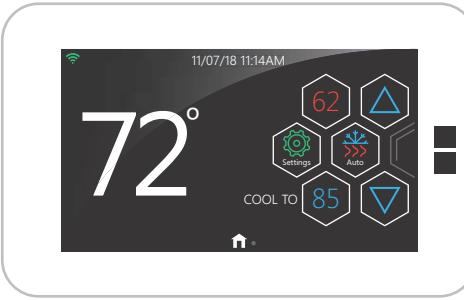
INSTALLATION MANUAL

Hx™3 TOUCH SCREEN THERMOSTAT

MODELS: S1-THXU430W



LIST OF SECTIONS

SECTION I: GENERAL

The Hx™3 Touch Screen Thermostat is designed to control conventional and communicating HVAC systems. Use applicable Johnson Controls Ducted Systems communicating equipment as follows:

- Variable speed modulating furnace
- Two-stage variable speed ECM furnace
- Variable speed air handler
- Premium 19 and 21 SEER air conditioners
- Premium 19 and 20 SEER heat pumps
- Variable capacity systems

While the communicating system has been designed for easy installation, this document provides a more detailed explanation of the installation process for installers. For communicating zoning applications, please refer to the literature kit that is included with the Zone Module (S1-ZMC401A).

To use the complete feature set available, you must connect the Hx™3 Touch Screen Thermostat to Wi-Fi.

For ease of installation and to ensure the thermostat has the latest software updates, make sure that Wi-Fi access is available (through the homeowner's Wi-Fi network or a mobile hotspot).

SECTION II: SAFETY CONSIDERATIONS

 This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury and equipment damage.

Understand and pay particular attention to the signal words **DANGER**, **WARNING**, and **CAUTION**.

DANGER indicates an **imminently** hazardous situation, which, if not avoided, **will result in death or serious injury.**

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

CAUTION indicates a potentially hazardous situation, which, if not avoided **may result in minor or moderate injury**. It is also used to alert against unsafe practices and hazards involving only property damage.

INSPECTION

The following table details the parts included in this kit. Examine the kit to ensure all parts are present.

TABLE 1: Content List

Item	QTY	Description
1	1	Thermostat Display
2	1	Thermostat Base
4	2	Screws
5	2	Drywall Anchors
6	1	User's Information Manual
7	1	Installation Manual

LIMITATIONS

The primary function of the thermostat is to command a system containing communicating products.

The following are exceptions:

- Installing a communicating variable speed modulating furnace with a non-communicating air conditioner. In this case, the variable-speed modulating furnace relays 24 VAC outputs to the non-communicating air conditioner (per communicated commands by the thermostat).
- Installing communicating controls in non-communicating Ducted Systems products
- Installing a communicating interface control (which converts communicating commands into 24 VAC outputs)

CONVENTIONAL COMPATIBILITY CHECK

The Hx™3 Touch Screen Thermostat works with 24 VAC systems and requires both R and C 24 VAC connections. This includes gas furnaces, air handlers, electric, oil, forced air, variable speed, heat pump, and hydronic heat.

You can configure the thermostat for the following:

- Conventional up to 2H/2C and heat pump up to 4H/2C
- Heating: 1 and 2 stages (W1, W2)
- Cooling: 1 and 2 stages (Y1, Y2)
- Heat pump: With auxiliary and emergency heat or fossil fuel
- HUM, O/B, Y2, Y1, W1, W2
- Fan single speed (G)
- Power (R, C) dual fuel compatible (heat pump with gas furnace)
- Humidity control (humidify and dehumidify)
- Outdoor air temperature or remote room sensor (optional)

NOTICE

Dual fuel systems require the use of the ambient sensor (S1-02542683000), if the room thermostat is used to control fossil fuel operation.

SECTION III: COMMUNICATING SYSTEM INSTALLATION

The intention of this document is to ensure proper connection and setup of the various communicating system components. Use these instructions in conjunction with instructions provided with indoor, outdoor, and accessory equipment with which the thermostat is used.

This manual contains information about setup, operation, and troubleshooting. Short videos illustrating the installation, setup, and configuration of the Hx™3 Touch Screen Thermostat are available at www.simplygettingthejobdone.com in the Academy TV application.

Installers must be trained, experienced service technicians. When installing this product, do the following:

- Read all instructions carefully before beginning the installation.

⚠ WARNING

Failure to follow these instructions can create hazardous situations or damage the product.

- Make sure the product is suitable for your application by checking all ratings on the product and in the instructions provided.

LOCATION

Install the thermostat at or around 5 ft (1.5 m) above the floor in an area with good circulation of room temperature. See Figure 1.

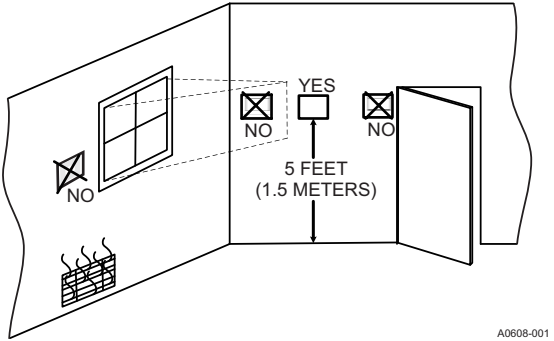


FIGURE 1: Control Location

Do not install the thermostat where it can be affected by the following:

- Drafts or stagnant air behind doors and in corners
- Hot or cold air from ducts
- Radiant heat from sun or appliances
- Concealed pipes and chimneys
- Unconditioned areas, such as an outside wall

MOUNTING THE THERMOSTAT

For most installations, you (the installer) can mount the thermostat by following the basic installation steps outlined below. However, there may be some cases where you are not able to penetrate the wall where you are mounting the thermostat, or where the thermostat being replaced has left a larger hole than needed for installation. For these and other cases (including installation with a vertical junction box), you can obtain an accessory wall plate.

⚠ WARNING

Voltage Hazard: Live wires can cause electrical shock or equipment damage. Disconnect power before beginning installation.

Follow these steps:

1. Turn off all power to the indoor and outdoor equipment.
2. If an existing thermostat is being replaced:
   a. Disconnect the wires from the existing thermostat.
   b. Remove the existing thermostat from the wall.
   c. Properly discard or recycle the old thermostat.

NOTICE

Mercury is a hazardous substance. If the existing thermostat contains any mercury, it MUST be disposed of properly. This thermostat does not contain mercury.

3. Mark where the thermostat is to be mounted on the wall (standard height is 5 ft from the floor).

NOTICE

If a thermostat was formerly in place, evaluate the location to make sure it meets the location requirements outlined earlier in this document.

INSTALLING A NEW THERMOSTAT

1. Position the thermostat base against the wall and determine if it completely covers the footprint of the current thermostat.
2. Position the thermostat base against the wall (or wall plate if used) and determine if the new screw locations align with prior locations.
3. If the thermostat base does not align with the existing anchor holes, mark the new screw locations with a pencil.
   - Drywall: Drill a 3/16 in. hole for the anchor and install.
   - Plaster: Drill a 7/32 in. hole for the anchor and install.
4. If the remote sensor is to be used, pull the wires through and connect them to the S1 and S2 terminals. Use the ambient sensor (S1-02542683000), which you can purchase separately.

5. Pull the wires through the opening in the thermostat base and secure the thermostat base (and wall plate) to the wall using the screws provided.
6. Though not required for operation, it is best practice that the thermostat is level.
7. One by one, connect each wire by pushing down on the quick connect tab, inserting the wire into the connector opening, and releasing the tab to complete.
8. Ensure the thermostat base is positioned with the UP arrow pointing upwards. See Figure 2.
9. Align the four positioning tabs with the four slots on the back side of the screen and gently press the screen into place.
10. Fasten the screen to the thermostat base with the two retaining screws provided.

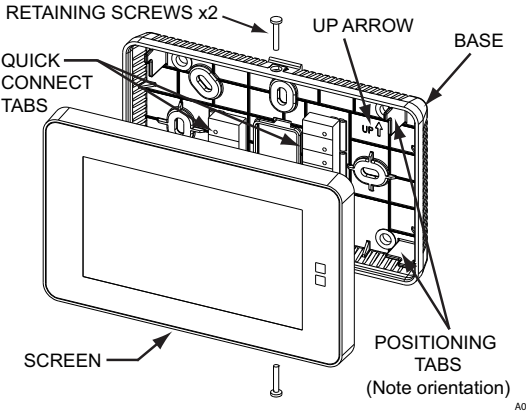


FIGURE 2: Thermostat Installation and Components

The thermostat may be wired conventionally. For wiring diagrams, see Section IX: Wiring Diagrams.

SECTION IV: WIRING COMMUNICATION

⚠ WARNING

If using the thermostat with variable capacity outdoor equipment, DO NOT connect to the R terminal of the outdoor unit control board.

All wiring must comply with local electrical codes and ordinances. See Table 2 for terminal designations.

TABLE 2: Terminal Designations

Signal	Definition	Label
Data	Non-inverted signal	A (+)
Low-voltage power hot	24 VAC (Hot)	R
Low-voltage power common and data ground	24 VAC (Common)	C
Data	Inverted signal	B (-)

WIRING REQUIREMENTS

Use standard 18 AWG thermostat wires to connect the communicating HVAC system and the conventional HVAC system.

Special (shielded) cable is not typically required. As with all communicating devices, it is a good idea to keep wiring at least 1 ft away from large inductive loads, for example, electronic air cleaners and motors. If these wiring practices are ignored, it may introduce electrical interference (noise), which can cause erratic system operation.

NOTICE

There may be installation applications where large inductive loads cannot be avoided. In these cases, use shielded wire in proximity to the inductive loads to ensure proper system functionality.

SYSTEM WIRING OVERVIEW

IMPORTANT: The communicating system requires four wires to operate. If installing a communicating system, ensure to supply at least four wires to each unit/control. For a simple diagram of the ideal wiring path, see Figure 3.

The system is connected by four wires. Two of the wires are used to bring power to the individual controls (R and C), and two of the wires are used for serial communication (A+ and B-).

Variable capacity outdoor units only require three wires. Variable capacity equipment has its own transformer, so it does not require an R connection between the indoor and outdoor equipment.

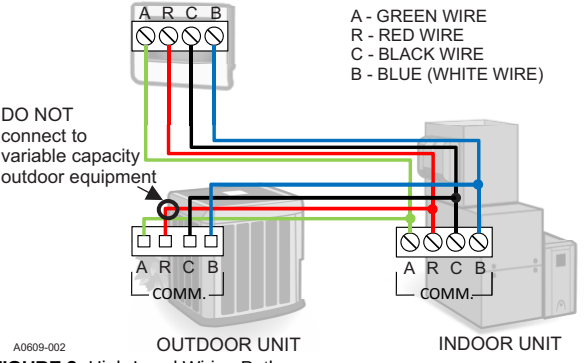


FIGURE 3: High-Level Wiring Path

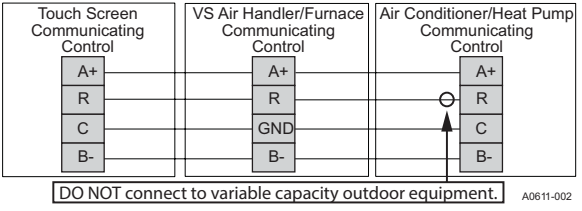


FIGURE 4: Wiring Diagram - Fully Communicating System Components

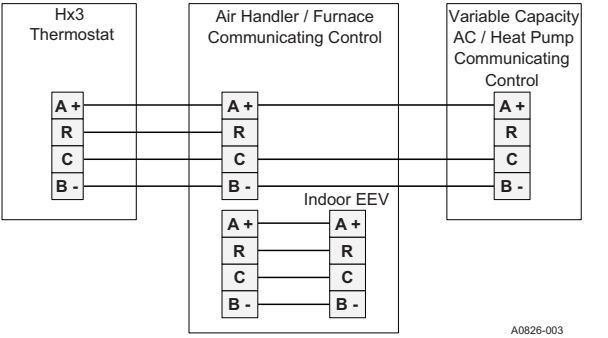


FIGURE 5: Wiring Diagram - Variable Capacity System

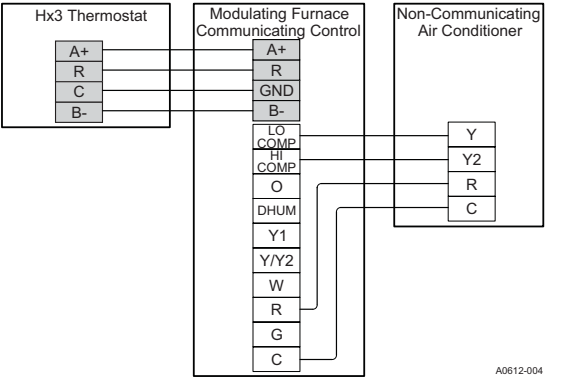


FIGURE 6: Wiring Diagram - Modulating Communicating Furnace, Non-Communicating AC

Thermostat Wiring

WARNING

ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury, death, or equipment damage. Before installing, modifying, or servicing the system, the main electrical disconnect switch must be in the OFF position. There may be more than one disconnect switch. Lock out and tag each switch with a suitable warning label.

1. Turn off all power to the equipment.
2. Remove the thermostat front plate.
3. Match and connect the thermostat wires to the proper terminals on the thermostat mounting back plate.
4. Push any excess wiring back into the wall.

