LENNOX VRF

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⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life.
Installation and service must be performed by a licensed professional HVAC installer (or equivalent) or service agency.

⚠ CAUTION

To ensure proper system performance and reliability, Lennox does not recommend operation of VRF systems during any phase of construction. Construction debris, low temperatures, harmful vapors, and operation of the unit with misplaced filters can damage the units. Failure to follow these guidelines will result in the warranty being voided.

⚠ IMPORTANT

Frequent changes to operating mode may cause system malfunction. Allow at least one minute between mode changes to allow the system to stabilize.

This manual must be left with the owner for future reference.

INSTALLATION INSTRUCTIONS

VRF Wi-Fi Controller Installation

VRF Systems - Controls
508210-03
06/2023

General

The F1943L-3P (19B16) controller is a wired touch screen programmable local controller for VRF Heat Recovery and Heat Pump indoor units capable of Wi-Fi control via a mobile application. These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities having jurisdiction before installation.

Be sure that power supply has been turned off before beginning installation. This controller should be used only as described in this manual.

Shipping and Packing List

Package 1 of 1 contains;
1 – Wired Controller
1 – Back plate and Wire Terminals
2 – Mounting screws and anchors
2 – Machine screws for connecting controller to back plate

Tools Needed

#2 Phillips screwdriver
Slotted precision screwdriver
Level
1/8” wall anchor tools

Controller Placement

Avoid installing local controller in high load or heat loss areas such as exterior walls or walls that are against unconditioned spaces, near entry doors and windows, or where direct sunlight may be present.

Installation

⚠ WARNING

Be sure that power supply has been turned off before beginning installation.
Do not operate controller with wet hands.

⚠ CAUTION

Do not install controller in areas where harmful gases containing sulfur or other damaging agents may exist or the controller may be damaged.
Clean controller using a clean, damp cloth. Do not spray cleanser on or around controller.

⚠ IMPORTANT

Electrostatic discharge can affect electronic components. Take precautions to neutralize electrostatic charge by touching your hand and tools to metal prior to handling the control.

⚠ IMPORTANT

Read all of the information in this manual before using this controller. All wiring must conform to local and national building and electrical codes and ordinances. This is a 12 VDC controller. Do not install on voltages higher than 12 VDC.

- This manual provides the installation instructions for this controller. Refer to the included wiring diagrams to connect the controller to the indoor unit.
- Do not expose to volatile organic compounds (V.O.C.) and/or alcohol that can cause sensor damage.
- Do not expose to construction dust, paint, and/or other contaminants that can deposit on the circuit board surface inside the unit.
- Physical damage can lead to broken cover glass as well as prevent the unit from functioning correctly.
- The controller uses low voltage. Keep a minimum distance of 12” (305 mm) between low voltage control wire and high voltage power wires.

Power wiring between controller and first indoor unit:

- Minimum 18 AWG stranded, shielded cable up to 164 feet (50 m).
- Ensure there are no gaps between the controller back cover and the mounting surface.
- Fill any holes in the wall behind the controller to avoid false readings from infiltration.
- Ground the shielded control wiring.
- Do not use a megger to test insulation.

Communication wiring between indoor units:

- Minimum 18 AWG stranded, shielded cable.

Connecting to a Single P3 Indoor Unit

Connect the controller to an indoor unit using Control Protocol 3, or P3, using 4-conductor wire to terminals +12V,-GND,HA,HB. See Figure 1.

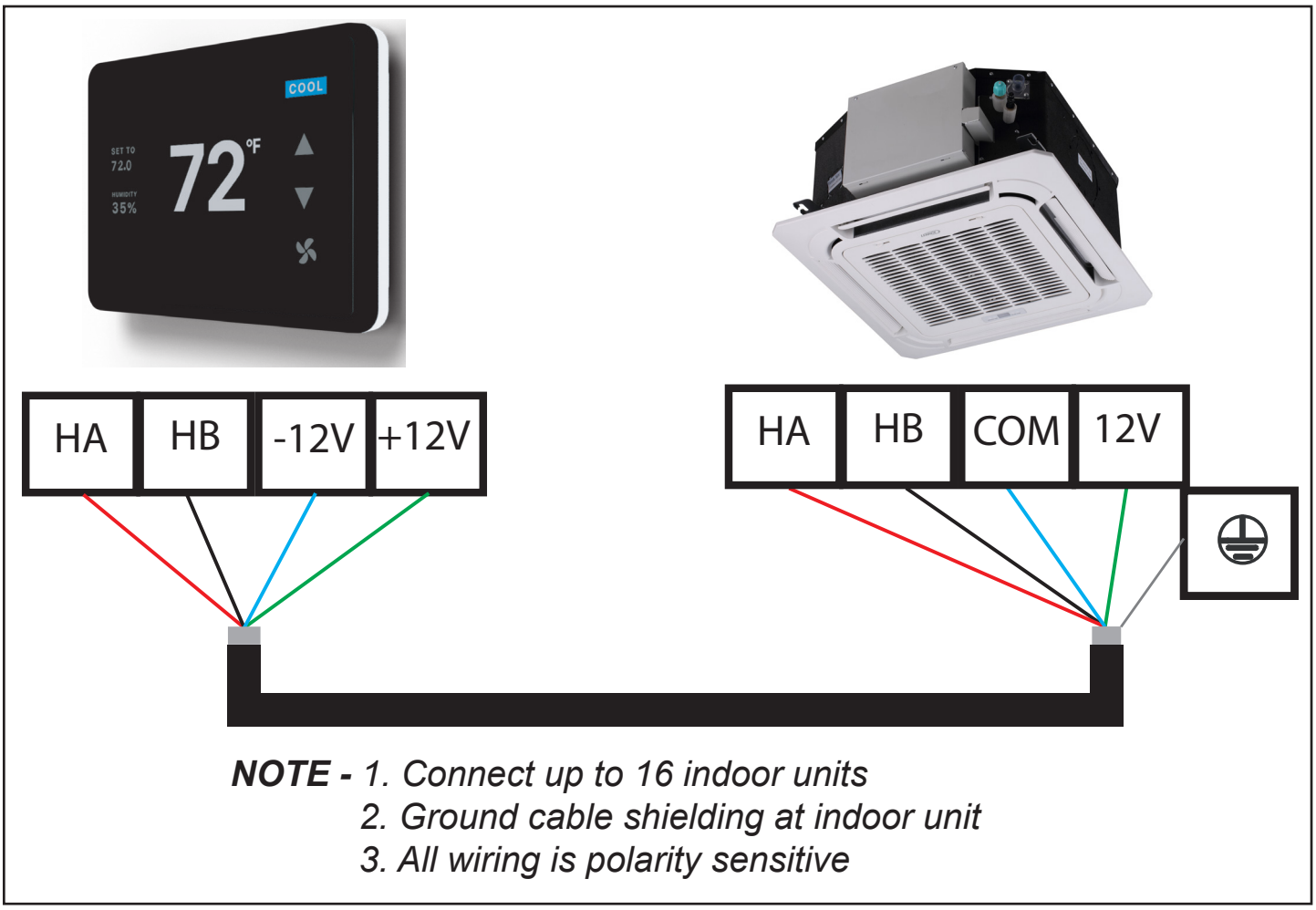

Figure 1. Connect to P3 Indoor Unit

Connecting to Multiple Indoor Units

Connect the controller to multiple indoor units, up to 16. Use 4-conductor shielded cable to connect to the first indoor unit, then daisy chain control wiring to each indoor unit using the HA/HB terminals in the electrical control box of the indoor unit. Do not daisy chain 12V power cable. See Figure 2.

***NOTE** – All of the indoor units connected to the controller must be on the same refrigerant circuit, connected to the same outdoor unit.*

