

Installation & Servicing



**Next Generation Infinity with Greenspeed®
Intelligence and Evolution™ Extreme & 5-Stage System's**

Presenter

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Carrier Enterprise Mid-Atlantic Technical Support Site
Carrier, Bryant and Payne Technical training and support.

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Welcome to Carrier Enterprise's Technical site, built by HVAC techs for HVAC techs!

Our goal is to help today's HVAC tech with Carrier Bryant and Payne Equipment gain a better understanding of operation and trouble shooting in every changing world.

We start by providing first class instruction to each technician that attends our training. Our goal is to enhance each technician's knowledge level in HVAC fundamentals, as well as in the area of Carrier, Bryant and Payne equipment. As a result, installation and troubleshooting efficiency will increase, leading to an increase in your technician's profitability. Whether it is in our training rooms or utilizing our new virtual web classroom, your technicians will receive an education that is second to none.

All technical training classes are eligible for NATE Continuing Education Hours.

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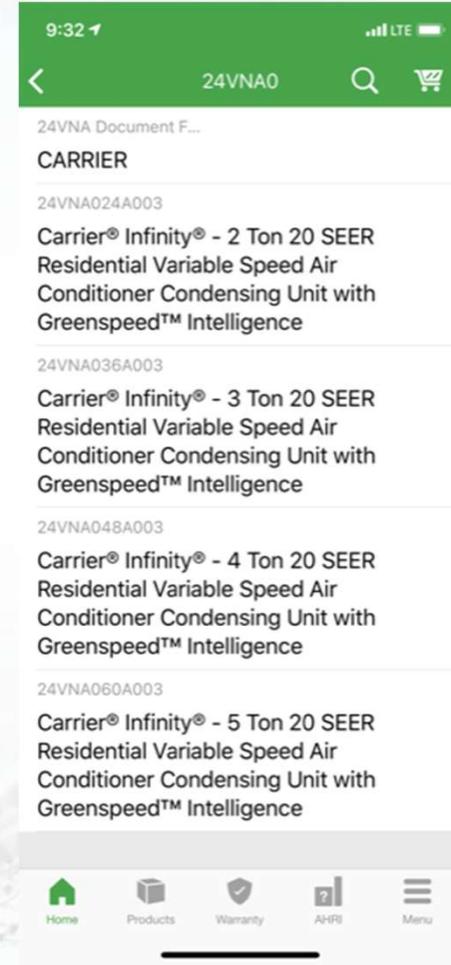
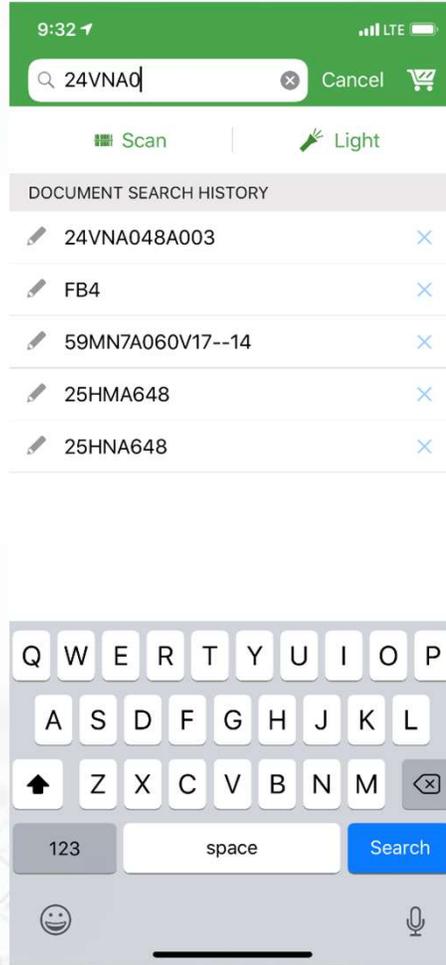
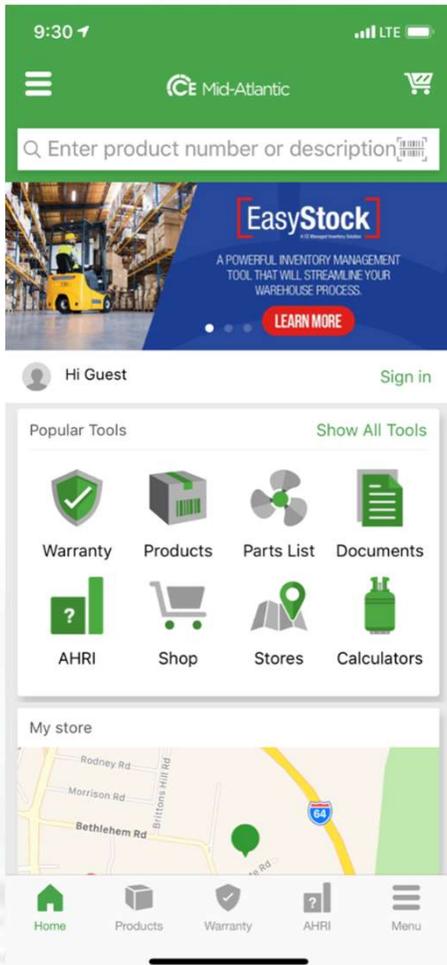


TROUBLESHOOTING RESOURCES

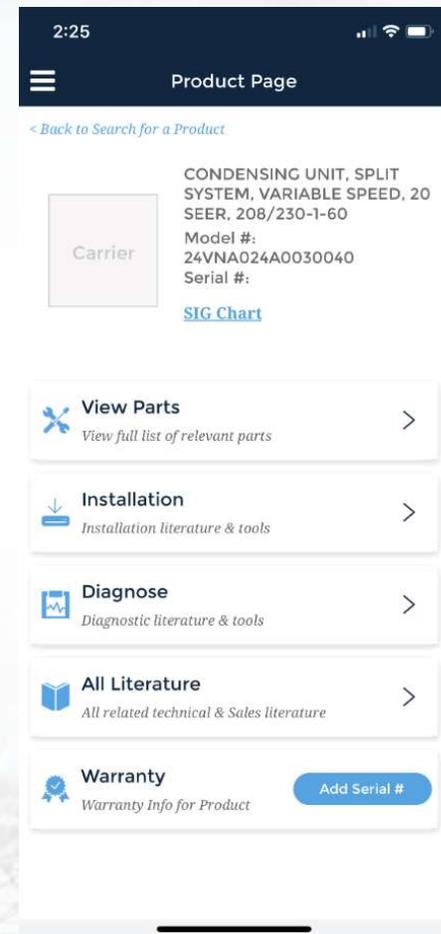
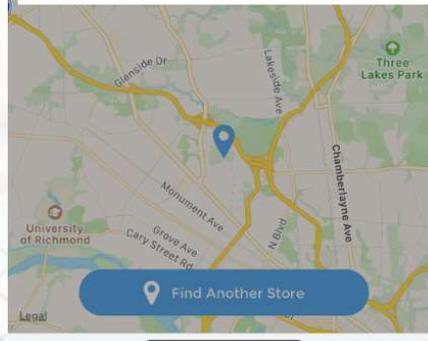
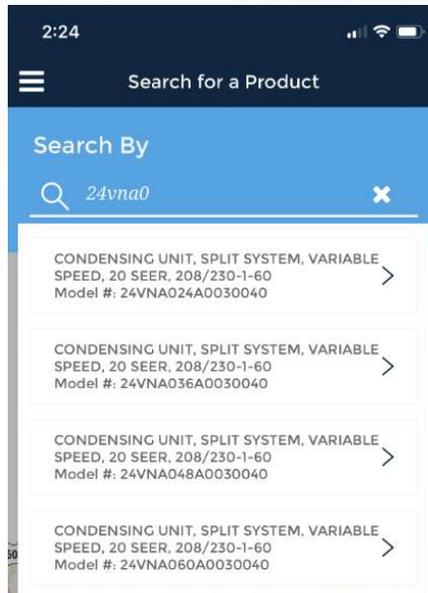
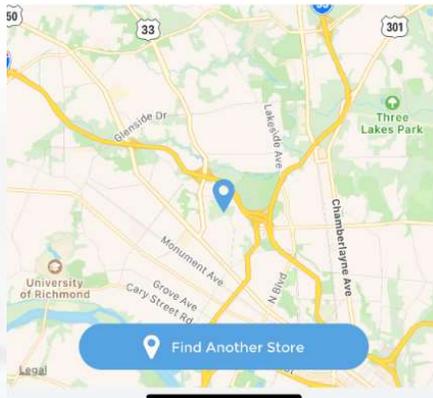
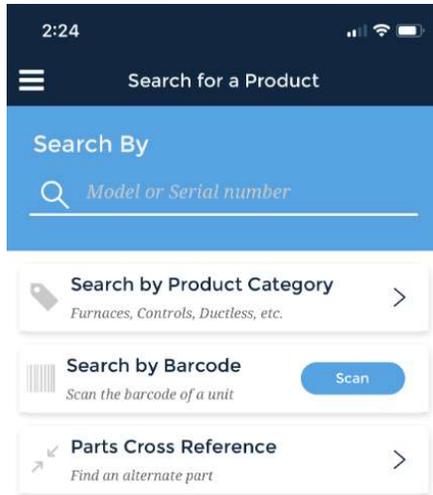
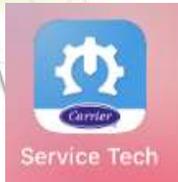
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“CE – HVAC Contractor Assist”



“Carrier Service Tech”





Tech Support

866-902-4822

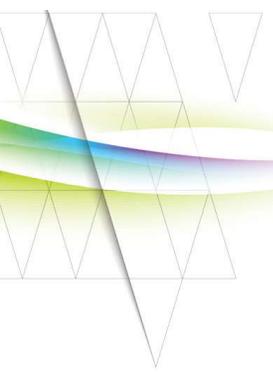
Option #4



Training Agenda

- Product Introduction
- Component Overview
- Installation Process
- Servicing





Product Introduction



The Value of 26/24

- Top Tier Air Conditioner/Heat Pump
- PLUS up to 26 SEER, 13 EER (5 Ton)
- PLUS Quiet Mode
- PLUS Wider Operating Range
- PLUS Enhanced Dehumidification
- PLUS Long Line-Set Length
- PLUS Over-the-Air Software Updates
- PLUS Outdoor Unit Updates via Bluetooth®
- PLUS Service Tech App Interactive Troubleshooting
- All in the same footprint as today!

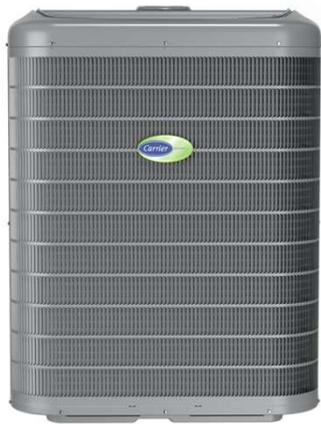


Down to 51 dBa

Quiet Mode = Max level of 69 dBa



26/24 Nomenclature

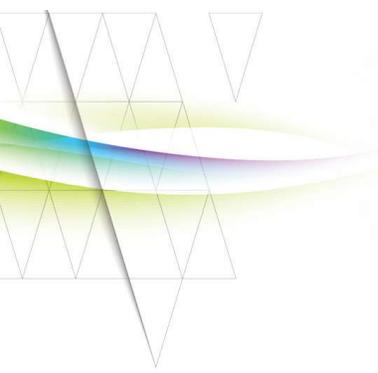


- AC: 24VNA6
- HP: 25VNA4
- VNA0 Products Phased Out



- AC: 186CNV
- HP: 284ANV
- 180CNV and 280ANV Products Phased Out





Component Overview



WALL CONTROL

IMPORTANT

- All 26/24 units come with an Infinity or Evolution™ (Series B) Wall Control
- 26/24 units operate on an Infinity or Evolution™ (Series B) Wall Control
- Before installation, the Infinity or Evolution™ wall control needs updated to latest firmware

Refer to document:

Infinity System Control and Infinity 26/24 Greenspeed® Firmware Update OR Evolution™ Connex™ and 26/24 Evolution™ Extreme Via MicroSD® Card for Controls Manufactured Prior to the S/N Cutoff Date



FIRST – Update Wall Control



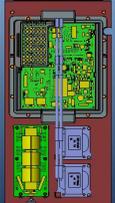
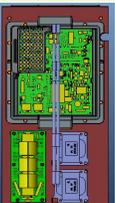
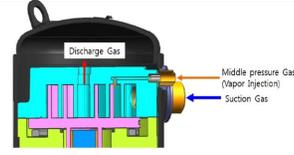
- Check Control Software Versioning
- **Control must be firmware version 3.0 or higher**
- Control must be a Series B model:

- ✓ SYSTXCCITC01-B
- ✓ SYSTXCCICF01-B
- ✓ SYSTECCWIC01-B
- ✓ SYSTECCWIF01-B



Once the Infinity or Evolution™ System Control serial number cutoff date is determined, refer to Product Bulletin #101-20-12.

New Components

	Inverter	Compressor	ECM Fan Motor	EXV	Bluetooth® Module	Vapor-Injection
2 TON		Rotary 				
3 TON		Rotary 				
4 TON		Rotary 				
5 TON		Scroll 				



PCM – Primary Control Module

(formerly AOC Board)



Primary Control Module

- VFD
- Controls heating EXV and defrost
- Vapor injection EXV (where used) to either provide superheat or engage the vapor injection circuit



PCM – Primary Control Module

(formerly AOC Board)



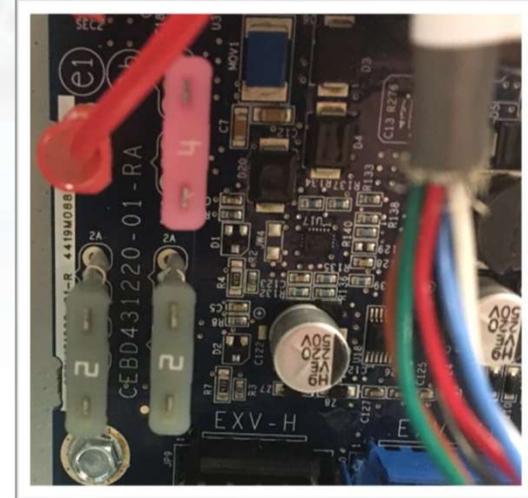
The PCM also proactively prevents fault trip events; and modifies operation to provide the VFD and compressor protections and utilizes the following sensors:

Sensors

- suction pressure transducer (SPT),
- discharge pressure transducer (DPT)
- an outdoor suction thermistor (OST)
- outdoor air thermistor (OAT),
- outdoor coil thermistor (OCT),
- high pressure switch (HPS), and
- discharge temperature sensor (ODT).
- Motor Control Drive (VFD)



Fuses



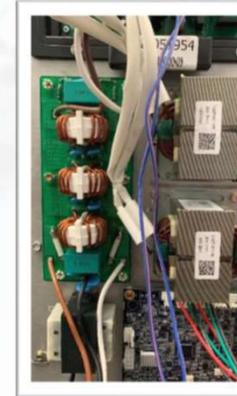
PCM Low Voltage Fuses

- 3 fuses
- Separated into circuits
- Fuse 1: PEV, BTM, Reversing Valve
- Fuse 2: LLS
- Fuse 3: EXVs



EMI Filter Board

Location of
EMI Filter
Board on
Inverter
assembly



The EMI filter board is intended to block the inherent electrical noise associated with VFD drives from being transmitted over power lines throughout the home.

