTORY INSTALLED JUMPERS.

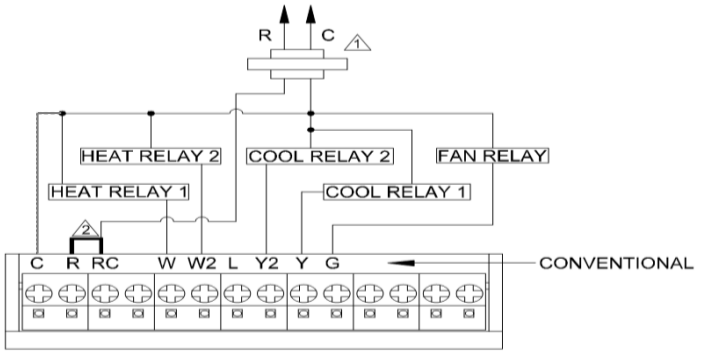
Figure 10. Typical hookup of heat only system with fan (1H conventional)



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2. FACTORY INSTALLED JUMPER.

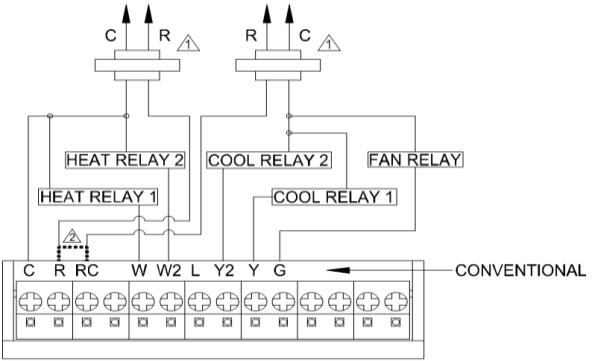
Figure 11. Typical hookup of cool only system (1C conventional)



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2. FACTORY INSTALLED JUMPER.

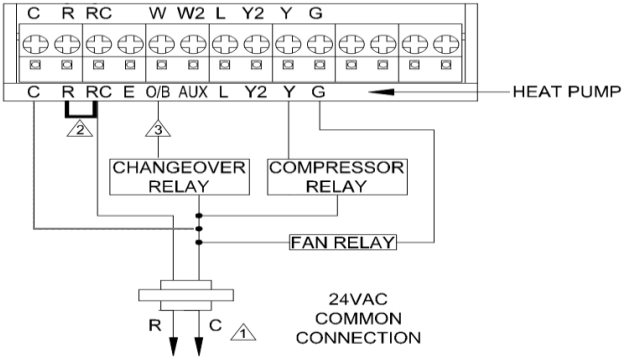
Figure 12. Typical hookup of conventional multistage two-stage heating and two-stage cooling in a single-transformer system (2H/2C, 2H/1C or 1H/2C conventional)



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2. FACTORY INSTALLED JUMPER.

Figure 13. Typical hookup of conventional multistage two-stage heating and two-stage cooling in a two-transformer system (2H/2C, 2H/1C or 1H/2C conventional)

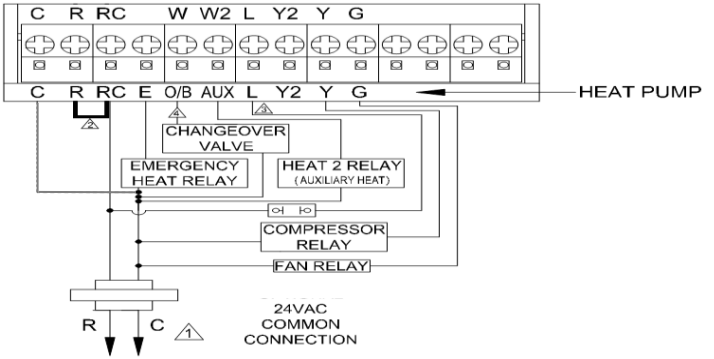


1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2. FACTORY INSTALLED JUMPER.

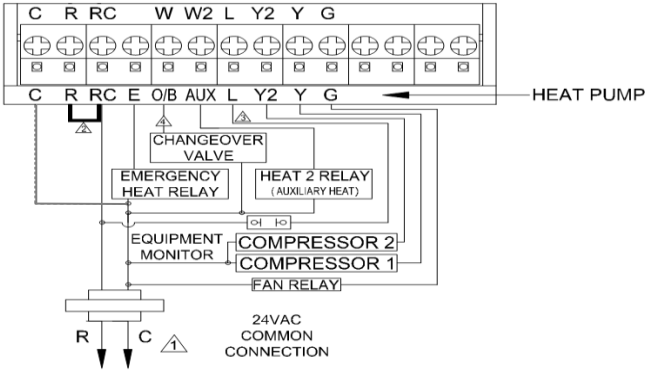
3. "O/B" TERMINAL SET TO CONTROL AS EITHER "O" OR "B" IN THE INSTALLER SETUP.

