INSTALLATION MANUAL

Hx™ TOUCH SCREEN THERMOSTAT

MODELS: S1-THXU280B & S1-THXU280W

Energy Saver

5 YEAR Limited Parts Warranty

SECTION I: GENERAL

The thermostat is designed to control communicating system components. In general, these components are the variable speed modulating furnace, 2-stage variable speed ECM furnace and variable speed air handler, premium 15 & 18 SEER air conditioners or premium 15 & 18 SEER heat pumps and variable capacity system.

While the communicating system has been designed for easy installation, this document will provide the installer with a more detailed explanation of installation process.

In order to utilize the complete feature set available, the Hx™ Touch Screen Thermostat must be connected to Wi-Fi.

For ease of installation and to ensure that the thermostat has the latest software update, please be sure that Wi-Fi access is available (via homeowner Wi-Fi network or 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 list details the parts included in this kit. Examine the kit to insure that all parts are included.

TABLE 1: Content List

Item	QTY.	Description
1	1	Thermostat Display
2	1	Thermostat Base
3	1	Wall Plate
4	2	Wire Connectors
5	2	Screws
6	2	Drywall Anchors
7	1	Homeowner Quick Reference Guide
8	1	Installer Conventional Quick Reference Guide
9	1	Installer Communicating Quick Reference Guide
10	1	Custom Skins & Wire Stickers
11	1	Remote Sensor Connector

LIMITATIONS

The thermostat primary function is to command a system containing communicating product.

Exceptions to this rule are:

- 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 UPG products.
- Installing Communicating Interface Control (which converts communicating commands into 24VAC outputs).

SECTION III: INSTALLATION

The intention of this document is to ensure proper connection/setup of the various communicating system components. These instructions should be used in conjunction with the instructions provided with indoor, outdoor and accessory equipment of which the thermostat will command.

This installation instruction contains (in part) setup, operation, and troubleshooting.

When Installing this Product.

1. Read all instructions carefully before beginning installation. Failure to follow these instructions can create hazardous situations or damage the product.
2. Make certain the product is suitable for your application by checking all ratings on the product and in the instruction provided.
3. Installer must be a trained, experienced service technician.

LOCATION

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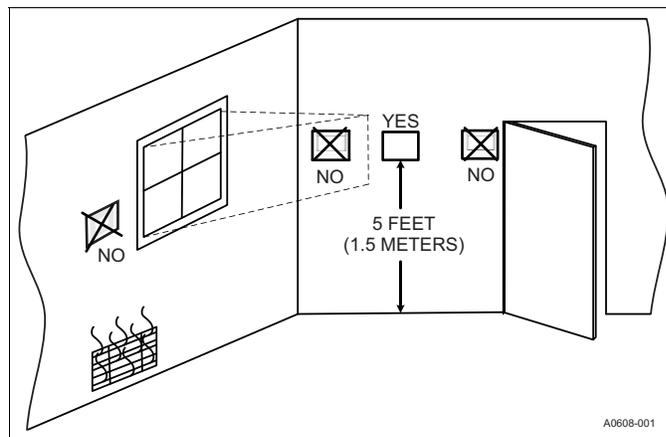

FIGURE 1: Control Location

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

- 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
- Unconditioned areas such as an outside wall

MOUNTING THE THERMOSTAT

For most installations, mounting thermostat can be done following some very basic installation steps outlined below. However, there may be some cases where the installer is not able to penetrate the wall where mounting the thermostat, or there may be an application where the thermostat/control being replaced has left a larger hole than needed for installation of this control. For these and other applications, (including installation with a vertical j-box) an installer can obtain an accessory wall plate.

⚠ WARNING

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

1. If an existing thermostat or control is being replaced:
    a. Disconnect wires from existing control.
    b. Remove existing control from wall.
    c. Properly discard or recycle old control.

NOTICE

Mercury is a hazardous substance, if existing thermostat or control contains any mercury, it MUST be disposed of properly. The thermostat does not contain mercury.

2. Mark on the wall where the thermostat will be mounted (standard height is 5 feet from the floor).

NOTICE

If an existing thermostat was in place, it may be ideal to use the same location for the thermostat.

INSTALLING NEW THERMOSTAT

3. Position the thermostat base against the wall and determine if the wall plate will completely cover the footprint of the current thermostat.

4. Position the thermostat base against the wall (or wall plate if used) and determine if the new screw locations align with prior locations.

5. If base does not align with existing anchor holes, mark new screw locations with a pencil.
   • Drywall: Drill 3/16" hole for the anchor & install.
   • Plaster: Drill 7/32" hole for the anchor & install.

6. If the Remote Sensor Connector is to be installed, plug in, pull wires through and connect wires to Ambient Sensor (S1-02542683000) using wire connectors (provided).

7. Pull wires through opening in base and secure base (and wall plate) to the wall using provided screws.

   Though not required for operation, it is recommended that the thermostat be level.

8. One by one, connect each wire by pushing down on the color coded quick connect tab, insert the wire into the connector opening and release the tab to complete.

9. Align the thermostat face with hinge guide on top of the back plate and snap forward into place.

The thermostat may be wired conventionally. For wiring diagrams, please refer to the "Installer Conventional Quick Reference Guide" that comes with the thermostat.

SECTION IV: WIRING COMMUNICATION

⚠ WARNING

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

All wiring must comply with local electrical codes and ordinances. Refer to Table 1 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 (-)

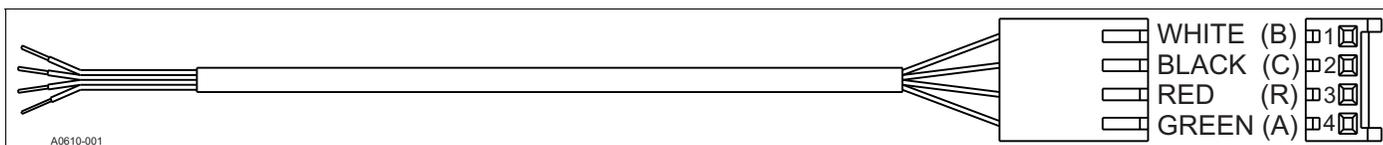### WIRING REQUIREMENTS

Standard 18 awg thermostat wires can be used to connect the communicating system.

Special (shielded) cable is not typically required. As with all communicating devices, it is a good idea to keep wiring at least one foot away from large inductive loads. Examples of large inductive loads include: electronic air cleaners, motors, etc. 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 shielded wire would be desired to ensure proper system functionality.

SYSTEM WIRING OVERVIEW

IMPORTANT

The communicating system requires 4 wires to operate. If installing a communicating system, be sure to supply at least 4 wires to each unit/control. Below is a simple diagram showing the ideal wiring path.

The system is connected by four wires. Two of the wires are used to bring power into the individual controls (R and C) and two of the wires are used for serial communication (A+ and B-). The plug/harness that is provided in the kit should be used on the outdoor control.

IMPORTANT

If this thermostat is being used with Communicating Outdoor equipment other than variable capacity, the communicating plug harness S1-02542694000 is required. See Figure 3.
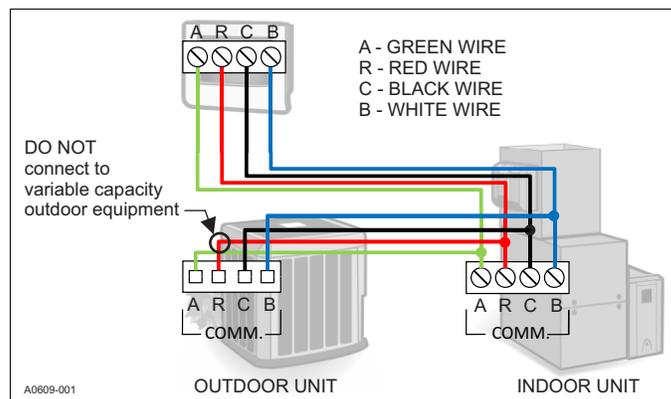

A - GREEN WIRE
R - RED WIRE
C - BLACK WIRE
B - WHITE WIRE

FIGURE 2: High Level Wiring Path

FIGURE 3: Communicating Plug Harness
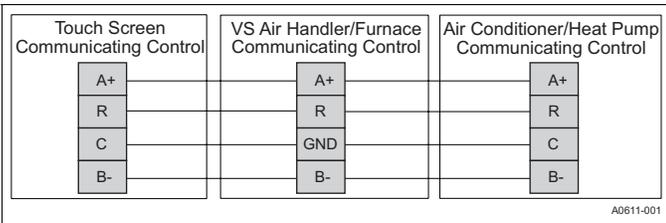
WHITE (B)
BLACK (C)
RED (R)
GREEN (A)

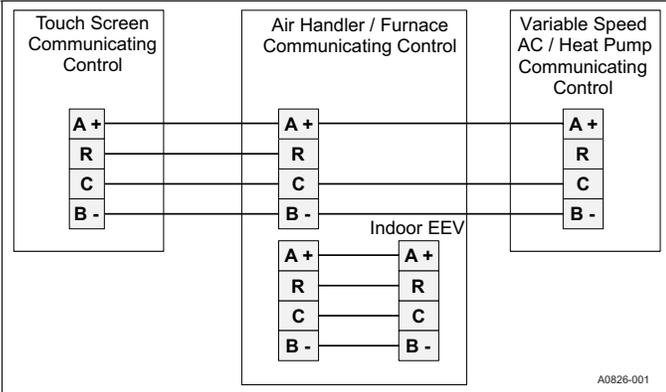**FIGURE 4:** Wiring Diagram (Fully Communicating System Components)

FIGURE 5: Wiring Diagram (Variable Capacity System)
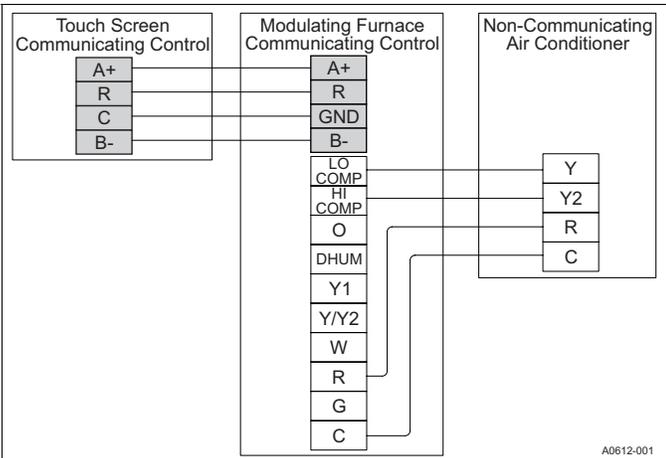
FIGURE 6: Wiring Diagram (Modulating Communicating Furnace, Non-Communicating AC)

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 system, the main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

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

A new communicating heat pump or air conditioner (denoted by a "-C" in the model number) will have two communicating plug terminals (as shown in Figure 8).