It also contains non-replaceable fuses which will protect the VFD in the event of a severe power surge condition.



VFD – Variable Frequency Drive (Inverter)



Motor Control Drive + Brushless Permanent Magnet (BPM)

- Operates over a wide range of speeds through the combination of the drive and motor
- Motor Control Drive
 - Provides system protection when various abnormal conditions occur
 - Limits the compressor envelope of operation to appropriate boundaries
- Provides system data feedback to the system controller
- Allows reduced operation in case of system faults or issues.

VFD – Variable Frequency Drive (Inverter)



- Converts sinusoidal AC input voltage into a variable frequency AC output generated using a PWM modulation
- Powers and adjusts fan motor and compressor operation.
- Adjust the output voltage to run the compressor/ fan motor at the correct speed at any load point within the envelope
- UPDATEABLE with Service App or OTA

Bluetooth® Module (BTM)



- First outdoor units with Bluetooth® connectivity to the ODU.
- Troubleshoot, service and even “push” software/firmware updates to the ODU via ServiceTech app.
- Reduces trips into the home
- Reduces wrenching and use of gauges, meters, and hoses



Compressor (Samsung)



Brushless Permanent Magnet Motor Compressor (BPM)

- The motor inductance reacts to the drive current and a sinusoidal current is induced through the motor windings.
- The sinusoidal current sets a rotating magnetic field, at the frequency set by the drive.
- The magnets enable the motor to synchronize to that frequency, set by the drive.
- Supplies the mechanical power afforded to it by the drive voltage, current and frequency.



Compressor (Samsung)



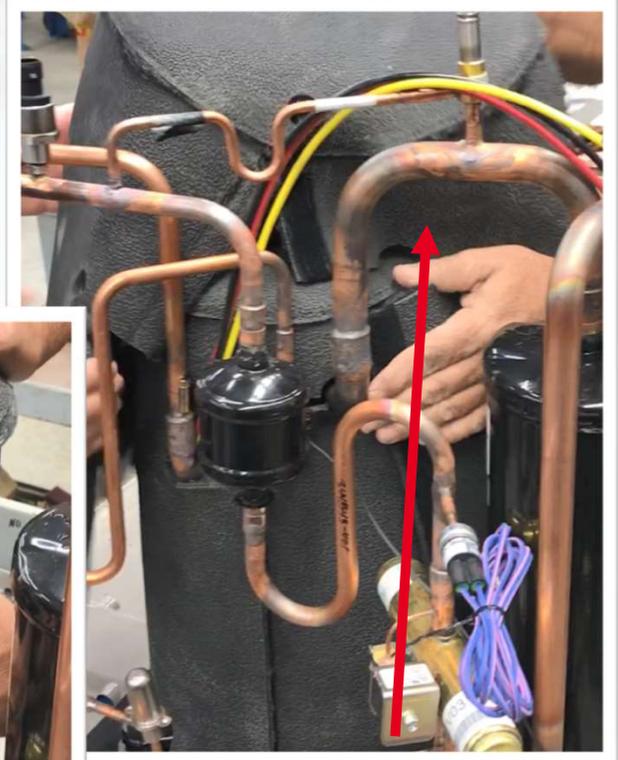
WINDING	24	36	48	60
Between terminals T1,T2,T3 (U,V,W)	.74	.453	.424	.424
Between terminal & ground	>1 mega OHM			

- Variable Speed Compressor Power **INPUT** Terminals
- This compressor operates with a 3-phase variable frequency PWM variable voltage to the three fuse terminals.
- Variable Speed Compressor Resistances (winding resistance at 68°F / 20°C)

DUAL Sound Blankets



First Sound
Blanket
(interior)



Second
Sound
Blanket
(exterior)

Crankcase Heater Operation

- This unit has an external crankcase heater that will be energized when the outdoor ambient temperature drops below 60F. This prevents the compressor from being the coldest part of the system thus enhancing the reliability.
- The crankcase heater will function as needed any time the outdoor unit is powered. The indoor unit and UI do not need to be installed for the crankcase heater to operate properly.



ECM Fan Motor



- The VFD energizes outdoor fan when compressor is operating, except for defrost and as needed during low-ambient cooling operation.
- The outdoor fan remains energized if an over pressure or over temperature event should occur. This OD fan is an ECM motor which operates at varying speeds depending on the ambient and the demand.



EXV



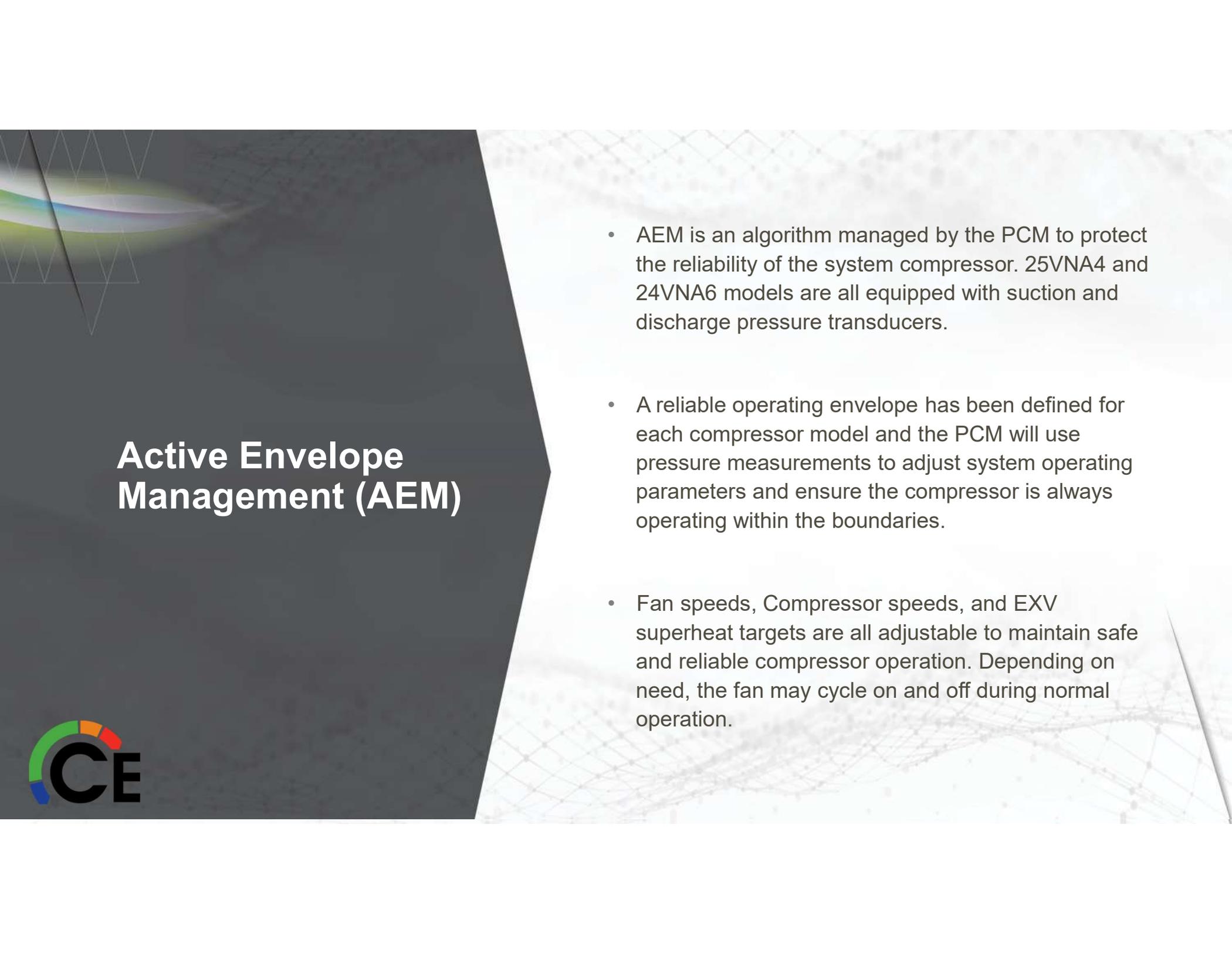
A heating EXV is used for refrigerant metering in heating mode.

- The primary control (PCM) senses suction pressure and temperature to control the EXV.
- EXV is a stepper motor with 475 steps that range from fully open to fully closed

Unit Time Delays

- Five-minute time delay to start cooling or heating operation when there is a call from the user interface. To bypass this feature, momentarily short and release Forced Defrost pins.
- Five-minute compressor re-cycle delay on return from a brown-out condition.





Active Envelope Management (AEM)

- AEM is an algorithm managed by the PCM to protect the reliability of the system compressor. 25VNA4 and 24VNA6 models are all equipped with suction and discharge pressure transducers.
- A reliable operating envelope has been defined for each compressor model and the PCM will use pressure measurements to adjust system operating parameters and ensure the compressor is always operating within the boundaries.
- Fan speeds, Compressor speeds, and EXV superheat targets are all adjustable to maintain safe and reliable compressor operation. Depending on need, the fan may cycle on and off during normal operation.



Model Plug

MODEL NUMBER	MODEL PLUG NUMBER	PIN RESISTANCE (K-ohms)	
		Pins 1-4	Pins 2-3
24VNA624	HK70EZ009	5.1K	91K
24VNA636	HK70EZ021	11K	39K
24VNA648	HK70EZ033	18K	11K
24VNA660	HK70EZ045	18K	220K

MODEL NUMBER	MODEL PLUG NUMBER	PIN RESISTANCE (K-ohms)	
		Pins 1-4	Pins 2-3
25VNA424	HK70EZ003	5.1K	24K
25VNA436	HK70EZ015	5.1K	360K
25VNA448	HK70EZ027	11K	150K
25VNA460	HK70EZ039	18K	62K

An RCD replacement board contains no model and serial information. If the factory control board fails, the model plug must be transferred from the original board to the replacement board for the unit to operate.



DP & SP Transducers

Discharge & Suction Pressure Transducers

These units use a 5 VDC output high & suction pressure transducers that provides a 0- 5VDC data for interpretation by the control board a 0 to 620 psig range of pressure at the locations.

Signals used by control board for:

- Low pressure cut-out
- Loss of charge management,
- Compressor overall envelope management
- Oil circulation management
- Lubrication management and
- EXV control
- Hi pressure monitoring





Temperature Thermistors

- Thermistors are electronic devices which sense temperature.
- As the temperature increases, the resistance decreases.
- Thermistors are used to sense outdoor air (OAT), coil temperature (OCT), the suction line thermistor (OST) between the reversing valve and the accumulator, and the outdoor discharge thermistor (ODT) at the outlet from the compressor.



Piping & 5-ton differences



- Vapor Injection
 - Braze plate heat exchanger (HEX)
 - Scroll compressor
 - 2 EXV
 - 1 expansion valve
 - 1 vapor injection control
- EXVs are different types and cannot be interchanged



Braze Plate Heat Exchanger

(5-ton units only)



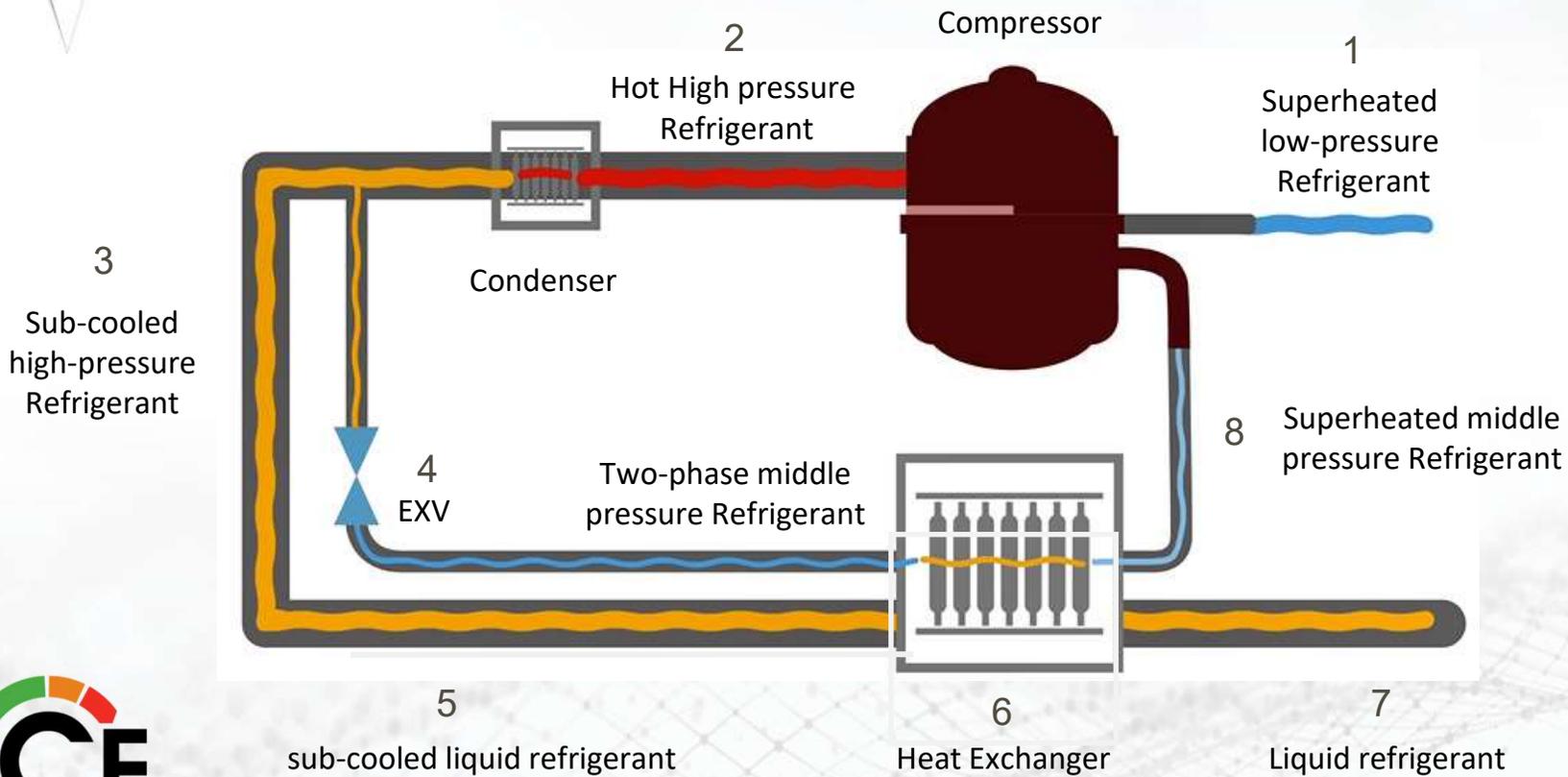
In the 5-ton only

- Increases capacity
- Part of the vapor-injection circuit
- Injects sub-cooled liquid from the condenser into the heat exchanger
- Injects into the mid-port of the compressor.
- Sub-cooled liquid then leaves the other side of the heat exchanger further sub-cooled before exiting to the evaporator