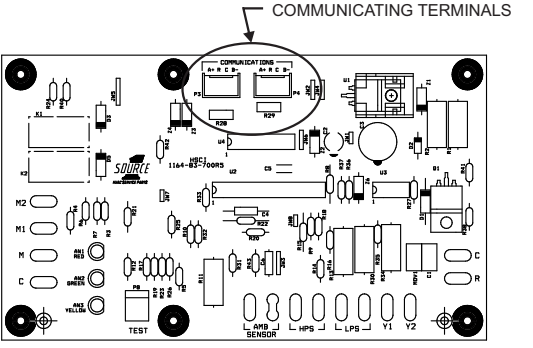
NOTICE

Plugging the hole in the wall with nonflammable insulation can help prevent drafts from adversely affecting temperature control.

Outdoor Control Wiring

Figure 7 shows a communicating AC control (see top of figure) and a communicating heat pump control (see bottom of figure). The communicating terminals shown are in parallel. Connect to either terminal.

COMMUNICATING AC CONTROL



COMMUNICATING HEAT PUMP CONTROL

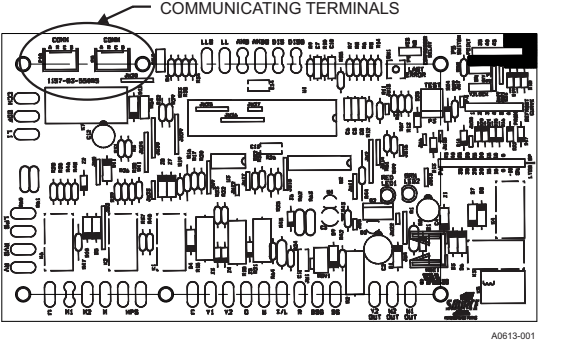


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FIGURE 7: Communicating Outdoor Controls - AC and Heat Pump

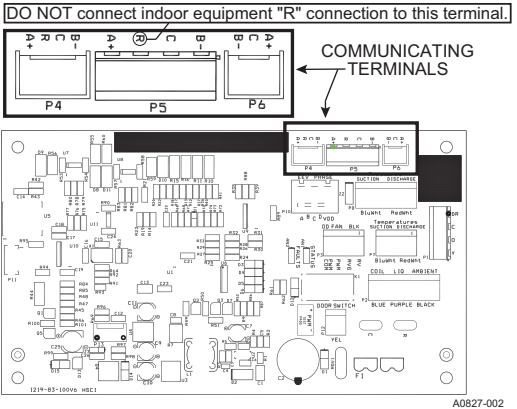


FIGURE 8: Variable Capacity Equipment - AC/Heat Pump Control

FIGURE 9: 2-Stage AC/Heat Pump Control

Communicating Non-Variable Capacity Models

Figures 3 and 4 show control wiring using communicating controls (non-variable capacity legacy outdoor models).

⚠ WARNING

ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury, death, or equipment damage. Before installing, modifying, or servicing the system, the main electrical disconnect switch must be in the OFF position. There may be more than one disconnect switch. Lock out and tag each switch with a suitable warning label.

Using a Communicating Wiring Harness

IMPORTANT: This procedure is only applicable to legacy communicating systems as follows: CZF, CZH, AC6B, AC8B, AL6B, AL8B, YZF, YZH, HC6B, HC8B, HL6B, and HL8B.

To use the S1-02542694000 communicating wiring harness:

1. Disconnect all high-voltage power from the system.
2. Plug the S1-02542694000 communicating harness into the outdoor control board and route the harness to the low-voltage wiring compartment.
3. Remove the conventional low-voltage wiring leads from the outdoor control board. Leave the wiring leads with the outdoor unit for future use.
4. Connect the field low-voltage thermostat wiring to the communicating control harness using spring wire connectors (commonly referred to as wire nuts).
5. Push excess wiring into the low-voltage wiring compartment of the outdoor unit.

NOTICE

When connecting the loose ends of the wire harness, ensure to note the color of each of the four wires (A+, R, C, B-).

6. Set the wires that are now connected (with wire connectors) into the junction box of the control housing.
7. Set the appropriate outdoor jumper settings to ensure proper control functionality. See Table 3.

Control Wiring Using Communicating Controls: Non-Variable Capacity Outdoor Models

1. Disconnect all high-voltage power from the system.
2. The outdoor unit contains a wire harness for conventional wiring and a wire harness for communicating wiring. Locate the wire harness with the plastic plug on the end. Cut the plastic connector off of the wire harness to be used and strip the wires approximately 1/2 in.
3. Connect the field low-voltage thermostat wiring to the appropriate harness using spring wire connectors.
4. Push excess wiring into the low-voltage wiring compartment of the outdoor unit.
5. Set the appropriate outdoor jumper settings to ensure proper control functionality. See Table 3.

Control Wiring Using Communicating Controls: Variable Capacity Outdoor Models

1. Disconnect all high-voltage power from the system.
2. The outdoor unit contains a wire harness for communicating wiring. A plastic connector used in manufacturing is left on the end of the control wires. Cut the plastic connector off of the wire harness and strip the wires approximately 1/2 in.
3. Connect the field low-voltage thermostat wiring to the harness using spring wire connectors. DO NOT connect the R connection of the indoor equipment to the outdoor control board.
4. Push excess wiring into the low-voltage wiring compartment of the outdoor unit.

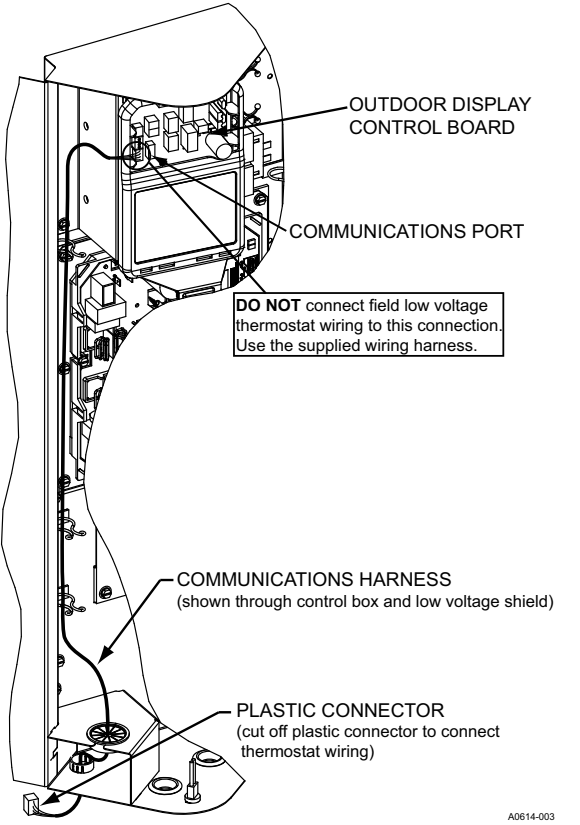


FIGURE 10: Variable Capacity - Outdoor Control Housing

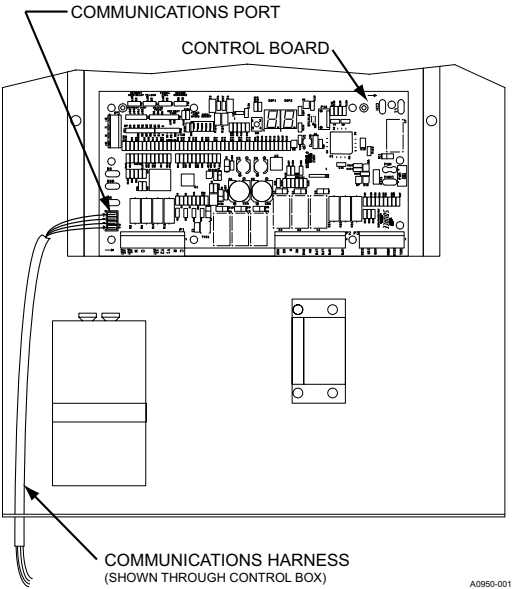


FIGURE 11: 2-Stage AC/Heat Pump - Outdoor Control Housing

TABLE 3: Outdoor Jumper Settings

Unit Control	Jumpers That Must Be Set
Heat Pump	Fossil Fuel: Set this jumper to ON if using a gas furnace.
Air Conditioner	No jumpers to set
Variable Capacity AC/HP	No jumpers to set

Variable Capacity Models

1. Disconnect all high-voltage power from the system.
2. Locate the factory-installed low-voltage wire harness at the bottom of the control box.
3. Connect the three low-voltage wires using wire connectors. See Figure 12 for the wiring diagram.

⚠ WARNING

DO NOT connect the R terminal from the thermostat to the unit control board.

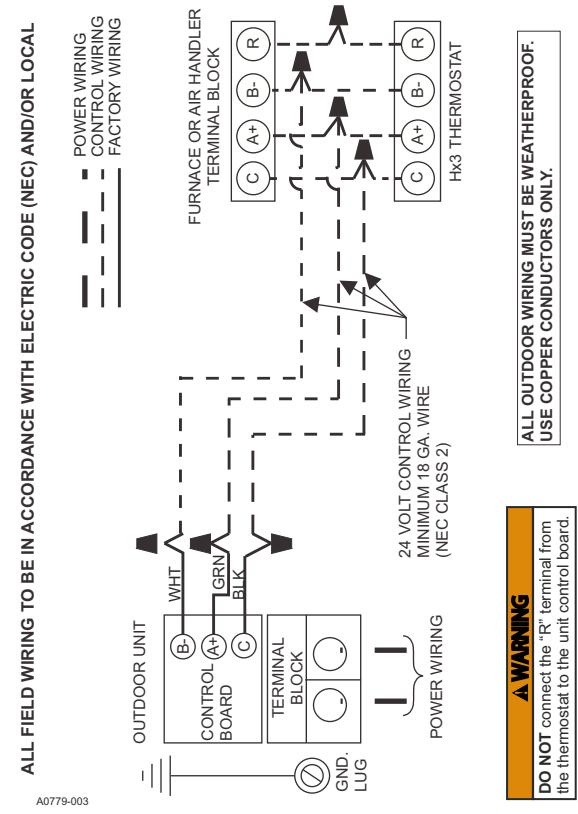


FIGURE 12: Typical Communicating Field Wiring - Variable Capacity Outdoor Unit

Indoor Control Wiring

IMPORTANT: DO NOT place more than one wire under any single communication terminal screw (there are four communication terminal screws). If more than one wire must be connected to a terminal screw, attach only the terminal end of a one-wire pigtail no longer than 6 in., and use a wire connector to connect the other end of the pigtail to the other wires. Failure to do this results in nuisance communication error faults. See Figure 13.

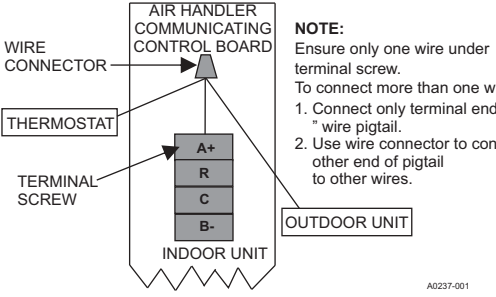


FIGURE 13: Multi-Wire Terminal Connection

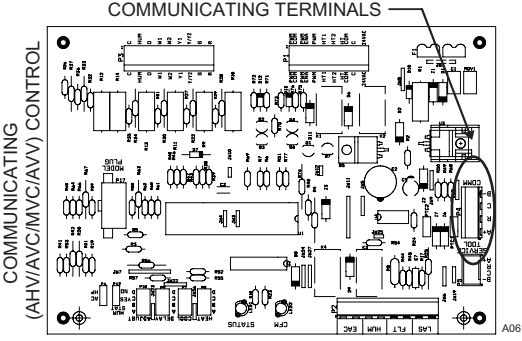


FIGURE 14: Communicating Indoor Controls - Air Handler

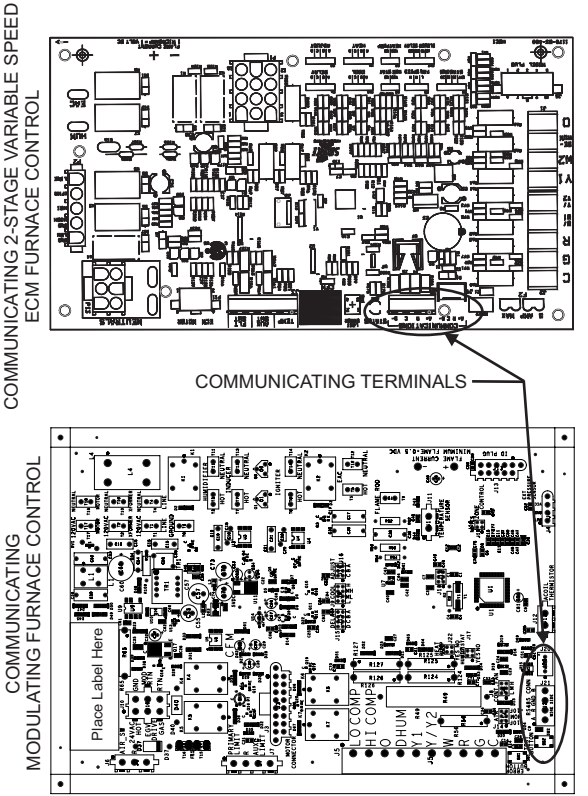


FIGURE 15: Communicating Indoor Controls - Furnaces

⚠ WARNING

ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury, death, or equipment damage. Before installing, modifying, or servicing the system, the main electrical disconnect switch must be in the OFF position. There may be more than one disconnect switch. Lock out and tag each switch with a suitable warning label.