Figure 14. Typical hookup of single-stage heat pump with no auxiliary/backup heat (1H/1C heat pump)



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
2. FACTORY INSTALLED JUMPER.
3. MUST CONNECT THE 24VAC COMMON WHEN USING L. THE TERMINAL IS SHOWN AS EQUIPMENT MONITOR.
4. "O/B" TERMINAL SET TO CONTROL AS EITHER "O" OR "B" IN THE INSTALLER SETUP.

Figure 15. Typical hookup of single-stage heat pump with auxiliary/backup heat (2H/1C heat pump)



1. POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
2. FACTORY INSTALLED JUMPER.
3. MUST CONNECT THE 24VAC COMMON WHEN USING L. THE TERMINAL IS SHOWN AS EQUIPMENT MONITOR.
4. "O/B" TERMINAL SET TO CONTROL AS EITHER "O" OR "B" IN THE INSTALLER SETUP.

Figure 16. Typical hookup of multistage heat pump with auxiliary/backup heat (3H/2C heat pump).

POWER THE THERMOSTAT

Wiring 24VAC Common

Single-Transformer System

Connect the common side of the transformer to the C screw terminal of the thermostat wall plate. Leave the metal jumper wire in place between RC and R.

Two-Transformer System

Connect the common side of the heating transformer to the C screw terminal of the thermostat wall plate. Remove the metal jumper wire between RC and R.

Mount Thermostat to Wall Plate

Align the terminal screw blocks with the pins on the back of the thermostat. Push the thermostat straight onto the wall plate until it snaps into place. See Figure 17.

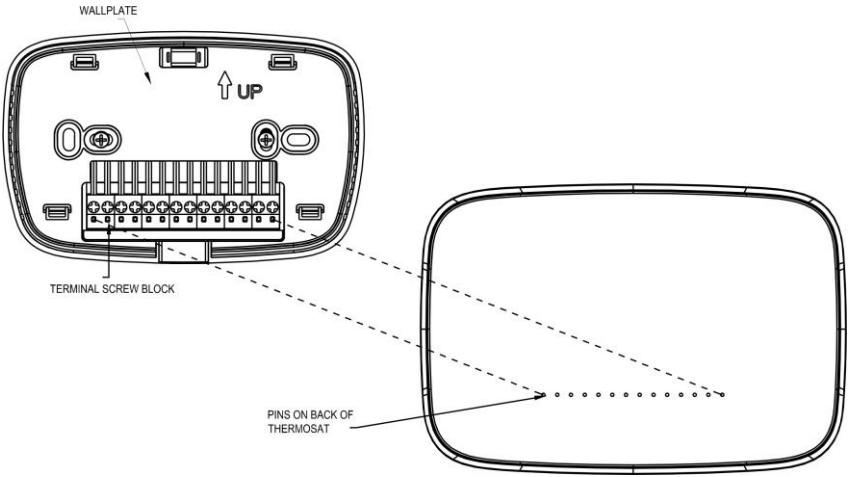


Figure 17. Mount thermostat to wall plate

INSTALLER SETUP

Follow these steps to enter the Installer Setup:

1. Press and release the System key. See Figure 18. System mode will blink.
2. Press and hold the System key for approximately 5 seconds until the menu number is displayed in the bottom right corner. See Figure 19.

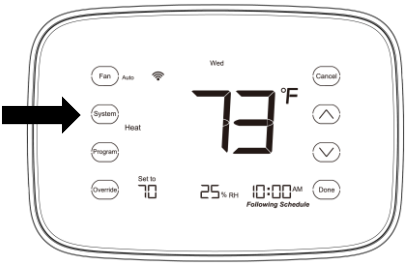


Figure 18. Arrow points to System key

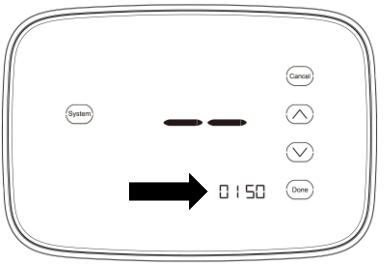


Figure 19. Arrow points to menu number

3. Press ⌃ or ⌄ key to view the submenu, and press System key to enter the submenu. Under submenu, use ⌃ or ⌄ to set parameters. See Figure 20. Note: See Table 2 for Installer Setup Menu and Table 3 for Settings.

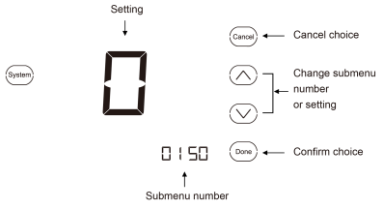


Figure 20. Arrow points to displayed submenu number and current setting

4. Press Done key to exit and confirm the installer setup, or press Cancel to exit without saving changes.

Table 2. Installer Setup Menu

Number	Name	Settings	Notes
0140	Version		
0150	Date and time	Set calendar date and time	
0160	Schedule options	0: Non-programmable 1: 7-day programmable	The schedule setting will default if changed.
0170	System type selection	1: Heat only, conventional, with fan (default) 2: Cool only, conventional 4: Single stage heat and cool, conventional 5: Single stage heat and cool, conventional, multi-speed fan 6: Single stage heat pump with AUX heat 7: Single stage heat pump with emergency heat	Available options and defaults vary by thermostat. System selection automatically modifies some default settings and/or hides other Installer Setup options.