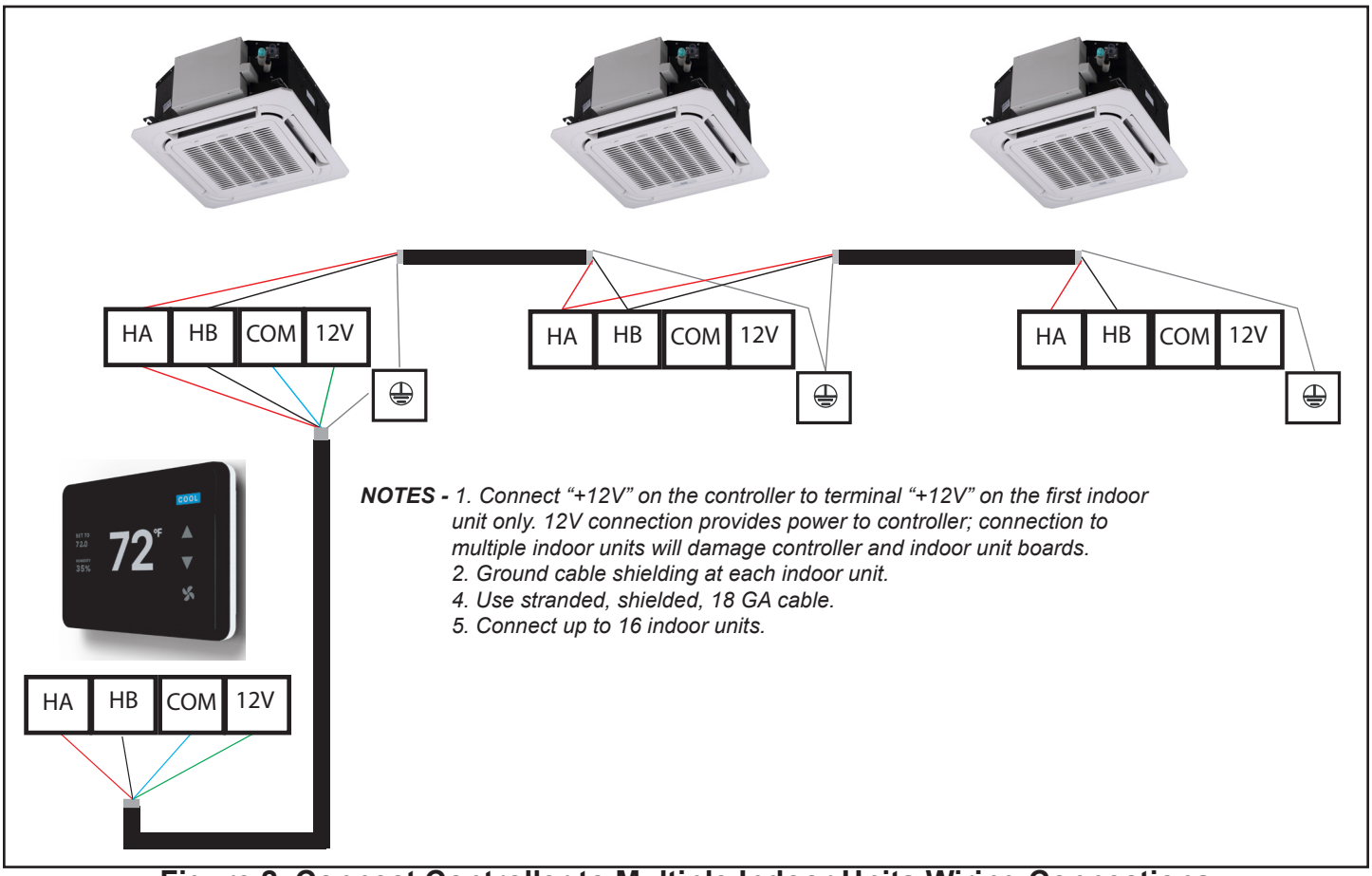

Figure 2. Connect Controller to Multiple Indoor Units Wiring Connections

⚠ CAUTION

Connect "12V" on the controller to terminal "12V" on the first indoor unit only. 12V connection provides power to controller; connection to multiple indoor units will damage controller and indoor unit boards.

Mount the Controller

1. Attach the back cover to the wall using screws.
2. Connect the controller to one indoor unit main control board using appropriate wiring method as determined.
3. Push the controller back toward the back plate until it “snaps” into place, use machine screws to secure cover to back plate.

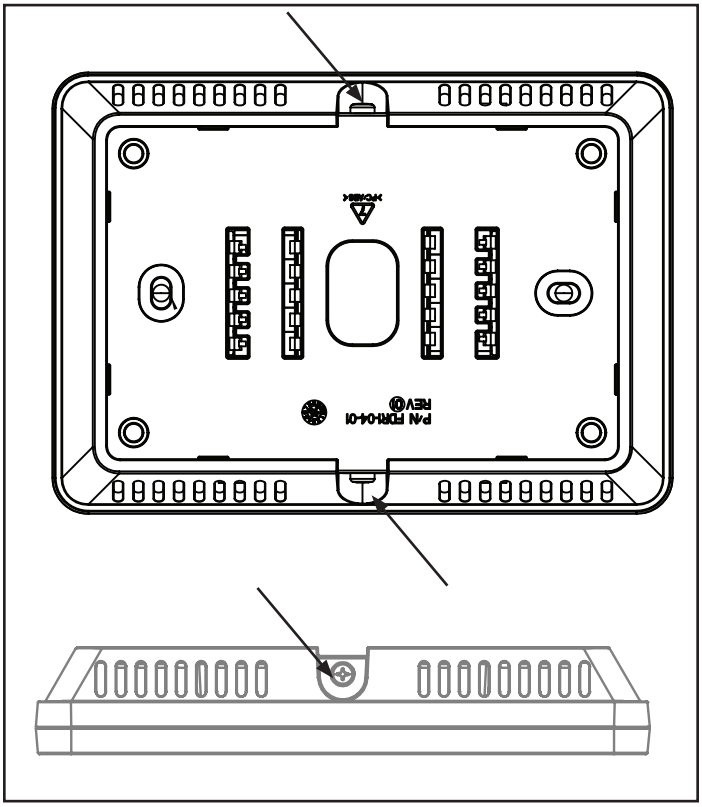

Figure 3. Back Plate

Operation

Main Menu

To access the main menu, tap the mode (HEAT, COOL, or OFF) on the top right corner of the screen.

The main menu allows for quick access to changing modes, fan operation, and other settings if enabled by the system operator.

Depending on your HVAC system, some options may be disabled and not displayed.

When the system is actively cooling or heating the space, an underline will appear below the HEAT/COOL indicator on the main screen. The line will disappear during the system is idle or when the set-point is satisfied.

Factory Reset: A reset switch is hidden behind the first grill on the top right (see image below). Use a non-metal tool to contact and press the reset switch.

Single Press: A single press of the switch will reboot the device without changes to the stored information.

Long Press (Factory Reset): Holding the switch down for more than five seconds will put the device in factory reset.

A visual indication is shown on the screen.

Note: Factory resets do not erase network information and the device will remain on the network until a leave operation is performed (via the network menu or over the air).

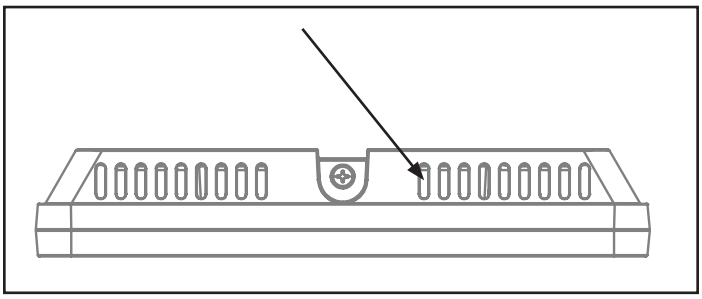

Figure 4. Factory Reset Button

Set Up Auxiliary Heat

Set up auxiliary heat operation.

Auxiliary heat setup takes place using the controller.