Follow these steps:

1. Disconnect all high-voltage power from the system.
2. Connect the communicating control wiring to the indoor equipment as shown in Figure 13. Do not connect the indoor equipment R wire connection to variable capacity outdoor equipment.

NOTICE

Variable capacity AC and HP systems do not use an R wire to the outdoor unit.

NOTICE

The furnace control may be labeled so that C = GND.

3. Set the appropriate indoor jumper settings to ensure proper control functionality. If you do not set the relevant jumpers, the thermostat does not control all the functions you require, for example, dehumidification. See Table 4 and refer to the relevant equipment installation manual.

TABLE 4: Indoor Jumper Settings

Unit Control	Jumpers That Must Be Set
Modulating furnace	Heat Pump
	Humidistat
	Zone Control
Air handler (AHV)	Heat
	Cool
	Delay
	Adjust
	Hum Stat
	AC/HP
Air handler (AVC, AVV, MVC)	Heat
	Cool
	Delay
	Adjust
	Hum Stat
	AC/HP
Air handler (AV/MV)	Heat/No Heat
	Heat
	Cool
	Delay
	Adjust
	Hum Stat
	AC/HP
2-stage variable speed furnace	Heat
	Cool
	Delay
	Adjust
	Hum Stat
	Heat Pump

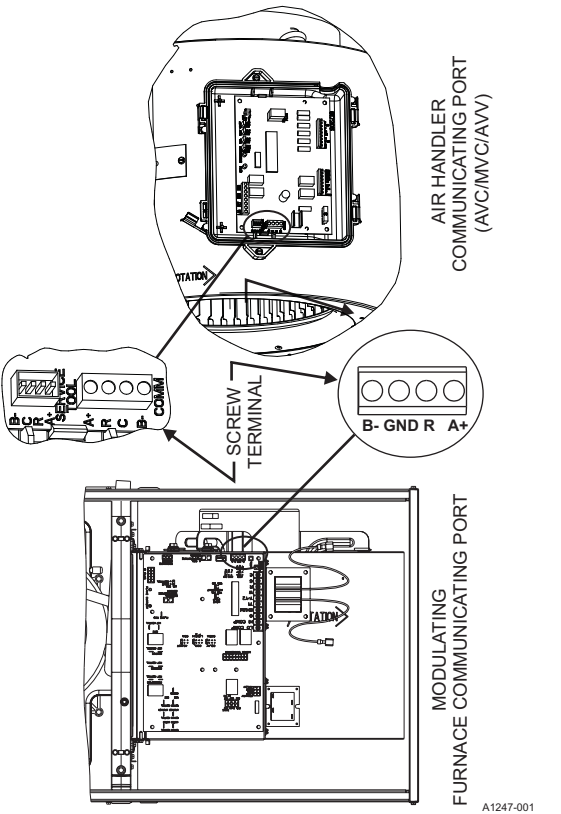


FIGURE 16: Indoor Screw Terminal Location

HUMIDIFIER CONNECTION

You can install a bypass or fan powered humidifier with the communicating system. Physically install the humidifier according to the instructions included with the humidifier. For information on the wiring of the humidifier, see the following figures.

NOTICE

Do Not Use a traditional humidistat to control humidifier operation. If a humidifier is installed, the thermostat can operate the humidifier.

Bypass Humidifier

Communicating Furnace

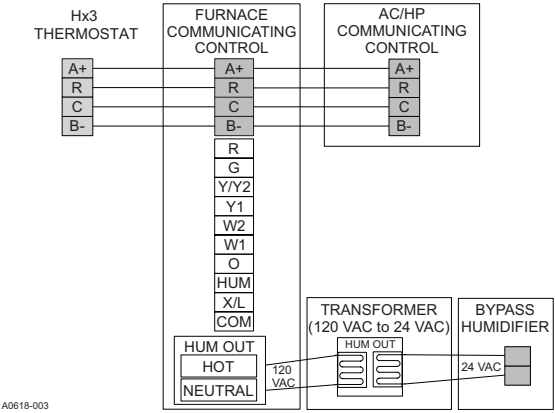


FIGURE 17: Furnace and Bypass Humidifier

NOTICE

Furnace or air handler humidifier terminals can be used to power a control relay if using a humidifier of the steam type. Line voltage power for a steam humidifier MUST be provided from an alternate power supply.

Communicating Air Handler

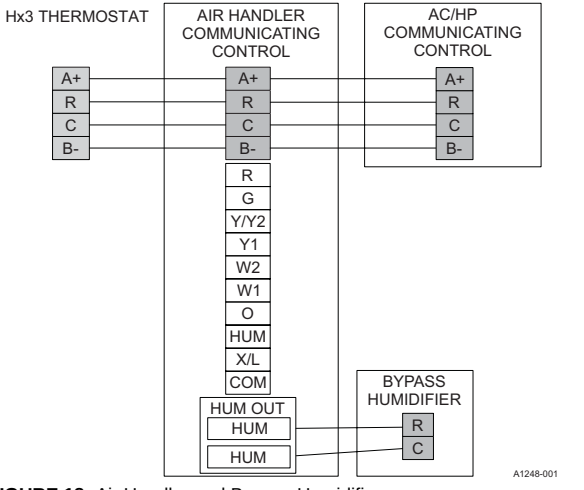


FIGURE 18: Air Handler and Bypass Humidifier

Fan Powered Humidifiers

Communicating Furnace

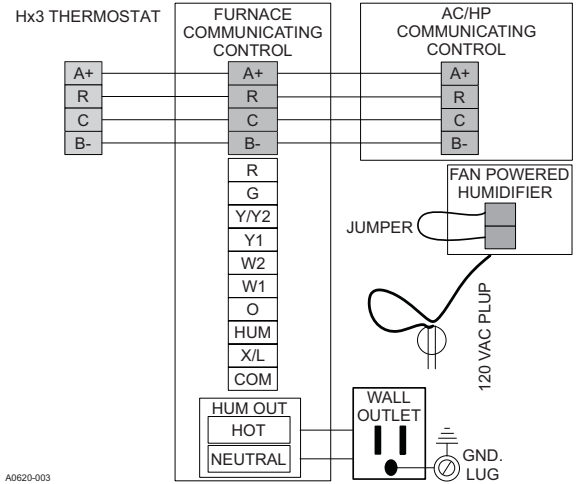


FIGURE 19: Furnace and Fan Powered Humidifier

⚠ WARNING

Do not exceed the recommended 1 Amp current limit on the 120 VAC HUM OUT connection or furnace control board damage will occur.

Communicating Air Handler

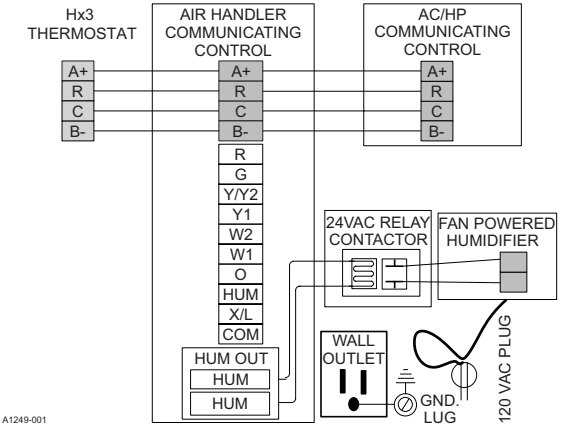


FIGURE 20: Air Handler and Fan Powered Humidifier

SECTION V: HUMIDIFICATION AND DEHUMIDIFICATION

This section outlines how the humidification and dehumidification functionality operates in communicating and conventional (non-communicating) systems.

The following tables show humidification and dehumidification options for each system type. For more information about humidification and dehumidification settings, see the System Settings Overview section.

TABLE 5: Humidification - Communicating and Conventional (Non-Communicating) Systems

Communicating Humidification Options	Conventional Humidification Options
No humidification: If you select the NO option for the humidifier in the general system settings, humidification operation does not occur.	No humidification: If you select the NO option for the humidifier in the general system settings, humidification operation does not occur.
Humidification with equipment: The HUM output sends power to the humidifier equipment if there is a demand for humidity and the heating equipment is actively heating. This option is only available if a humidifier is installed. Gas furnaces provide a 120 VAC output for a power humidifier or a control transformer if a bypass humidifier is used. Air handling units provide a 24 VAC output for a control relay for a humidifier. If a steam humidifier is used, the equipment HUM OUT connection is for a control relay only. In Auto mode, the indoor humidity setpoint is automatically adjusted in relation to the outdoor temperature.	Humidification with heat demand: The HUM output from the thermostat enables the humidifier equipment if there is a demand for humidity and the heating equipment is actively heating. This option is only available if a humidifier is installed. The HUM output is 24 VAC to power a control relay for a humidifier. In Auto mode, the indoor humidity setpoint is automatically adjusted in relation to the outdoor temperature.

TABLE 6: Dehumidification - Communicating and Conventional (Non-Communicating) Systems

Communicating Dehumidification Options	Conventional Dehumidification Options
No dehumidification: If you select the NO option for the dehumidifier in the general system settings, dehumidification operation does not occur.	No dehumidification: If you select the NO option for the dehumidifier in the general system settings, dehumidification operation does not occur.
Overcool 1°F, 2°F, or 3°F: When the dehumidify by overcooling function is used, the system operates the compressor (within limits) when there is a demand for dehumidification, even if there is no demand for cooling.	Overcool 1°F, 2°F, or 3°F: When the dehumidify by overcooling function is used, the system operates the compressor (within limits) when there is a demand for dehumidification, even if there is no demand for cooling.
Dehumidification with equipment: If there is a demand for dehumidification and the cooling equipment is actively cooling, the system reduces the indoor airflow by 15%. In Auto mode, the indoor humidity setpoint is automatically adjusted in relation to the indoor temperature.	N/A
Whole Home Dehumidifier: If there is a demand for dehumidification and no demand for cooling, the system will energize continuous fan airflow. A communication accessory control (S1-CVENTDEH01) is required in order for this option to be available.	N/A

SECTION VI: INITIAL POWER-UP

⚠ CAUTION

Failure to follow this caution may result in equipment damage. Do not power the system until you have confirmed that the wiring has been completed correctly (per this document).

Before you apply power, check that all wiring has been completed as directed in the installation instructions for the equipment in the system.

Once power is applied, return to the thermostat to complete the installation process.

POWER-UP

The Auto Setup screen displays on initial power-up. See Figure 21.

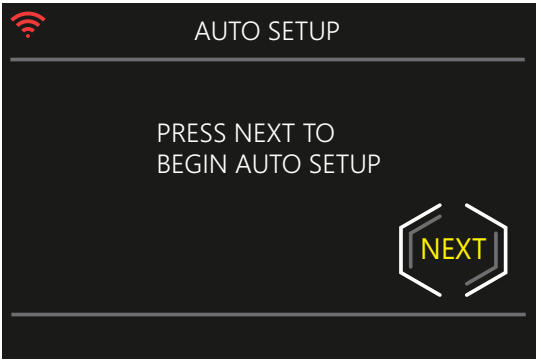


FIGURE 21: Power-Up - Auto Setup Screen

SYSTEM CONFIGURATION

When you tap **Next** on the Auto Setup screen, the thermostat begins a process to detect the system components and identify the indoor and outdoor communicating equipment. See Figures 22–25.

NOTICE

If the outdoor unit is a variable capacity model, apply power to the outdoor unit before the indoor unit.

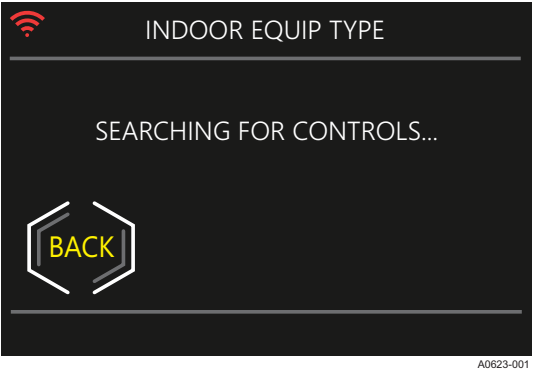


FIGURE 22: Control Search - Indoor Equipment

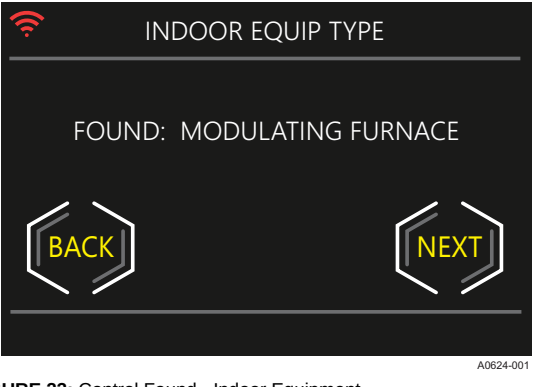


FIGURE 23: Control Found - Indoor Equipment

FIGURE 24: Control Search - Outdoor Equipment

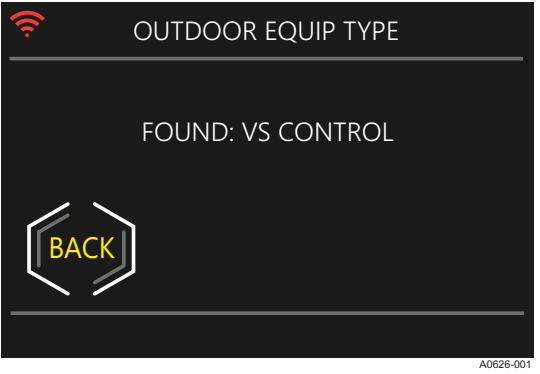


FIGURE 25: Control Found - Outdoor Equipment

You are directed through different configuration screens, depending on the system being configured.