Number	Name	Settings	Notes
0170	System type selection	8: Single stage heat pump with AUX and emergency heat 9: 2-stage heat and cool, conventional 10: 2-stage heat pump with AUX heat 11: 2-stage heat pump with emergency heat 12: 2-stage heat pump with AUX and emergency heat	Available options and defaults vary by thermostat. System selection automatically modifies some default settings and/or hides other Installer Setup options.

Number	Name	Settings	Notes
0180	Fan control in heating	0: Electric furnace thermostat controls fan in heating (factory setting) 1: Gas or oil furnace equipment controls fan in heating	Only shown if conventional system （except cool-only system） is selected. If heat pump is chosen, fan defaults to electric.
0190	Changeover valve O/B terminal energized in heating or cooling (heat pumps only)	0: Changeover valve O/B terminal is energized in cooling 1: Changeover valve O/B terminal is energized in heating	Only shown if heat pump system is chosen

Number	Name	Settings	Notes
0200	Backup heat source (auxiliary heat)	0: Heat pump backup heat source is electric (factory setting) 1: Heat pump backup heat source is fossil fuel	Only applicable in heat pump systems with AUX heating
0220	Dehumidification option	0: Turn off dehumidification 1: Turn on dehumidification	
0230	During dehumidification, the max value of temperature can be set	Fahrenheit: 1 to 5°F, Default: 3°F Celsius: 0.5 to 2.5°C, Default: 1.5°C	Fahrenheit temperature is 2 times larger than Celsius temperature. Only applicable in dehumidification mode.
0240	External temperature sensor option	0: No sensor (default) 1: Outdoor temperature sensor 2: Remote sensor, report only	

Number	Name	Settings	Notes
		3: Remote sensor, disable thermostat sensor 4: Indoor sensor 5: Occupancy input (dry contact) 6: Float switch input (dry contact) 7: Dry contact input	
0250	Fan Type	1: Single speed fan 2: Two speed fan 3: Three speed fan	Only applicable in multi-speed fan type
0260	High balance point set range	Fahrenheit: 23°F to 122°F Celsius: -5°C to 50°C	Only applicable in heat pump systems with AUX heating and 0240 set to 1

Number	Name	Settings	Notes
0270	Low balance point set range	Fahrenheit: -22°F to 77°F Celsius: -30°C to 25°C	Only applicable in heat pump systems with AUX heating and 0240 set to 1
0280	Disable standby interface option	0: Disable 1: Enable	
0290	Multistage equipment start timer	10 to 90 mins Default is 20 mins	Stepping unit is 5 minutes; applicable in multistage system or multispeed fan system
0300	Changeover	0: Manual changeover 1: Auto changeover (default setting)	

Number	Name	Settings	Notes
0310	Dead band	2: 2°F (1.5°C) 3: 3°F (2°C) 4: 4°F (2.5°C) 5: 5°F (3°C) 6: 6°F (3.5°C) 7: 7°F (4°C) 8: 8°F (4.5°C) 9: 9°F (5°C)	Shown only if automatic changeover is selected
0320	Temperature indication scale	F: Fahrenheit temperature display (factory setting) C: Celsius temperature display	If changed, the schedule will need to be reprogrammed

Number	Name	Settings	Notes
0330	1st stage temperature difference	1°F to 3°F	Fahrenheit temperature is 2 times larger than Celsius temperature
0340	2nd stage temperature difference	1°F to 3°F	Fahrenheit temperature is 2 times larger than Celsius temperature
0350	3rd stage temperature difference	1°F to 3°F	Fahrenheit temperature is 2 times larger than Celsius temperature
0360	Disable cooling output if outdoor temp	Fahrenheit: 41°F to 122°F, Default: 50°F Celsius: 5°C to 50°C, Default: 10°C	

Number	Name	Settings	Notes
0370	Disable heating output if outdoor temp	Fahrenheit: 41°F to 122°F, Default: 77°F Celsius: 5°C to 50°C, Default: 25°C	
0380	Humidity Difference	5 – 20%，Default：5%	
0390	Occupied heating set temp	Fahrenheit: 41°F to 120°F, Default: 68°F Celsius: 5°C to 49°C, Default: 20°C	
0400	Occupied cooling set temp	Fahrenheit: 43°F to 122°F, Default: 74°F Celsius: 6°C to 50°C, Default: 23°C	
0410	Unoccupied heating set temperature	Fahrenheit: 41°F to 120°F, Default: 68°F Celsius: 5°C to 49°C, Default: 20°C	

Number	Name	Settings	Notes
0420	Unoccupied cooling set temperature	Fahrenheit: 43°F to 122°F, Default: 74°F Celsius: 6°C to 50°C, Default: 23°C	
0430	Override time limit	30 to 90 mins, Default: 60 mins	
0440	External sensor compensation value	-9°F ~ 9°F (°F as temperature format) -4.5°C ~ 4.5°C (°C as temperature format) 0°F (0°C) (factory setting)	
0450	Override temperature limit	2°F - 5°F (°F as temperature format) 0.5°C ~ 2.5°C (°C as temperature format) 5°F (2.5°C) (factory setting)	