FIGURE 7: Outdoor Communicating Terminals

FIGURE 8: Variable Speed Capacity AC/Heat Pump Control

Communicating Non-Variable Capacity Models

> ## ⚠ WARNING
>
> **ELECTRICAL OPERATION HAZARD**
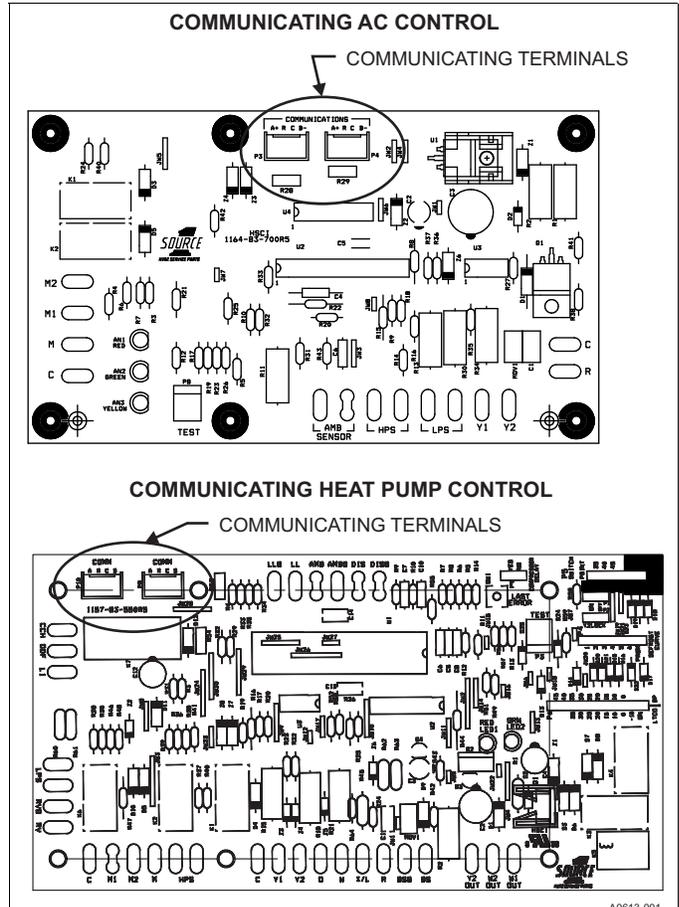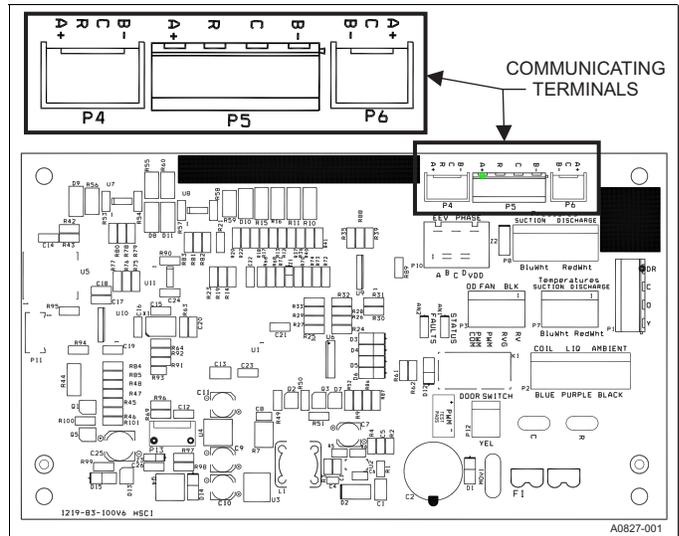> *Failure to follow this warning could result in personal injury, death, or equipment damage. Before installing, modifying, or servicing system, the main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.*

1. Disconnect all high voltage power from system.
2. Remove factory installed low voltage harness.
3. Plug the communication harness (S1-02542694000) into the communication port on the outdoor control.
4. Connect thermostat wire using wire connectors from the indoor control to the communication harness wires.

> ## NOTICE
>
> *When connecting the loose ends of the wire harness, be sure to note color for each of the four wires (A+, R, C, B-).*

5. Set the wires which are now connected (with wire connectors) into the Junction Box of the control housing (pictured below).
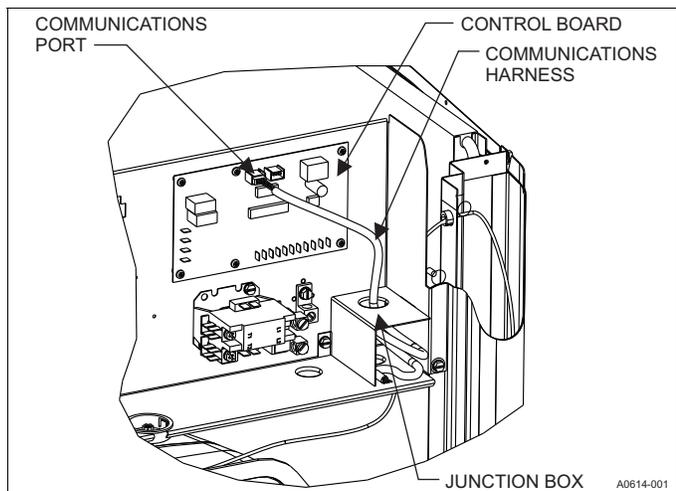
FIGURE 9: Outdoor Control Housing

6. Set the appropriate jumper settings to insure proper control functionality (See table below).

TABLE 3: Outdoor Jumper Settings

Unit Control	Jumpers which must be set
Heat Pump	Fossil Fuel
	Hot Heat Pump
	Switch Point
	Balance Point (BP)
	Low Temperature Cutout (LTCO)
	Y2 Lock
	Compressor Delay
	Defrost Curve
Air Conditioner	No jumpers to set
Variable Speed Capacity AC/HP	No jumpers to set

> ## NOTICE
>
> *For installation of a non-communicating outdoor unit with the thermostat, the installer should reference the indoor and outdoor unit installation instructions. If information is not provided, there may be a need for a Communicating Interface Control Field Kit (S1-33102953000).*

Variable Capacity Models

1. Disconnect all high voltage power from system.
2. Locate factory installed low voltage wire harness at bottom of control box. Connect low voltage wiring together using wire connectors. See wiring diagram show in Figure 10.

> ## ⚠ WARNING
>
> *DO NOT connect the "R" terminal from the thermostat to the unit control board.*
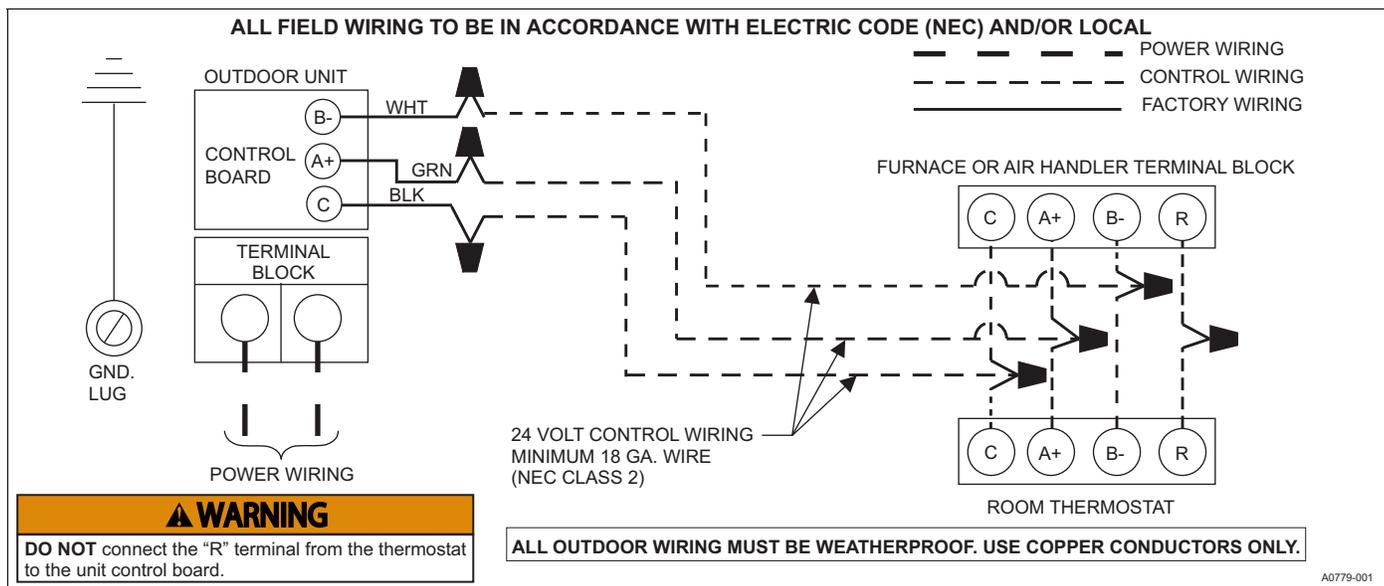
FIGURE 10: Typical Communicating Field Wiring (Variable Capacity outdoor unit)

Indoor Control Wiring

A communicating furnace or air handler (denoted by a "-C" in the model number) will arrive with a control outfitted for communication. The communicating indoor controls will have two communicating terminals. One will be a communicating plug input and the other will be a screw terminal (as shown in Figure 12 & 13). DO NOT place more than on wire under each screw terminal See Figure 11.

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", and use a wire connector to connect the other end of the pigtail to the other wires. Failure to do this will result in nuisance communication error faults. See Figure 11.

NOTE

ENSURE ONLY ONE WIRE UNDER TERMINAL SCREW.