In a communication system that includes a communicating variable speed air handler, heat kit configuration screens appear. See Figures 26–28.

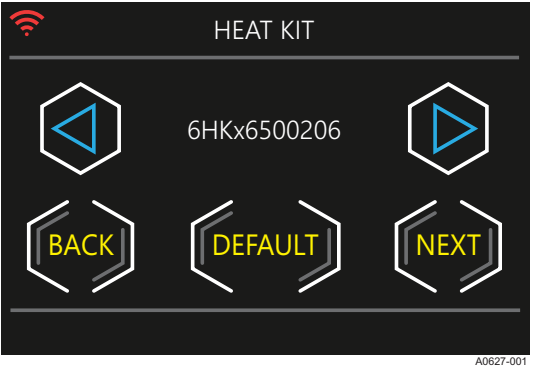


FIGURE 26: Heat Kit Configuration - Screen 1

If you select a 13 kW heat kit or larger, there are two available stages of electric heat. You must select the amount of electric heat that is applied during a first-stage (W1) heat call. During a second-stage (W2) heat call, the entire amount of electric heat available is applied. For a first-stage (W1) heat call, it is best practice to only use the appropriate amount of heat required to temper the air during an outdoor unit defrost cycle.

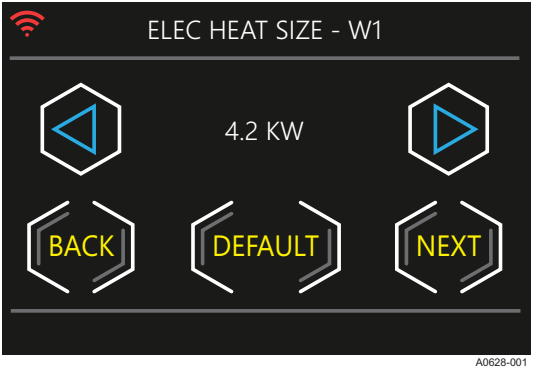


FIGURE 27: Heat Kit Configuration - Screen 2

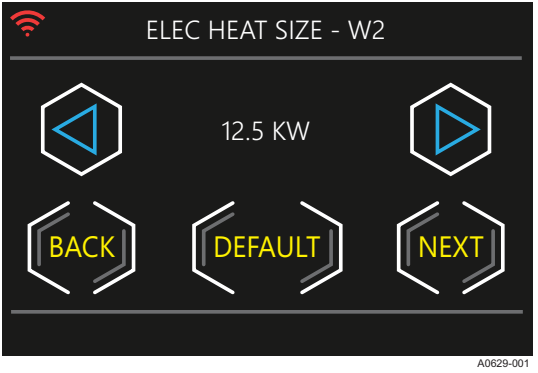


FIGURE 28: Heat Kit Configuration - Screen 3

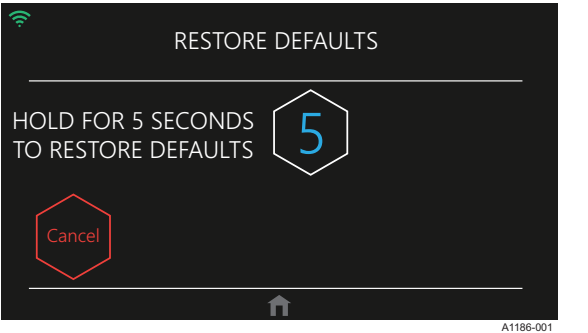


FIGURE 29: Restore Defaults

The System Summary screen appears during every system installation. This screen displays the equipment configuration.

NOTICE

During heating, the modulating furnace airflow is controlled by the ignition control, not the thermostat.

SOFTWARE UPDATES

NOTICE

Prior to any Over the Air (OTA) software updates, the thermostat MUST be connected to the homeowner's Wi-Fi.

When the initial power-up sequence is complete and the thermostat is connected to Wi-Fi, if a software update is available, an OTA software update begins. This occurs approximately 5 minutes after the thermostat is connected to Wi-Fi. See Figure 30.

When the OTA update is complete, if a communicating thermostat has *not* identified the indoor or outdoor controls, you ***MUST*** restore the thermostat defaults to complete the system configuration properly. See the System Configuration section for details.

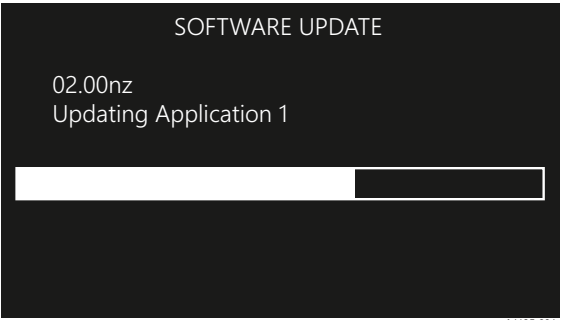


FIGURE 30: Software Update Screen Example

SECTION VII: SERVICE MODE

ACCESSING SYSTEM SETTINGS

To access the system settings of the thermostat, on the Settings screen, tap and hold the **Service** icon (for 5 seconds). See Figure 31.

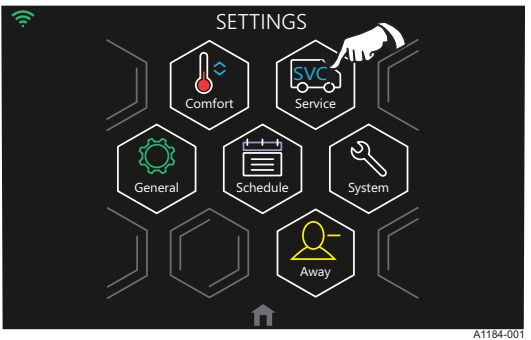


FIGURE 31: System Settings Access

⚠ CAUTION

Installer settings are designed for certified installation technicians and are not intended for homeowner use. Adverse system configurations may result in equipment damage and void equipment warranty.

SYSTEM SETTINGS

Depending on the equipment installed, the System Settings screen displays different user options.

Demand Response

IMPORTANT: The Demand Response setting is only available with variable capacity and 2-stage AC/HP. See Tables 9 and 10.

The Demand Response setting is located on the System Settings screen under installer settings. Demand Response allows the installer or utility service provider to choose how the thermostat operates when a demand response signal is active. When Demand Response is active, the thermostat updates the setpoint to the selected temperature value.

The available options are 4°F, 6°F, 8°F, 10°F, or Shut Down. The default setting is 4°F. The user can make setpoint changes when Demand Response is active. However, the temperature selection differential must be maintained.

System Settings Overview

The following tables provide a detailed overview of the system settings.

TABLE 7: General System Settings

Name	Default Setting	Available Settings	Explanation
Auto Allowed	Yes	Yes or No	Enables or disables the Auto mode feature
Prog or Non-Prog	Prog	Prog or Non-Prog	Controls whether the thermostat can run a schedule or not
Fahrenheit or Celsius	°F	°F or °C	Determines if thermostat temperatures are displayed in Fahrenheit or Celsius

TABLE 7: General System Settings (Continued)

Name	Default Setting	Available Settings	Explanation
Smart Recovery	Yes	Yes or No	Enables or disables smart recovery. Smart recovery is used in Programmable mode. The controller initiates equipment operation, if required before the start time of the program schedule day part. This is done to reach the desired temperature setpoint of the program schedule event at the time the event occurs, rather than after.
Fan On with W	No	Yes or No	Enables or disables Fan On with W. When enabled, this supplies a fan output demand as soon as a W1 or W2 output demand is active
Indoor Temp Offset	0°	-5°, -4°, -3°, -2°, -1°, 0°,1°, 2°, 3°, 4°, 5°	Allows you to adjust the displayed temperature to offset it from the measured temperature in the thermostat
Indoor Hum Offset	0%	-5%, -4%, -3%, -2%, -1%, 0%, 1%, 2%, 3%, 4%, 5%	Allows you to adjust the displayed humidity to offset it from the measured humidity in the thermostat
Auto Changeover	30 MIN	5 MIN, 10 MIN, 15 MIN, 20 MIN, 25 MIN, 30 MIN	Sets the minimum time that must elapse between switches from heat-to-cool to cool-to-heat demands when operating in Auto mode
Remote Sensor	None	None, Indoor, Outdoor, Average	If you opt to use the remote sensor, you can set it to sense the indoor room temperature or the outdoor temperature. If you select the Average option, the onboard temperature sensor and the connected sensor are averaged to determine the room temperature on the thermostat.
Cool Lockout	OFF	OFF, 55°F, 60°F, 65°F, 70°F, 75°F, 80°F	When enabled, this setting prevents cooling operation when the outdoor temperature drops below the selected temperature.
Time Between Fuel Types	15 MIN	10 MIN, 15 MIN, 20 MIN, 25 MIN	Sets the minimum time limit between the switch from one fuel type to another

TABLE 7: General System Settings (Continued)

Name	Default Setting	Available Settings	Explanation
Cycles per Hour	4	4 or 6	This timer is set to four cycles per hour. Fifteen minutes must elapse from the start of one cycle before another can start. A setting of six cycles per hour requires 10 minutes before the next cycle.
Humidifier	No	Yes or No	Enables or disables the humidifier. The thermostat only activates the humidifier if there is a demand for heating and humidity.
Dehumidifier	No	NO, OVERCOOL 1°F, OVERCOOL 2°F, OVERCOOL 3°F, WITH EQUIPMENT	If the NO option is selected, no dehumidification operation occurs. If you select one of the OVERCOOL options, the thermostat continues to run cooling up to 1°F, 2°F, or 3°F below the setpoint to meet the humidity setting of the home. The WITH EQUIPMENT option only applies to communicating systems. The Humidistat Jumper setting on the thermostat must be set to YES. The control reduces the indoor airflow by 15% if there is a demand for both cooling and dehumidification.
Max Heat Setpoint	88°	50°F to 88°F	Allows you to define the maximum heating setpoint that is available
Min Cool Setpoint	52°F	52°F to 90°F	Allows you to define the minimum cooling setpoint that is available
AUX Heat Lockout	Off	Off, 5°F, 10°F, 15°F, 20°F, 25°F, 30°F, 35°F, 40°F, 45°F, 50°F, 55°F	Applies to CONVENTIONAL ONLY. Allows you to specify an auxiliary heat lockout temperature. If the outdoor ambient temperature is greater than the selected auxiliary heat lockout temperature, the auxiliary heat (W1 and W2) outputs are not energized.

TABLE 7: General System Settings (Continued)

Name	Default Setting	Available Settings	Explanation
HP Lockout	Off	Off, 5°F, 10°F, 15°F, 20°F, 25°F, 30°F, 35°F, 40°F, 45°F, 50°F, 55°F	Applies to CONVENTIONAL ONLY. If Off is selected, the heating equipment cycle always starts with the heat pump, regardless of the outdoor air temperature. If you select a lockout temperature, and the outdoor air temperature is less than the selected temperature, the heating cycle starts with the AUX Heat source. If the outdoor air temperature is equal to or greater than the selected temperature, the heating cycle starts with the heat pump.
Stage Delay	10 MIN (120 MIN for Variable Capacity)	2-15 MIN (2-120 MIN for Variable Capacity) in 1 minute increments	Defines the minimum amount of time for which a stage must be energized before the thermostat stages up to the next stage of capacity
Forced Stage Up	30 MIN (360 MIN for Variable Capacity)	OFF-120 MIN (OFF-360 MIN for Variable Capacity) in 10 minute increments	Allows you to specify a forced stage-up time. If the time in a demanded stage reaches the selected forced stage-up time, the thermostat stages up to the next available stage of capacity (even if differential demand is not met).
Differential	0.5°F	0.3°F, 0.4°F, 0.5°F, 0.6°F, 0.7°F, 0.8°F, 0.9°F, 1.0°F, 1.1°F, 1.2°F, 1.3°F, 1.4°F, 1.5°F, 1.6°F, 1.7°F, 1.8°F, 1.9°F, 2.0°F	Defines the differential. This is the required difference between the current room temperature and the setpoint before demand is initiated. This value is additive for each additional stage of equipment that is demanded.
Air Filter Reminder	3000 HRS	OFF to 15,000 HRS	Allows you to define how many hours elapse before a system event occurs to remind the homeowner to change the indoor air filter

TABLE 7: General System Settings (Continued)

Name	Default Setting	Available Settings	Explanation
Line Frequency	60 HZ	50 HZ or 60 HZ	Used to ensure the thermostat operation timers are accurate and allow for preemptive control if a power-out occurs. The thermostat uses the line frequency as a timing source for the timers it controls. If you choose the incorrect line frequency, the timers are inaccurate. For example, if you select the 50 Hz option when operating on a 60 Hz power grid, a timer that is normally 5 minutes is 6 minutes. Similarly, if you select the 60 Hz option when operating on a 50 Hz power grid, a timer that is normally 6 minutes is 5 minutes. If the correct line frequency is selected and the timers are not accurate, this may be due to an impending power cycle or an abnormality in the power quality.
Brands	York	None, York, Coleman, Luxaire, Champion, Fraser-Johnson	Allows you to specify which brand displays on the Sleep screen

TABLE 8: Communicating System Settings

Name	Default Setting	Available Settings	Explanation
UV Lamp Reminder	Off	OFF to 15,000 HRS	If a UV lamp is installed, this allows you to define how many hours elapse before a system event occurs to remind the homeowner to clean the UV lamp.
EAC Reminder	Off	OFF to 15,000 HRS	If an Electronic Air Cleaner (EAC) is installed, this allows you to define how many hours elapse before a system event occurs to remind the homeowner to clean the EAC.
Delay Profiles	Normal	Normal, Humid, Dry, Temperate	This setting controls the indoor fan motor rampup and rampdown profiles in Cool mode. The Normal option is the default. The Humid option provides dehumidification at the start of the cooling cycle. The Dry option prevents dehumidification at the end of the cooling cycle. The Temperate option is appropriate for locations that are slightly drier than normal. The fan speed in Heat mode is not affected by this setting.
Humidistat Jumper	No	Yes or No	Enables or disables the Humidistat jumper. This setting affects Cool mode only. When the jumper is set to YES and there is a demand for dehumidification, the indoor CFM is reduced by 15%.
Efficiency Fault	Disabled	Disabled or Enabled	Enables or disables the display of efficiency faults on the Home screen. Efficiency faults cause reduced system output but do not stop the equipment from running. Disabled faults are logged but are not displayed on the Home Screen Banner.
Warning Fault	Disabled	Disabled or Enabled	Enables or disables the display of warning faults on the Home screen. Disabled faults are logged but are not displayed on the Home Screen Banner.
Status Fault	Disabled	Disabled or Enabled	Enables or disables the display of status faults on the Home screen. Status faults do not harm or stop equipment operation. Disabled faults are logged but are not displayed on the Home Screen Banner.