Number	Name	Settings	Notes
0500	Furnace change reminder	0: Furnace filter reminder off 1: 10 run time days 2: 30 run time days 3: 60 run time days 4: 90 run time days 5: 120 run time days 6: 365 run time days	Run time based on call for fan
0530	Adaptive intelligent recovery	1: Adaptive intelligent recovery control is activated (system starts early so setpoint is reached by start of program period) 0: Conventional recovery (system starts recovery at programmed time)	

Number	Name	Settings	Notes
0540	Number of periods	2: Two periods available (Wake and Sleep) 4: Four periods available (Wake, Leave, Return and Sleep)	Not shown if non- programmable is selected. Applies to all days of the week. If changed, schedule must be reprogrammed.
0580	Minimum compressor off time	5: Five-minute compressor off-time setting (factory setting) 0,2,3,4: Other compressor off-time settings	
0600	Heat temp range stop	41 to 120: Temperature range of heating setpoint (1°F increments)	Shown in 1/2 °C
0610	Cool temp range stop	43 to 122: Temperature range of cooling setpoint (1°F increments)	Shown in 1/2 °C
0640	Clock format	12: 12-hour clock (factory setting) 24: 24-hour clock	

Number	Name	Settings	Notes
0650	Extended fan on time heat	0: No extended fan operation after call for heat ends 90: Fan operation is extended 90 seconds after call for heat ends	Not shown if 0180 is set to 1 or in cool-only systems
0660	Extended fan on time cool	0: No extended fan operation after call for cool ends 90: Fan operation is extended 90 seconds after call for cool ends	Not shown in heat-only systems
0670	Keypad lockout	0: Unlocked keypad 1: Locked keypad 2: All keys locked except Up/Down/Cancel/Done/Override	Must enter User Setup to unlock keypad

Number	Name	Settings	Notes
0680	ModBus address	1 - 32	
0700	Temperature display offset	-9°F ~ 9°F (°F as temperature format) -4.5°C ~ 4.5°C (°C as temperature format) 0°F (0°C) (factory setting)	
0710	Reset thermostat	0: No thermostat reset 1: Resets all Installer Setup options to default values and resets schedule to default setting	Only calendar settings and time are retained

OPERATION

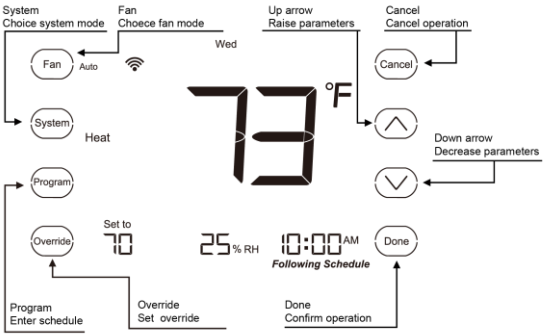


Figure 21. Thermostat keys

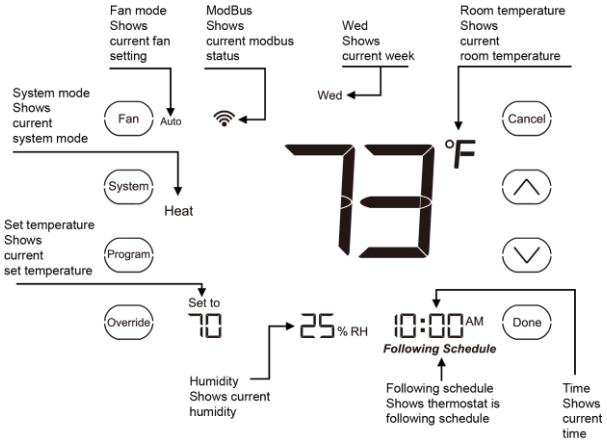


Figure 22. Thermostat display

User Setup

Follow these steps to enter the User Setup:

1. Press and hold the Fan key for approximately 3 seconds until the screen changes. Menu number will be displayed at bottom right corner.
2. Press ∧ or ∨ key to view the submenu, and press System key to enter the submenu. Under submenu, use ∧ or ∨ to set parameters.
3. Press Done key to exit and confirm the user setup, or press Cancel to exit without saving changes.

Note: See Tables 3 for the User Setup Settings, and see the Installer Setup chapter for operations reference.

Table 3. User Setup Settings

Number	Description	Settings
0140	Version	
0150	Date and time	Current calendar date and time
0320	Display temperature in °F or °C	F: °F setting (factory setting) C: °C setting
0640	Clock format	12: 12-hour clock (factory setting) 24: 24-hour clock
0670	Keypad Lockout	0: Unlocked keypad 1: Locked keypad 2: All keys locked except Up/Down/Cancel/Done/Override

Number	Description	Settings
0700	Temperature Display Offset	-9°F ~ 9°F (°F as temperature format) -4.5°C ~ 4.5°C (°C as temperature format) 0°F (0°C) (factory setting)
0710	Reset Thermostat	0: No thermostat reset 1: Resets all Installer Setup options to default values and resets schedule to default setting

Date/Time Setting

1. Consult the User Setup section to enter the User Setup menu. Choose submenu number 0150 to enter the date and time setting. See Figure 23.
2. Press System to switch the date or time. Options will scroll through in the following order: year, month, day, hour, and minute.
3. Press ^ or v to adjust the time. You can advance the time more quickly by holding the ^ or v key buttons.
4. Press Done to save changes and exit or press Cancel to exit without changing the date and time.