TO CONNECT MORE THAN ONE WIRE:

1. CONNECT ONLY TERMINAL END OF 6" WIRE PIGTAIL,

2. USE WIRE CONNECTOR TO CONNECT OTHER END OF PIGTAIL TO OTHER WIRES.

FIGURE 11: Multi-wire Terminal Connection
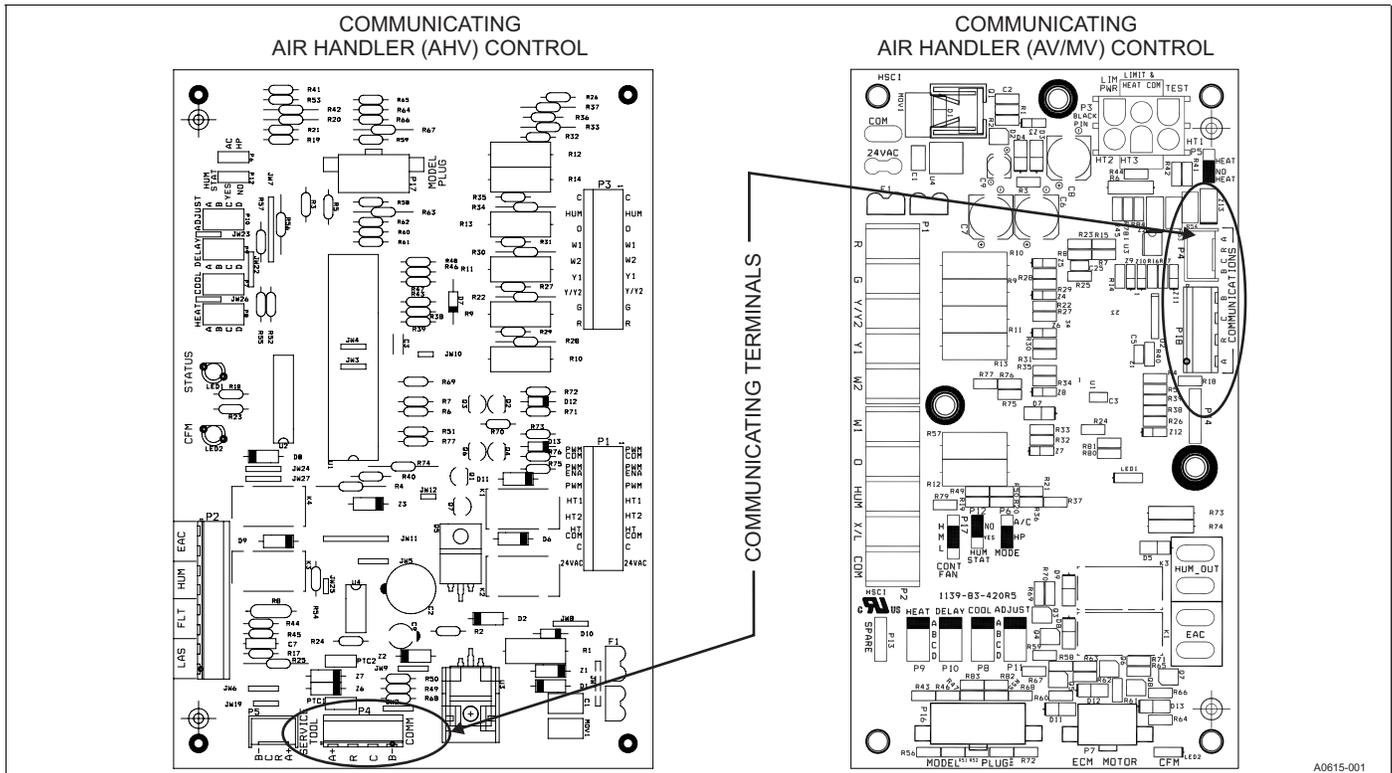
FIGURE 12: Communicating Indoor Controls - Air Handler

COMMUNICATING
MODULATING FURNACE CONTROL

COMMUNICATING 2-STAGE VARIABLE SPEED
ECM FURNACE CONTROL

COMMUNICATING TERMINALS

FIGURE 13: Communicating Indoor Controls - Furnaces

⚠ WARNING

ELECTRICAL OPERATION HAZARD
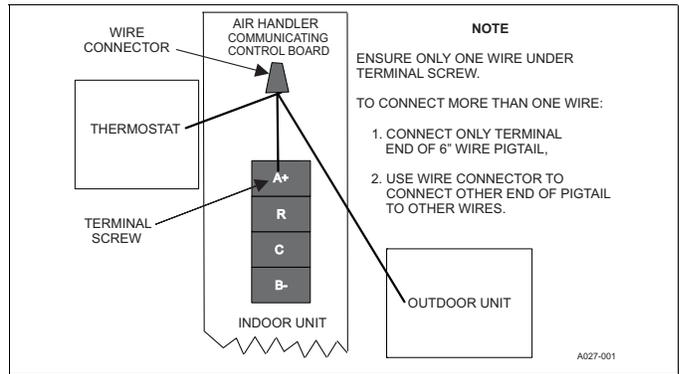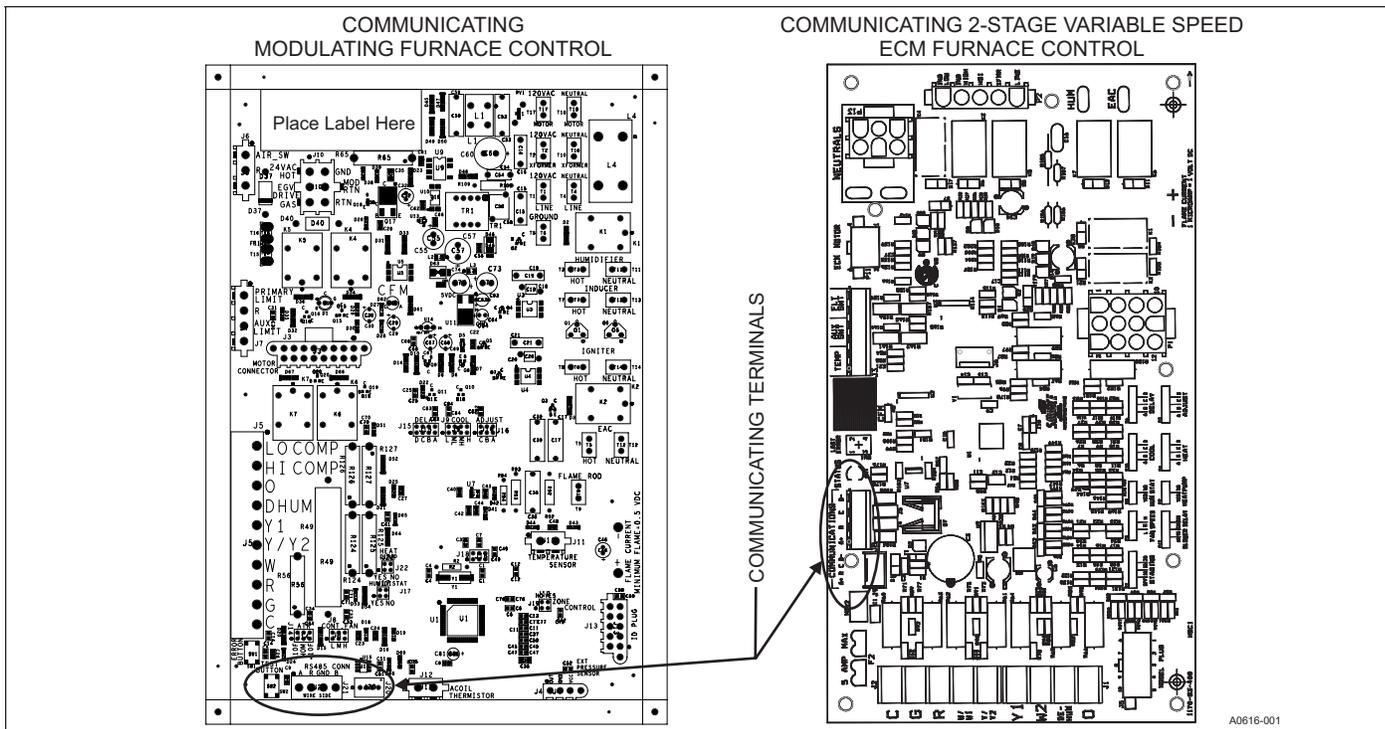
Failure to follow this warning could result in personal injury, death, or equipment damage. Before installing, modifying, or servicing system, the main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

1. Disconnect all high voltage power from system.
2. Screw the 4 wires from the thermostat and outdoor control to the communicating screw terminal (8 wires in all). Be sure that all wires are connected respectively (A+ = A+, R = R, C = C, B- = B-).

NOTICE

If the installer finds that the indoor control screw terminals are presenting a challenge, twist on wire connections can be used to connect the controls on the outside of the indoor unit.

NOTICE

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

Set the appropriate jumper settings to insure proper control functionality See Table 4.

NOTICE

For installation of a non-communicating indoor unit with the thermostat, the installer should reference the indoor and outdoor unit installation instructions. If information is not provided, there may be a need for use of an Communicating Interface Control Field Kit(S1-33102953000).

TABLE 4: Indoor Jumper Settings

Unit Control	Jumpers which 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)	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
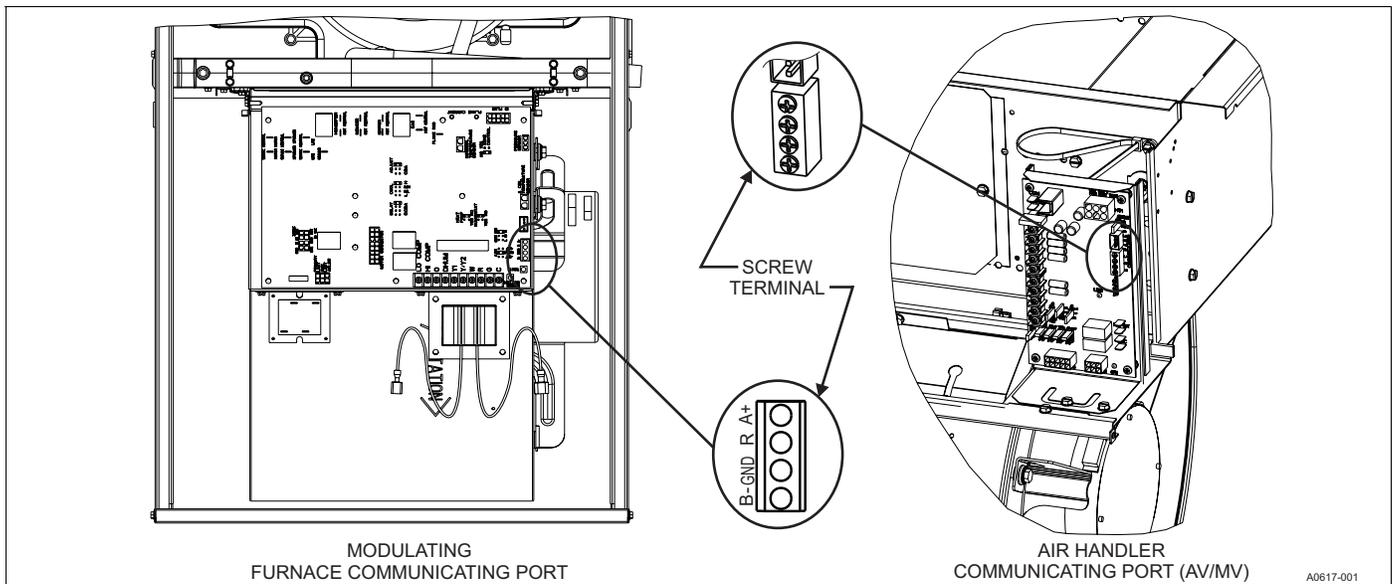
FIGURE 14: Indoor Screw Terminal Location

HUMIDIFIER CONNECTION

A bypass or fan powered humidifier may be installed with the communicating system. The installer should physically install the humidifiers according to the instructions that are included with the humidifier being installed. For information on the wiring of the humidifier, see below diagrams.