TABLE 9: System Settings: Variable Capacity Systems

Name	Default Setting	Available Settings	Explanation
AUX Heat Lockout	OFF	OFF, 5°F, 10°F, 15°F, 20°F, 25°F, 30°F, 35°F, 40°F, 45°F, 50°F, 55°F	Allows you to specify an auxiliary heat lockout temperature. If the outdoor ambient temperature is greater than the selected auxiliary heat lockout temperature, the auxiliary heat (W1 and W2) outputs are not energized.
HP Lockout	OFF	OFF, 5°F, 10°F, 15°F, 20°F, 25°F, 30°F, 35°F, 40°F, 45°F, 50°F, 55°F	If OFF is selected, the heating equipment cycle always starts with the heat pump, regardless of the outdoor air temperature. If you select a lockout temperature, and the outdoor air temperature is less than the selected temperature, the heating cycle starts with the AUX Heat source. If the outdoor air temperature is equal to or greater than the selected temperature, the heating cycle starts with the heat pump.
Comfort/ Efficiency	Efficiency	Comfort or Efficiency	Used to determine how quickly the compressor ramps up to meet setpoint
Heating Airflow Adjust	0%	-10%, -5%, 0%, 5%, 10%	Allows you to adjust the heating airflow CFM by plus/minus 5% or 10%
Cooling Airflow Adjust	0%	-10%, -5%, 0%, 5%, 10%	Allows you to adjust the cooling airflow CFM by plus/minus 5% or 10%
Climate	Normal	Normal, Humid, Dry	Adjusts the indoor fan motor maximum speed in Cool mode. The Normal option is the default. The Humid option reduces the max fan CFM by 10%. The Dry option increases the max fan speed by 10%. The fan speed in Heat mode is not affected by this setting.
Defrost Temp	50°F	50°F, 60°F, 70°F, or 80°F	If necessary, you can increase this temperature setpoint for more aggressive defrost operation.
Demand Response	Disabled	Disabled, Enabled (Open), Enabled (Closed)	Enables or disables the Demand Response feature
Demand Resp Action	4°F	4°F, 6°F, 8°F, 10°F, Shut Down	When Demand Response is active, the setpoint updates to the selected temperature value or the equipment shuts down. The setpoint can be raised or lowered when the event is active, but the temperature selection differential must be maintained.

TABLE 10: System Settings: 2-Stage AC/HP Systems

Name	Default Setting	Available Settings	Explanation
Balance Point	35°F	0°F, 10°F, 15°F, 20°F, 25°F, 30°F, 35°F, 40°F, 45°F	Prevents the operation of auxiliary heat above the specified temperature
Low Temperature Cutout (LTCO)	ON	ON, -20°F, -10°F 0°F, 10°F, 15°F, 20°F, 25°F, 30°F, 35°F	Prevents compressor operation below the specified temperature
Switch Point	35°F	35°F, 40°F, 45°F	Works in conjunction with the Forced Second Stage feature of the hot heat pump to allow more comfort
Compressor Delay	OFF	OFF or ON	Enables or disables the Compressor Delay feature. This feature allows for smooth transitions and proper cycling of the reversing valve.
Hot Heat Pump	OFF	OFF or ON	Enables or disables the Hot Heat Pump feature. This feature provides increased discharge air temperatures by reducing indoor blower speed while forcing the outdoor unit into a higher stage for increased comfort.
Y2 Lock	OFF	OFF or ON	Enables or disables the Y2 Lock feature. This feature only applies to second-stage compressor operation that is initiated based on the thermostat signals. This feature does not apply to the Hot Heat Pump functionality.
Defrost Temp	70°F	50°F, 60°F, 70°F, 80°F	If necessary, you can increase this temperature setpoint for more aggressive defrost operation.
Fossil Fuel	OFF	OFF or ON	The jumper can be set to ON or OFF. The jumper is in the ON position for a fossil fuel furnace installation.
Demand Response	Disabled	Disabled, Enabled (Open), Enabled (Closed)	Enables or disables the Demand Response feature
Demand Response Action	4°F	4°F, 6°F, 8°F, 10°F, Shut Down	When Demand Response is active, the thermostat updates the setpoint to the selected temperature value.

TABLE 11: Float Switch Settings (AHV, AVC, MVC, AVV, and 2-Stage Variable Speed ECM Furnace)

Name	Default Setting	Available Settings	Explanation
Float Switch	Disabled	Enabled (Open), Enabled (Closed), Disabled	Allows you to activate an optional condensate float switch (S1-ACS2). If a normally closed (NC) switch is used, choose Enabled (Open). If a normally open (NO) switch is used, choose Enabled (Closed).

TABLE 12: Auxiliary Settings (2-Stage Variable Speed ECM Furnace)

Name	Default Setting	Available Settings	Explanation
AUX Switch	Disabled	Enabled (Open), Enabled (Closed), Disabled	Allows you to activate the optional dry relay contact that is supplied by the utility company
AUX Switch: Heat	Stage Down	Stage Down or Shut Off Comp	Allows you to determine the equipment functionality when the AUX switch is activated
AUX Switch: Cool	Stage Down	Stage Down or Shut Off Comp	Allows you to determine the equipment functionality when the AUX switch is activated

FAULTS AND SYSTEM EVENTS

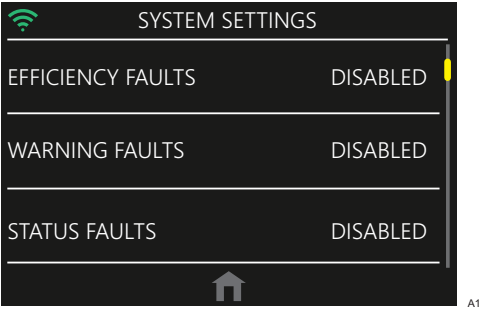


FIGURE 32: Fault Display Settings

Use this screen to enable or disable the display of faults on the Home screen. There are four categories of equipment faults. See Table 13.

TABLE 13: Fault Categories

Category	Default	Settings	Explanation
Critical	N/A	N/A	Faults that stop equipment operation
Efficiency	Disable	Disable or Enable	Faults that cause reduced system output but do not stop the equipment from running. Disabled faults are logged but are not displayed on the Home Screen Banner.
Warning	Disable	Disable or Enable	Disabled faults are logged but are not displayed on the Home Screen Banner.
Status	Disable	Disable or Enable	Faults that do not harm or stop equipment operation. Disabled faults are logged but are not displayed on the Home Screen Banner.

The following tables provide a detailed overview of equipment faults. See Table 13 for an explanation of the fault categories and their severity.

TABLE 14: Thermostat

Fault (Displayed Text)	Description	Category
COMM ERROR OD CTRL	There was no response from the device within 10 seconds of the primary control's query after communicating prior.	Critical
COMM ERROR ID CTRL	There was no response from the device within 10 seconds of the primary control's query after communicating prior.	Critical
ID TEMP SENSOR HIGH	Temperature reading is > 122°F	Efficiency
ID TEMP SENSOR LOW	Temperature reading = 0 or reading is not available	Efficiency
REMOTE SENSOR HIGH	Remote temperature is > 122°F. This is only flagged if the remote sensor is set to sense the indoor temperature (that is, if the Indoor or Average option is selected).	Efficiency
REMOTE SENSOR LOW	Remote temperature = 0. This is only flagged if the remote sensor is set to sense the indoor temperature (that is, if the Indoor or Average option is selected).	Efficiency

TABLE 14: Thermostat (Continued)

Fault (Displayed Text)	Description	Category
HUM TEMP SENSOR HIGH	Humidity sensor temperature > 122°F. This is only flagged if using humidity temperature as a backup source during a fault condition with the primary temperature sensor.	Efficiency
HUM TEMP SENSOR LOW	Humidity sensor temperature = 0. This is only flagged if using humidity temperature as a backup source during a fault condition with the primary temperature sensor.	Efficiency
ID TEMP RANGE HIGH	Indoor temperature is > 99.0°F	Efficiency
ID TEMP RANGE LOW	Indoor temperature is < 40.0°F	Efficiency
HUM SENSOR FAILURE	Humidity sensor timed out. Humidity reading is > 99% or humidity reading = 0	Efficiency
HUMIDITY RANGE HIGH	Humidity reading is > 90%	Efficiency
HUMIDITY RANGE LOW	Humidity reading is < 10%	Efficiency
OUTDOOR SENSOR FAILURE	OD temperature is > 127°F or < -60°F	Efficiency
NOT CONNECTED TO SERVER	Not connected to Ayla server	Status
NOT CONNECTED TO ROUTER	Router signal strength is 0 bars (not connected)	Status
WIFI HARDWARE FAULT	Communications error occurred with Wi-Fi module (resets after valid message received)	Status
PROXIMITY HARDWARE FAULT	N/A	Status
NFC COMMUNICATIONS FAULT	N/A	Status

TABLE 15: Air Handler (AHV, MV, AVC, MVC, AVV)

Fault (Displayed Text)	Description	Category
INDOOR: NO MODEL PLUG	ID plug is not present or not connected properly. Check for loose plug or loose wires in plug.	Critical
INDOOR: CONTROL FAILURE RECOVERY	Control recovered from internal error	Critical
INDOOR: CONTROL FAILURE	Control failure	Critical
INDOOR: HEAT & COOL CALLS SAME TIME	Simultaneous call for heating and cooling	Efficiency
INDOOR: CONTROL IN TEST MODE	Control is in test mode	Efficiency

TABLE 16: Modulating Furnace

Fault (Displayed Text)	Description	Category
FURNACE: FLAME W/OUT POWER	Flame is present with no power being supplied to gas valve. This can be caused by a gas valve that is slow to close or that leaks gas through to the burners.	Critical
FURNACE: HIGH LIMIT OPEN	High limit switch or 24 V fuse is open. This can be caused by restricted airflow or an open fuse.	Critical
FURNACE: ROLLOUT OR AUX OPEN	Rollout or auxiliary switch open. Reset the rollout switch if possible. Check the limit switch in the air blower housing.	Critical
FURNACE GAS VALVE FAILURE	Current failure on modulating gas valve	Critical
FURNACE: SUPPLY PWR REVERSED	Reversed line polarity or improper grounding. Check the polarity of incoming power and grounding. Check the transformer.	Critical
FURNACE: GAS VALVE CIRCUIT SHORT	Gas valve circuit shorted. Check the gas valve wiring. If correct, replace the gas valve.	Critical
FURNACE: BLOWER FAILURE	Main blower failure	Critical
FURNACE: NO MODEL PLUG	ID plug is not present or not connected properly. Check for loose plug or loose wires in plug.	Critical
FURNACE: JUMPER ERROR	Jumper error	Critical
FURNACE: PRESSURE SWITCH OPEN	Stuck open pressure switch indicates that the pressure switch is open when it should be closed	Critical
FURNACE: IGNITION FAILED	Lockout due to no ignition. Check gas supply, ignitor, gas valve, and flame sensor.	Critical
FURNACE: MULTI FLAME DROPOUTS	Lockout due to too many flame recycles. This can be caused by a faulty gas valve, low gas pressure, or a dirty flame sensor.	Critical

TABLE 16: Modulating Furnace (Continued)

Fault (Displayed Text)	Description	Category
FURNACE: PRESSURE SWITCH CLOSED	Pressure switch closed with inducer pressure below pressure switch set-point (switch is closed when it should be open). Check pressure switch.	Efficiency
FURNACE: SOFT LIMIT WARNING	Soft limit warning	Efficiency
FURNACE: AIR BLOCK-AGE WARNING	Air blockage warning	Efficiency
FURNACE: UNKNOWN FAILURE	Unknown failure	Efficiency
FURNACE: FLAME ROD AGE WARNING	Flame rod age warning	Efficiency