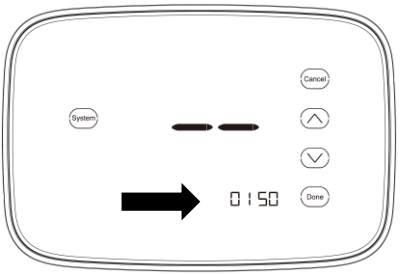


Figure 23. Menu 0150 is displayed, indicating the user can now set the date and time.

Fan Setting

Multispeed fan system

Only single stage heating/cooling systems support the multispeed fan function. In a multispeed fan system: relay G controls fan speed low; relay G2/Y2 controls fan speed mid; relay G3/W2/AUX controls fan speed high. A multispeed fan system supports manual mode and auto mode. Select 0250 in the Installer Setup Menu to set the fan type.

Multispeed fan: manual mode

When the fan is in manual mode, the fan will always be ON. Pressing the FAN button will allow the user to change the speed of the fan. As long as the user has selected LOW, MED, or HIGH, the fan will remain ON and at the set speed. Calls for heating or cooling will not override the fan speed when the upstage timer expires, nor will the fan turn OFF after the desired setpoint is reached.

Multispeed fan: auto mode

When in automatic mode, the thermostat must control the fan speed. All calls for heat and cool will use the lowest fan speed by asserting G1. Speed increases will occur if the setpoint for either temperature or dehumidification have not been met after the interval defined by the timed upstage delay period (upstage timer). For two-speed fans, after the timed upstage delay period, G3 will be asserted. For three speed fans, G2 will be asserted. After a second time upstage delay period has passed, G3 will be asserted if the setpoints have not been reached.

Fan selection

Press Fan to enter fan type selection, ordered in low, mid, high, auto fan mode. Press Done to confirm and exit, or press Cancel to cancel and exit. Please consult the following figures.

Figures 24-27 zoom in at arrow.

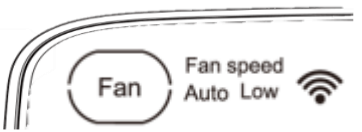


Fig 24. Fan speed set to Auto Low

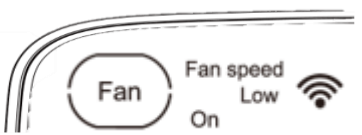


Fig 25. Fan speed set to Low

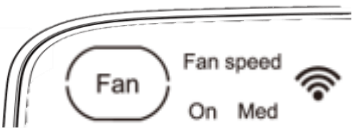


Fig 26. Fan speed set to Medium

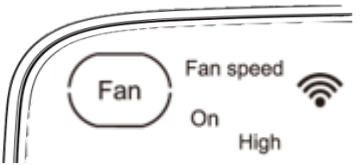


Fig 27. Fan speed set to High

ON: Fan is always on.

AUTO: Fan runs only when the heating or cooling system is on.

Single speed fan system

Multistage heating/cooling systems do not support the multispeed fan selection. It can only be set to On or auto mode. Details are listed in the fan selection chapter.

Selecting System Mode

1. Press System to display options.
2. Press System again to select an option. You may need to press two or three times to make a selection. The selected option blinks.
3. Press Done to save setting/selection, or press Cancel to exit without saving changes.

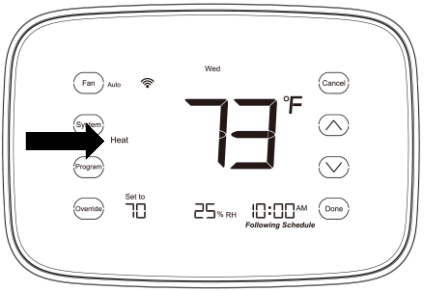


Figure 28. System mode is set to Heat

Possible System Modes

HEAT: Controls only the heating system.

COOL: Controls only the cooling system.

OFF: Heating/cooling systems are off.

AUTO: Selects heating or cooling depending on the indoor temperature.

EMER (heat pumps with aux. heat): Controls auxiliary/emergency heat. Compressor is locked out. AUTO and EMER system settings may not appear, depending on how your thermostat was installed.

Note: When under auto mode, pressing the Done key can switch the set temperature between heat and cool.

Overrides

Wave has two temperature override options: **Override Until** and **Permanent Hold**.

Override Until (temporary override)

Holds temperature temporarily until the next scheduled period time or until time is selected. Setting 0430 in the Installer Setup Menu sets the length of a temporary override. If 0 is chosen, the temporary override will move to the next period.

1. Press ⌃ or ⌄ key to adjust the temperature to desired setpoint. The icon “Until” appears above the time, and the time indicates the override stop time.
2. Press Done key to exit and confirm the changes, or press Cancel to exit without saving changes.
3. If you want to exit the Override Until, press the Override button until the icon “Following Schedule” appears under the time.