1. Go to the wired controller.
2. Touch the Mode in the top-right corner of the screen.

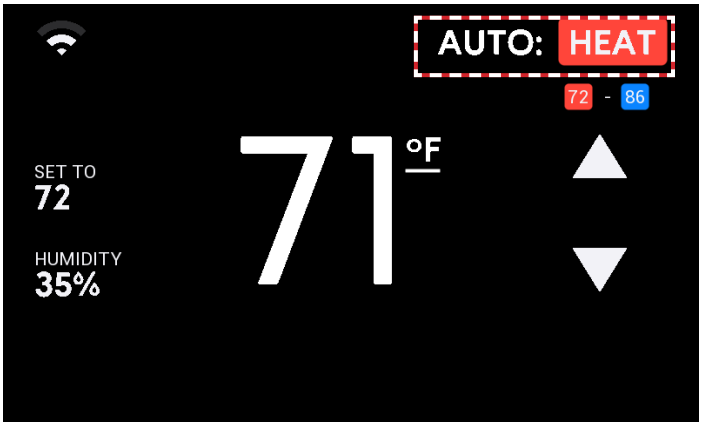

Figure 5. Touch the Mode of Operation

3. Tap Settings (Gear icon).

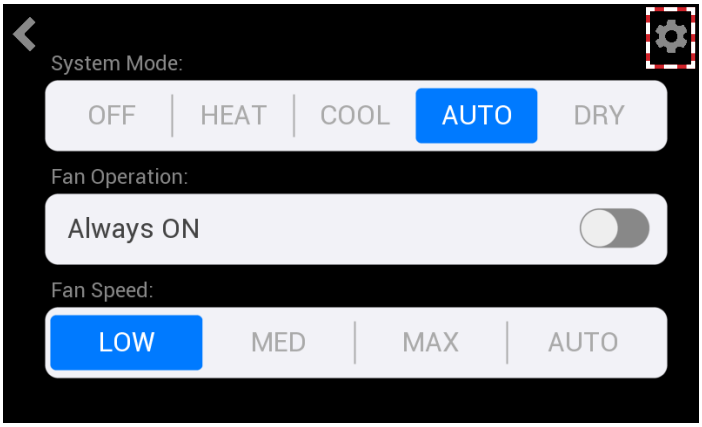

Figure 6. Tap the Settings icon

4. Tap Additional Settings.

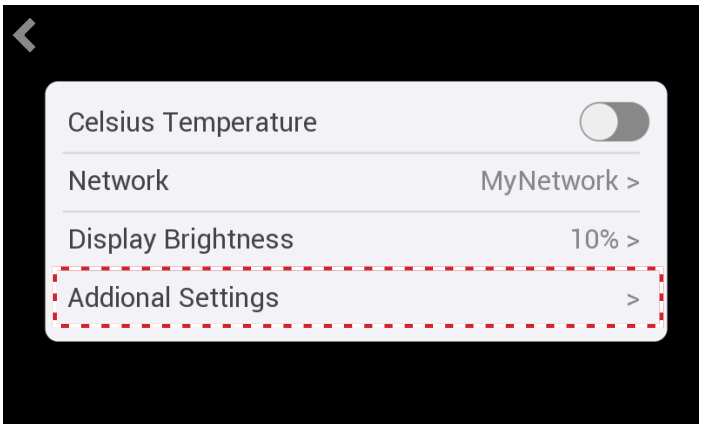

Figure 7. Tap Additional Settings

5. Tap Service Menu.

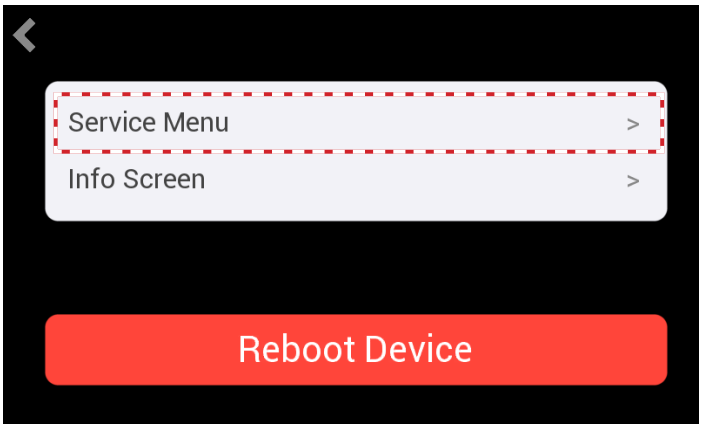

Figure 8. Tap Service Menu

6. Enter passcode (default: 0000).

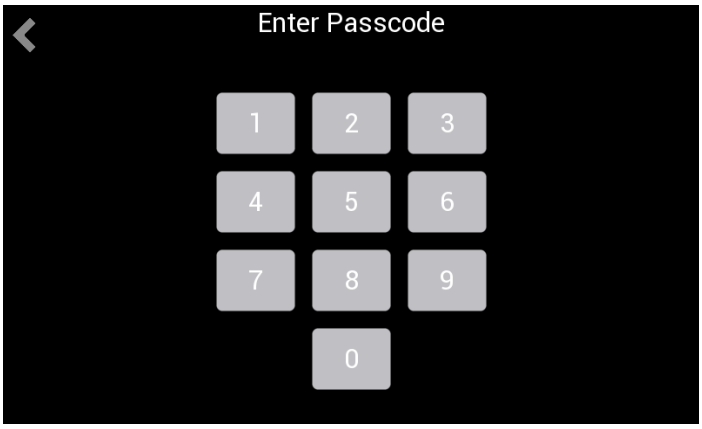

Figure 9. Enter Passcode

7. Tap Aux Heat Setup.

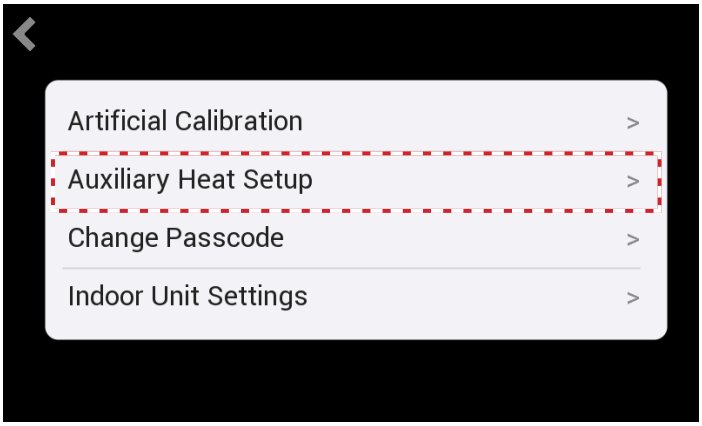

Figure 10. Tap Auxiliary Heat Setup

8. Tap Aux System Type

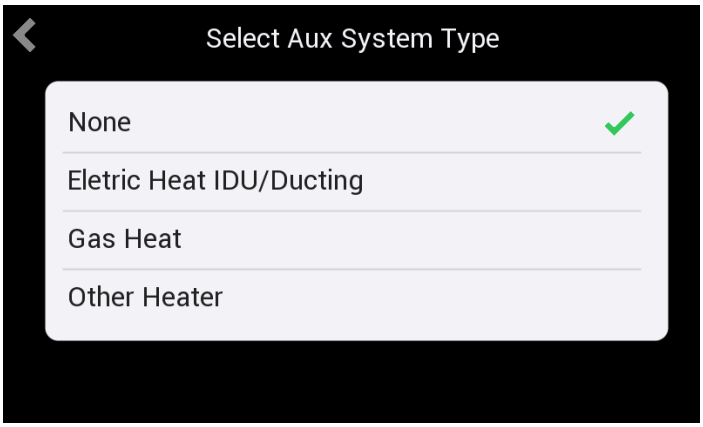

Figure 11. Select Auxiliary or Alternate Heat System Type

1. Tap the selection for the type of auxiliary or alternative heat.
2. Tap the Next button. The next screen will depend on the selection made.

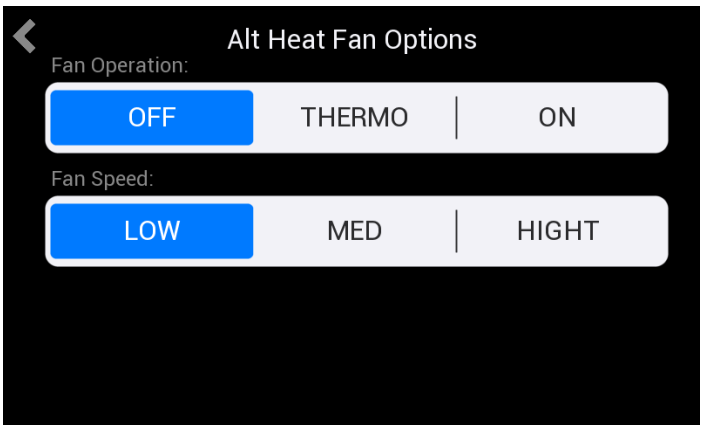

Figure 12. Set Electric Heat Fan Operation and Fan Speed

3. If Electric Heat IDU/Ducting is selected, the next screen displays fan operation and fan speed settings.

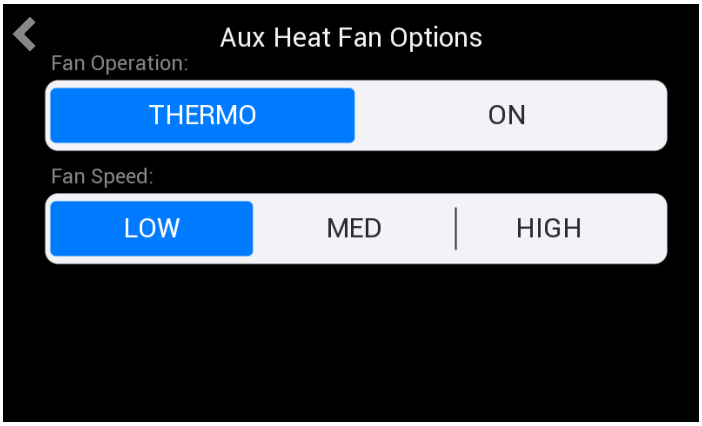

Figure 13. Set Gas Heat or Other Heater Fan Operation and Fan Speed

4. If Gas Heat or Other Heater is selected, the next screen displays fan operation and fan speed settings.

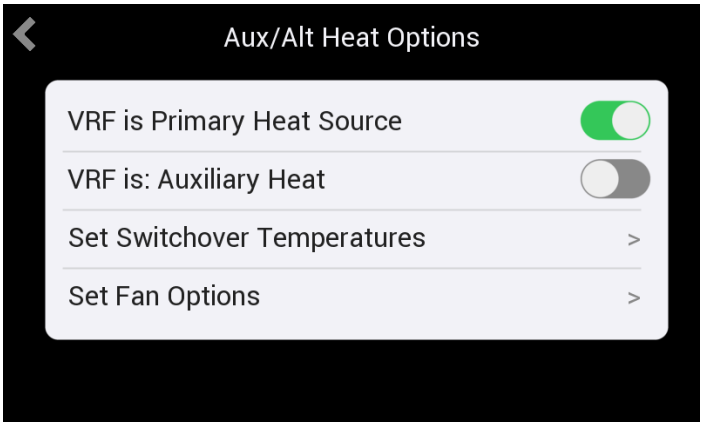

Figure 14. Select if VRF system is the Primary or Auxiliary Heat Source

5. Select if the VRF system is the Primary or Auxiliary heat source.
   Primary: Mechanical Heat (VRF) is used first until an aux-condition is met.
   Secondary: VRF is not used for Heat.
   Alternative: When an Aux-Condition is met, VRF heat is no longer used.
   Auxiliary: When an Aux-Condition is met, VRF heat is used in conjunction with Secondary Source.
   Aux-Condition: e.g. switch-over temperature, set-point delta