NOTICE

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

Bypass Humidifiers

Communicating Furnace
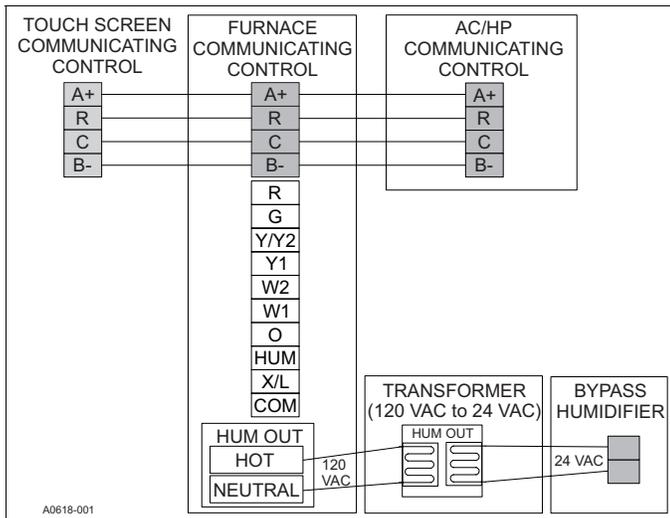
FIGURE 15: Furnace Bypass

Communicating Air Handler
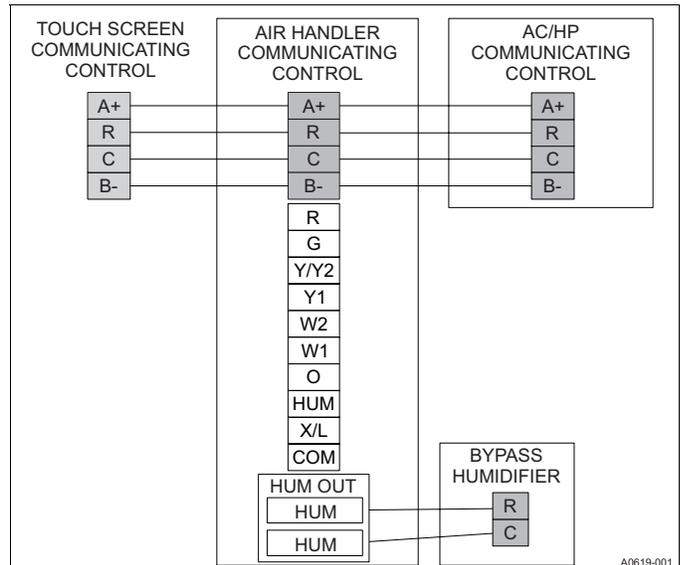
FIGURE 16: Air Handler Bypass

Fan Powered Humidifiers

Communicating Furnace
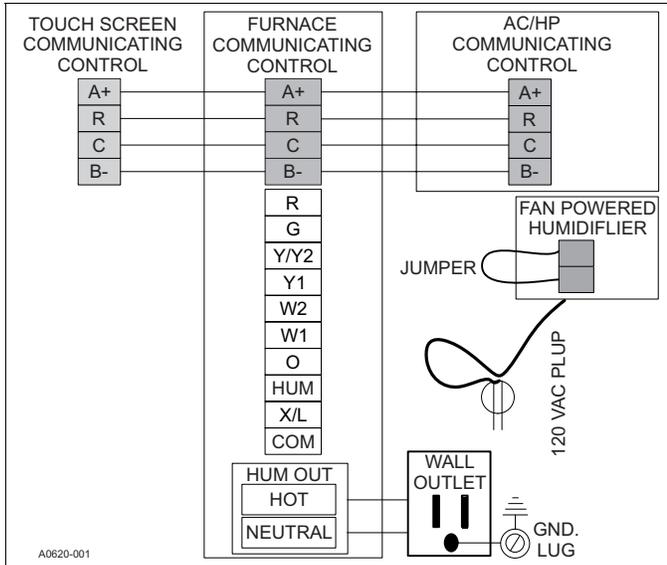
FIGURE 17: Furnace Fan Powered

⚠ WARNING

Do not exceed the recommended 1 amp limit on the 120 VAC Plug or it could cause damaged to the Contactor and Control Board.

Communicating Air Handler
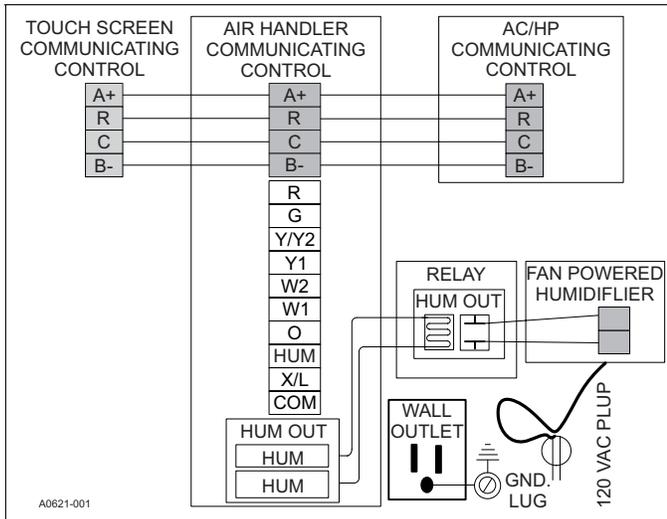
FIGURE 18: Air Handler Fan Powered

⚠ WARNING

Do not exceed the recommended 1 amp limit on the 120 VAC Plug or it could cause damage to the relay on control board.

SECTION V: 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 applying power, check to make sure that all wiring has been completed as instructed through the installation instructions of the equipment on the system.

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

POWER-UP SEQUENCE

The following screens will load upon initial power up.
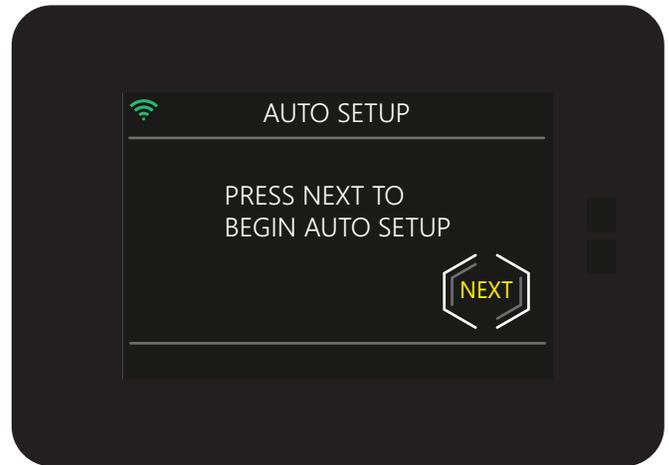
FIGURE 19: Auto Setup

SYSTEM CONFIGURATION

After selecting the "Next" button, the Touch-Screen Thermostat will begin a routine to "discover" the system components and identify the Indoor and Outdoor Communicating Equipment.
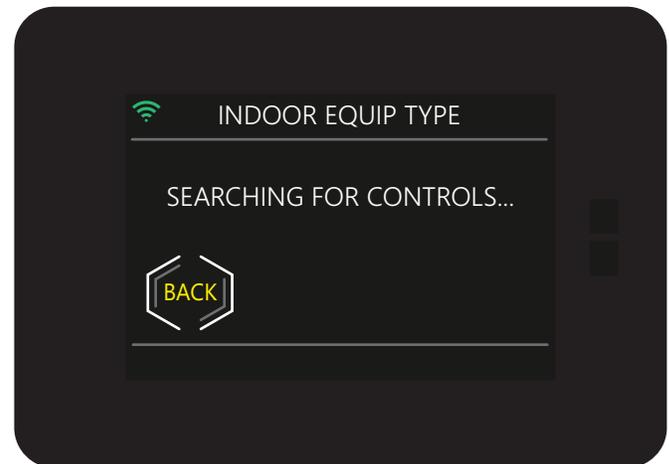
FIGURE 20: ID Search
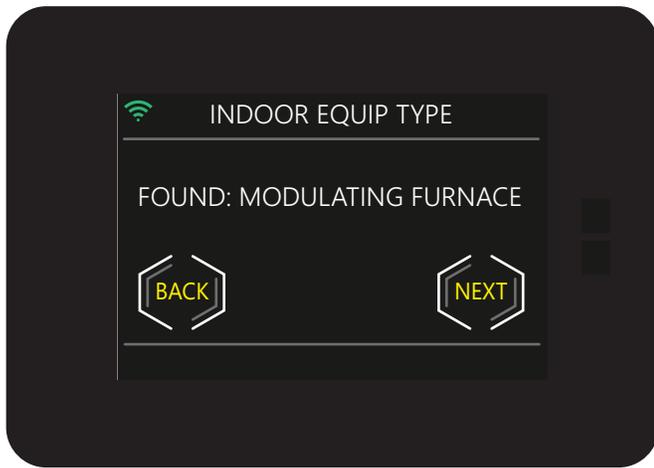
FIGURE 21: Found Mod Furnace
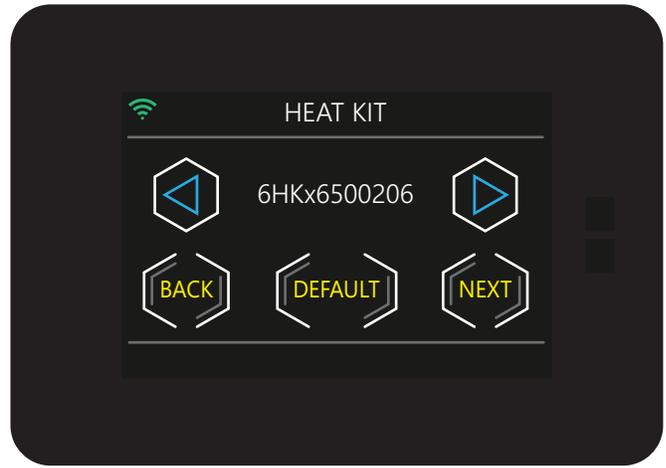
FIGURE 24: Heat Kit