Permanent Hold

Holds temperature setpoint permanently.

1. Press  or  key once. The “Until” icon appears above the time.
2. Press the Done key.
3. Press  key once. The “Until” icon disappears and the “Permanent Hold” icon appears.
4. Press  or  key to adjust to desired temperature.

Note: The current day of the week should already be set correctly. If not, see User Setup to set the date and time setting.

Clean Thermostat Screen

Follow these steps to clean the screen without making thermostat changes:

1. Press and hold the Cancel key for approximately 3 seconds until the screen changes. Thermostat locks out all touch keys for 30 seconds to allow for cleaning. See Figure 29.
2. Clean screen using a cloth moistened with water or glass cleaner.
3. Press Done to return to the Home Screen.

Figure 29. Thermostat keys are locked, and the screen can now be cleaned.

IMPORTANT:

Do not spray liquid directly onto the thermostat. Spray cleaner onto a cloth, then use cloth to clean the screen.

Key Lock

Select 0670 in the User Setup or Installer Setup Menu to set key lock. Key lock includes partial locking or full locking.

Partial locking

In partial locking mode,  will appear on display. If user presses locked keys,  will blink to remind user keys are locked. All keys are locked except up, down, confirm, and control. User can press up and down keys to enter override mode, but temperature set range will be limited. See details in Permitted Setpoint Range chapter.

Full locking

In full locking mode,  will appear on display. If user press locked keys,  will blink to remind user keys are locked. See the User Setup section for how to unlock keys.

Setting Filter Reminder Intervals

If activated during installation, the filter reminder flashes “Filter” on screen when it is time to replace your filter. To change the reminder interval:

1. Press and hold the Override key for approximately 3 seconds until the screen changes.
2. Press ^ or v to select the desired interval (in days), then press Done to save and exit, or press Cancel to exit without saving.
3. Press Cancel for approximately 3 seconds to restart the timer.

Figure 30. Filter reminder is on

Note: System setting function 0500 governs the filter interval maximum. The days are counted as fan run time, so anytime the fan is running, the reminder is counting that time against the number of days selected.

Dehumidification

The thermostat supports basic dehumidification using the cooling mode of the unit. Dehumidification occurs if these conditions are met and signals are present at specific terminals:

- dehumidification control has been enabled on installer settings, and
- the unit is in COOL mode, and
- a dehumidification demand exists (RH above setpoint plus RH-Hysteresis band)

The thermostat does not support connection to external or auxiliary humidification or dehumidification units. See Installer Setup Menu settings 0220, 0230, and 0380 for more information.

Control Dehumidification Setting

On the home screen, press Done key for 3 seconds to enter the humidification setting (shown in Figure 31). The humidification setpoint will be displayed in the position as humidification was being displayed. Press ^ or v key to change setpoint. Press Done key to confirm and exit; press Cancel key to cancel and exit.

Figure 31. Humidification settings

Dehumidification Droop Control

The dehumidification control attempts to control to the user's humidity setpoint by turning on the air conditioner. In extremely high humidity conditions, the thermostat keeps the air conditioner running (energizing Y and G) for up to 3°F below the temperature setpoint. It does this while trying to achieve the desired humidity setpoint and balancing that with the temperature setpoint. The thermostat controls up to 3°F below the temperature setting until either the humidity is satisfied or conditions change. After enabling the dehumidification function, “Dry” will blink on the display. See Figure 32.

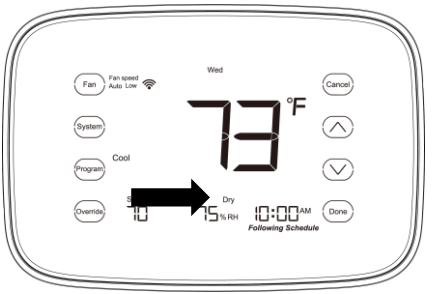


Figure 32. “Dry” blinks to indicate dehumidification function has been enabled

Upstage Timer

This value will be used when determining when to turn the second stage ON (multistage configurations), turning the auxiliary heat ON (heat pump configurations), and increasing fan speed (multispeed fan configurations). See 0290 in the Installer Setup Menu. Examples:

- For a multi-stage heating and cooling system with a 20-minute upstage timer, if the system calls for cooling and it has not reached the desired setpoint after 20 minutes AND the current temperature is greater than [Setpoint plus Second Stage Hysteresis], the second stage compressor will turn ON.
- For a multi-speed fan system with a 20-minute upstage timer, if the system calls for heating and it has not reached the desired setpoint after 20 minutes, the fan speed will be increased (2-speed system from LOW to HIGH, 3-speed system from LOW to MED). On a 3-speed system, if the temperature still has not reached the desired setpoint after 20 minutes (40 minutes after the system starts conditioning the space), the fan speed will be increased from MED to HIGH.