TABLE 17: 2-Stage Furnace

Fault (Displayed Text)	Description	Category
FURNACE: FLAME W/OUT POWER	Flame sensed with gas valve off	Critical
FURNACE: LIMIT/ROLL-OUT OPEN	Limit/Rollout switch open	Critical
FURNACE: LIMIT/ROLL-OUT OPEN 15 MIN	Limit/Rollout switch open for more than 15 minutes	Critical
FURNACE: PRESSURE SWITCH LOCKOUT	Pressure switch cycle lockout	Critical
FURNACE: SUPPLY PWR REVERSED	Incorrect line voltage polarity	Critical
FURNACE: GAS VALVE CIRCUIT SHORT	Gas valve circuit shorted	Critical
FURNACE: LIMIT/ROLL-OUT OPEN 5 MIN	Limit/Rollout switch open from 5 minutes to 15 minutes	Critical
FURNACE: NO MODEL PLUG	ID plug is missing or not connected properly	Critical
FURNACE: CONTROL FAILURE	Control failure	Critical
FURNACE: PRESSURE SWITCH OPEN	Pressure switch open with inducer on	Critical
FURNACE: IGNITION FAILED	Lockout due to failed ignition	Critical
FURNACE: MULTI FLAME DROPOUTS	Lockout due to too many flame drop-outs	Critical
FURNACE: PRESSURE SWITCH CLOSED	Pressure switch closed with inducer off	Efficiency
FURNACE: 2S PRESSURE SWITCH OPEN	Second-stage pressure switch open with high inducer on	Efficiency
FURNACE: FLAME ROD AGE WARNING	Flame rod warning	Efficiency
FURNACE: Y WITHOUT G	Y thermostat demand without a G	Status

TABLE 18: Indoor AUX

Fault (Displayed Text)	Description	Category
INDOOR: CONTROL FAILURE	Control failure	Critical
INDOOR: LOW VOLTAGE (<16 VAC)	Low voltage (below 16 VAC) stopped current relay outputs	Critical
OUTDOOR: LOW VOLTAGE(< 19 VAC)	Low voltage (below 19.2 VAC) preventing further relay outputs	Warning
INDOOR: X/L INPUT-FLASH 1	X/L Input Status-FLASH 1	Status
INDOOR: X/L INPUT-FLASH 2	X/L Input Status-FLASH 2	Status
INDOOR: X/L INPUT-FLASH 3	X/L Input Status-FLASH 3	Status
INDOOR: X/L INPUT-FLASH 4	X/L Input Status-FLASH 4	Status
INDOOR: X/L INPUT-FLASH 5	X/L Input Status-FLASH 5	Status
INDOOR: X/L INPUT-FLASH 6	X/L Input Status-FLASH 6	Status
INDOOR: X/L INPUT-FLASH 7	X/L Input Status-FLASH 7	Status
INDOOR: X/L INPUT-FLASH 8	X/L Input Status-FLASH 8	Status
INDOOR: X/L INPUT-FLASH 9	X/L Input Status-FLASH 9	Status
INDOOR: X/L INPUT-CONSTANT	N/A	Status

TABLE 19: AC

Fault (Displayed Text)	Description	Category
OUTDOOR: HPS LOCK-OUT	System is in high pressure switch lock-out	Critical
OUTDOOR: CONTROL FAILURE	Control failure	Critical
OUTDOOR: LPS LOCK-OUT	System is in low pressure switch lock-out	Critical
OUTDOOR: LOW VOLT-AGE(< 16 VAC)	Low voltage (below 16.0 VAC) stopped current relay outputs	Critical
OUTDOOR: COMPRES-SOR MISWIRE	Compressor contactor miswire	Critical
OUTDOOR: Y2 W/O Y1-SOFT LOCKOUT	Y2 present without Y1	Efficiency
OUTDOOR: HPS OPEN W/O COMPRESSOR	HPS is open with no call for compressor	Efficiency
OUTDOOR: LOW VOLT-AGE(< 19 VAC)	Low voltage (below 19.2 VAC) prevent-ing further relay outputs	Warning
OUTDOOR: AMBIENT SENSOR SHORTED	Outdoor ambient temperature sensor failure (shorted)	Warning
OUTDOOR: AMBIENT SENSOR OPEN	Outdoor ambient temperature sensor failure (open)	Warning

TABLE 20: Variable Capacity Control

Fault (Displayed Text)	Description	Category
OUTDOOR: HPS SOFT LOCK-OUT-NORMAL	High pressure switch lock-out. The last mode of opera-tion was normal compressor.	Critical
OUTDOOR: HPS HARD LOCK-OUT-NORMAL	High pressure switch lock-out. The last mode of opera-tion was normal compressor.	Critical
OUTDOOR: HPS SOFT LOCK-OUT-DEFROST	High pressure switch lock-out. The last mode of opera-tion was defrost.	Critical
OUTDOOR: HPS HARD LOCK-OUT-DEFROST	High pressure switch lock-out. The last mode of opera-tion was defrost.	Critical

TABLE 20: Variable Capacity Control (Continued)

Fault (Displayed Text)	Description	Category
OUTDOOR: LOW VOLTAGE (< 19VAC)	Low voltage (below 19 VAC) stopped current relay outputs for > 2 seconds	Critical
OUTDOOR: COMM LOST INVERTER DRIVE	Inverter control communications fault	Critical
OUTDOOR: COMM LOST- SYSTEM MASTER	RS-485 communications lost	Critical
OUTDOOR: AMBIENT SENSOR SHORTED	Outdoor ambient sensor failure (shorted)	Critical
OUTDOOR: AMBIENT SENSOR OPEN	Outdoor ambient sensor failure (open)	Critical
OUTDOOR: COIL TEMP SENSOR SHORTED	Coil sensor failure (shorted)	Critical
OUTDOOR: COIL TEMP SENSOR SHORTED-SOFT LOCKOUT	Coil sensor failure (shorted)	Critical
OUTDOOR: COIL TEMP SENSOR OPEN	Coil sensor failure (open)	Critical
OUTDOOR: COIL TEMP SENSOR OPEN-SOFT LOCKOUT	Coil sensor failure (open)	Critical
OUTDOOR: LIQUID TEMP SENSOR SHORTED	Liquid line temperature sensor failure (shorted)	Critical
OUTDOOR: LIQUID TEMP SENSOR SHORTED-SOFT LOCKOUT	Liquid line temperature sensor failure (shorted)	Critical
OUTDOOR: LIQUID TEMP SENSOR OPEN	Liquid line temperature sensor failure (open)	Critical
OUTDOOR: LIQUID TEMP SENSOR OPEN-SOFT LOCKOUT	Liquid line temperature sensor failure (open)	Critical
OUTDOOR: DISCHARGE TEMP SENSOR SHORTED	Discharge temperature sensor failure (shorted)	Critical
OUTDOOR: DISCHARGE TEMP SENSOR OPEN	Discharge temperature sensor failure (open)	Critical
OUTDOOR: DISCHARGE TEMP SENSOR OPEN-SOFT LOCKOUT	Discharge temperature sensor failure (open)	Critical
OUTDOOR: SUCTION TEMP SENSOR SHORTED	Suction temperature sensor failure (shorted)	Critical

TABLE 20: Variable Capacity Control (Continued)

Fault (Displayed Text)	Description	Category
OUTDOOR: SUCTION TEMP SENSOR SHORTED-SOFT LOCKOUT	Suction temperature sensor failure (shorted)	Critical
OUTDOOR: SUCTION TEMP SENSOR OPEN	Suction temperature sensor failure (open)	Critical
OUTDOOR: SUCTION TEMP SENSOR OPEN-SOFT LOCKOUT	Suction temperature sensor failure (open)	Critical
OUTDOOR: DISCHARGE PRESSURE SENSOR LOW VOLTAGE	Discharge pressure sensor failure (low voltage)	Critical
OUTDOOR: DISCHARGE PRESSURE SENSOR LOW VOLTAGE-SOFT LOCKOUT	Discharge pressure sensor failure (low voltage)	Critical
OUTDOOR: DISCHARGE PRESSURE SENSOR HIGH VOLTAGE	Discharge pressure sensor failure (high voltage)	Critical
OUTDOOR: DISCHARGE PRESSURE SENSOR HIGH VOLTAGE-SOFT LOCKOUT	Discharge pressure sensor failure (high voltage)	Critical
OUTDOOR: SUCTION PRESSURE SENSOR LOW VOLTAGE-SOFT LOCKOUT	Suction pressure sensor failure (low voltage)	Critical
OUTDOOR: SUCTION PRESSURE SENSOR HIGH VOLTAGE-SOFT LOCKOUT	Suction pressure sensor failure (high voltage)	Critical
OUTDOOR: W & O INPUTS-HP MODE – SOFT LOCKOUT	W and O signal received in HP mode	Critical
OUTDOOR: HIGH DISCHARGE TEMP - SOFT LOCKOUT	High discharge temperature	Critical
OUTDOOR: HIGH DISCHARGE TEMP - HARD LOCKOUT	High discharge temperature	Critical
OUTDOOR: LOW SUCTION PRESSURE	Low suction pressure	Critical
OUTDOOR: LOW SUCTION PRESSURE - SOFT LOCKOUT	Low suction pressure	Critical
OUTDOOR: LOW SUCTION PRESSURE - HARD LOCKOUT	Low suction pressure	Critical
OUTDOOR: MULTIPLE INVERTER FAULTS-SOFT LOCKOUT	Multiple inverter faults	Critical

TABLE 20: Variable Capacity Control (Continued)

Fault (Displayed Text)	Description	Category
OUTDOOR: HPS OPEN	High pressure switch fault (not in lockout yet)	Efficiency
OUTDOOR: PIPE FREEZE TIMER ACTIVE	Pipe freeze timer expiration	Efficiency
OUTDOOR: HIGH SUPERHEAT	High superheat	Efficiency
OUTDOOR: LOW SUPERHEAT	Low superheat	Efficiency
OUTDOOR: HIGH DISCHARGE TEMP	High discharge temperature	Warning
OUTDOOR: LOW VOLTAGE (< 22 VAC)	Low voltage (below 22.2 VAC) preventing further relay outputs for > 2 seconds	Warning
OUTDOOR: O INPUT-AC MODE	O signal received in AC mode	Warning
OUTDOOR: W & O INPUTS-AC MODE	W and O signal received in AC mode	Warning
OUTDOOR: LOW SUCTION PRESSURE	Low suction pressure	Warning
OUTDOOR: LOW DISCHARGE TEMP	Low discharge temperature	Warning
OUTDOOR: LOW SYSTEM CHARGE	Low system charge	Warning
OUTDOOR: HIGH SYSTEM CHARGE	High system charge	Warning
OUTDOOR: DEMAND RESPONSE	Demand response	Status

TABLE 21: Variable Capacity Inverter Control

Fault (Displayed Text)	Description	Category
INVERTER: COMPRESSOR PHASE OVER CURRENT	Compressor phase over current	Critical
INVERTER: AC INPUT OVER CURRENT	AC input over current	Critical
INVERTER: DC BUS OVER VOLTAGE	DC bus over voltage	Critical

TABLE 21: Variable Capacity Inverter Control (Continued)

Fault (Displayed Text)	Description	Category
INVERTER: DC BUS UNDER VOLTAGE	DC bus under voltage	Critical
INVERTER: AC INPUT OVER VOLTAGE	AC input over voltage	Critical
INVERTER: AC INPUT UNDER VOLTAGE	AC input under voltage	Critical
INVERTER: POWER MODULE OVER TEMP	Power module over temperature	Critical
INVERTER: PFC-IGBT OVER TEMP	PFC-IGBT over temperature	Critical
INVERTER: LOST ROTOR POSITION	Lost rotor position	Critical
INVERTER: COMPRESSOR PHASE CURRENT IMBALANCE	Compressor phase current imbalance	Critical
INVERTER: MICROELECTRONIC FAULT	Microelectronic fault	Critical
INVERTER: POWER MODULE TEMP LOW/SENSOR OPEN	Power module temperature low or sensor open fault	Critical
INVERTER: COMM ERROR	Modbus communication lost	Critical
INVERTER: PFC MCU & DSP COMM ERROR	PFC MCU and DSP communication lost	Critical
INVERTER: COM MCU & DSP COMM ERROR	COM MCU and DSP communication lost	Critical
INVERTER: PFC-IGBT LOW TEMP/SENSOR OPEN	PFC-IGBT temperature low or sensor open fault	Critical
INVERTER: COMPRESSOR MODEL CONFIG ERROR	Compressor model configuration error	Critical
INVERTER: HPS CONFIG ERROR	High pressure sensor type configuration error	Critical
INVERTER: DLT CONFIG ERROR	DLT sensor configuration error	Critical

TABLE 21: Variable Capacity Inverter Control (Continued)

Fault (Displayed Text)	Description	Category
INVERTER: FAULT LIMIT LOCKOUT	Fault limit lockout	Critical
INVERTER: POWER MODULE HIGH TEMP	Power module temperature high	Critical
INVERTER: PFC-IGBT HIGH TEMP	PFC-IGBT high temperature	Critical
INVERTER: COMPRESSOR PHASE CURRENT FOLDBACK	Compressor phase current foldback timeout	Efficiency
INVERTER: AC INPUT CURRENT FOLDBACK	AC input current foldback timeout	Efficiency
INVERTER: POWER MODULE TEMP FOLDBACK	Power module temperature foldback timeout	Efficiency