6. Tap Set Switchover Temperatures to set the Auxiliary or Alternate Heat Delta Temperature.

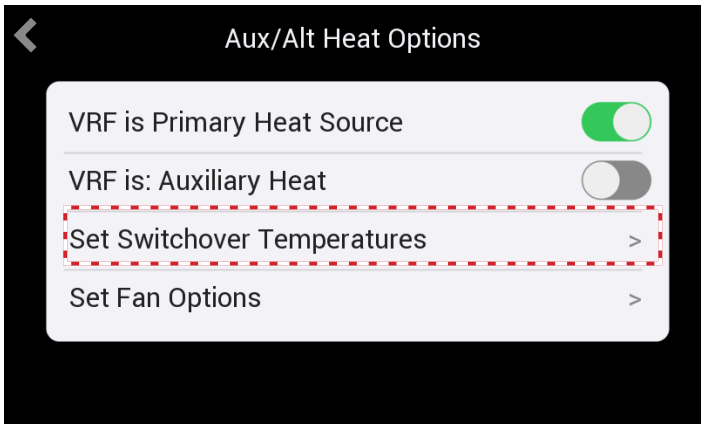

Figure 15. Tap Set Switchover Temperatures

7. Tap Set Aux/Alt Delta Temperature.

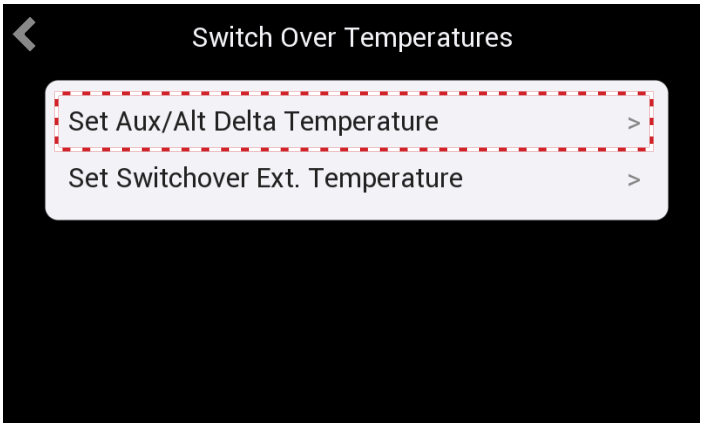

Figure 16. Tap Set Aux/Alt Delta Temperature

8. Use the slider to adjust the auxiliary or alternate heat delta temperature.

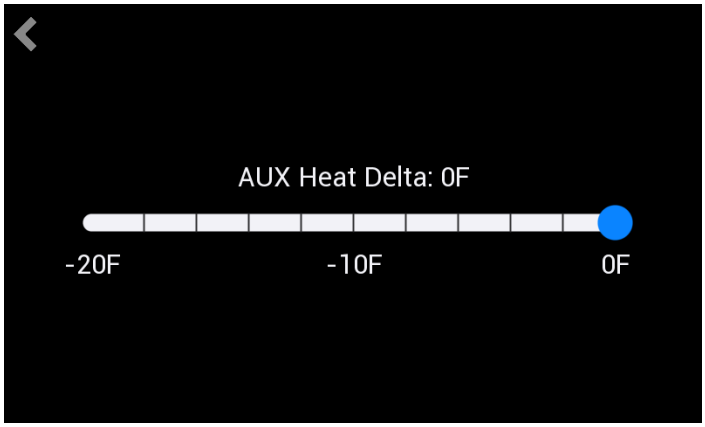

Figure 17. Adjust Aux Heat Delta Temperature

9. Tap Set Switchover Ext. Temperature.

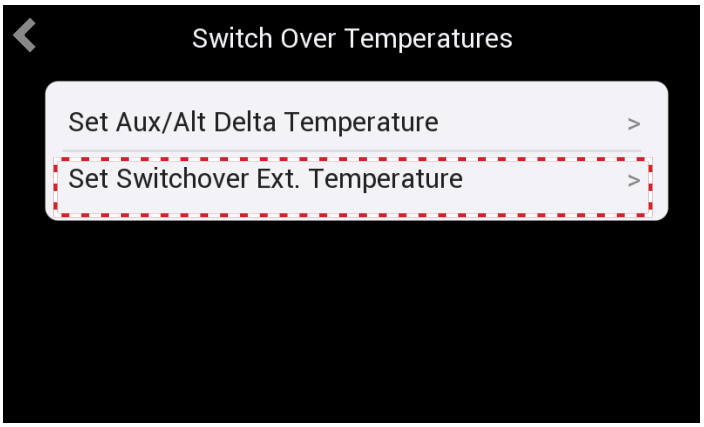

Figure 18. Tap Set Switchover Ext. Temperature

10. Use the slider to adjust the switchover ext. temperature

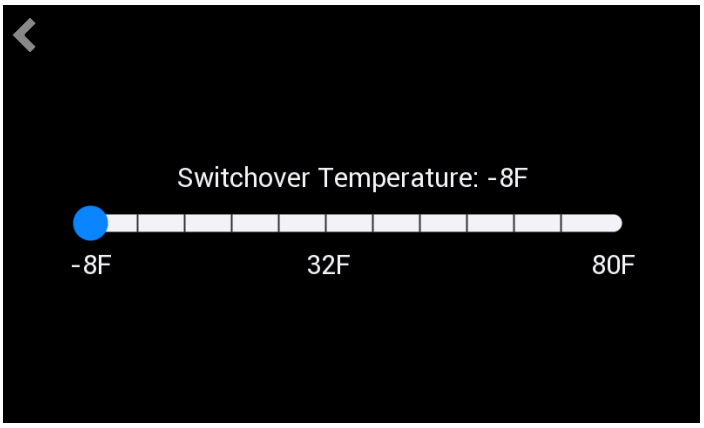

Figure 19. Set Switchover Ext. Temperature

Static Pressure Settings

Set static pressure.