FIGURE 22: OD Search
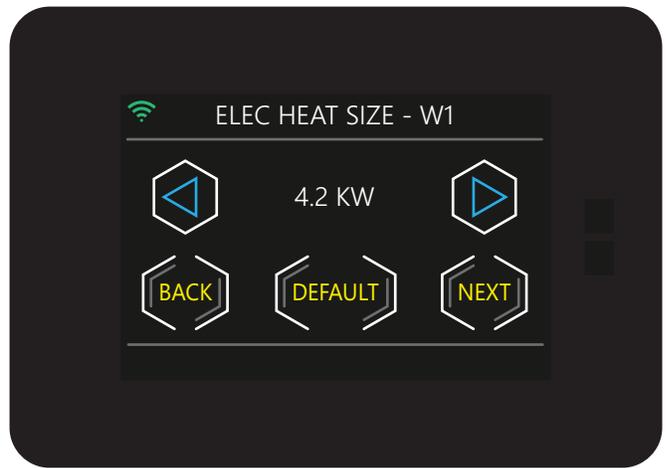
FIGURE 25: Electric Heat Size - W1 4.2

FIGURE 23: YGVI
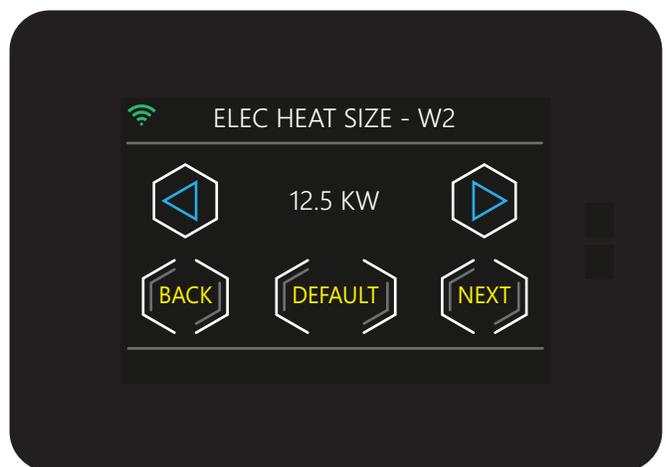
FIGURE 26: Electric Heat Size - W2 12.5

The installer will be directed through screens that are dependent upon the system being configured.

Heat kit configuration screens will appear in a communication system that includes a communicating variable speed air handler (indicated by a "-C" in the model number).

IMPORTANT

If you have a system which has a heat kit installed, but did not see the heat kit configuration screens, be sure to check the air handler control to insure that the heat kit jumper is on "Heat". This only applies to the AV/MV Air Handler.

They system summary screen will appear in every system install. This screen displays the equipment configuration.

> ## NOTICE
> *The modulating furnace airflow during heating is still controlled by the ignition control not the thermostat.*

SECTION VI: SERVICE MODE

ENTERING SERVICE MODE

To enter the service portion of the control press and hold (for 5 seconds) on the service van located on the settings screen. See Figure 23.

A0630-001
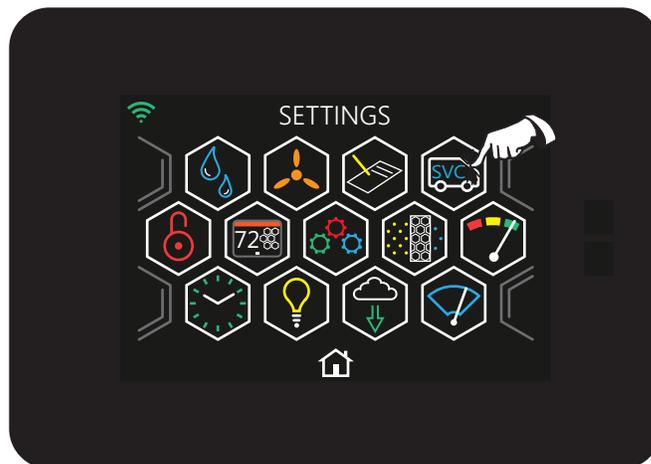
FIGURE 27: Screen Settings

SYSTEM SETTINGS

Depending on the equipment that has been installed, the system settings screen will display different user options.

TABLE 5: Equipment Settings

Variable	Default	Settings	Explanation
Auto Allowed	Yes	Yes or No	This enables or disables the ability of the Auto Mode Feature.
Prog or Non-Prog	Prog	Prog or Non-Prog	Allows the thermostat to run a schedule or not
Fahrenheit or Celsius	°F	°F or °C	Allows the thermostat temperatures to be displayed in Fahrenheit or Celsius
Smart Recovery	Yes	Yes or No	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 program schedule event's desired temperature setpoint at the time the even occurs, rather than after.
Fan On with W	No	Yes or No	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 the user to calibrate the displayed temperature from the measured temperature in the control
Indoor Hum Offset	0%	-5%, -4%, -3%, -2%, -1%, 0%, 1%, 2%, 3%, 4%, 5%	Allows the user to calibrate the displayed humidity from the measured humidity in the control
Auto Changeover	30 MIN	5 MIN, 10 MIN, 15 MIN, 20 MIN, 25 MIN, 30 MIN	Sets the minimum time between switching from heat-to-cool from cool-to-heat demands when operating in Auto Mode.
Cool Lockout	OFF	OFF, 55°, 60°, 65°, 70°, 75°, 80°	When enabled, will not allow cooling operation when the outdoor temperature drops below the setting.
Time Between Fuel Types	15 MIN	10 MIN, 15 MIN, 20 MIN, 25 MIN	Sets the minimum time limit between switching from one fuel type to another
Cycles per Hour	4	4 or 6	This timer is set to 15 or 10 minutes. This time must elapse from the start of one cycle before another can start.
Humidifier	No	Yes or No	The control will only activate the humidifier if there is a demand for both heating and humidity.
Dehumidifier	No	NO, OVERCOOL 1°F, OVERCOOL 2°F, OVERCOOL 3°F,	The control will continue to run cooling up to 3 degrees below set point to meet humidity setting of the home
Max Heat Setpoint	88°	50°F to 88°F	Choose the maximum heating setpoint that is available.
Min Cool Setpoint	52°F	52°F to 90°F	Choose the minimum cooling setpoint that is available
AUX Heat Lock-out	OFF	OFF, 5°, 10°, 15°, 20°, 25°, 30°, 35°, 40°, 45°, 50°, 55°	If the auxiliary heat lock out temperature setting is not OFF and the outdoor air temperature is greater than auxiliary heat lock out temperature, then the Aux Heat (W1 & W2) outputs shall not turn on.

Continued on next page.

TABLE 5: Equipment Settings

HP Lockout	OFF	OFF, 5°, 10°, 15°, 20°, 25°, 30°, 35°, 40°, 45°, 50°, 55°	If a setting of OFF is selected, The heating equipment cycle shall always start with the heat pump regardless of the outdoor air temperature. If a lockout temperature is selected and the outdoor air temperature is less than the selected temperature, the heating cycle is started with the AUX Heat source. If the outdoor air temperature is equal to or greater than the selected temperature, the heating cycle is started with the heat pump.
Stage Delay	10 MIN (120 MIN for Variable Speed)	2 MIN - 120 MIN (in 1 Minute increments)	The minimum amount of time the current stage must be energized before staging up to the next stage of capacity
Forced Stage Up	30 MIN(360 MIN for Variable Speed)	OFF - 360 MIN (in 10 Minute increments)	If time in a current demanded stage reaches the forced stage up selected time, the thermostat will stage 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	This is the required difference between the current room temperature and the setpoint before demand is initiated. This value is additive fore each additional stage of equipment being demanded.
Air Filter Reminder	3000 HRS	OFF to 15,000 HRS	Defines a chosen number of hours before a System Event will occur to remind the homeowner to change the indoor air filter.
UV Lamp Reminder	OFF	OFF to 15,000 HRS	If a UV Lamp is installed, this enables a chosen number of hours before a System Event will occur to remind the homeowner to clean the UV Lamp.
EAC Reminder	OFF	OFF to 15,000 HRS	If an EAC is installed, this enables a chosen number of hours before a System Event will occur to remind the homeowner to clean the EAC Reminder.
Line Frequency	60 HZ	50 HZ or 60 HZ	This is used to increment operation timers within the thermostat to ensure timing accuracy and to allow for preemptive control of a power-out situation for the thermostat.
Brands	York	None, York, Coleman, Luxaire, Champion, Fraser-Johnson	This will be displayed on the Sleep Screen.
Efficiency Fault	Disabled	Disabled or Enabled	Faults that cause reduced system output but does not stop the equipment from running. Disabled faults will be logged but will not be displayed on the Home Screen Banner.
Warning Fault	Disabled	Disabled or Enabled	Disabled faults will be logged but will not be displayed on the Home Screen Banner.
Status Fault	Disabled	Disabled or Enabled	Fault that does not harm or stop equipment operation. Disabled faults will be logged but will not be displayed on the Home Screen Banner.
Defrost Temp	50°F	50°F, 60°F, 70°F, or 80°F	The temperature at which defrost is terminated
Comfort/Efficiency	Efficiency	Comfort or Efficiency	This is used to determine how quickly the compressor will ramp up to meet setpoint.
Demand Response	Disabled	Disabled, Enabled (Open), Enabled (Closed)	This is used to enable or disable the demand response feature.
Demand Resp Action	4°F	4°, 6°, 8°, 10°, Shut Down	When Demand Response is active, the setpoint will update to the selected temperature value or the equipment will shut down. The setpoint can be raised or lowered when the event is active, but the temperature selection differential must be maintained
Heating Airflow Adjust	0%	-10%, -5%, 0%, 5%, 10%	Allows the heating airflow CFM to be adjusted by plus/minus 5 or 10%.
Cooling Airflow Adjust	0%	-10%, -5%, 0%, 5%, 10%	Allows the cooling airflow CFM to be adjusted by plus/minus 5 or 10%.
Climate	Normal	Normal, Humid, Dry	These settings are not implemented in Heat Mode. Selecting a Dry climate will increase the current CFM by 10%. Selecting a Humid climate will decrease the current CFM by 10%.
Delay Profiles	Normal	Normal, Humid, Dry, Temperate	These profiles will run in COOL mode and are not implemented in heating. Each profile is designed to accommodate the original environment where the equipment is installed.
Humidistat Jumper	Yes	Yes or No	This setting will affect COOL Mode only. When the jumper is set to YES and there is a demand for dehumidification then the indoor CFM will be reduced by 15%.