Vapor Injection Process

Introduce subcooled refrigerant into the system to increase capacity while using little additional power

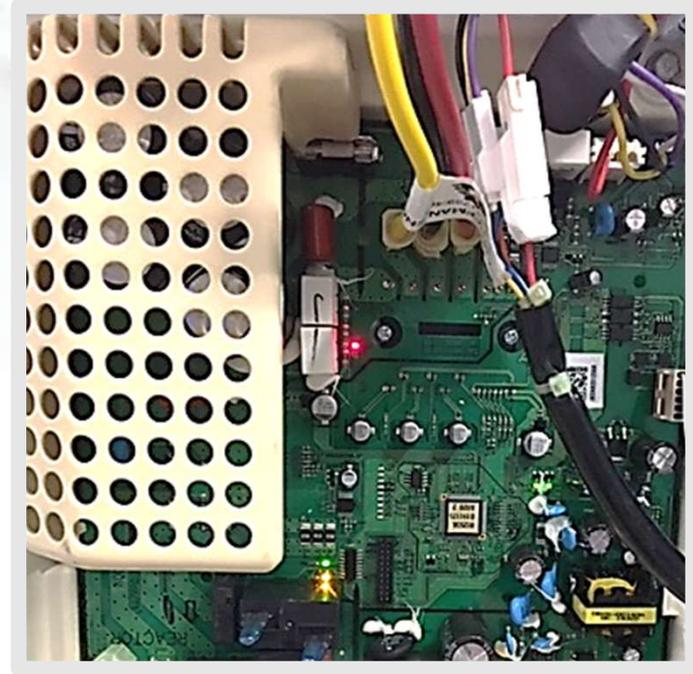




New Components: Status Lights



LED Lights – VFD



Solid red LED on Inverter indicates power to the Inverter



LED Lights – VFD

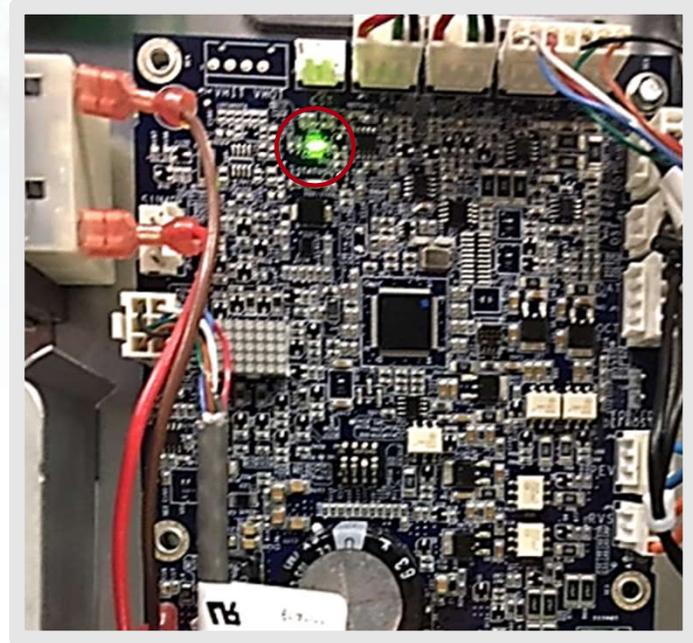


Solid green LED indicates low voltage power

Rapid inconsistent flashing green LED indicates communication with the PCM board



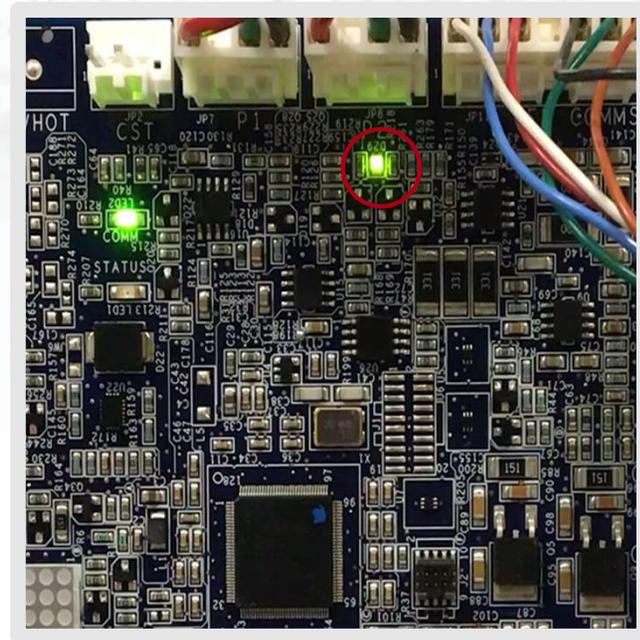
LED Lights – PCM



Solid green LED indicates low voltage power and communication with the UI



LED Lights – PCM (GREEN)



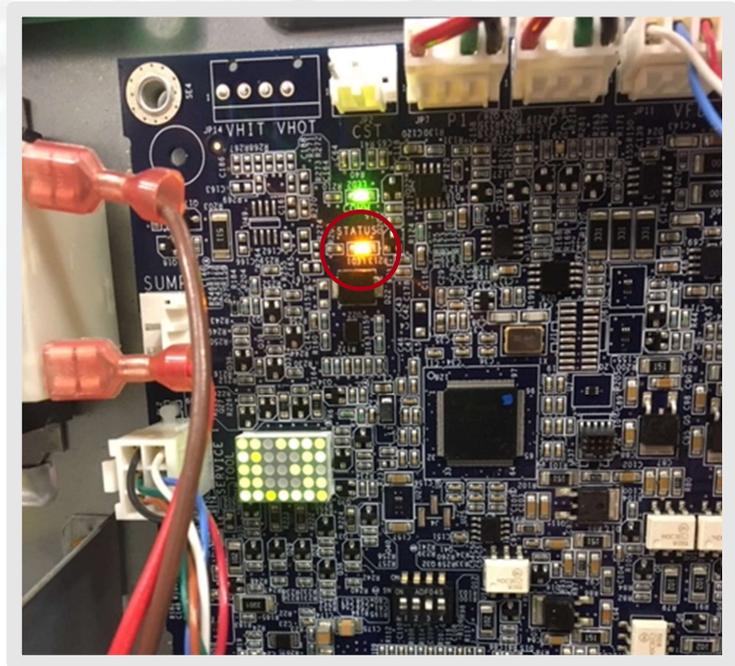
The PCM is equipped with a bi-color LED for indicating successful or unsuccessful communication with the VFD.

This LED is located just below the VFD-PCM communication port on the PCM.

The LED will flash green when good messages are received from the VFD and red when bad or no messages are received from the VFD.



LED Lights – PCM (AMBER)

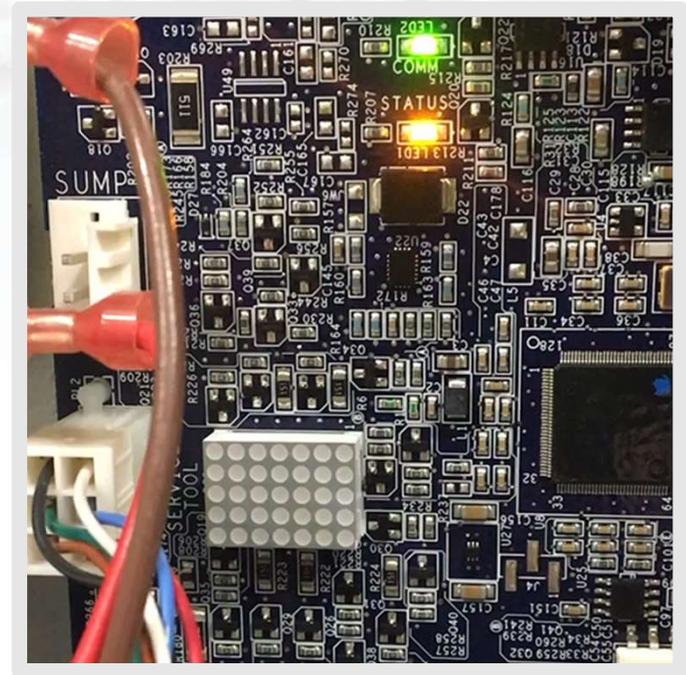


Amber LED flashes fault code

Amber colored STATUS light indicates operation and error status.



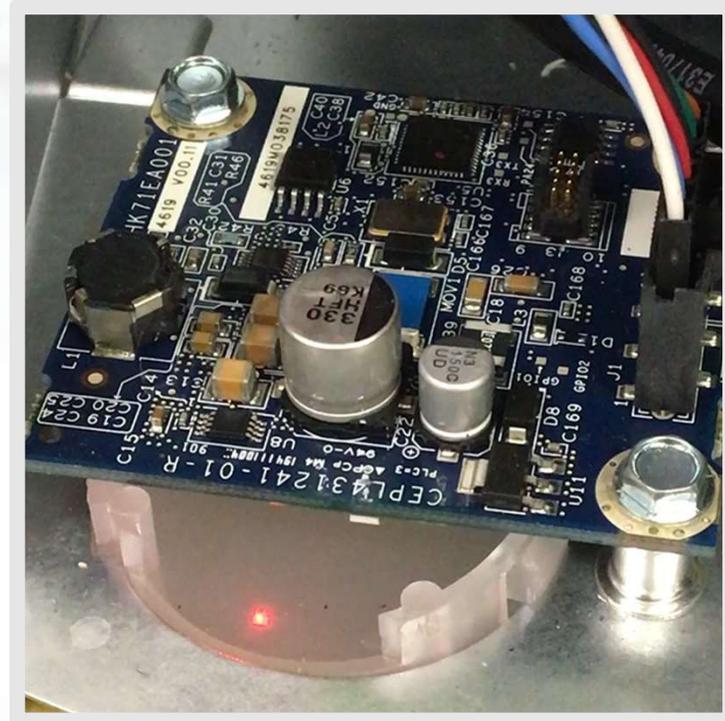
Fault Code Display – PCM



5X7 Scrolling LED panel displays fault code for easy identification



LED Lights – BTM



Steady flashing red LED indicates powered and ready



5-Speed



There is no reason to remove the black covers



5-Speed

Variable frequency and amplitude 3-phase output to fan motor

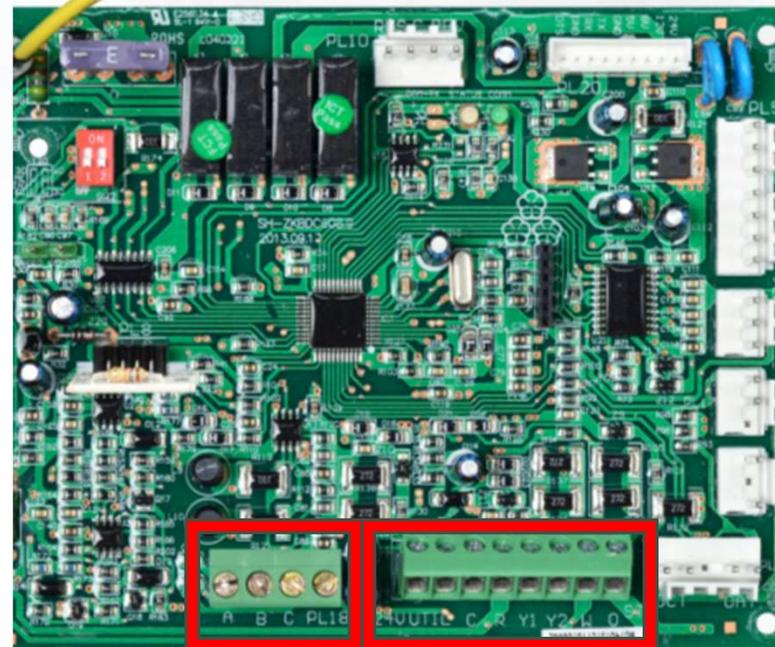
Variable frequency and amplitude 3-phase output to compressor

Input voltage rectified and increased to feed DC bus

230-volt split-phase input power from outdoor disconnect



Unit Low Voltage

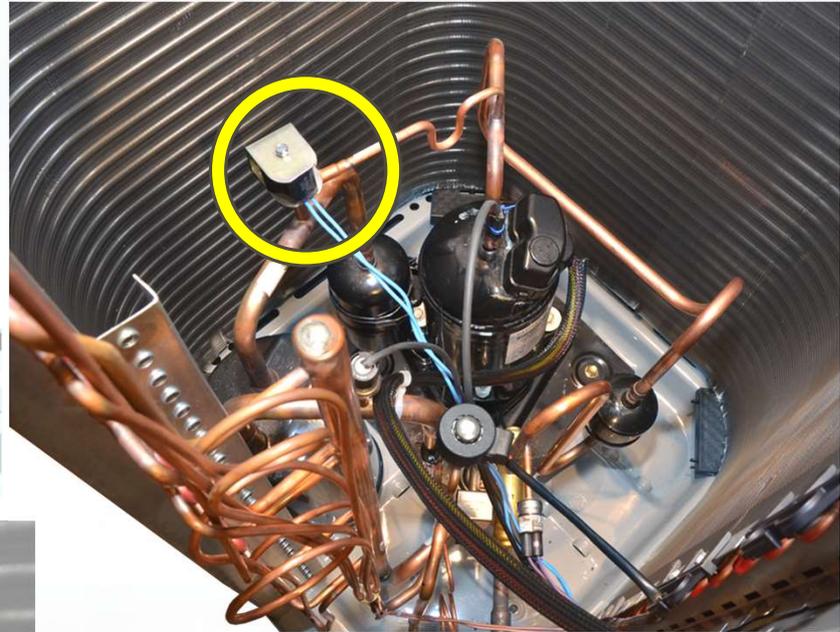


Control wiring connections:

- AB plug used for communicating applications
- Discrete 24VAC connections used for 2-stage applications (must connect indoor 24VAC to R)



Pressure Equalizer Valve (PEV)