TABLE 22: 2-Stage AC-HP

Fault (Displayed Text)	Description	Category
OUTDOOR: CONTROL FAILURE	Control failure	Critical
OUTDOOR: HPS SOFT LO-NORM	High pressure switch lockout. The last mode of operation was normal compressor.	Critical
OUTDOOR: HPS HARD LO-NORM	High pressure switch lockout. The last mode of operation was normal compressor.	Critical
OUTDOOR: HPS SOFT LO-DFST	High pressure switch lockout. The last mode of operation was defrost.	Critical
OUTDOOR: HPS HARD LO-DFST	High pressure switch lockout. The last mode of operation was defrost.	Critical
OUTDOOR: LPS SOFT LOCKOUT	Low pressure switch lockout	Critical
OUTDOOR: LPS HARD LOCKOUT	Low pressure switch lockout	Critical
OUTDOOR: LOW VOLTAGE<16V	Low voltage (below 16.0 VAC) stopped current relay outputs	Critical
OUTDOOR: AMB SENS SHORT-CL	Outdoor ambient sensor failure in cooling mode (shorted)	Critical

TABLE 22: 2-Stage AC-HP (Continued)

Fault (Displayed Text)	Description	Category
OUTDOOR: AMB SENS OPEN-CL	Outdoor ambient sensor failure in cooling mode (open)	Critical
OUTDOOR: AMB SENS SHORT-HT	Outdoor ambient sensor failure in heating mode (shorted)	Critical
OUTDOOR: AMB SENS SHORT-HT-SFT LO	Outdoor ambient sensor failure in heating mode (shorted)	Critical
OUTDOOR: AMB SENS OPEN-HT	Outdoor ambient sensor failure in heating mode (open)	Critical
OUTDOOR: AMB SENS OPEN-HT-SFT LO	Outdoor ambient sensor failure in heating mode (open)	Critical
OUTDOOR: COIL SENSOR SHORT	Coil (liquid line) sensor failure (shorted)	Critical
OUTDOOR: COIL SENSOR OPEN	Coil (liquid line) sensor failure (open)	Critical
OUTDOOR: DIS LINE SENS SHORT	Discharge line sensor failure (shorted)	Critical
OUTDOOR: DIS LINE SENS OPEN	Discharge line sensor failure (open)	Critical
OUTDOOR: HI DISCHARGE TEMP	High discharge line temperature	Critical
OUTDOOR: LO DISCHARGE TEMP	Low discharge line temperature	Critical
OUTDOOR: HI DIS TEMP - SFT LO	High discharge line temperature	Critical
OUTDOOR: LO DIS TEMP - SFT LO	Low discharge line temperature	Critical
OUTDOOR: HI DIS TEMP - HRD LO	High discharge line temperature	Critical
OUTDOOR: LO DIS TEMP - HRD LO	Low discharge line temperature	Critical
OUTDOOR: BONNET SENS SHORT	Bonnet sensor failure (shorted)	Critical
OUTDOOR: Y2 W/O Y1-SOFT LO	Y2 present without Y1	Critical

TABLE 22: 2-Stage AC-HP (Continued)

Fault (Displayed Text)	Description	Category
OUTDOOR: FFUEL CONFIG ERROR	Fossil fuel mode setting error. The FFUEL jumper is in the OFF position with the bonnet sensor present.	Critical
OUTDOOR: AC NOW HP	System previously configured as AC, now HP	Critical
OUTDOOR: HP NOW AC	System previously configured as HP, now AC	Critical
OUTDOOR: HP NOW AC-HRD LO	System previously configured as HP, now AC	Critical
OUTDOOR: NO TONNAGE SET	Jumpers at 000 with no program loaded and no tonnage selected	Critical
OUTDOOR: COOLING LTCO	Cooling LTCO active	Critical
OUTDOOR: HPS OPEN	High-pressure switch fault (not in lockout yet)	Efficiency
OUTDOOR: PIPE FRZE TIMER EXP	Pipe freeze timer expiration	Efficiency
OUTDOOR: LOW VOLTAGE< 19V	Low voltage (below 19.2 VAC) preventing further relay outputs	Warning
OUTDOOR: O INPUT-AC MODE	O signal received in AC mode	Warning
OUTDOOR: W INPUT-AC MODE	W signal received in AC mode	Warning
OUTDOOR: W & O INPUTS-AC	W and O signals received in AC mode	Warning
OUTDOOR: W & O INPUTS-HP	W and O signals received in HP mode	Warning

TABLE 23: ID EEV Control

Fault (Displayed Text)	Description	Category
ID EEV: INVALID PRESSURE TRANSDUCER	Invalid pressure transducer	Status
ID EEV: INVALID SUCTION TEMP	Invalid suction temperature	Status
ID EEV: FULLY OPEN IN SUPERHEAT	Valve position to fully open while in superheat control mode	Status
ID EEV: SUCTION PRESSURE OUT OF RANGE	Suction pressure out of range	Status
ID EEV: COMMUNICATIONS LOST	RS-485 communication not sensed	Status

TABLE 24: System Events

System Events: Logged but not shown in banner	
Event (Displayed Text)	**Description**
SETUP CORRECTION	Setting was adjusted because it was out of range or there was an issue with another related setting
OTA PASS (APPF)	OTA software update for front PCB application successful
OTA PASS (APPB)	OTA software update for back PCB application successful
OTA PASS (BOOT)	OTA software update for boot loader application successful
OTA TIMED OUT	OTA software update has timed out after 3 (15-minute) attempts
FRONT BOARD CHANGED	Front PCB has been changed with a new unconfigured front PCB
AIR FILTER RESET	Number of hours before air filter reminder becomes active has been reset (from Filter screen)
HUMIDIFIER FILTER RESET	Number of hours before humidifier filter reminder becomes active has been reset (from Filter screen)
UV LAMP RESET	Number of hours before UV lamp reminder becomes active has been reset (from Filter screen)
EAC RESET	Number of hours before EAC reminder becomes active has been reset (from Filter screen)

TABLE 24: System Events (Continued)

STARTUP	Flagged at startup to indicate that the thermostat has been reset
NFC EVENT SUCCESS	Successful NFC Read/Write has occurred
LOG CLEARED	Faults and events have been reset from the log
System Events: Logged and displayed in banner while condition exists	
Event (Displayed Text)	**Description**
AIR FILTER REMINDER	Reminder to change air filter is active (run hours have expired)
HUMIDIFIER FILTER REMINDER	Reminder to change humidifier filter is active (run hours have expired)
UV LAMP REMINDER	Reminder to change UV lamp is active (run hours have expired)
EAC REMINDER	Reminder to change EAC is active (run hours have expired)

AIRFLOW CONFIGURATION

The airflow configuration screen allows the user to change airflow settings. Default CFM values are defined by the Heat, Cool, and Adjust jumper settings on the Indoor Control.

IMPORTANT: Changing airflow settings can effect system efficiency. Reference outdoor equipment tech guide for more information on system efficiencies.

The airflow configuration screen displays all current airflow settings at a glance. For multi-stage communicating outdoor equipment, to edit the airflow settings select the stage. The user can adjust the airflow by using the left or right arrows to increase or decrease in 10 CFM increments.

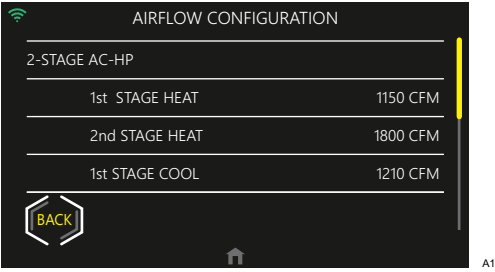


FIGURE 33: Airflow Configuration - 2-Stage AC-HP

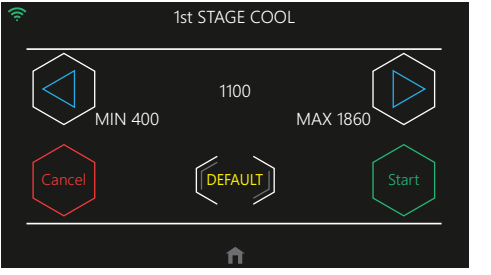


FIGURE 34: Airflow Configuration: 1st Stage Cool

For Variable Capacity systems, users will be able to adjust the Heating and Cooling airflow by +/- 5 to 10%.

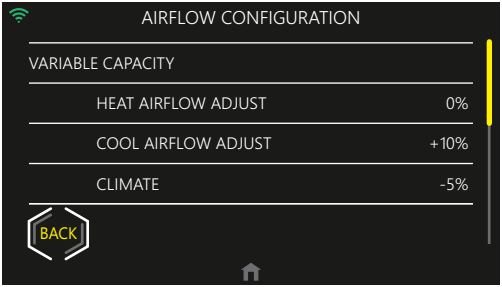


FIGURE 35: Airflow Configuration - Variable Capacity

FORCED OPERATION

The Forced Operation screen options and functions available depend on the system configuration. This screen allows the thermostat to command indoor and outdoor operation which may include compressor cooling operation, compressor heating operation (if heat pump is present), Furnace/Gas heating operation and Electric/Air Handler heating operation for a designated time period.

NOTICE

When entering forced operation, normal operation of the system will be discontinued. This means that the controller will not control equipment to maintain a set point, schedule, mode of operation, etc. Forced operation is a deviation from normal operation and the system will only run when commanded through the forced operation menus. Normal operation is restored when forced operation is exited.

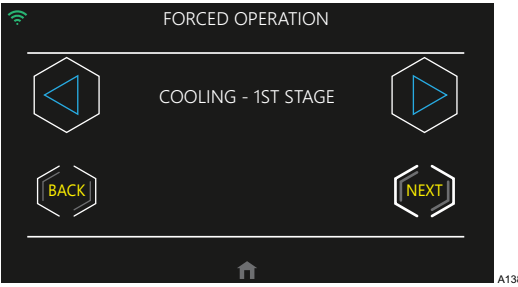


FIGURE 36: Forced Operation - 1st Stage

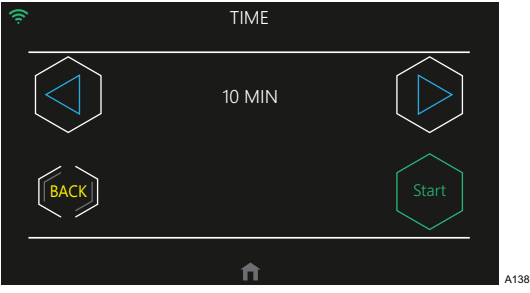


FIGURE 37: Forced Operation - Time

VENTILATION SETTINGS

Use the Ventilation Settings screens to view and edit settings associated with home ventilation (ERV/HRV) devices. These screens are only accessible in systems that have an ERV/HRV accessory control installed. The following table describes the available settings.

TABLE 25: Ventilation Settings

Variable	Default	Settings	Explanation
Ventilation Mode	Timed	Continuous, Timed, or Off	This determines how often the ventilation device is opened.
Ventilation Runtime per Cycle	20 min.	5–55 min in 5 min intervals	If Ventilation mode is set to Timed, the thermostat allows ventilation per this setting per the ventilation cycle time.
Ventilation Cycle Time	1 hour	1–4 hours	If Ventilation mode is set to Timed, the thermostat allows ventilation runtime per this setting.
Ventilation Limits	Disabled	Disabled, Default, and Manual	If a damper has been installed for ventilation purposes, this controls how the damper operates.
No Ventilation Above	100°F	95°F, 100°F, 105°F	The thermostat does not allow ventilation if the outdoor temperature exceeds this setting.
No Ventilation Below	0°F	-5°F, 0°F, 5°F	The thermostat does not allow ventilation if the outdoor temperature is below this setting.

There are additional settings for ventilation. These settings determine if the ventilation device is opened during a call for conditioning. The thermostat initiates ventilation any time there is a call for conditioning, that is, when the outdoor temperature reaches a level that requires ventilation as part of a heating or cooling call. Otherwise, the ventilation device runs with the indoor blower as per the settings described in Table 26.

Ventilation can be controlled according to indoor humidity. If the outdoor temperature is above 50°F and the indoor humidity rises above the desired setting, the thermostat can be set to disable ventilation.

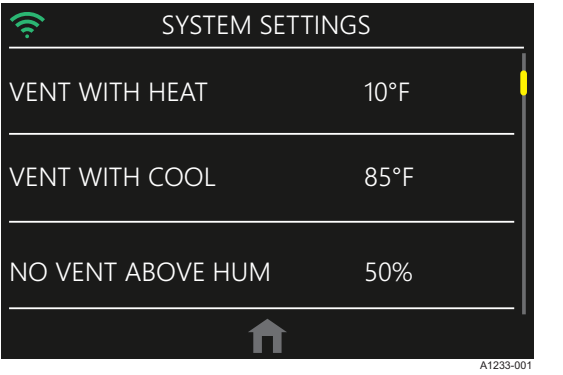


FIGURE 38: Ventilation Settings

RESTORE DEFAULTS

To restore default settings:

1. Scroll to the bottom of the System Settings screen and tap **Restore Defaults**. See Figure 39.
2. On the Restore Defaults screen, tap and hold **5** for 5 seconds. See Figure 40.

Note: To return to the System Settings screen without restoring the default settings, on the Restore Defaults screen, tap **Cancel**.

NOTICE

When Restore Defaults is invoked, the following Hx Thermostat app settings reset: **Schedule Hold Length**, **Away Mode Setpoints**, and **Service Reminders**.