TABLE 6: Float Switch Settings (AHV, AVC, and 2-Stage Variable Speed ECM Furnace)

Variable	Default	Settings	Explanation
Float Switch	Disabled	Enabled (Open), Enabled (Closed), Disabled	This screen allows the user to activate the optional condensate float switch (S1-ACS2) and to determine how the outdoor equipment will shut down.

TABLE 7: Auxiliary Settings (2-Stage Variable Speed ECM Furnace)

Variable	Default	Settings	Explanation
AUX Switch	Disabled	Enabled (Open), Enabled (Closed), Disabled	This screen allows the user to activate the optional dry relay contact which is supplied by the utility company.
AUX Switch: Heat	Stage Down	Stage Down or Shut Off Comp	This screen allows the user to determine the equipment functionality when the AUX Switch is activated.
AUX Switch: Cool	Stage Down	Stage Down or Shut Off Comp	This screen allows the user to determine the equipment functionality when the AUX Switch is activated.

FAULTS & SYSTEM EVENTS
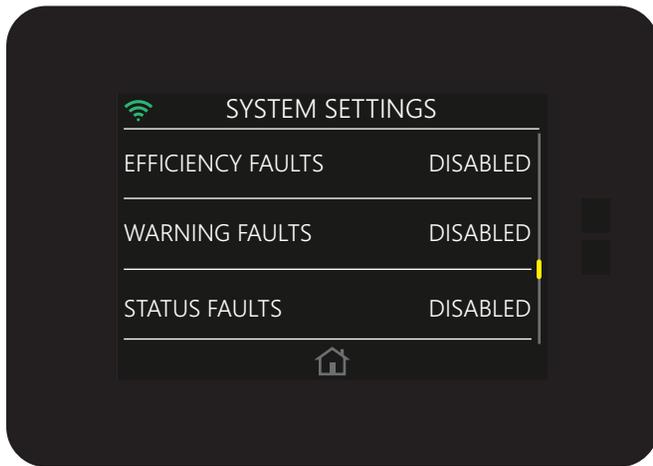
A0631-001

FIGURE 28: Screen System Set Faults

This screen allows the user to activate whether faults will be displayed on the home screen. Equipment faults will fall into 1 of the following 4 categories.

TABLE 8: Faults

Variable	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 does not stop the equipment from running
Warning	Disable	Disable or Enable	
Status	Disable	Disable or Enable	Fault that does not harm or stop equipment operation.

TABLE 9: Critical Faults

CRITICAL Fault (Displayed Text)	Description
Thermostat	
COMM ERROR OD CTRL	There was no response from the device within 10 seconds of the Primary Control's query after having communicated prior
COMM ERROR ID CTRL	There was no response from the device within 10 seconds of the Primary Control's query after having communicated prior
COMM ERROR BACK PCB	Valid packet has not been received from back PCB within last 15 seconds
Air Handler (AHV or AVC)	
INDOOR: NO MODEL PLUG	ID Plug is not present or not connected properly. Check for loose plug or loose wires in plug.
INDOOR: CONTROL FAILURE RECOVERY	Control recovered from internal error
INDOOR: CONTROL FAILURE	Control Failure
Modulating Furnace	
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
FURNACE: HIGH LIMIT OPEN	High limit switch or 24 volt fuse is open. Can be caused by restricted airflow or open fuse
FURNACE: ROLLOUT OR AUX OPEN	Rollout or auxiliary switch open. Reset rollout switch if possible. Check limit switch in air blower housing
FURNACE GAS VALVE FAILURE	Current failure on modulating gas valve
FURNACE: SUPPLY PWR REVERSED	Reversed line polarity or improper grounding. Check the polarity of incoming power and grounding. Check transformer.
FURNACE: GAS VALVE CIRCUIT SHORT	Gas valve circuit shorted. Check gas valve wiring. If correct, replace gas valve
FURNACE: BLOWER FAILURE	Main blower failure
FURNACE: NO MODEL PLUG	ID plug is not present or not connected properly. Check for loose plug or loose wires in plug
FURNACE: JUMPER ERROR	Jumper Error
FURNACE: PRESSURE SWITCH OPEN	Stuck open pressure switch indicates that the pressure switch is open when it should be closed
FURNACE: IGNITION FAILED	Lockout due to no ignition. Check gas supply, ignitor, gas valve, and flame sensor
FURNACE: MULTI FLAME DROPOUTS	Lockout due to too many flame recycles. Can be caused by fault gas valve, low gas pressure, or dirty flame sensor
2-Stage Furnace	
FURNACE: FLAME W/OUT POWER	Flame sensed with gas valve off
FURNACE: LIMIT/ROLLOUT OPEN	Limit/Rollout switch open
FURNACE: LIMIT/ROLLOUT OPEN 15 MIN	Limit/Rollout switch open more than 15 minutes
FURNACE: PRESSURE SWITCH LOCKOUT	Pressure switch cycle lockout
FURNACE: SUPPLY PWR REVERSED	Incorrect line voltage polarity
FURNACE: GAS VALVE CIRCUIT SHORT	Gas valve circuit shorted
FURNACE: LIMIT/ROLLOUT OPEN 5 MIN	Limit/Rollout switch open from 5 to 15 minutes
FURNACE: NO MODEL PLUG	ID Plug missing or not connected properly
FURNACE: CONTROL FAILURE	Control Failure
FURNACE: PRESSURE SWITCH OPEN	Pressure switch open with inducer on
FURNACE: IGNITION FAILED	Lockout due to failed ignition
FURNACE: MULTI FLAME DROPOUTS	Lockout due to too many flame dropouts
Indoor AUX	
INDOOR: CONTROL FAUILURE	Control Failure
INDOOR: LOW VOLTAGE (<16VAC)	Low voltage (below 16 VAC) stopped current relay outputs
INDOOR:X/L INPUT – FLASH 2	X/L Input Status
INDOOR:X/L INPUT – FLASH 4	X/L Input Status
Outdoor AUX	
OUTDOOR:HPS LOCKOUT	System in high pressure switch lockout
OUTDOOR:CONTROL FAILURE	Control Failure
OUTDOOR:LPS LOCKOUT	System in low pressure switch lockout
OUTDOOR:LOW VOLTAGE(< 16VAC)	Low voltage (below 16.0 VAC) stopped current relay outputs
OUTDOOR:COMPRESSOR MISWIRE	Compressor contactor miswire

TABLE 9: Critical Faults

CRITICAL Fault (Displayed Text)	Description
YGVI	
OUTDOOR:HPS LOCKOUT-HP	High Pressure Switch fault. Last mode of operation was heat pump.
OUTDOOR:HPS LOCKOUT-DEFROST	High Pressure Switch fault. Last mode of operation was defrost.
OUTDOOR:CONTROL FAILURE	Control Failure
OUTDOOR:LPS LOCKOUT	Low Pressure Switch Lockout
OUTDOOR:LOW VOLTAGE(< 16VAC)	Low voltage (below 16.0 VAC) stopped current relay outputs
OUTDOOR:AMBIENT SENSOR SHORTED	Outdoor ambient temperature sensor failure (shorted)
OUTDOOR:AMBIENT SENSOR OPEN	Outdoor ambient temperature sensor failure (open)
OUTDOOR:LIQUID LINE SENSOR SHORT	Liquid line sensor failure (shorted)
OUTDOOR:LIQUID LINE SENSOR OPEN	Liquid line sensor failure (open)
OUTDOOR:HIGH DISCHARGE TEMP - SOFT LOCKOUT	High discharge line temperature
OUTDOOR:LOW DISCHARGE TEMP - SOFT LOCKOUT	Low discharge line temperature
OUTDOOR:HIGH DISCHARGE TEMP - HARD LOCKOUT	High discharge line temperature
OUTDOOR:LOW DISCHARGE TEMP - HARD LOCKOUT	Low discharge line temperature
OUTDOOR:DISCHARGE LINE SENSOR SHORT	Discharge line sensor failure (shorted)
OUTDOOR:BONNET SENSOR SHORT	Bonnet sensor failure (shorted)
OUTDOOR:FOSSIL FUEL CONFIG ERROR	Fossil Fuel Mode setting error. FFUEL jumper in the OFF position with bonnet sensor present
OUTDOOR:COMPRESSOR MISWIRE	Compressor contactor miswire
OUTDOOR:Y2 W/O Y1-SOFT LOCKOUT	Y2 present without Y1
OUTDOOR:NO DEFROST CURVE SELECTED	Defrost Curve Jumper Error. Invalid jumper setting preventing compressor operation.
VS Outdoor Control	
OUTDOOR:CONTROL FAILURE	Control Failure
OUTDOOR:HPS SOFT LOCKOUT-NORMAL	High pressure switch lockout. Last mode of operation was normal compressor.
OUTDOOR:HPS HARD LOCKOUT-NORMAL	High pressure switch lockout. Last mode of operation was normal compressor.
OUTDOOR:HPS SOFT LOCKOUT-DEFROST	High pressure switch lockout. Last mode of operation was defrost.
OUTDOOR:HPS HARD LOCKOUT-DEFROST	High pressure switch lockout. Last mode of operation was defrost.
OUTDOOR:LOW VOLTAGE(< 19VAC)	Low Voltage (<19 VAC) stopped current relay outputs for > 2 seconds
OUTDOOR:COMM LOST INVERTER DRIVE	Inverter Control Communications Fault
OUTDOOR: COMM LOST- SYSTEM PRIMARY CONTROL	RS-485 Communications Lost
OUTDOOR:AMBIENT SENSOR SHORTED	Outdoor ambient sensor failure (short)
OUTDOOR:AMBIENT SENSOR OPEN	Outdoor ambient sensor failure (open)
OUTDOOR:COIL TEMP SENSOR SHORTED	Coil sensor failure (short)
OUTDOOR:COIL TEMP SENSOR SHORTED-SOFT LOCKOUT	Coil sensor failure (short)
OUTDOOR:COIL TEMP SENSOR OPEN	Coil sensor failure (open)
OUTDOOR:COIL TEMP SENSOR OPEN-SOFT LOCKOUT	Coil sensor failure (open)
OUTDOOR:LIQUID TEMP SENSOR SHORTED	Liquid line temperature sensor failure (short)
OUTDOOR:LIQUID TEMP SENSOR SHORTED-SOFT LOCKOUT	Liquid line temperature sensor failure (short)
OUTDOOR:LIQUID TEMP SENSOR OPEN	Liquid line temperature sensor failure (open)
OUTDOOR:LIQUID TEMP SENSOR OPEN-SOFT LOCKOUT	Liquid line temperature sensor failure (open)
OUTDOOR:DISCHARGE TEMP SENSOR SHORTED	Discharge temperature sensor failure (short)
OUTDOOR:DISCHARGE TEMP SENSOR OPEN	Discharge temperature sensor failure (open)
OUTDOOR:DISCHARGE TEMP SENSOR OPEN-SOFT LOCKOUT	Discharge temperature sensor failure (open)
OUTDOOR:SUCTION TEMP SENSOR SHORTED	Suction temperature sensor failure (short)
OUTDOOR:SUCTION TEMP SENSOR SHORTED-SOFT LOCKOUT	Suction temperature sensor failure (short)
OUTDOOR:SUCTION TEMP SENSOR OPEN	Suction temperature sensor failure (open)
OUTDOOR:SUCTION TEMP SENSOR OPEN-SOFT LOCKOUT	Suction temperature sensor failure (open)
OUTDOOR:DISCHARGE PRESSURE SENSOR LOW VOLTAGE	Discharge pressure sensor failure (low voltage)
OUTDOOR:DISCHARGE PRESSURE SENSOR LOW VOLTAGE-SOFT LOCKOUT	Discharge pressure sensor failure (low voltage)
OUTDOOR:DISCHARGE PRESSURE SENSOR HIGH VOLTAGE	Discharge pressure sensor failure (high voltage)
OUTDOOR:DISCHARGE PRESSURE SENSOR HIGH VOLTAGE-SOFT LOCKOUT	Discharge pressure sensor failure (high voltage)
OUTDOOR:SUCTION PRESSURE SENSOR LOW VOLTAGE-SOFT LOCKOUT	Suction pressure sensor failure (low voltage)