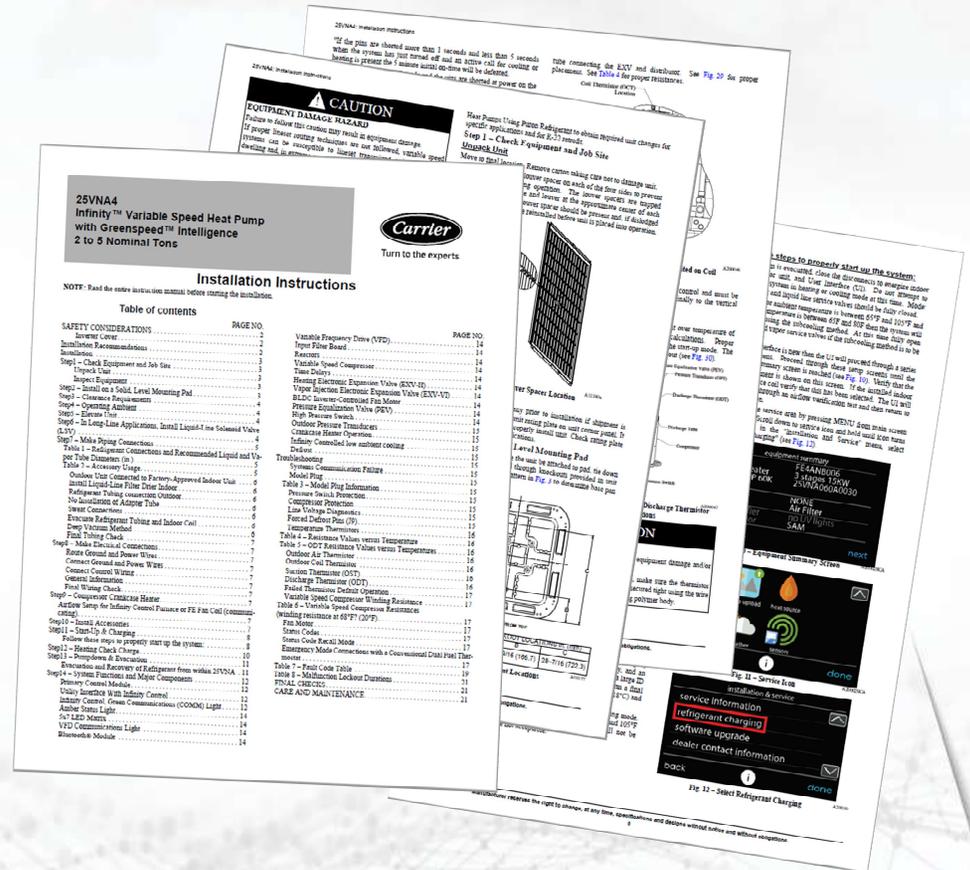


Installation Process



Installation Order of Operations

- Before you start – Wall Control
- Safety
- Indoor Coil
- Line-sizing / Piping Connections
- Wiring & Electrical Connections
- Airflow
- Accessory Install
- Unit Start-up & Charging
- Pump-down & Evacuation
- Firmware Updates



FIRST – Update Wall Control



- Check Control Software Versioning
- **Control must be firmware version 3.0 or higher**
- Control must be a Series B model:

- ✓ SYSTXCCITC01-B
- ✓ SYSTXCCICF01-B
- ✓ SYSTECCWIC01-B
- ✓ SYSTECCWIF01-B



Once the Infinity or Evolution™ System Control serial number cutoff date is determined, refer to Product Bulletin #101-20-12.

Step 1 – Updating the Wall Control



- **Update with MicroSD™ Card**
- From the MENU screen, select the SERVICE icon
- Select software update



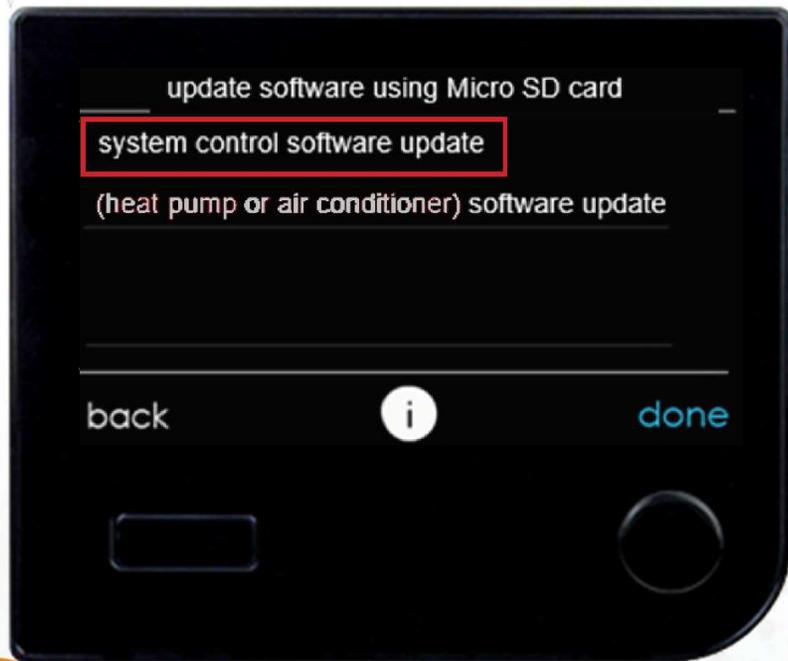
Step 2 – Updating the Wall Control



- Insert the MicroSD™ card in the bottom of the System Control until it clicks



Step 3 – Updating the Wall Control



- Select update software using MicroSD™ card
- If the card has been inserted correctly, the screen below will appear. Select system control software update



Step 3 – Updating the Wall Control



- If the MicroSD™ card is not in place or fully locked into the slot you will get the message below.
- Reinsert the MicroSD™ card and the control will automatically detect the card and begin the upgrade process.



Step 4 – Updating the Wall Control

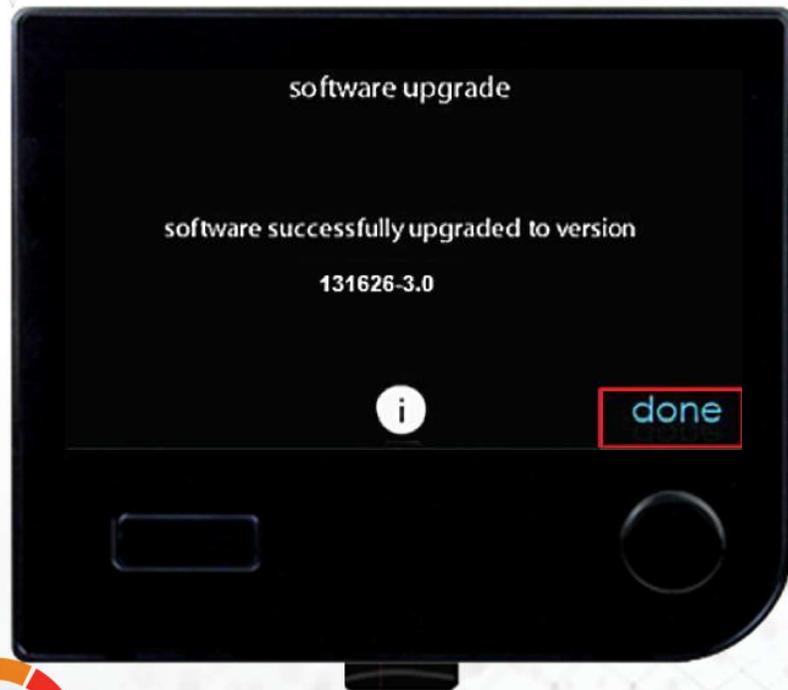


- Press YES to continue with the firmware upgrade
- The upload and installation will take several minutes
- Once upgraded, select the done button

NOTE: There will be a longer than normal delay as the firmware is installed



Step 5 – Updating the Wall Control



- Once restarted, this will complete the Infinity or Evolution™ System Control firmware upgrade process
- Remove the MicroSD™ card







Safety

- *Review safety information in the installation manual*
- *Always check local codes*
- *Utilize electrical lock-out/tag-out procedures*
- *Wear gloves, goggles, and appropriate PPEs*
- *Always consult the Installation Instructions for additional safety warnings*





Installation Improvements

- Packaging redesigned – less damage
- No exterior muffler (all sizes)
- Bluetooth[®] module added (BTM)





Replacement Unit Applications

Apply normal equipment de-commissioning processes when doing a replacement installation. Always:

- Pull old line-sets and use new tubing on the new installation
- Pull wiring from disconnect to the unit and use new 18 AWG wiring on the new installation
- Properly discharge the old system by using appropriate EPA recovery measures



Installing the 26/24





26/24 Match-up & Compatibility

- Must be communicating equipment
- 26/24 outdoor unit must be connected to a factory-approved, properly sized, AHRI-rated combinations:
 - Fan coils (all FEs)
 - Furnaces (Infinity, Evolution™)
 - Evaporator coils





Indoor Coil & Filter Drier Installation

ALWAYS install the Liquid-Line Filter Drier to protect the EXV & TXV

- Braze 5-inch (127 mm) liquid tube to indoor coil
- Wrap filter drier with damp cloth and braze it to the 5-inch liquid tube
- Connect and braze liquid refrigerant tube to filter drier

**Must use refrigerant-grade tubing for line-sets*

**Installation of filter drier in liquid line is required*

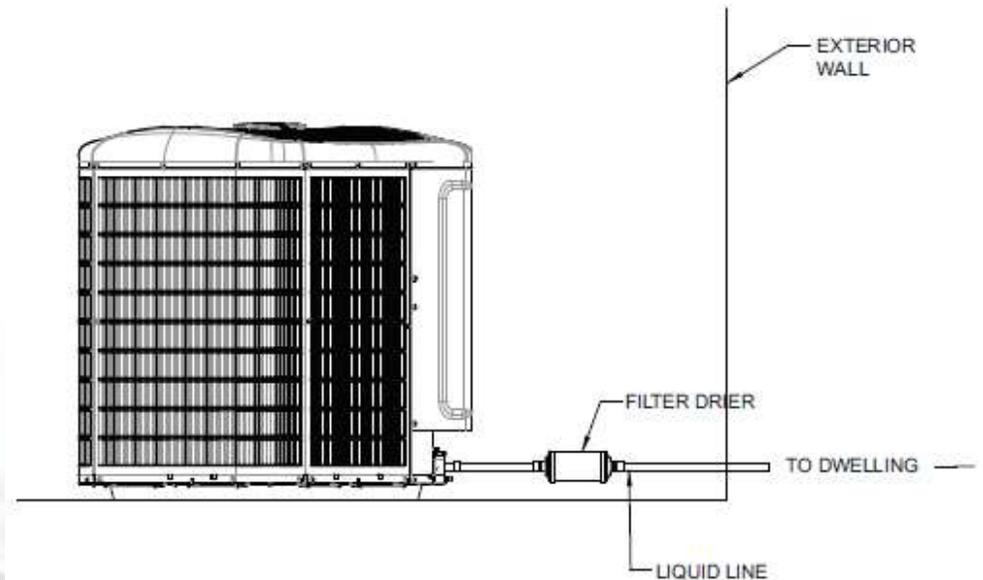
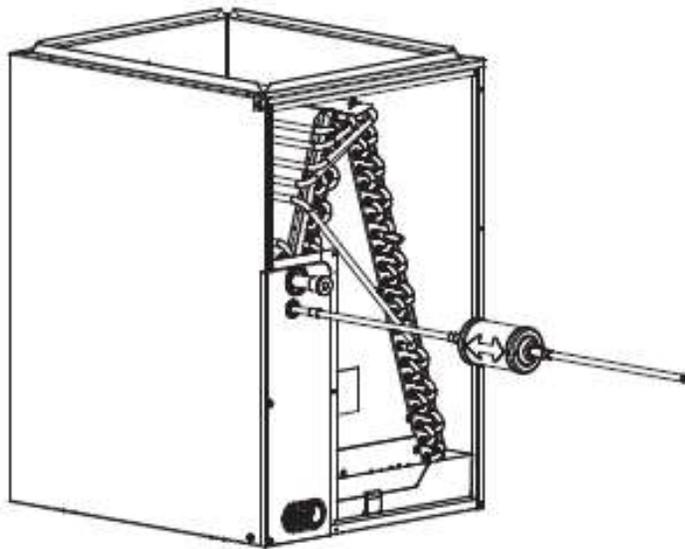
**Consult Indoor Coil Installation Instructions for complete installation information*



Filter Drier Locations 26/24

Inside – 2, 3, and 4 Ton

Outdoor – 5 Ton unit only



5-Stage units place the filter drier at the indoor unit





Placing the Outdoor Unit

- Choose best location (away from bedrooms, dryer vents, debris, etc.)
- Install on a solid, level mounting pad
 - Elevate unit (for HPs)
- Adhere to minimum clearance requirements
- Check operating ambient temperature
 - Max. in cooling mode is 125°F
 - Max. in heating is 66°F



Running Line-set & Connections 26/24

UNIT SIZE	LIQUID		VAPOR*		
	Connection Diameter	Tube Diameter	Connection Diameter	Max (Rated) Diameter	Minimum Tube Diameter
25VNA424	3/8	3/8	3/4	3/4	5/8
25VNA436	3/8	3/8	7/8	7/8	5/8
25VNA448	3/8	3/8	7/8	1-1/8	3/4
25VNA460	3/8	3/8	7/8	1-1/8	3/4

The muffler install no longer needed (first generation Greenspeed)

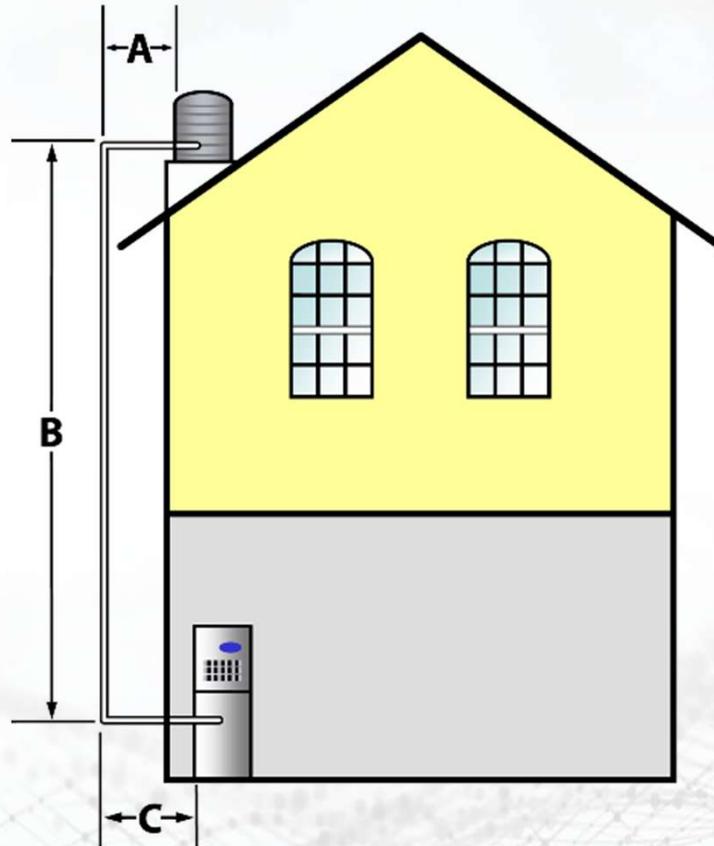
250 feet maximum equivalent length

- LLS needed if vertical line-set exceeds 20 feet or the horizontal line-set is greater than 80 feet