Permitted Setpoint Range

The thermostat provides the ability to limit the range of values a user can select for desired temperature setpoints (Heat, Cool, Occupied Heat, Occupied Cool). This value works in conjunction with the Keypad Lockout settings. When the Keypad Lockout is configured to “All Keys Locked Except Up/Down” AND the permitted range variable is set to a value other than zero (0), the thermostat limits the user to changing the desired setpoint by plus/minus (+/-) the permitted setpoint value.

As an example, if the Keypad Lockout setting is “All Keys Locked Except Up/Down” and the Permitted Setpoint Range is five (5), the user can adjust the current COOL or HEAT setpoints by + or - 5 degrees.

Balance Point Control

When a remote sensor is connected and the thermostat is configured for heat pump with emergency or auxiliary heat, the Y1 relay should lock out (prevent from being asserted) when the outdoor temperature is at or below the low balance point, and the W2 relay should lock out (prevent from being asserted) when the outdoor temperature is at or above the high balance point. See 0260 and 0270 in the Installation Menu.

Low Balance Point

If the outside temperature is below the programmed low balance point (set by default at 25°F), compressor operation is not allowed. Since the heat pump is not as effective at a lower outdoor temperature, it may be more comfortable to use the auxiliary electric heat or the furnace (in dual fuel systems, it may be more economical) to satisfy a demand for heat.

High Balance Point

If the outside temperature is above the programmed high balance point (set by default at

50°F), auxiliary electric heat operation or furnace operation (in dual fuel system) is not allowed. This ensures that the lower cost heat pump operation will satisfy the heating demand, rather than the more expensive auxiliary electric heat. The high and low balance points will not lock out both the compressor and the auxiliary heat/furnace at the same time.

Remote Sensor

Select 0240 in the Installation Menu to set external sensors. Details are listed in the Installation Setup chapter.

Outdoor Temperature Sensor

If 0240 is set to “outdoor temperature sensor” and the outdoor temperature sensor is installed, pressing the Cancel key will display the remote sensor temperature. Ten seconds after pressing the Cancel key, the display will revert to the thermostat temperature sensor. Additionally, the outdoor temperature is used for enabling high/low balance point function (see Balance Point Control chapter) and for blocking cooling/heating output.

Report Only

If 0240 is set to “report only” and the outdoor temperature sensor is installed, pressing the Cancel key will display the outdoor temperature. Ten seconds after pressing the Cancel key, the display will revert to the thermostat temperature sensor. The outdoor temperature can

only be displayed; no logic input judgement will occur.

Disable Internal Sensor

If 0240 is set to “disable internal sensor” and the outdoor temperature sensor is installed, the outdoor temperature will be displayed in the position where the indoor temperature is displayed. Additionally, the internal temperature sensor will be disabled, and the outdoor temperature will completely replace indoor temperature joining logic output judgement.

Indoor Sensor

If 0240 is set to “indoor sensor” and the outdoor temperature sensor is installed, the mean of indoor and outdoor temperature will replace indoor temperature for display and logic output.

Occupancy Sensor

If 0240 is set to “occupancy sensor,” the thermostat will check the input status of the dry contact sensor, which enables either occupied mode (contact CLOSED) or unoccupied mode (contact OPEN). If occupied mode is enabled, thermostat will replace current temperature

setpoint with occupied heating and cooling setpoint for logic output. If unoccupied mode is enabled, thermostat will replace current temperature setpoint with unoccupied heating and cooling setpoint for logic output, and temperature cannot be set via UP and DOWN keys.

Float Switch Sensor

If 0240 is set to “float switch sensor,” the thermostat will check the input status of the dry contact sensor. If the contact is closed, the thermostat will close. If the contact is open, the thermostat will operate normally.

Dry Contact Sensor

If 0240 is set to “dry contact sensor,” the thermostat will check the input status of the dry contact sensor, but output status will not be used for logic control.

ModBus

ModBus port setup is: 9600 Baud, 8 data bits, No parity, 1 stop bit. Choose menu item 0680 in the Installer Setup Menu to set the equipment address. If the  symbol is displayed, connecting to the host was successful. If the  symbol is not displayed, connecting to the host failed.

PROGRAMMING

Table 4. Schedule Default Program Settings

Schedule	Time	Setpoints		Fan Setting
		Heat	Cool	
Wake	6:00AM	68°F (20°C)	78°F (26°C)	Auto
Leave	8:00AM	60°F (16°C)	85°F (29°C)	Auto
Return	4:00PM	68°F (20°C)	78°F (26°C)	Auto
Sleep	10:00PM	60°F (16°C)	82°F (28°C)	Auto

Program Heating and Cooling Schedule

Your thermostat can control up to four different schedule periods per day:

- **Wake** - Period when you awaken and want your home at a comfortable temperature.
- **Leave** - Period when you are away from home and want an energy-saving temperature.
- **Return** - Period when you return home and want your home back to a comfortable temperature.
- **Sleep** - Period when you are asleep and want an energy-saving temperature.

Note: Schedule times are in 15-minute intervals.