1. Go to the wired controller.
2. Touch the Mode in the top-right corner of the screen.

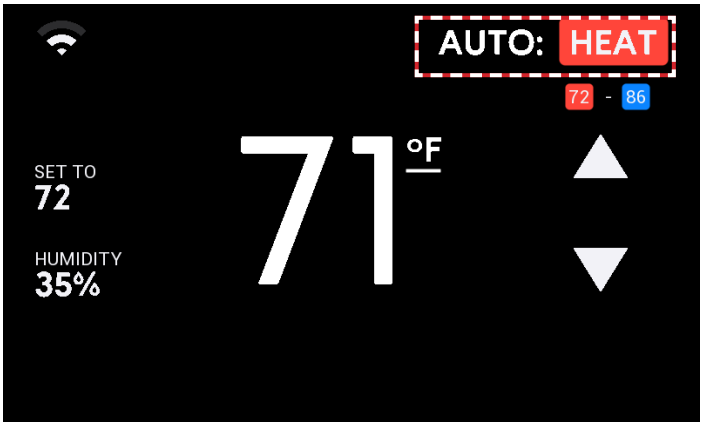

Figure 20. Touch the Mode of Operation

3. Tap Settings (Gear icon).

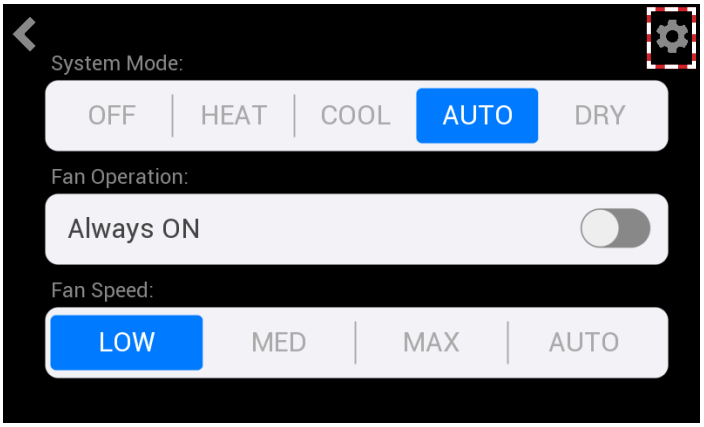

Figure 21. Tap the Settings icon

4. Tap Additional Settings.

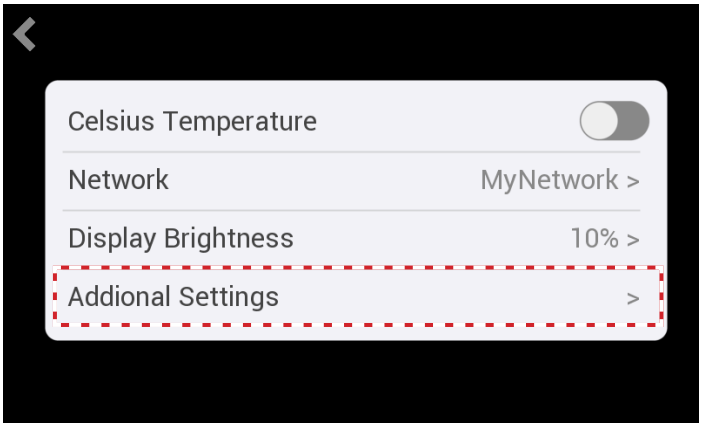

Figure 22. Tap Additional Settings

5. Tap Service Menu.

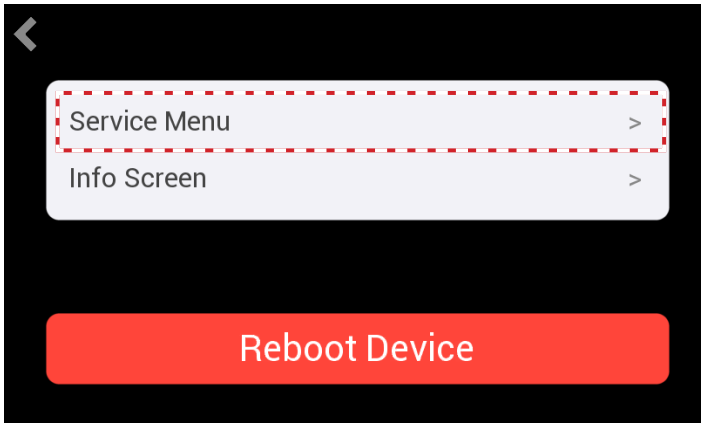

Figure 23. Tap Service Menu

6. Enter passcode (default: 0000).

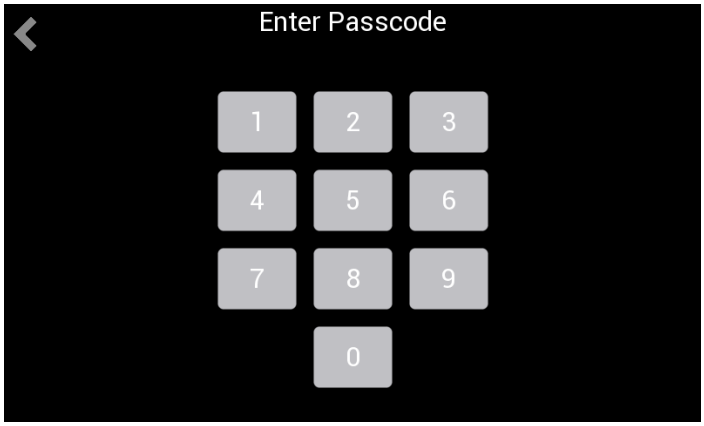

Figure 24. Enter Passcode

7. Tap Indoor Unit Settings.

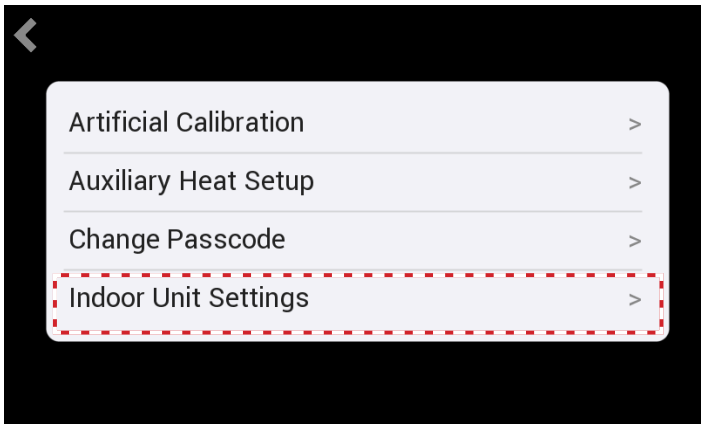

Figure 25. Tap Indoor Unit Settings

8. Tap Static Pressure Setting.

NOTE - *Static pressure setting requires a one-to-one connection to the indoor unit.*

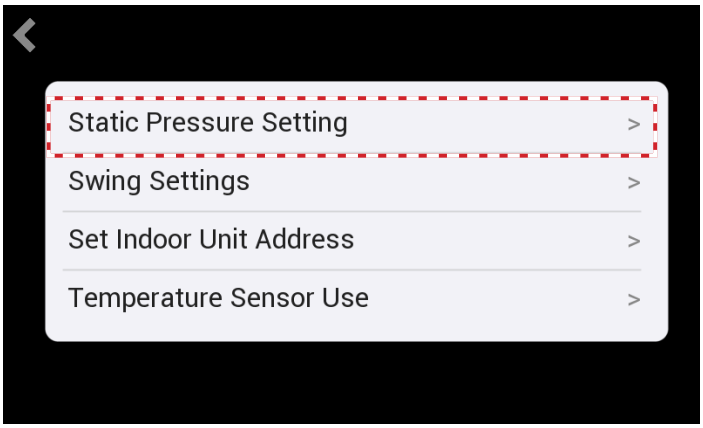

Figure 26. Tap Static Pressure Setting

9. Tap the up or down arrows to increase or decrease the static pressure value.
10. Tap the Save button to save these settings.

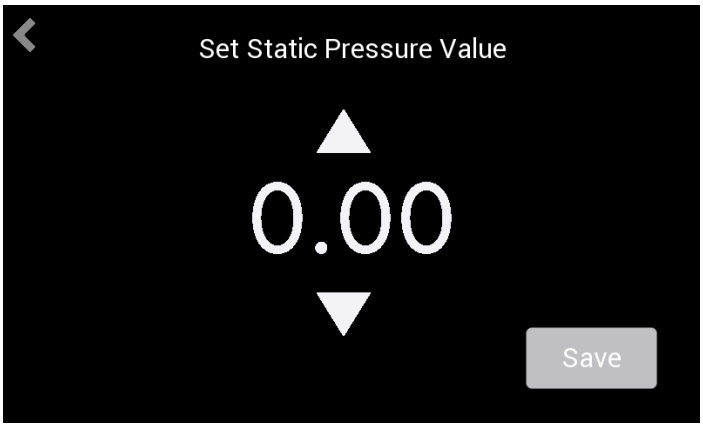

Figure 27. Adjust Static Pressure & Save

Swing Settings

Set indoor unit louver swing operation.