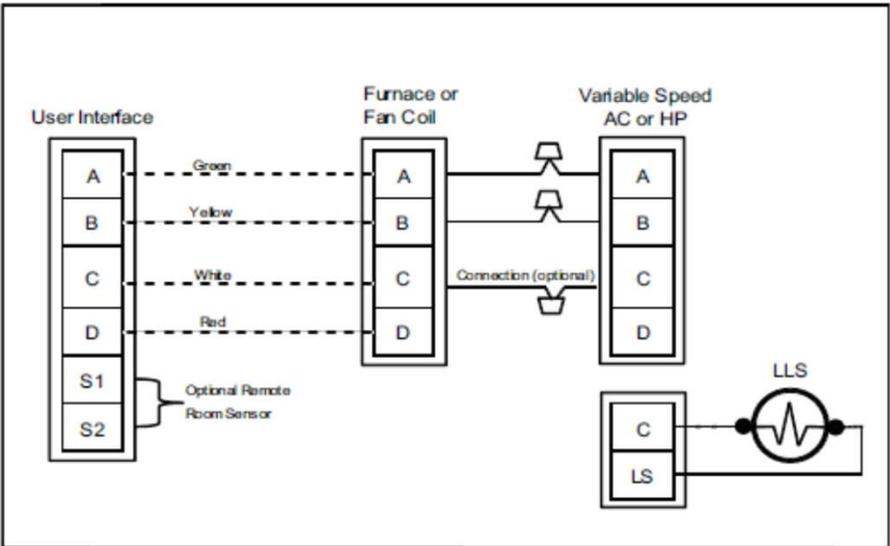


Running Line-set & Connections

- IF B EXCEEDS 20', LIQUID LINE SOLENOID VALVE REQUIRED
- IF $A + B + C$ EXCEEDS 80', LIQUID LINE SOLENOID VALVE REQUIRED
- REFER TO INSTALLATION INSTRUCTIONS FOR GUIDELINES



LLS wiring



**Fig. 4 – Liquid Line Solenoid Electrical Connection
(Required for long line applications)**

A180243



5-Stage Lineset Sizing

Table 1 – Refrigerant Connections and Recommended Liquid and Vapor Tube Diameters (in.)

UNIT SIZE	LIQUID		VAPOR†		
	Connection Diameter	Tube Diameter	Connection Diameter	Max (Rated) Diameter	Minimum Tube Diameter
13, 24B	3/8	3/8	3/4	3/4	5/8
25	3/8	3/8	3/4	7/8	5/8
36	3/8	3/8	3/4	7/8	5/8
37	3/8	3/8	7/8	1-1/8	5/8
48	3/8	3/8	7/8	1-1/8	3/4
60	3/8	3/8	7/8	1-1/8	3/4

Maximum Line Lengths for Heat Pump Applications

	MAXIMUM ACTUAL LENGTH ft (m)	MAXIMUM EQUIVALENT LENGTH† ft (m)	MAXIMUM VERTICAL SEPARATION ft (m)
Units on equal level	100 (30.5)	100 (30.5)	N/A
Outdoor unit ABOVE indoor unit	100 (30.5)	100 (30.5)	100 (30.5)
Outdoor unit BELOW indoor unit	See Table 'Maximum Total Equivalent Length: Outdoor Unit BELOW Indoor Unit'		

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

Maximum line set length is 100 feet for 5-stage units



Piping Connections

Make Piping Connections

- Vapor tube to vapor service valve
- Liquid line to liquid service valve



IMPORTANT – Use nitrogen brazing for ALL sweat connections

- Prevents oxidation and carbon inside of tubing/closed system
- Protects EXV
- Eliminates issues down the road

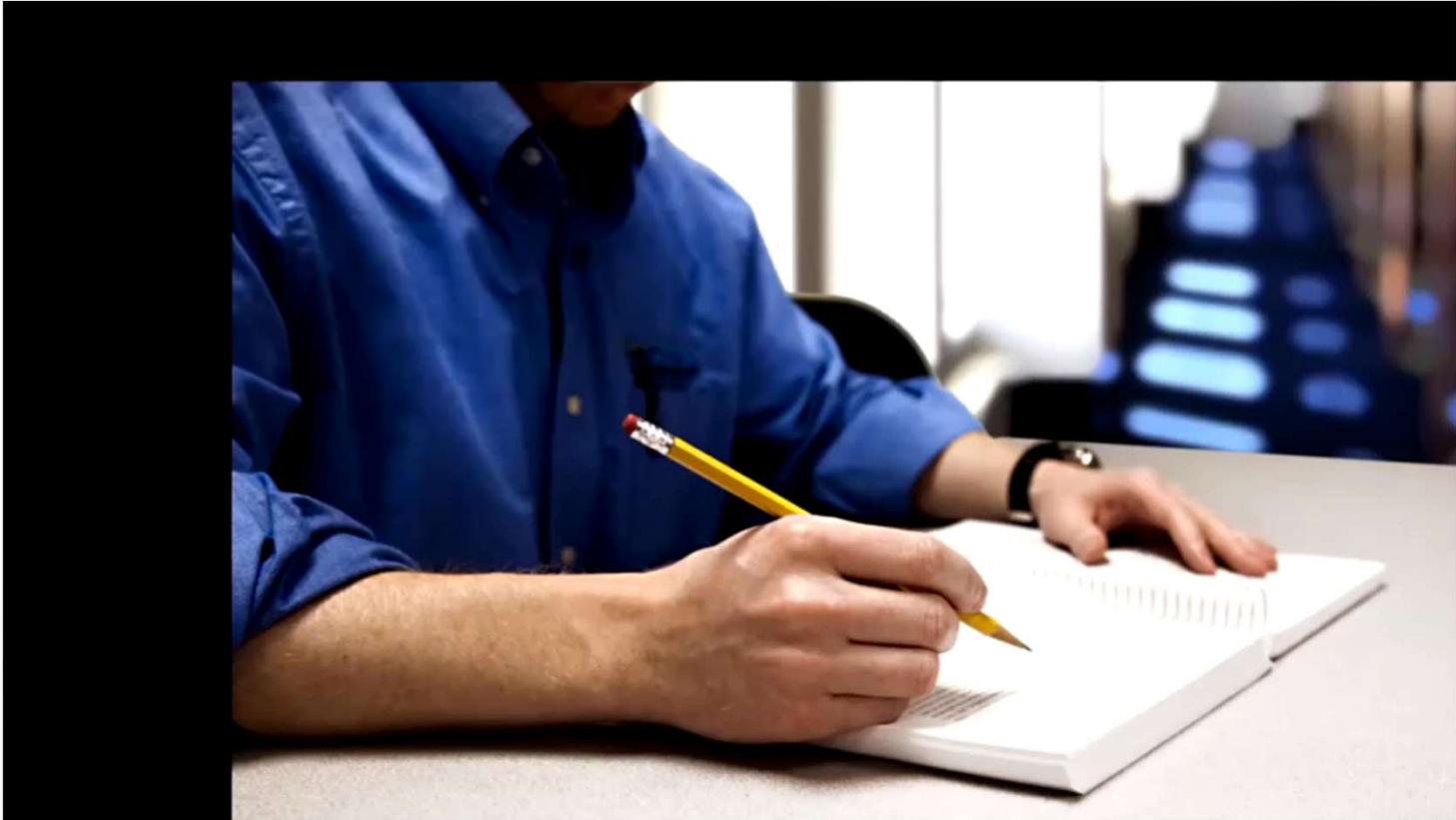


Nitrogen



Always use nitrogen when brazing. Just 1 -2 lbs. moving thru the tubes while brazing
Pressure test systems to 400 psig
Pressure test Ductless systems to 500 psig







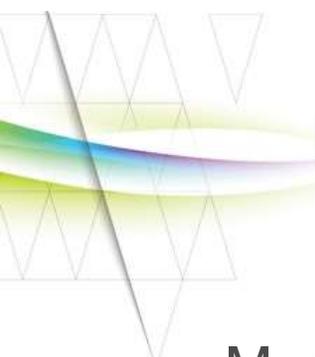
Test Piping Connections

IMPORTANT

Perform final check of all tubing

- Ensure factory tubing did not shift during shipment
- Tubes aren't rubbing against other tubes or sheet metal
- Feeder tubes wire ties are secure and tight





Evacuate Refrigerant Tubing and Indoor Coil

Must use proper evacuation using:

- **Deep vacuum method** (down to 500 microns)
- OR
- **Triple evacuation method**

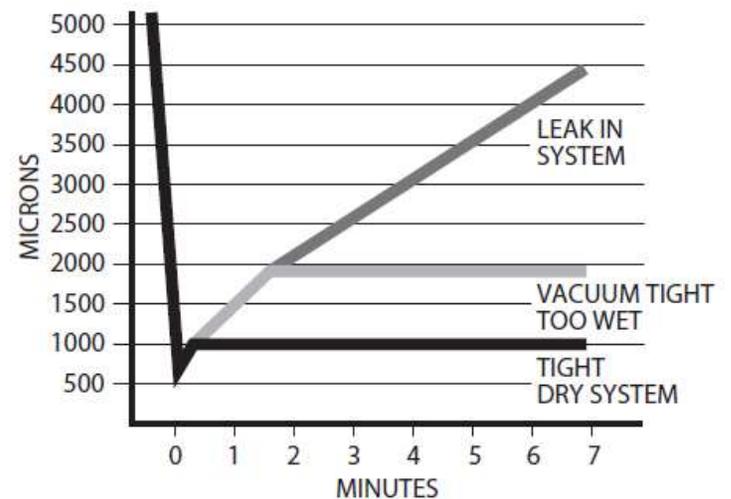
**See Service Manual for triple evacuation method*



Evacuate Refrigerant Tubing and Indoor Coil

Deep Vacuum Method - Assures system is free of air and liquid water

- Use high-capacity vacuum pump capable of pulling a vacuum of 500 microns
- Vacuum gauge must be capable of accurately measuring vacuum depth





Wiring & Electrical Connections

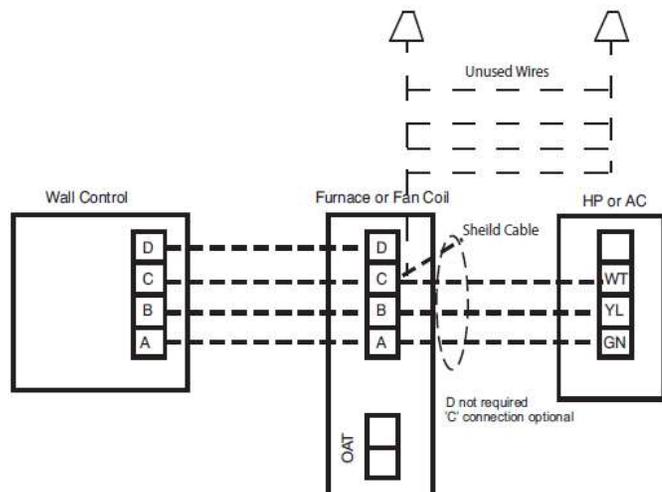
- Make Electrical Connections
- Route Ground and Power Wires
- Connect Ground and Power Wires
- Connect Control Wiring
- General Information
- Final Wiring Check



Wiring the Wall Control

Connect Control Wiring

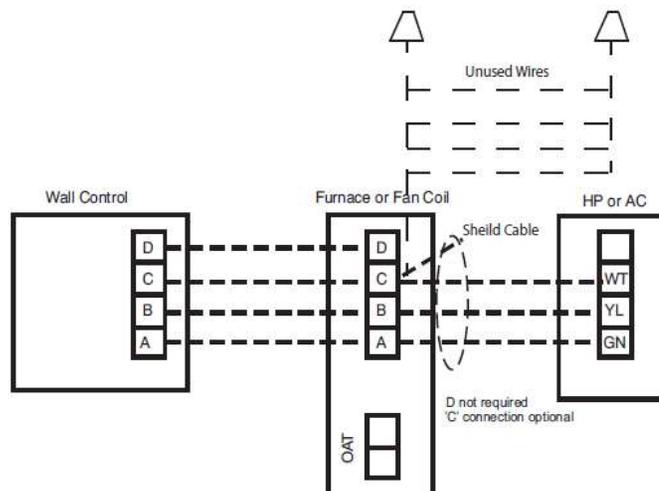
- Only two wires (AB) to Infinity or Evolution™ capable indoor unit are required
- Typical 4-wire (ABCD) may be connected



Wiring the Wall Control

Wiring Requirements

- Use #18 AWG or larger color-coded, insulated (35°C minimum) wire for low voltage
- All wiring must be NEC Class 2
- Separate wires from incoming power leads
- Low voltage wiring
- Runs of greater than 200 feet, consult wall control manual





Eliminating Wiring Communication Noise

DO NOT route control wires parallel to high voltage wires

- Creates electrical noise
- Generates nuisance fault codes

ONLY cross low-voltage control and high voltage wires at perpendicular angles

- Eliminates line noise

USE SHIELDED wiring/cable install accessories if communication issues exist

- Shielding grounded at one end of the wire only





Airflow Set-up

- 26/24 can only be installed with Infinity or Evolution™-capable indoor and Infinity or Evolution™ System Control
- 26/24 configuration and indoor airflows are determined by communicating control setup
- 26/24 automatically selects the airflow based on equipment size, and call from the Infinity or Evolution™ control
 - Comfort, Efficiency and Max airflow for Heating and/or Cooling modes available
 - Dip switch adjustments are not necessary

**See User Interface Installation Instructions for additional available adjustments*

NOTE: Ensure the Infinity or Evolution™ control, VFD, and PCM are updated with the latest available software version.





turn to the experts™ 



Heating & Cooling Systems®



Infinity® Touch
User Interface

Evolution® Connex
User Interface



Introduction

Compatible with the following products:

- Infinity[®] / Evolution[®] Series Furnaces, Fan Coils, Condensing Units and Heat Pumps
- Performance[™] / Preferred[™] Series Condensing Units and Heat Pumps
- Infinity[®] / Evolution[®] Wi-Fi System
- Small Packaged Products
- Geothermal Heat Pumps



Compatibility

- The Touch / Connex replaces original User Interfaces
- The Touch /Connex is backward compatible with all Infinity[®] / Evolution[®] equipment
- Not all control features are backward compatible
 - Low ambient control
 - Auto defrost
 - (features dependent on outdoor unit)

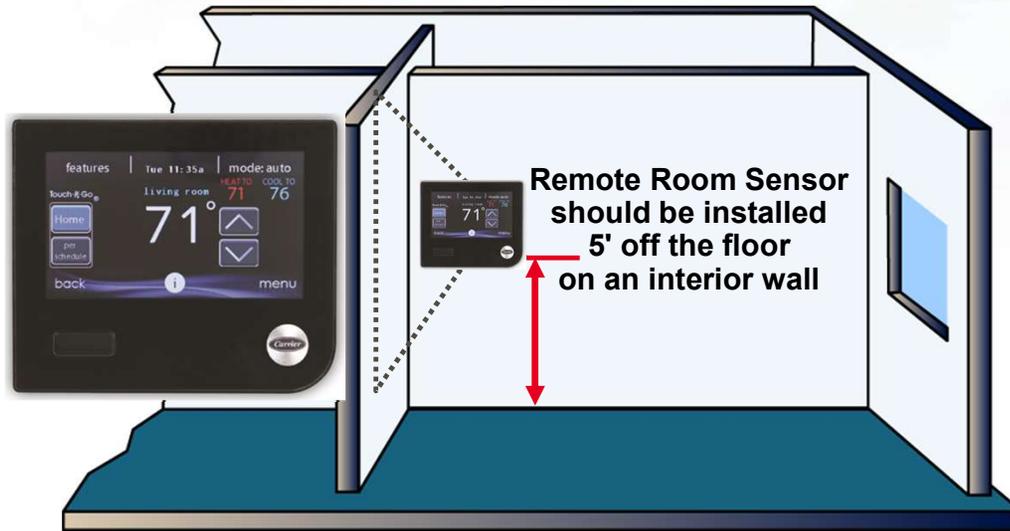


User Interface Overview

- Command center for entire system
- Locate as if a thermostat
 - See earlier sensor location guidelines
 - Only humidity sensor in system
- For more freedom in location:
 - Use Remote Room Sensor. Connects to S1&S2 Connections on UI Back plate.