Continued on next page.

TABLE 9: Critical Faults

CRITICAL Fault (Displayed Text)	Description
OUTDOOR:SUCTION PRESSURE SENSOR HIGH VOLTAGE-SOFT LOCKOUT	Suction pressure sensor failure (high voltage)
OUTDOOR:HIGH DISCHARGE TEMP	High discharge temperature
OUTDOOR:HIGH DISCHARGE TEMP - SOFT LOCKOUT	High discharge temperature
OUTDOOR:HIGH DISCHARGE TEMP - HARD LOCKOUT	High discharge temperature
OUTDOOR:LOW SUCTION PRESSURE	Low suction pressure
OUTDOOR:LOW SUCTION PRESSURE - SOFT LOCKOUT	Low suction pressure
OUTDOOR:LOW SUCTION PRESSURE - HARD LOCKOUT	Low suction pressure
OUTDOOR: MULTIPLE INVERTER FAULTS-SOFT LOCKOUT	Multiple Inverter Faults
VS Inverter Control	
INVERTER:COMPRESSOR PHASE OVER CURRENT	Compressor Phase Over Current
INVERTER:AC INPUT OVER CURRENT	AC Input Over Current
INVERTER:DC BUS OVER VOLTAGE	DC Bus Over Voltage
INVERTER:DC BUS UNDER VOLTAGE	DC Bus Under Voltage
INVERTER:AC INPUT OVER VOLTAGE	AC Input Over Voltage
INVERTER:AC INPUT UNDER VOLTAGE	AC Input Under Voltage
INVERTER:POWER MODULE OVER TEMP	Power Module Over Temp
INVERTER:PFC-IGBT OVER TEMP	PFC-IGBT Over Temp
INVERTER:LOST ROTOR POSITION	Lost Rotor Position
INVERTER:COMPRESSOR PHASE CURRENT IMBALANCE	Compressor Phase Current Imbalance
INVERTER:MICROELECTRONIC FAULT	Microelectronic Fault
INVERTER:POWER MODULE TEMP LOW/SENSOR OPEN	Power Module Temp Low or Sensor Open Fault
INVERTER:COMM ERROR	Modbus Communication Lost
INVERTER:PFC MCU & DSP COMM ERROR	PFC MCU and DSP Communication Lost
INVERTER:COM MCU & DSP COMM ERROR	COM MCU and DSP Communication Lost
INVERTER:PFC-IGBT LOW TEMP/SENSOR OPEN	PFC-IGBT Temp Low or Sensor Open Fault
INVERTER:COMPRESSOR MODEL CONFIG ERROR	Compressor Model Configuration Error
INVERTER:HPS CONFIG ERROR	High Pressure Sensor Type Configuration Error
INVERTER: DLT CONFIG ERROR	DLT Sensor Configuration Error
INVERTER:FAULT LIMIT LOCKOUT	Fault Limit Lockout

TABLE 10: Efficiency Fault

EFFICIENCY Fault (Displayed Text)	Description
Thermostat	
ID TEMP SENSOR HIGH	Temperature reading > 122 F
ID TEMP SENSOR LOW	Temperature reading = 0 or reading not available
REMOTE SENSOR HIGH	Remote temperature > 122 F. Only flagged if remote sensor set to use as indoor temperature (REMOTE SENSOR setting se to INDOOR or AVERAGE
REMOTE SENSOR LOW	Remote temperature = 0. Only flagged if remote sensor set to use as indoor temperature (REMOTE SENSOR setting se to INDOOR or AVERAGE
HUM TEMP SENSOR HIGH	Humidity sensor temperature > 122 F. Only flagged if using hum temperature as a backup source during a fault condition with the primary temperature sensor
HUM TEMP SENSOR LOW	Humidity sensor temperature = 0. Only flagged if using hum temperature as a backup source during a fault condition with the primary temperature sensor
ID TEMP RANGE HIGH	Indoor temperature is > 99.0 F
ID TEMP RANGE LOW	Indoor temperature is < 40.0 F
HUM SENSOR FAILURE	Humidity sensor timed out. Humidity reading is > 99% or Humidity reading is 0
HUMIDITY RANGE HIGH	Humidity reading is > 90%
HUMIDITY RANGE LOW	Humidity reading is < 10%
OUTDOOR SENSOR FAILURE	OD temp > 127 or < -60
Modulating Furnace	
FURNACE: PRESSURE SWITCH CLOSED	Pressure switch closed with inducer pressure below pressure switch setpoint (switch is closed when it should be open). Check pressure switch.
FURNACE: SOFT LIMIT WARNING	Soft limit warning
FURNACE: AIR BLOCKAGE WARNING	Air blockage warning
FURNACE: UNKNOWN FAILURE	Unknown failure
FURNACE: FLAME ROD AGE WARNING	Flame rod age warning
2-Stage Furnace	
FURNACE: PRESSURE SWITCH CLOSED	Pressure switch closed with inducer off
FURNACE: 2S PRESSURE SWITCH OPEN	2nd stage pressure switch open with high inducer on
FURNACE: FLAME ROD AGE WARNING	Flame rod warning
Outdoor AUX	
OUTDOOR:Y2 W/O Y1-SOFT LOCKOUT	Y2 present without Y1
OUTDOOR:HPS OPEN W/O COMPRESSOR	HPS open with no call for compressor
YGVI	
OUTDOOR:PIPE FREEZE TIMER EXPIRED	Pipe Freeze Protection Timer expiration
OUTDOOR:HPS OPEN W/O COMPRESSOR	HPS open with no call for compressor
VS Control	
OUTDOOR:HPS OPEN	High-pressure switch fault (not in lockout yet)
OUTDOOR:PIPE FREEZE TIMER EXPIRED	Pipe Freeze Timer expiration
OUTDOOR:REPAIR MODE HEAT-HP	Conventional Y1 signal receive in HP mode
OUTDOOR:REPAIR MODE COOL-HP"	Conventional Y1 and O signals receive in HP mode
OUTDOOR:REPAIR MODE COOL-AC	Conventional Y1 signal receive in AC mode
OUTDOOR:HIGH SUPERHEAT"	High Superheat
OUTDOOR:LOW SUPERHEAT	Low Superheat
OUTDOOR:HIGH SUBCOOL	High Subcool
OUTDOOR:LOW SUBCOOL	Low Subcool
VS Inverter	
INVERTER:COMPRESSOR PHASE CURRENT FOLDBACK	Compressor Phase Current Foldback Timeout
INVERTER:AC INPUT CURRENT FOLDBACK	AC Input Current Foldback Timeout
INVERTER:POWER MODULE HIGH TEMP	Power Module Temp High
INVERTER:PFC-IGBT HIGH TEMP	PFC-IGBT High Temp
INVERTER:POWER MODULE TEMP FOLDBACK	Power Module Temp. Foldback Timeout

TABLE 11: Warning Fault

WARNING Fault (Displayed Text)	Description
Indoor AUX	
OUTDOOR:LOW VOLTAGE(< 19VAC)	Low voltage (below 19.2 VAC) preventing further relay outputs
Outdoor AUX	
OUTDOOR:LOW VOLTAGE(< 19VAC)	Low voltage (below 19.2 VAC) preventing further relay outputs
OUTDOOR:AMBIENT SENSOR SHORTED	Outdoor ambient temperature sensor failure (shorted)
OUTDOOR:AMBIENT SENSOR OPEN	Outdoor ambient temperature sensor failure (open)
YGVI	
OUTDOOR:LOW VOLTAGE(< 19VAC)	Low voltage (below 19.2 VAC) preventing further relay outputs
OUTDOOR:O INPUT-AC MODE	O signal received in AC Mode
OUTDOOR:W INPUT-AC MODE	W signal received in AC Mode
OUTDOOR:W & O INPUTS-AC MODE	W and O signals received in AC Mode
OUTDOOR:W & O INPUTS-HP MODE	W and O signals received in HP Mode
VS Control	
OUTDOOR:LOW VOLTAGE(< 22VAC)	Low Voltage (< 22.2VAC) preventing further relay outputs for > 2 seconds
OUTDOOR:O INPUT-AC MODE	O signal received in AC mode
OUTDOOR:W & O INPUTS-AC MODE	W and O signal received in AC mode
OUTDOOR:W & O INPUTS-HP MODE	W and O signal received in HP mode
OUTDOOR: LOW SUCTION PRESSURE	Low suction pressure
OUTDOOR: LOW DISCHARGE TEMP	Low discharge temperature
OUTDOOR: LOW SYSTEM CHARGE	Low system charge
OUTDOOR: HIGH SYSTEM CHARGE	High system charge