1. Go to the wired controller.
2. Touch the Mode in the top-right corner of the screen.

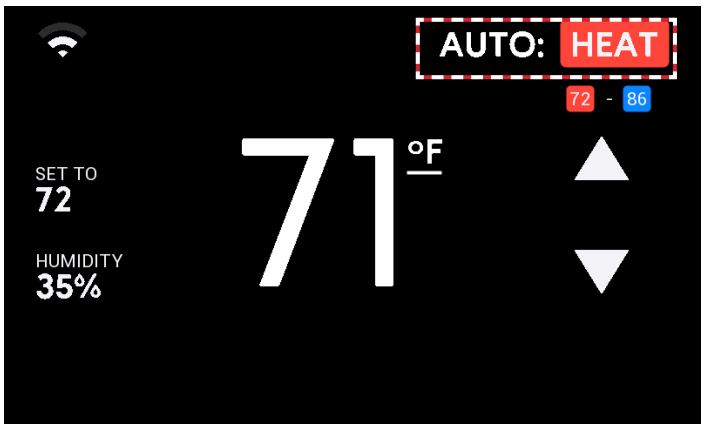

Figure 28. Touch the Mode of Operation

3. Tap Settings (Gear icon).

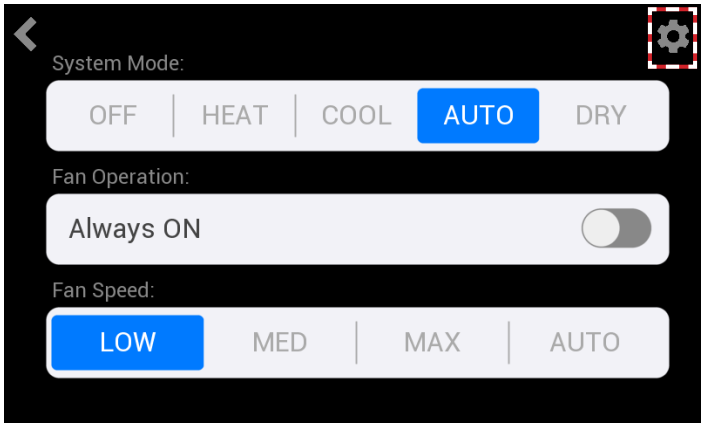

Figure 29. Tap the Settings icon

4. Tap Additional Settings.

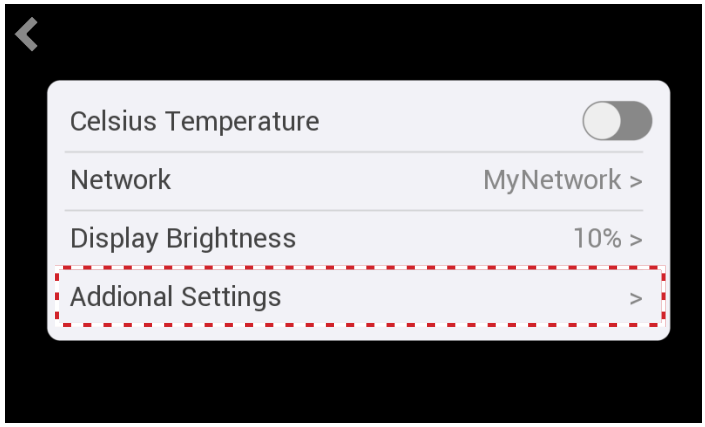

Figure 30. Tap Additional Settings

NOTE - *Swing setting requires a one-to-one connection to the indoor unit.*

1. Tap Service Menu.

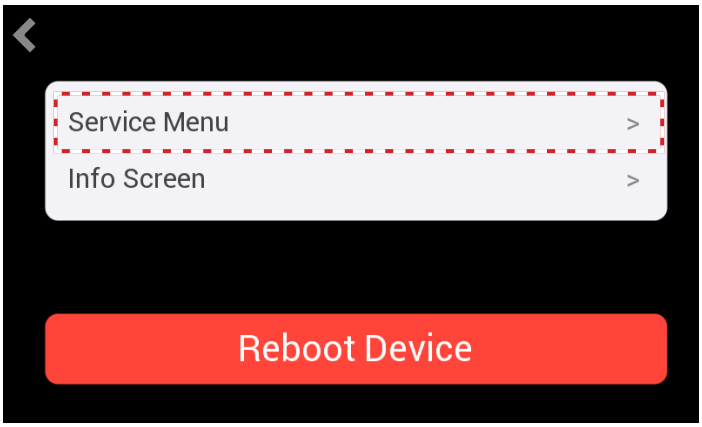

Figure 31. Tap Service Menu

2. Enter passcode (default: 0000).

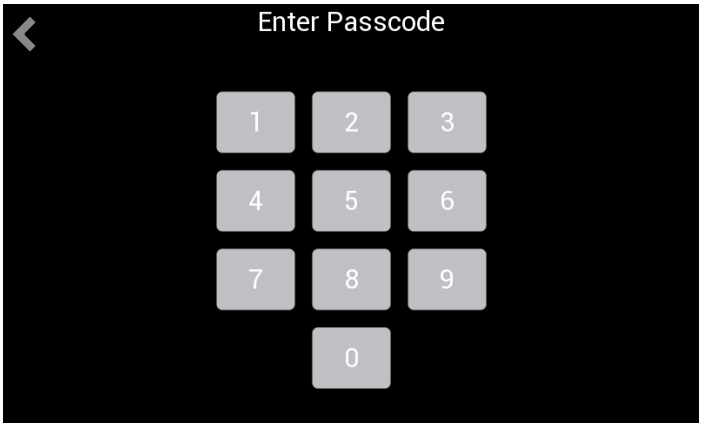

Figure 32. Enter Passcode

3. Tap Indoor Unit Settings.

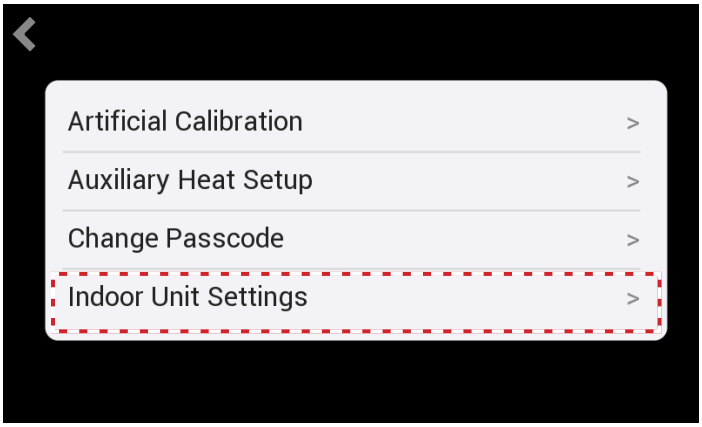

Figure 33. Tap Indoor Unit Settings

4. Tap Swing Settings.

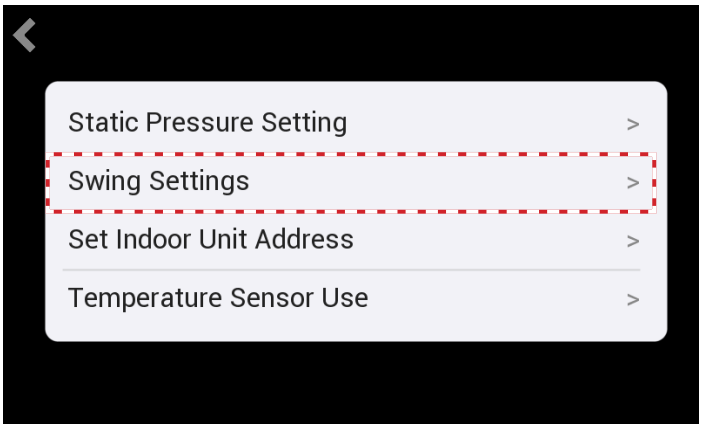

Figure 34. Tap Swing Settings

5. Tap the vertical swing position to set the indoor unit vertical louvers to continuous swing or to a specific position..
6. Tap the Horizontal Swing slide lock to turn on horizontal swing.

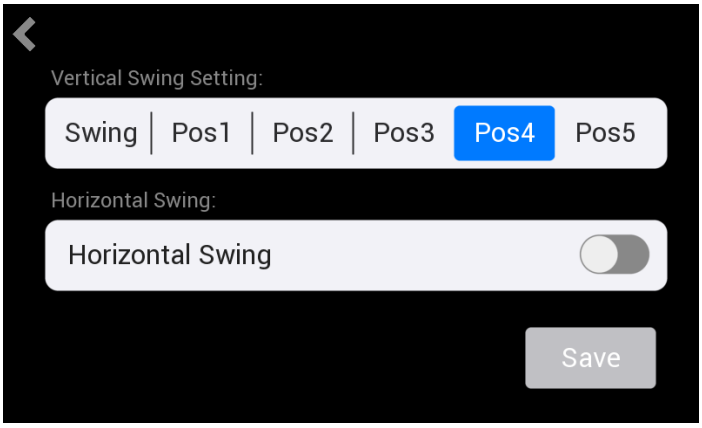

Figure 35. Make Swing Settings

7. Tap the Save button to save these settings.

Set Room Temperature Sensor Location

Select the location of the T1 (return air) sensor to use for unit operation. ***NOTE -*** *The thermostat will display the reading of its T1 sensor in all cases, this selection is to determine operation.*