Sensor Location Guidelines



Locate devices:

- Approximately 5 feet (1.5 m) from the floor
- Close to or in a frequently used room
- On an inside partition
- On a wall without pipes or ductwork

Do not locate devices:

- Close to a window outside wall or a door to the outside
- Exposed to direct light, heat, sun, etc.
- Close to or in direct airflow from registers
- In alcoves, behind doors, or other areas of poor circulation



User Interface (UI)

4.3.2. Remote Room Sensors

A Remote Room Sensor can be used with the Infinity System Control to take the place of the control's internal temperature sensor. This allows the Infinity System Control to be mounted in areas with less than optimal airflow (such as near an exterior door, window or in a closet). The remote sensor can be wired to the terminal block connectors labeled S1 and S2 at the control's backplate, or the ZS1 and ZS1C connection at the Damper Control Module. In either case, the Infinity System Control will automatically detect the Remote Room Sensor and ignore its internal temperature sensor.

NOTE: Humidity sensing will occur ONLY at the Infinity System Control. The Remote Room Sensor does NOT have humidity sensing capability.



Condensate safety connections - “G” Terminal

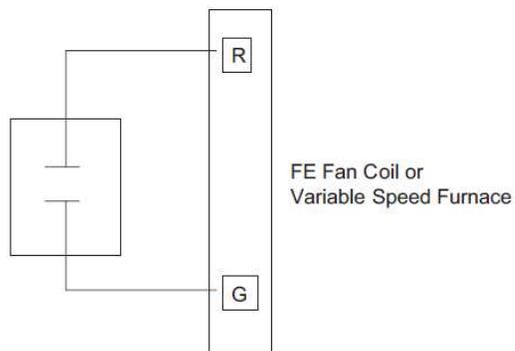


Fig. 26 - G Input Wiring for Blower Operation

A07114

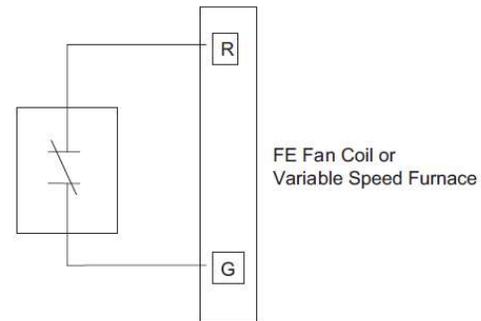


Fig. 27 - G Input Wiring for System Shutdown with Infinity™ Control (Contact type selectable; Normally Closed (default) or Normally Open)

A07115

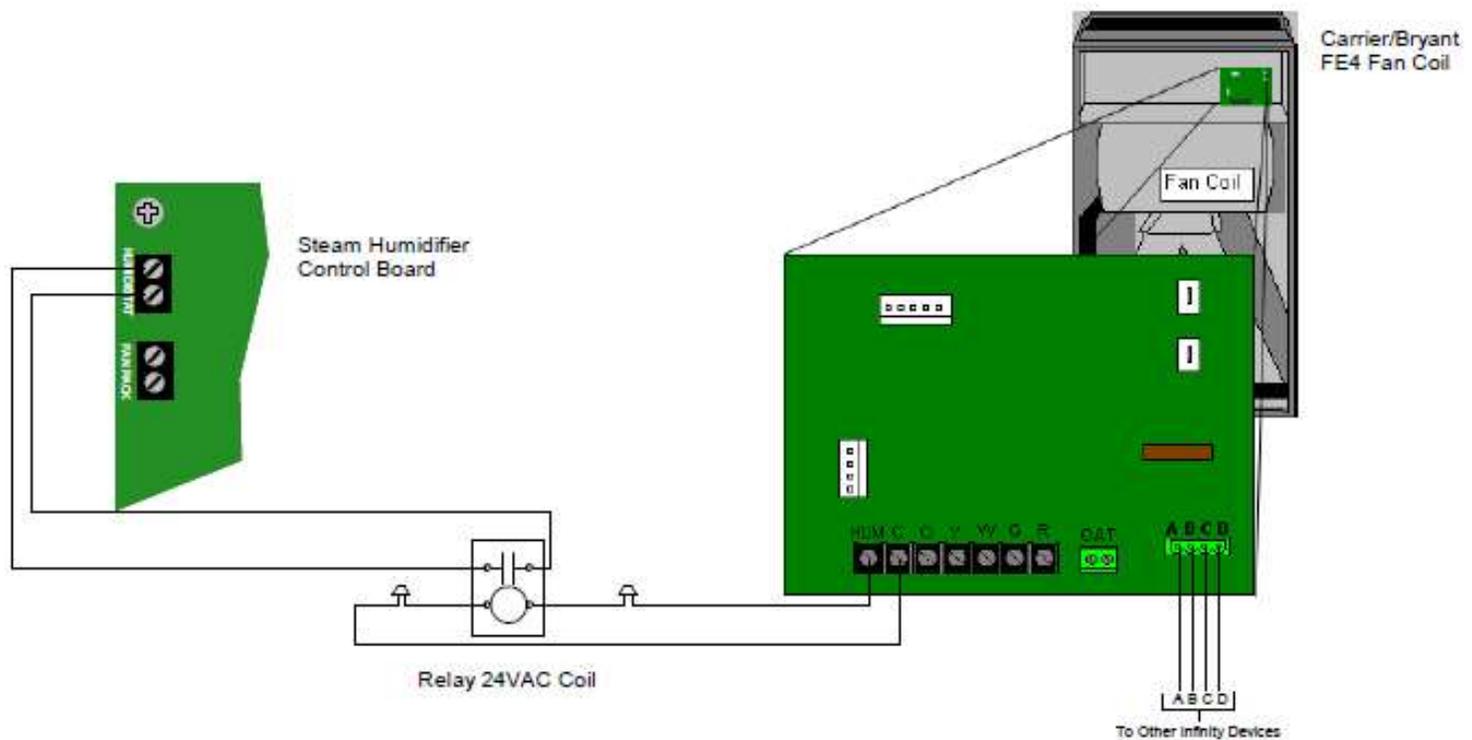
Do not connect to the ABCD wires

Will be shown in a few slides how to setup in the UI



Humidifier Wiring Configurations

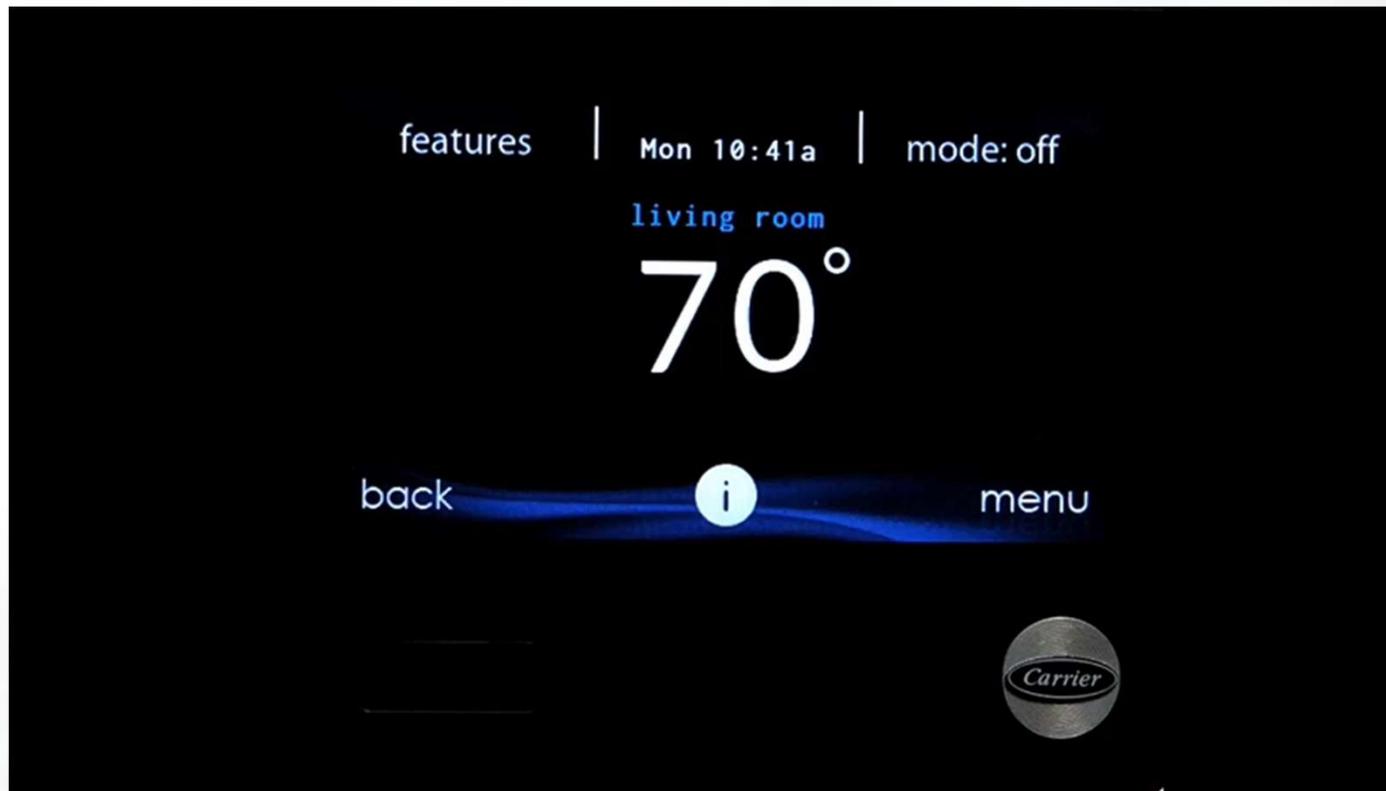
Infinity/Evolution with a Steam Humidifier



Note: Connections for humidifier isolation relay will be similar on all Carrier Infinity or Bryant Evolution furnaces.



Installation Sequence



Power Up Sequence

On power up

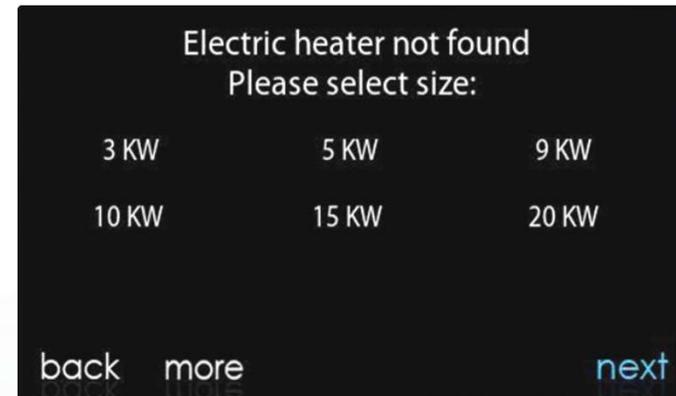
- User interface:
 - Scans ABCD bus
 - Identifies indoor unit
 - Identifies communicating outdoor unit
 - Identifies self-identifying electric heat

Searching for indoor unit



Selecting Electric Heat

- User interface locates self-identifying heater kW
- Enter heater kW for non-self-identifying heaters
- Touch MORE for additional heater sizes
- Touch NONE for a unit without an electric heater
- Select NEXT



Zoning

Zoning

Searching_

Zoning

Zone 1	User Interface
Zone 2	Smart Sensor
Zone 3	Smart Sensor
Zone 4	Remote Sensor
Zone 5	Remote Sensor
Zone 6	Remote+Smart Sensor
Zone 7	Smart Sensor
Zone 8	Remote Sensor

retry

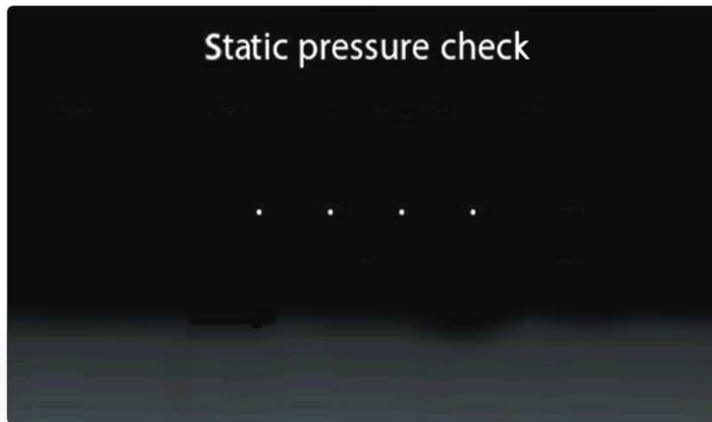
next



Static Pressure Check

Airflow measures:

Duct static pressure, system cfm, and motor rpm



Static pressure check	
Static Pressure	0.52
Blower CFM:	0
Blower RPM:	792
back	next



Zone System Duct Assessment

Duct Assessment

Measures duct capacity for each zone

10 minutes are required to complete

cancel

next

NOTE: NOT PERFORMED FOR
A NON-ZONED SYSTEM

Duct Assessment

Assessment active, please wait

Opening all zones

cancel

Duct Assessment

Assessment active, please wait

Measuring zone 1

cancel





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Heating & Cooling Systems®



Infinity® Touch
User Interface

Evolution® Connex
User Interface



Installation Instructions

SYSTXCCITC01 – B
Infinity® System Control



Installation Instructions



Instructions
come with every
User Interface....