TABLE 12: Status Fault

STATUS Fault (Displayed Text)	Description
Thermostat	
NOT CONNECTED TO SERVER	Not connected to Ayla server
NOT CONNECTED TO ROUTER	Router signal strength is 0 bars (not connected)
WIFI HARDWARE FAULT	Communications error occurred with Wi-Fi module (resets after valid message received)
Indoor AUX	
INDOOR:X/L INPUT-FLASH 1	X/L Input Status
INDOOR:X/L INPUT-FLASH 4	X/L Input Status
INDOOR:X/L INPUT-FLASH 5	X/L Input Status
INDOOR:X/L INPUT-FLASH 6	X/L Input Status
INDOOR:X/L INPUT-FLASH 7	X/L Input Status
INDOOR:X/L INPUT-FLASH 8	X/L Input Status
INDOOR:X/L INPUT-FLASH 9	X/L Input Status
INDOOR:X/L INPUT-CONSTANT	X/L Input Status
2-Stage Furnace	
FURNACE: Y WITHOUT G	Y thermostat demand without a G
VS Control	
OUTDOOR:DEMAND RESPONSE	Demand Response
ID EEV	
ID EEV: INVALID PRESSURE TRANS-DUCER	Invalid pressure transducer
ID EEV: INVALID SUCTION TEMP	Invalid suction temperature
ID EEV: FULLY OPEN IN SUPERHEAT	Valve position to fully open while in superheat control mode
ID EEV: SUCTION PRESSURE OUT OF RANGE	Suction pressure out of range
ID EEV: COMMUNICATIONS LOST	RS-485 Communication not sensed

Ventilation Settings

The Ventilation Settings screens are used to view/edit settings associated with a whole home ventilator (ERV/HRV) devices. These screens are only accessible in system which have an ERV/HRV Accessory control installed. The settings available are explained in the table below.

TABLE 13: System Events

System Events: Logged but NOT shown in banner	
Event (Displayed Text)	Description
SETUP CORRECTION	Setting was adjusted b/w it was out of range or issue w/ other 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 bootloader application successful
OTA TIMED OUT	OTA software updated 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	Air Filter # hours remaining has been reset (from FILTER screen)
HUMIDIFIER FILTER RESET	Humidifier Filter # hours remaining has been reset (from FILTER screen)
UV LAMP RESET	UV Lamp # hours remaining has been reset (from FILTER screen)
EAC RESET	EAC # hours remaining has been reset (from FILTER screen)
STARTUP	Flagged at startup to indicate that 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	
AIR FILTER REMINDER	Air filter change reminder is active (run hours have expired)
HUMIDIFIER FILTER REMINDER	Humidifier filter change reminder is active (run hours have expired)
UV LAMP REMINDER	UV Lamp change reminder is active (run hours have expired)
EAC REMINDER	EAC change reminder is active (run hours have expired)

TABLE 14: Ventilation Settings

Variable	Default	Settings	Explanation
Ventilation Mode	Timed	Continuous, Timed or Off	This will determine how often the ventilation device will be opened
Ventilation Runtime per Cycle	20 min.	5-55 min in 5 min intervals	If ventilation mode is set to "Timed", the control will allow ventilation per this setting per Ventilation Cycle Time
Ventilation Cycle Time	1 hour	1 -4 hours	If ventilation mode is set to "Timed", the control will allow Ventilation Runtime per this setting
Ventilation Limits	Disabled	Disabled, Default, and Manual	If there is a damper installed for ventilation purposes
No Ventilation Above	100 F		The touch screen will not allow ventilation if the outdoor temperature exceeds this setting
No Ventilation Below	0 F		The touch screen will not allow ventilation if the outdoor temperatures is below this setting

There are additional settings for ventilation. These settings will determine if the ventilator is opened during a call for conditioning. The thermostat will open ventilation any time there is a call for conditioning if the outdoor temperature falls in the "Ventilation with a heating/cooling call". Otherwise ventilation will run with the indoor blower per the previously described settings.

Finally the ventilation can be controlled per indoor humidity. If the outdoor temperature is above 50 degrees the touch screen can be set so that it will disable ventilation if the indoor humidity rises above the desired setting.
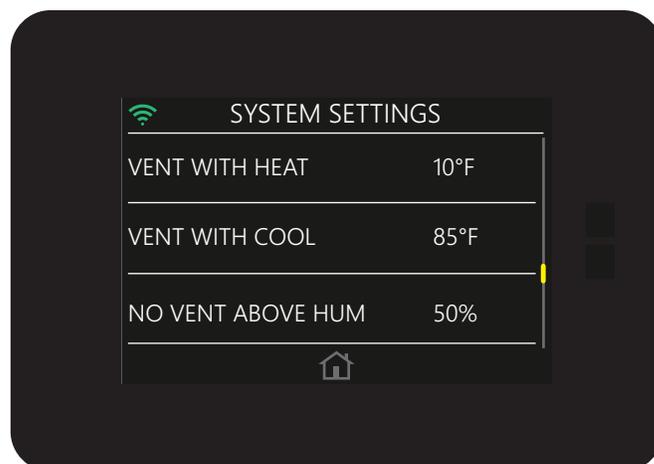

A0632-001

FIGURE 29: Vent with Heat

SECTION VII: SERVICE SETTINGS

Additional service information such as event/fault logs and dealer content can be found by going to the homeowner settings screen.

LOG

Here the event and fault log screen can be viewed. Pressing an entry displayed on the "Log" screen will prompt a screen that tells when the event or fault last occurred and how many times it has occurred.

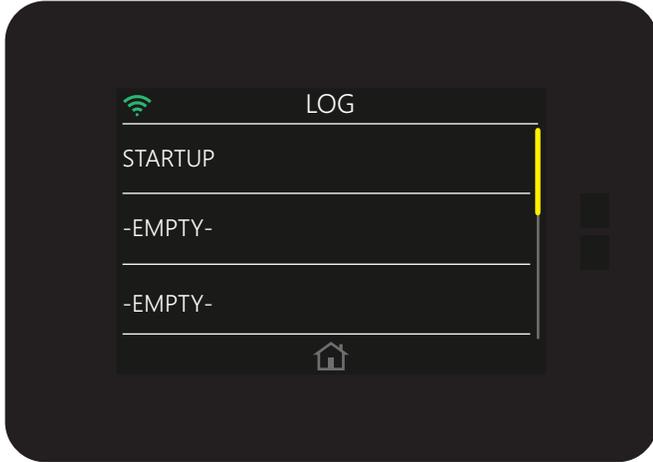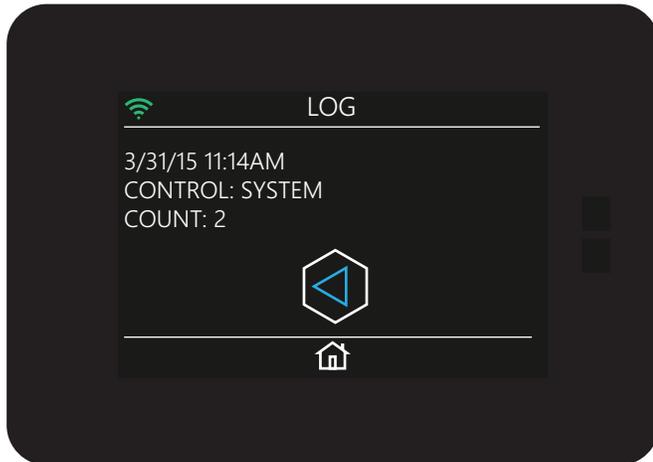Press the "Reset Log" to delete all the displayed log entries.

FIGURE 30: Log

FIGURE 31: Screen Log Startup

DEALER INFORMATION

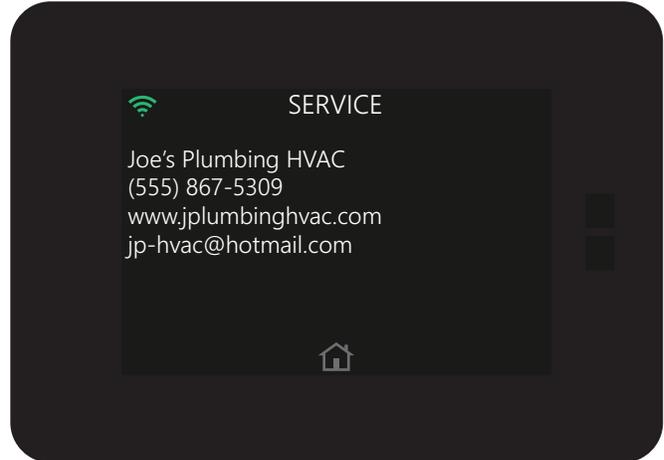The information displayed on this screen is editable via the Thermostat 280 app.

FIGURE 32: Screen Service

FORCED OPERATION

Pressing and holding TIMERS text for 5 seconds will clear timer countdown values for ON timer, OFF timer, CYCLE timer and STAGE DELAY timer. Current lockouts will be actively displayed in this screen. Pressing and holding LOCK-OUT TIMERS text for 5 seconds will clear timer values for COOL timer, AUX HEAT timer and HP HEAT timer
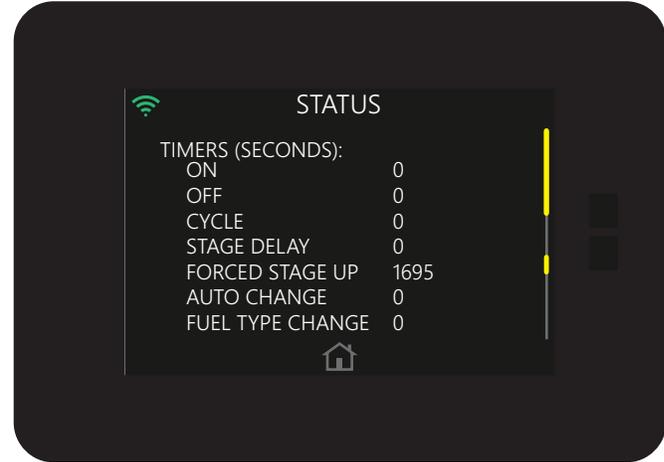

FIGURE 33: Status