Edit Schedule

1. Press (Program) and the screen will change. See Figures 33 and 34.

Figure 33. Initial display

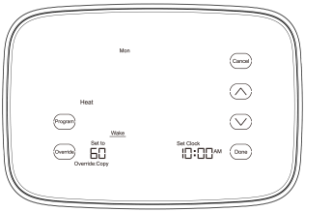


Figure 34. Display after pressing (Program)

2. The time will blink. Press (^) or (v) to adjust the time. Press (Program) to turn to next setting.
3. The temperature will blink. Press (^) or (v) to adjust the temperature. Press (Program) to turn to next time period.

4. Repeat steps 2 and 3 until all four times periods have been set.
5. Press Program to turn to next day. Repeat steps 2 and 3 until all seven days of the week have been set.
6. Press Done key to exit and confirm the program setting, or press Cancel to exit without saving changes.

NOTE: The Fan setting defaults to auto and cannot be programmed.

Copying a Daily Schedule

After entering a day program, you can copy this into another day to save time when creating a weekly program. For example, to copy Monday's program to Thursday:

1. Select the program for Monday, and complete the steps for setting the schedule. After the temperature is set for Sleep, press Override. The icon Copy to: appears on the screen and the icon TUE will blink, indicating that you can select or skip this day. Press Done to select the day or press Cancel to skip.
2. To copy the Monday schedule to Thursday, press Cancel until the icon THU is blinking. Press Done to select Thursday, and the THU icon will be solid and the icon FRI will blink. Press Override and the Copy to: icon will disappear, and the schedule for Monday will be copied to Thursday.
3. To select other days, press Done when the desired day icon is blinking. Press Cancel to skip days. Once all desired days are selected, press Override.

Reset Schedule

To reset the thermostat schedule to the default setting (as seen in Table 4), press and hold the Program key for approximately 5 seconds until the screen changes (see Figure 35). Release the Program key.

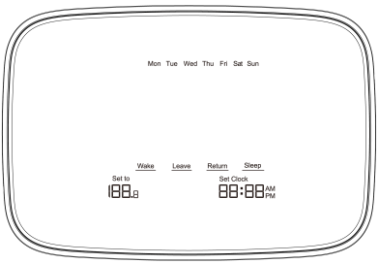


Figure 35. Display after pressing and holding Program key

TROUBLESHOOTING

Symptom	Possible Cause	Action
No LCD display	Thermostat is not being powered.	Check 24VAC between C and R.
Temperature settings do not change.	Upper or lower temperature limits were reached.	Check temperature setpoints. Check Installer Setup Numbers 0600 or 0610, modify as needed.
	The keypad is fully locked.	Check Installer Setup Number 0670 to change keypad locked options.
Heating or cooling does not come on.	Thermostat minimum off-time is activated.	Wait up to five minutes for the system to respond.

Symptom	Possible Cause	Action
	System selection is not set to Heat or Cool.	Set system selection to correct position.
	System type selection is incorrect.	Check Installer Setup Number 0170 and make sure correct System type is chosen.
Thermostat calls for Heat (Heat on) or Cool (Cool on) but no heating or cooling is running.	Heating or cooling equipment is not operating.	Check wiring. Check Installer Setup Number 0170 and make sure correct system type is chosen. Verify operation of equipment in System Test mode.

Symptom	Possible Cause	Action
Fan does not turn on in a call for heat (electric furnace).	Fan Control in Heating is set to Gas or Oil Furnace (Setting 0180).	Set Fan Control in Heating to Electric Furnace (Setting 0180).
Heat pump puts out cool air in the heat mode and warm air in the cool mode.	Changeover Valve is not configured to match the changeover required by the installed heat pump.	Set Changeover Valve (Installer Setup Number 0190) to match the changeover required by the installed heat pump.
Both the heating and cooling equipment are running at the same time.	The heating equipment is not a heat pump but the System Type is set to Heat Pump.	Set System Type (Installer Setup Number 0170) to match the installed heating and/or cooling equipment.
	Heating and cooling wires are shorted together.	Separate the shorted heating and cooling wires.

Symptom	Possible Cause	Action
Heating equipment is running in the cool mode.	Heating equipment is not a heat pump but System Type (Installer Setup Number 0170) is set to Heat Pump.	Set System Type (Installer Setup Number 0170) to match the installed heating and/or cooling equipment.
Heating equipment does not turn off and heat temperature setting is set below room temperature	Heating equipment is not a heat pump but System Type (Installer Setup Number 0170) is set to Heat Pump.	Set System Type (Installer Setup Number 0170) to match the installed heating and/or cooling equipment.
Cannot set the system setting to Heat or Cool.	System Type is set to Cool Only or Heat Only or Heat Only with Fan.	Set System Type (Installer Setup Number 0170) to match the installed equipment.

Symptom	Possible Cause	Action
Heat On is not in the display.	System is not set to Heat and/or temperature is not above room temperature.	Set the system setting to Heat and set the temperature setting above the room temperature.
Cool On is not in the display.	System is not set to Cool and/or temperature is not below room temperature.	Set the system setting to Cool and set the temperature setting below the room temperature.
Wait is in the display.	Compressor minimum off timer is active.	Wait up to five minutes for the cooling or heating (heat pump) equipment to turn on.
Screen Locked appears on screen, keys do not respond.	The keypad is locked.	Check Installer Setup Number 0670 to change keypad locked options.