1. Go to the wired controller.
2. Touch the Mode in the top-right corner of the screen.

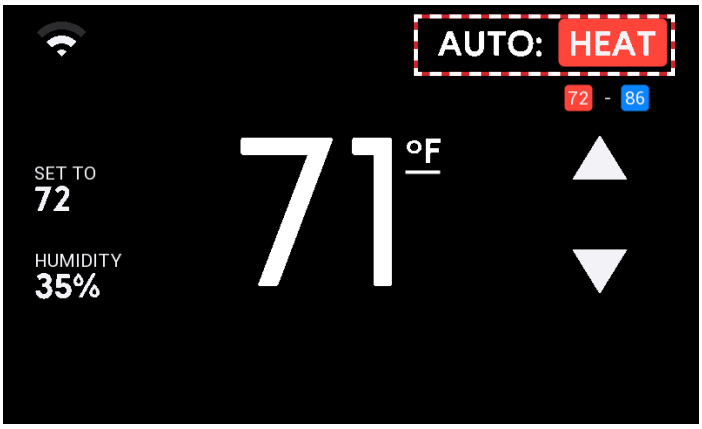

Figure 36. Touch the Mode of Operation

3. Tap Settings (Gear icon).

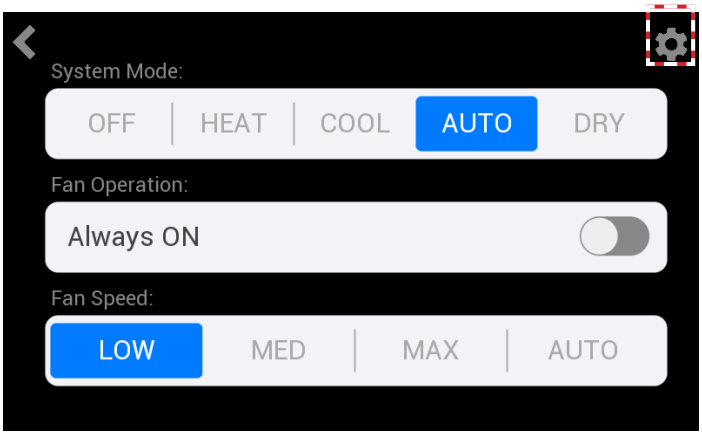

Figure 37. Tap the Settings icon

4. Tap Additional Settings.

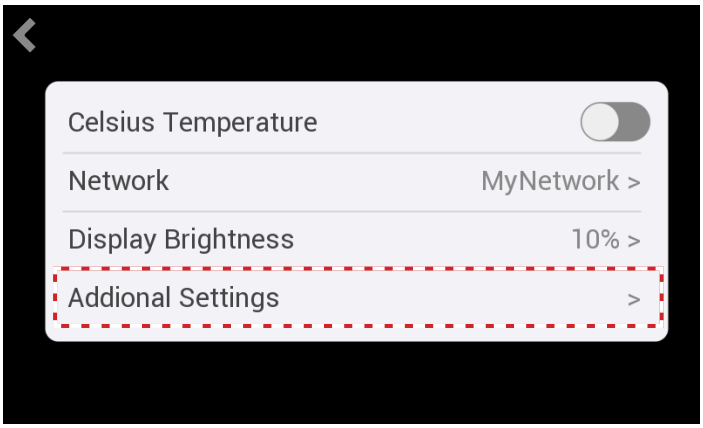

Figure 38. Tap Additional Settings

1. Tap Service Menu.

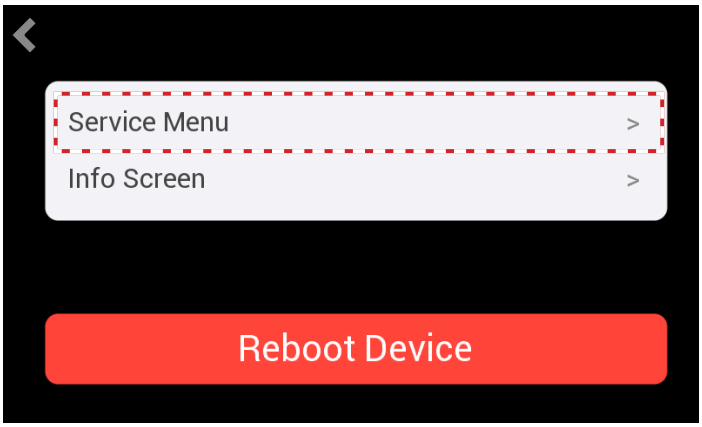

Figure 39. Tap Service Menu

2. Enter passcode (default: 0000).

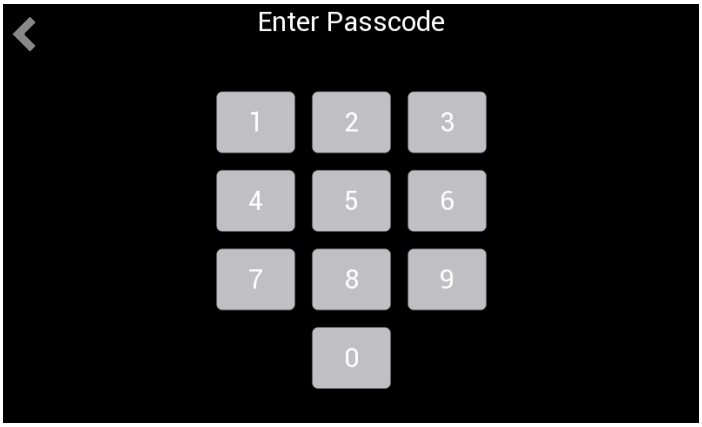

Figure 40. Enter Passcode

3. Tap Indoor Unit Settings.

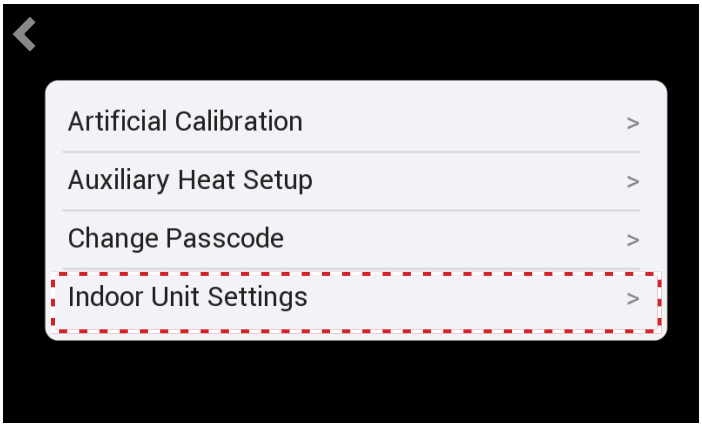

Figure 41. Tap Indoor Unit Settings

4. Tap Temperature Sensor Use.

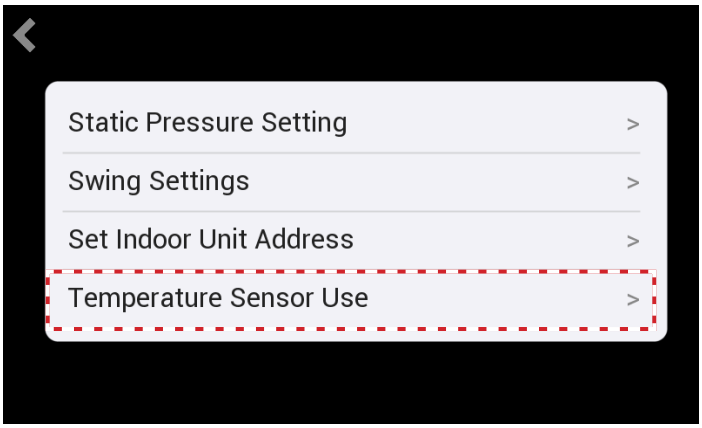

Figure 42. Tap Temperature Sensor Use

5. Select to use the return air sensor in the thermostat or the indoor unit. If more than one indoor unit is connected to the thermostat, each individual indoor unit will use its own internal return air sensor.

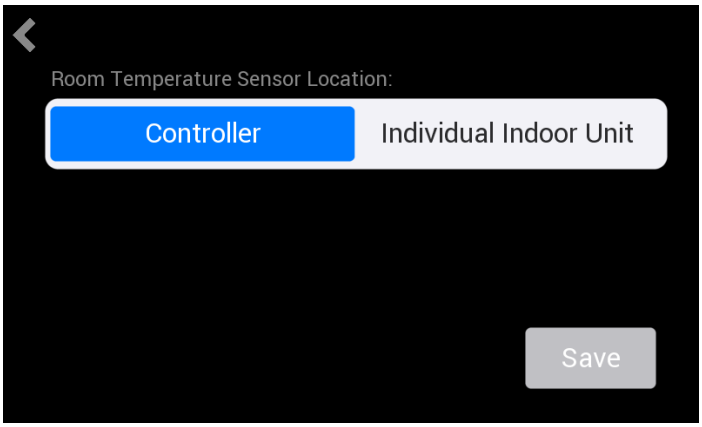

Figure 43. Select Return Air Sensor Location

6. Tap the Save button to save these settings.

Set Indoor Unit Address

Each indoor unit must have a unique address. Follow these steps to provide the indoor unit with an address.

1. Go to the wired controller.
2. Touch the Mode in the top-right corner of the screen.

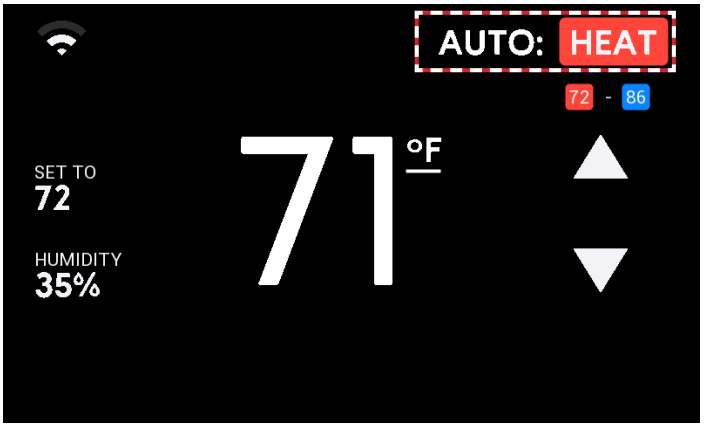

Figure 44. Touch the Mode of Operation

3. Tap Settings (Gear icon).

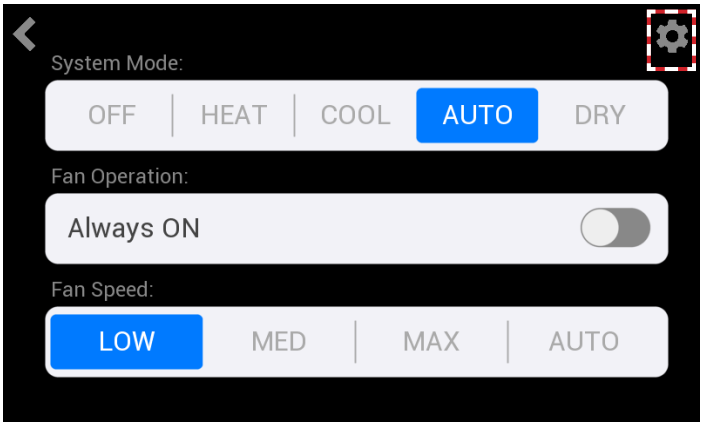

Figure 45. Tap the Settings icon

4. Tap Additional Settings.

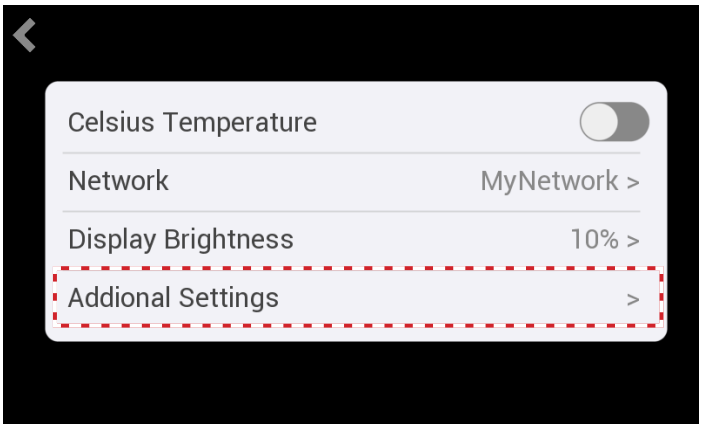

Figure 46. Tap Additional Settings

NOTE - *Indoor unit address setting requires a one-to-one connection to the indoor unit.*