**PLEASE READ
THEM!!**

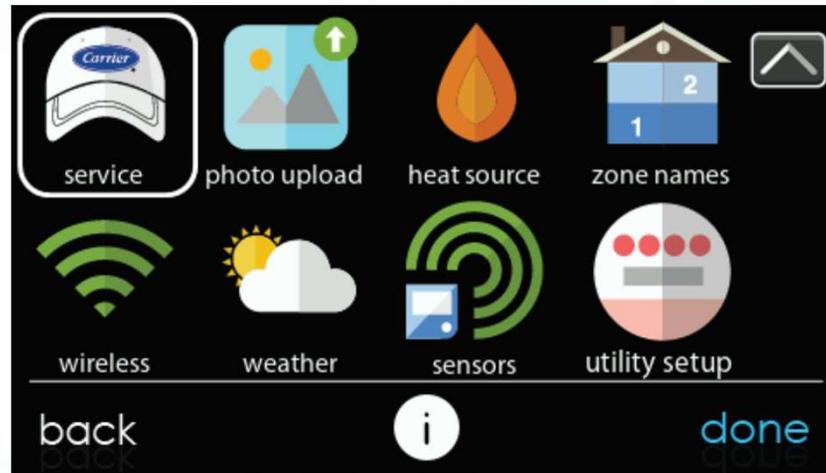
NOTE: Read the entire instruction manual before starting the installation.

NOTE: Please refer to the literature provided with the connected HVAC equipment for more details on system operations with specific pieces of equipment.

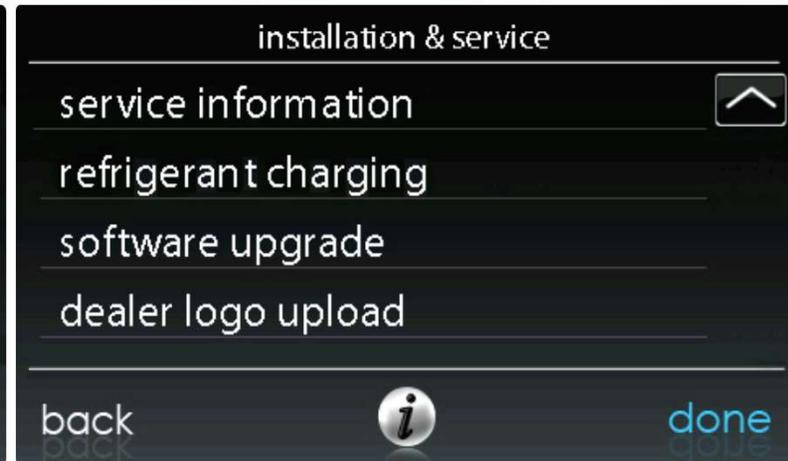
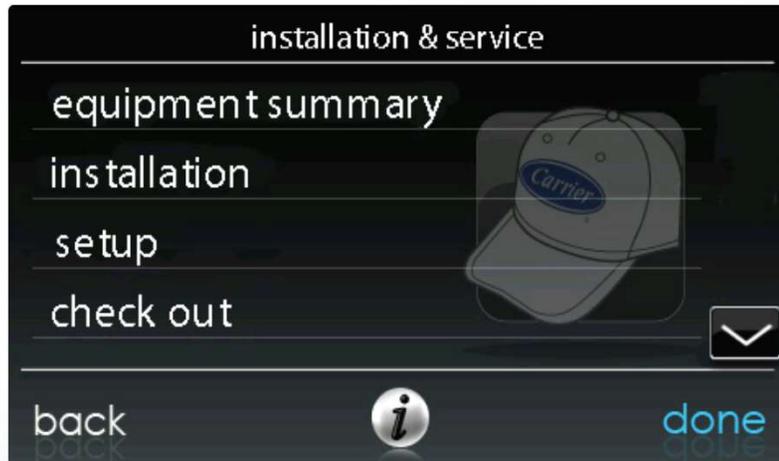
The features and functions outlined in the Installation Instructions reflect Version 1.3 or later software. Occupancy sensing compatibility is only available with Series B Infinity System Controls. See the Infinity System Control product page on the HVACPartners.com website or the Downloads section of the www.MyInfinityTouch.Carrier.com website for the latest software release and literature.



Installation & Service Menu



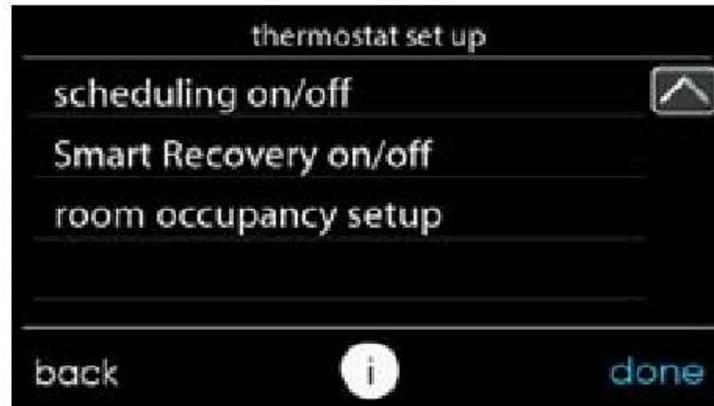
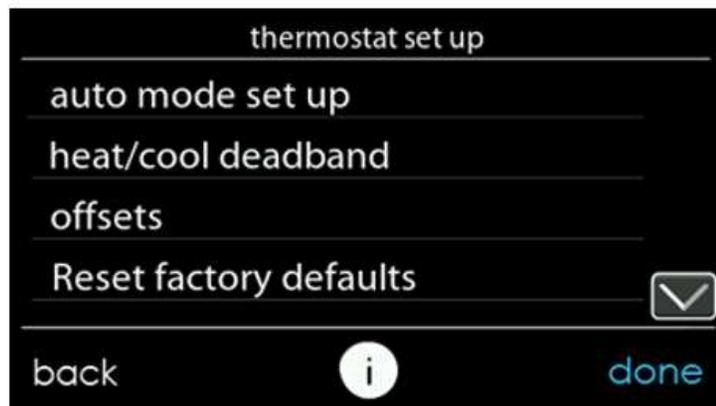
Installation & Service Menu



Thermostat – Setup



Thermostat – Setup





Thermostat – Auto Mode and Deadband

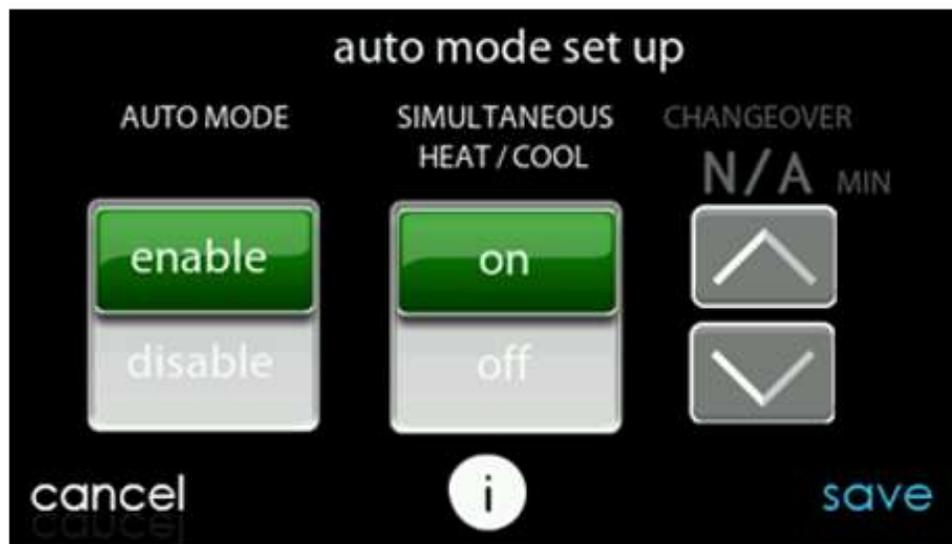
6.3.1.1. Auto Mode set up

Once the auto changeover option has been selected, touch SAVE.

- **Enable or Disable:** Choose to enable or disable auto changeover mode
 - Default = Enable
 - Default = Enable
- **Simultaneous Heat/Cool:** Choose to turn simultaneous heat cool demand feature on or off.
 - Default = Off
- If Simultaneous Heat/Cool is turned ON, Auto changeover time is grayed out and shows N/A.
- If Simultaneous Heat/Cool is turned OFF, Auto changeover time: Adjustable from 5 to 120 minutes
 - Default = 30 minutes



Thermostat – Auto Mode and Deadband





Thermostat – Auto Mode and Deadband

NOTE: AUTO mode is intended to switch between Heating and Cooling modes based on temperature demand. A gradual auto transition is the energy--conscious default that will satisfy the majority of customers.

Some customers might have significant and simultaneous heating and cooling demands in different zones. To address this need, a special

simultaneous heating and cooling demand auto mode could be enabled by the Installer. **The simultaneous heating and cooling demand auto**

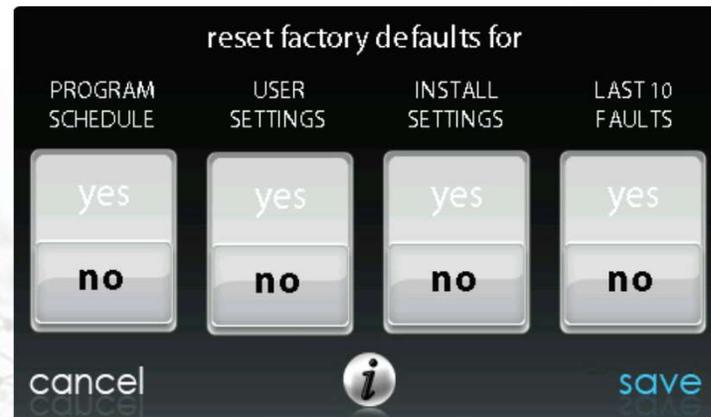
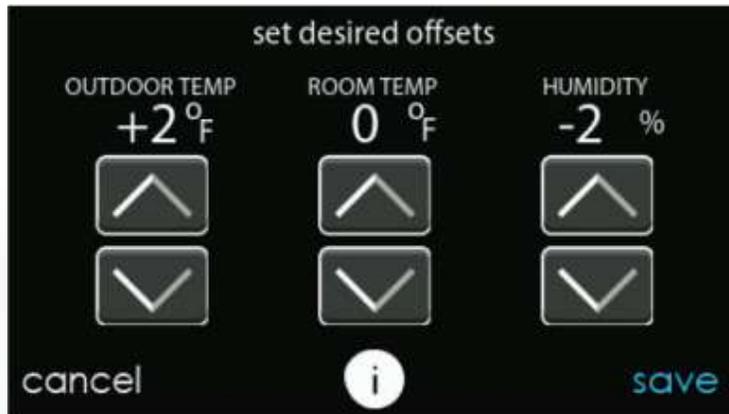
mode will result in higher energy usage but benefit the customer with greater comfort.

***NOT
RECOMENDED!!!***



Thermostat – Offsets and Reset

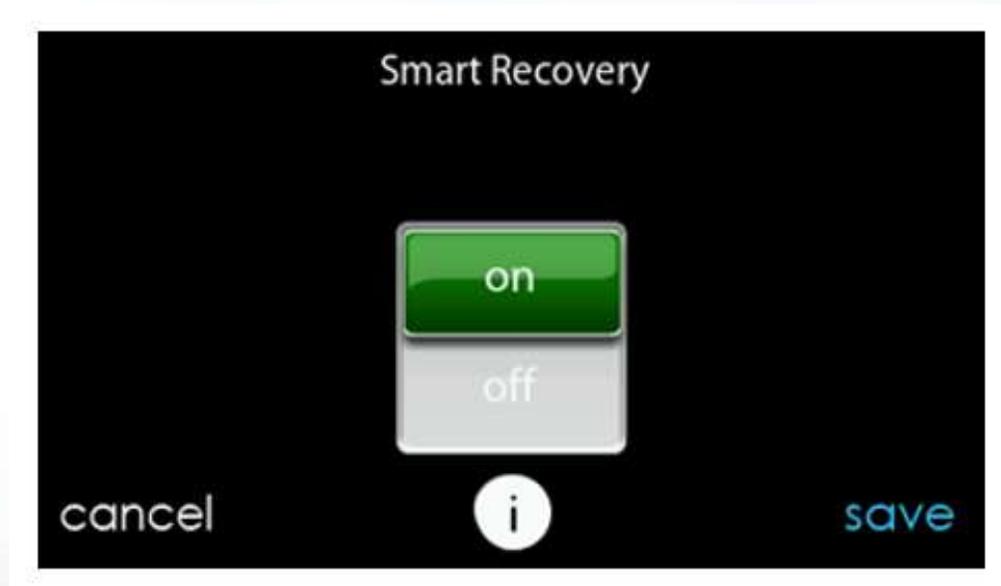
- Temperature Offsets
 - -5° F to +5° F, 1° F increments
- Humidity Offset
 - -10% to +10%, 1% increments



Scheduling

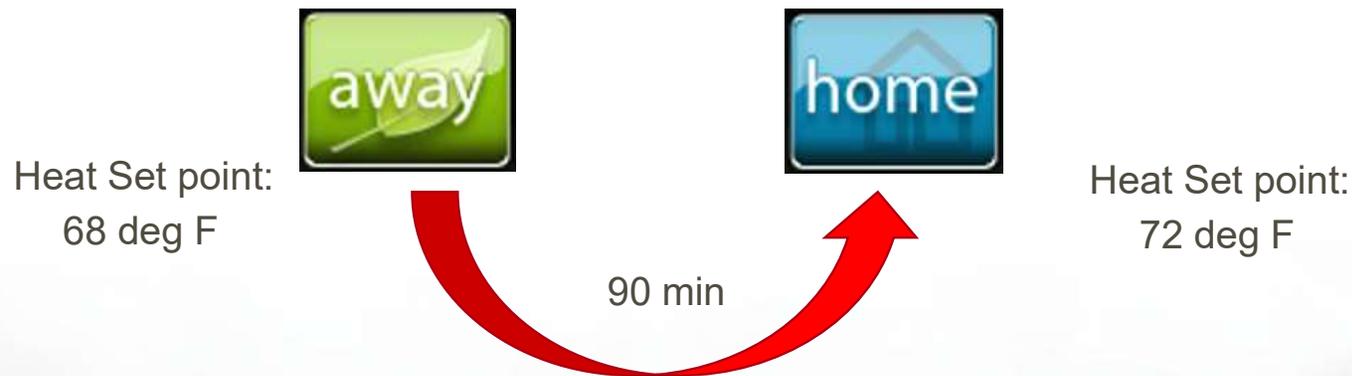


Smart Recovery



Smart Recovery

Smart Recovery causes the system to ramp the system target set points to those for the next programmed schedule period to help save energy during period transitions. Smart Recovery will start recovery 90 minutes prior to schedule change in both heating and cooling mode.