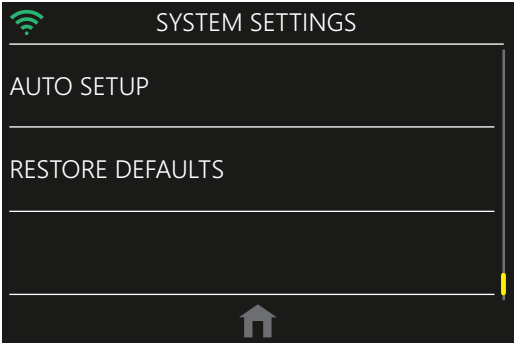


FIGURE 39: Restore Defaults

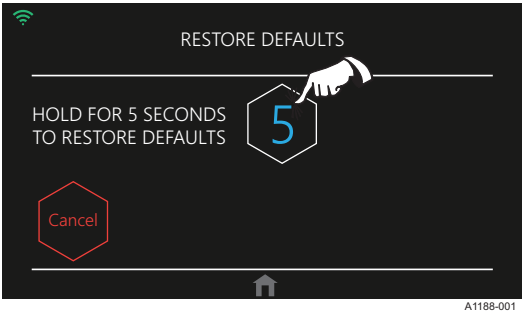


FIGURE 40: Five-Second Hold

SECTION VIII: SERVICE SETTINGS

You can access additional service information, such as event and fault logs and dealer content, using the Homeowner Settings screen.

LOG

Tap **Log** to view the event and fault log. When you select an entry displayed on the Log screen, a screen appears showing when the event or fault last occurred, and how many times it has occurred. To delete all the displayed log entries, tap **Reset Log**.

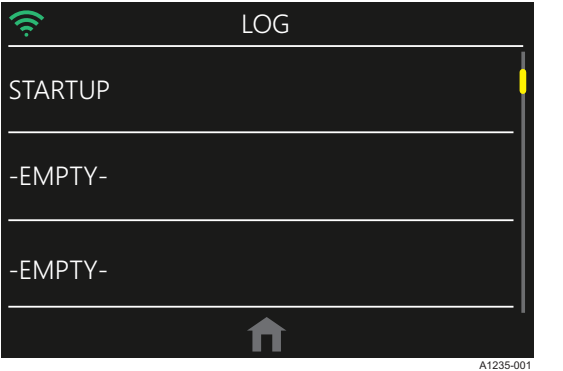


FIGURE 41: Event and Fault Log

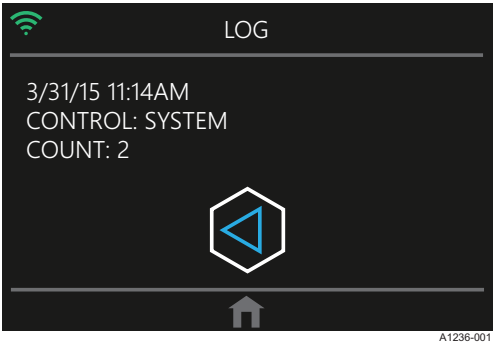


FIGURE 42: Event and Fault Occurrence Details

DEALER INFORMATION

You can edit the information displayed on the Dealer Information screen through the Hx Thermostat app.

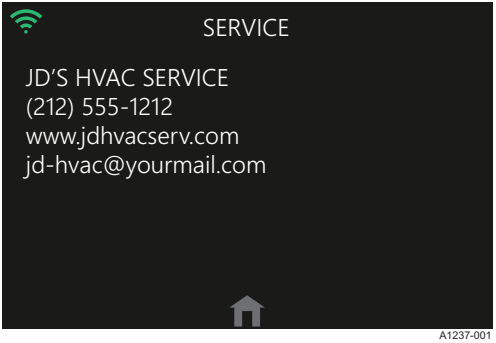


FIGURE 43: Dealer Information

STATUS

For forced operation, clear any active delay timers shown on the Status screen. To clear the timer values for the ON, OFF, CYCLE, and STAGE DELAY timers, tap the screen area as shown in Figure 39 and hold for 5 seconds. The Status screen also shows current lockouts. You clear lockout timers in the same way. To clear the timer values for the COOL, AUX HEAT, and HP HEAT lockout timers, tap the screen area and hold for five seconds.

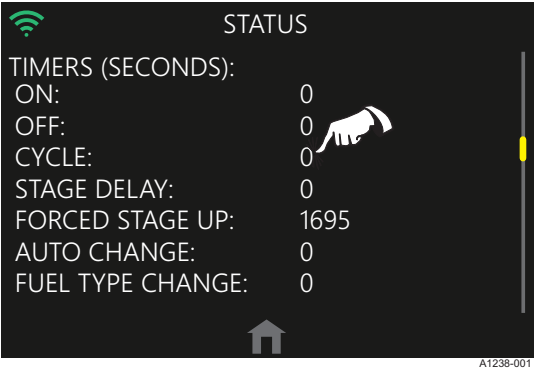
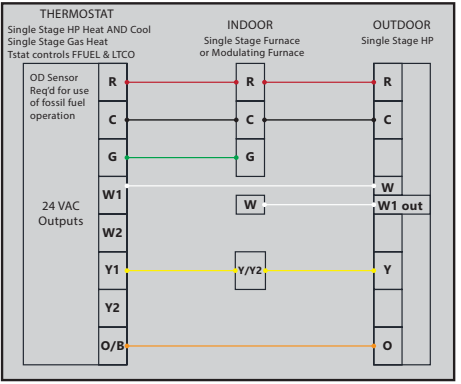
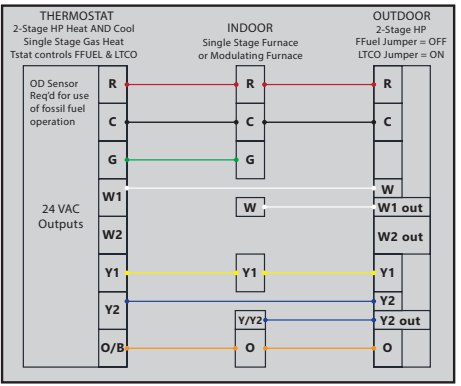


FIGURE 44: Status

SECTION IX: WIRING DIAGRAMS

DUAL FUEL SYSTEMS (Furnace and Heat Pump)

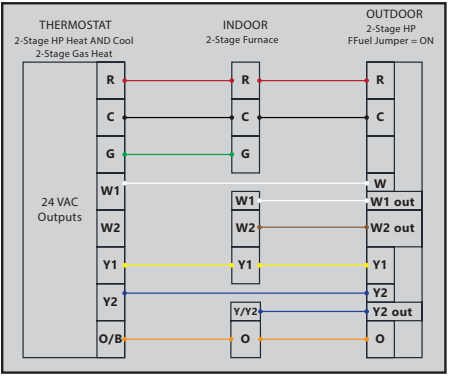


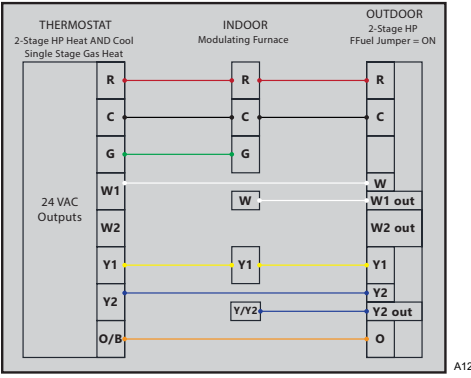


A1239-001

Outdoor Equip Type = HP when thermostat uses dual fuel logic.
Select REMOTE SENSOR - OUTDOOR in the thermostat service menu.

DUAL FUEL SYSTEMS
(Furnace and Heat Pump continued)

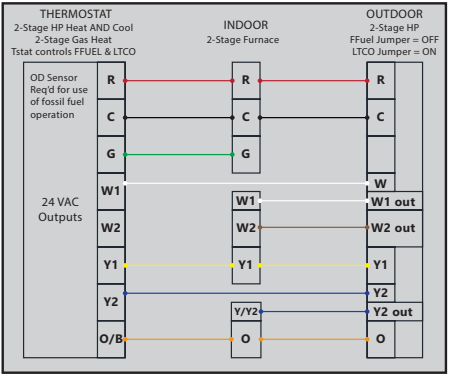




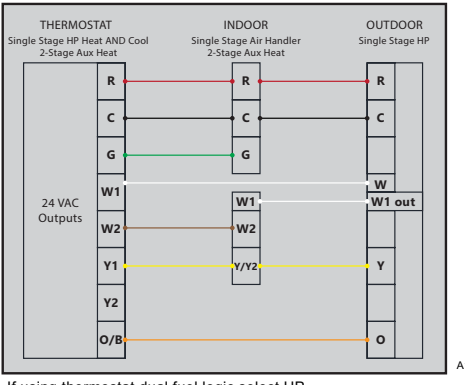
A1240-001

Outdoor Equip Type = External Dual Fuel when HP uses dual fuel logic, or external fossil fuel kit.

DUAL FUEL SYSTEMS
(Furnace and Heat Pump continued)

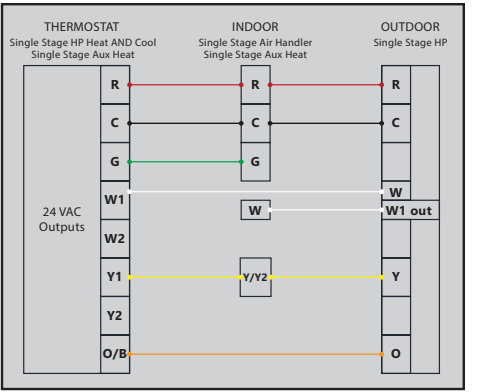


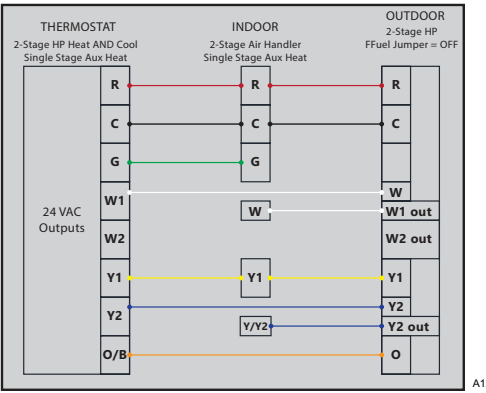
AIR HANDLER/HEAT PUMP SYSTEMS



If using thermostat dual fuel logic select HP.
Select REMOTE SENSOR - OUTDOOR in the thermostat service menu.

AIR HANDLER/HEAT PUMP SYSTEMS (continued)





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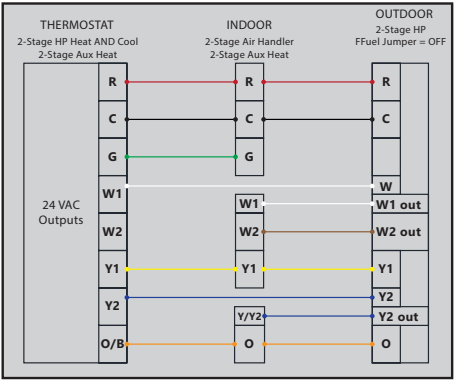
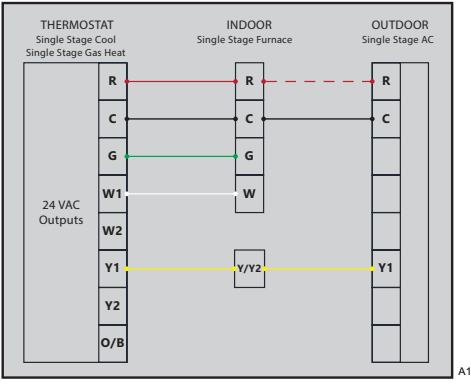
AIR HANDLER/HEAT PUMP SYSTEMS (continued)

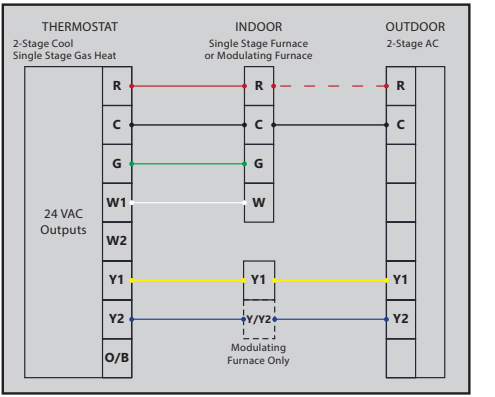


AC SYSTEMS Gas or Electric

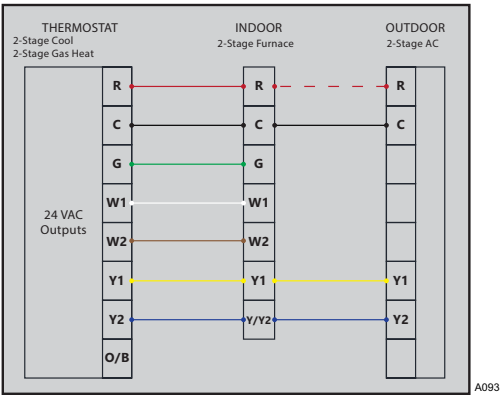
("R" connection ——= required, - - -= may be required)



AC SYSTEMS Gas or Electric (continued)



("R" connection —— = required, - - - = may be required)



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Supersedes: 5407934-UIM-B-0818

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