1. Tap Service Menu.

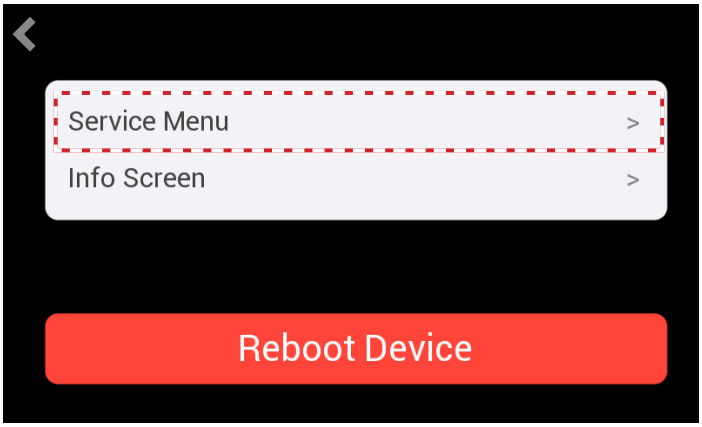

Figure 47. Tap Service Menu

2. Enter passcode (default: 0000).

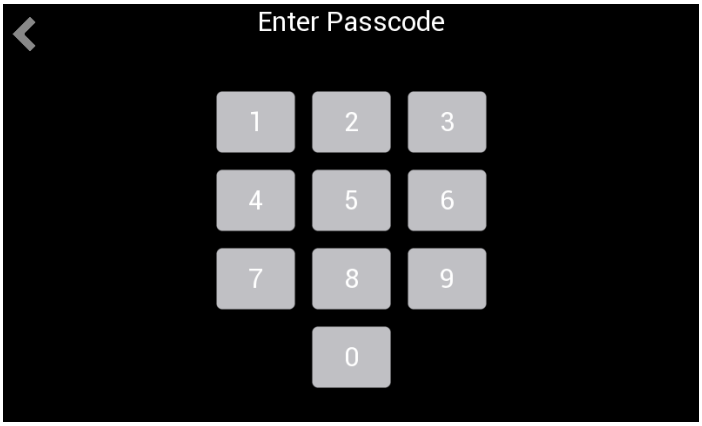

Figure 48. Enter Passcode

3. Tap Indoor Unit Settings.

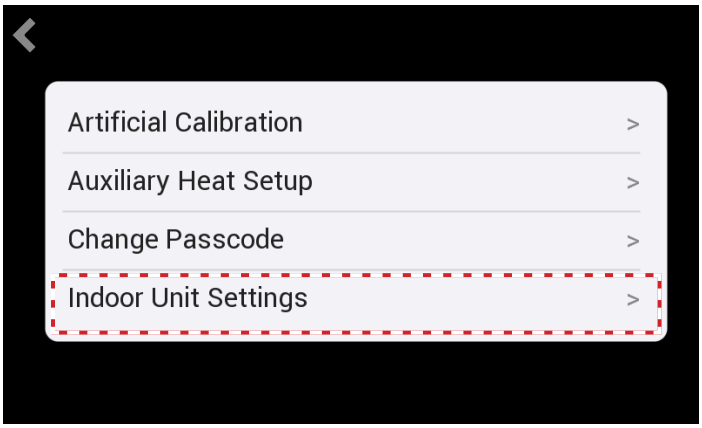

Figure 49. Tap Indoor Unit Settings

4. Tap Set Indoor Unit Address.

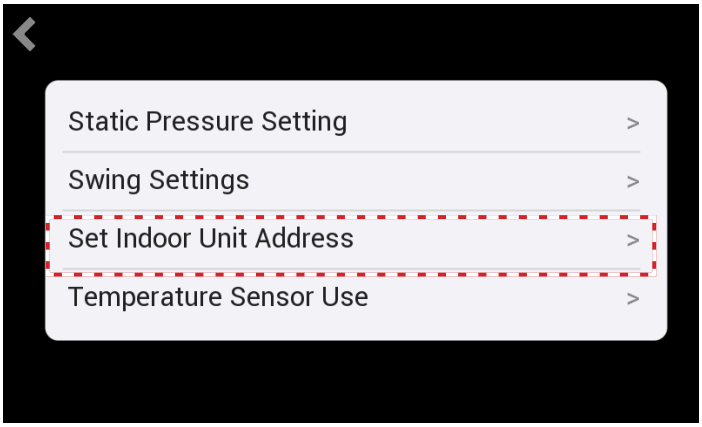

Figure 50. Tap Set Indoor Unit Address

5. Tap the up or down arrows to increase or decrease the indoor unit address.

Figure 51. Select Indoor Unit Address

6. Tap the Save button to save these settings.

Table 1. Indoor Unit Error Codes

Error Code	Description
FE	No address
E0	Mode conflict
E1	Communication error between indoor and main outdoor unit
E2	T1 (Room temperature sensor) malfunction
E3	T2 (Middle of evaporator sensor) malfunction
E4	T2B (Outlet of evaporator sensor) malfunction
E5	T2A (Inlet of evaporator sensor) malfunction
E6	DC fan motor error
E7	EEPROM failure
Eb	EEV malfunction
Ed	ODU fault
EE	High water alarm
A0	Emergency stop
D8	Remote off
U4	MS self-inspection error
F8	MS error

Table 2. Mode Selection Box Error Codes

Error Code	Description
E2	Communication error between MS box to master outdoor unit
E3	Outlet of plate exchanger(subcooler) error
E4	Inlet of plate exchanger(subcooler) error
H0	Communication error between first PCB to the other PCBs in the same MS box
LL	S1/S2 setting is not consistent to communication wiring

Table 3. Wired Controller Error Codes

Error Code	Description
F0	Communication/Address error between indoor units and wired controller
F1	Communication/Wiring error between indoor units and wired controller
E2	Controller temperature sensor error
F2	Controller EEPROM error
F8	Mode Selection Box error, check MS Box for detailed error information

Table 4. Outdoor Unit Error Codes

Error Code	Description
E0	Communication error between outdoor units
E1	Power phase loss error
E2	Communication error between indoor and main outdoor unit
E4	Outdoor ambient temperature sensor (T4/T10) and condenser pipe temperature sensor (T3A/T3B) error
E5	Voltage error
E6	Inverter module temperature sensor error
E7	Discharge temp sensor error
E8	Incorrect ENC 1 main - sub configuration
E9	Compressor driver error
H0	Communication error between main control chip and inverter driver chip
H2	Quantity of outdoor unit decreased
H3	Quantity of outdoor unit increased
H4	Compressor inverter module protection appears three times in 60 minutes, X stands for corresponding module
H5	Low pressure protection lock out (P2 3X in 60 minutes)
H6	Compressor discharge temperature protection (P4 3X in 100 minutes)
H7	Quantity of indoor unit decreased
H8	High pressure sensor error
H9	DC fan module protection (P9 10X in 120 minutes)
Hb	Low pressure sensor error
Hd	Sub ODU error
C7	Inverter module temperature protection (1PL / 2PL 3X in 100 minutes)
F1	PTC of DC filter board error
F3	ODU subcooler outlet temperature sensor error
F5	ODU subcooler inlet temperature sensor error
F6	EEV A/B/C error (Y will be 1,2 or 3, stands for A, B, C)
F9	Communication error between low ambient cooling kit(LAC kit) and ODU PCB
P1	High pressure protection, CI/CO = 4.4/3.2 Mpa or 638/464 PSIG
P2	Low pressure protection, CI/CO = .05/.15 Mpa or 7.25/21.8 PSIG
P3	Over current protection of inverter compressor
P4	Compressor discharge temp protection, CI/CO = 120/90 C or 248/194 F
P5	Condenser high temp protection, CI/CO = 65/55 C or 149/131 F
P9	Fan module protection
PL	Temperature protection of inverter module, CI/CO = 80/60 C or 176/140 F

Scan this QR code to download the Lennox VRF Wi-Fi Controller App
from the Apple App Store or the Google Play store.
The app provides control of the VRF Wi-Fi Controller.

Technical Support
1-800-4LENNOX
(1-800-453-6669)
vrftechsupport@lennoxind.com
www.LennoxCommercial.com

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from the Apple App Store or the Google Play store.
The app contains technical literature and troubleshooting resources.