Warn Your Customer: This is the default setting. System can come on as early as 90 minutes before programmed period to get space to next period's set point. There will be an indication on display that this is happening.



Occupancy

6.3.1.6. Room Occupancy Setup

This option lets the installer enable or disable the room occupancy sensor that is in the wall control. After the selection is made, touch SAVE. When enabled, the sensor will be used to determine if the room is occupied.



Occupancy

Integrated Motion/Occupancy Sensor

Software Version 1.1 includes Home function

Detection of occupancy changes system from Away or Vacation to Home activity

Software Version 1.3 adds Away function

Detection of unoccupied condition puts systems into the Away activity

Occupancy Status

Gray – Unoccupied
Blue – Motion
Green - Occupied



Motion/Occupancy
Sensor location





Occupancy Sensing

How does it work?

Motion \neq Occupancy

Wall control counts the number of motion events within a defined period of time to detect occupancy, versus “walking through the room”

Occupancy status sustained for one hour to account for stillness in the room while occupied

Occupancy-sustain timer reset to one hour each time occupancy is again detected

Once the Sleep activity is entered, the activity stays in Sleep

Any HOLD activity will override Occupancy sensing activity changes

During scheduled vacations, if Occupancy is sensed, the system will change to the Home activity

If Scheduling is disabled, and Occupancy Sensing is enabled, then activity changes based on Occupancy status will be enabled



Furnace - Setup

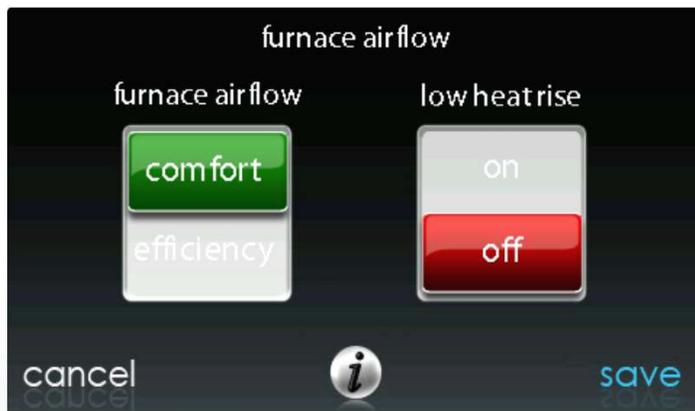


Furnace - Setup

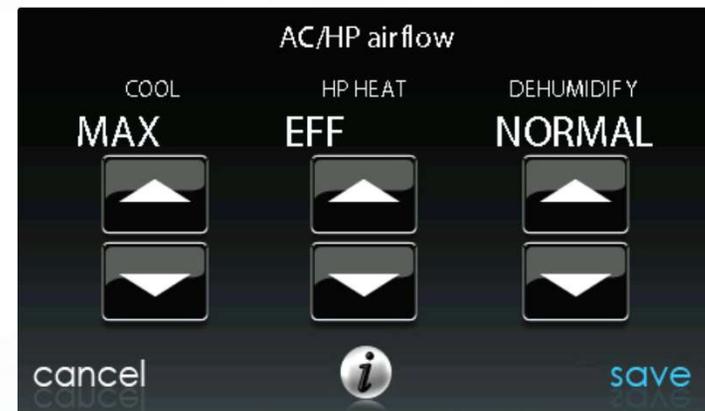
- Furnace Airflow
 - Comfort or Efficiency
- Air Conditioning and Heat Pump Airflow
 - Comfort, EFF325, EFF350, Maximum, and Quiet
- Heat Pump Heating Airflow
 - Comfort, EFF325, EFF350, and Maximum
- Dehumidification Airflow
 - High and Normal



Airflows



Furnace
Airflow

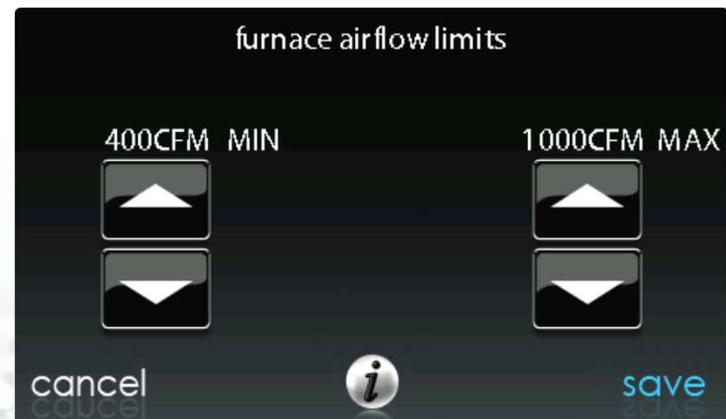
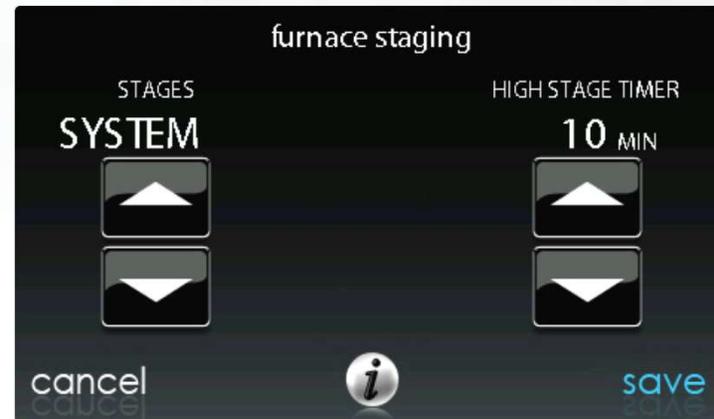


Fan Coil
Airflow

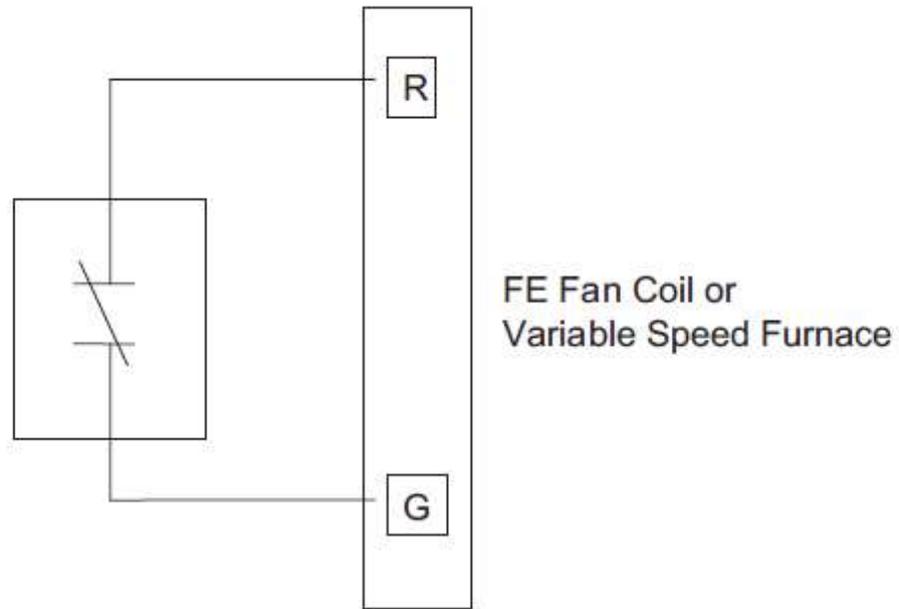


Furnace Staging

- Staging
 - Low, Low-Medium, Low-High, Medium, Medium-High, High, Furnace, and System
 - Airflow Limits*
 - MIN - Increase minimum capacity
 - MAX – Decrease maximum capacity
 - Off Delay
 - 90, 120, 150, and 180 seconds
 - Altitude
 - Installed elevation
 - Dehum Drain
 - Fan OFF at end of cooling (Continuous Fan Application)
- * These only apply to modulating furnaces



“G” Terminal

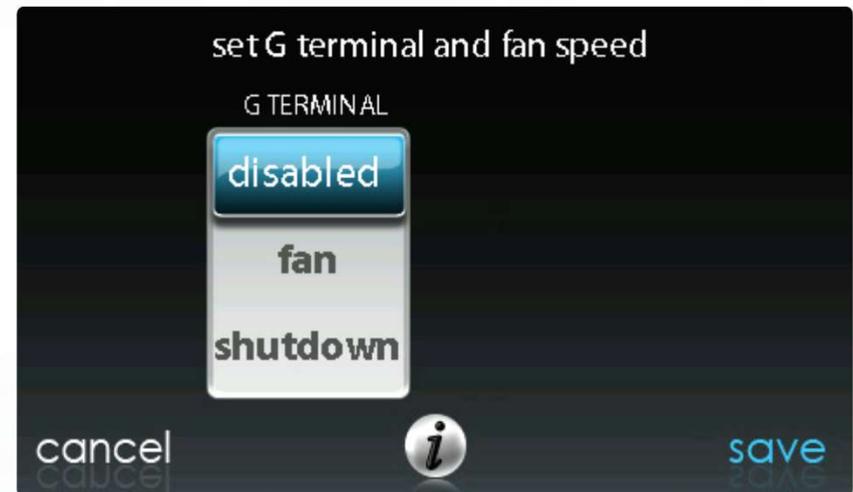


G Input Wiring for Shutdown Operation
Contact type selectable (N.O./N.C.)



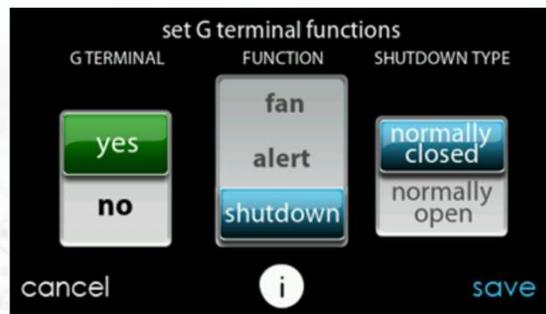
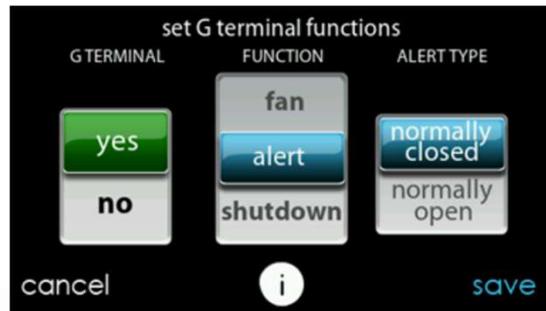
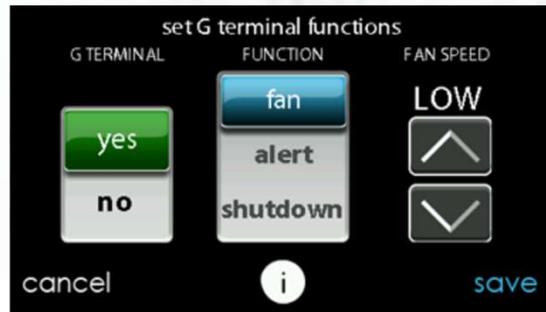
G Terminal - few ways to use it

- G Terminal (Furnace and Fan Coil)
 - Switch or relay between “R” and “G” terminal
- Fan Speed
 - Low
 - Medium
 - High
- Shutdown
 - N.O. contact
 - N.C. contact
- Alert
 - Ability to customize



The detailed instructions on how to perform the task of turning on the “G” option is in the User Interface Installation Manual.

You can only use the “G” Function for either the fresh air or the float switch but not both. If you have both it is recommended that you break “R” for the float switch.



Outdoor Unit - Setup



Outdoor Unit - Setup

- Cooling Lockout
 - None, 45, 50 or 55° F
- Defrost Interval (Heat Pump)
 - 30, 60, 90, 120 minutes and Auto
- Low Ambient Cooling
 - Yes or No
 - Cooling Lockout



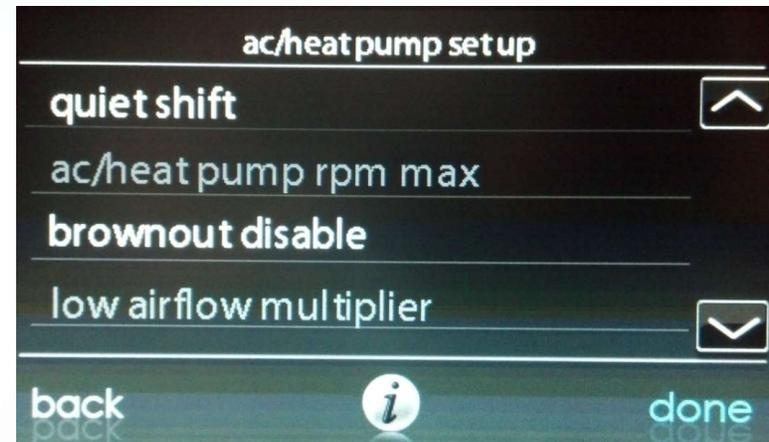
Outdoor Unit - Setup

- Quiet Shift
 - On or Off
- AC/Heat Pump rpm max
 - Only functions with variable-speed compressor
- High Cool Latch
 - System in control
 - High cool latch above (Temperatures between 80 to 110° F)
 - Low cool only
- High Heat Latch
 - System in control
 - High heat latch below (Temperatures between 20 to 50° F)
 - Low heat only



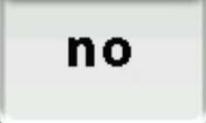
Outdoor Unit - Setup

- Quiet Shift
 - 10 seconds at the beginning end of defrost
- Brownout Disable
 - Voltage detection feature
- Heat Source Lockout
 - Heat Pump Lockout
 - NONE
 - - 20° F to 55° F
 - Furnace Lockout
 - NONE
 - 5° F to 55° F
 - Electric Heat
 - 15° F to 55° F



Heat Source Lockout

heat source lockout

HP lockout below 30 °	furnace lockout above 50 °	defrost with furnace?
 	 	 
cancel		save



Accessories

accessories set up

filter

humidifier

ultra violet lights

ventilator

back



done



Filter Type

- Change service interval notification to user
 - Replace or clean filter
 - 1 to 18 months
 - Default 3 months



Humidifier

- Change service interval notification to user
 - Replace or clean filter
 - 1 to 24 months
 - Default 12 months



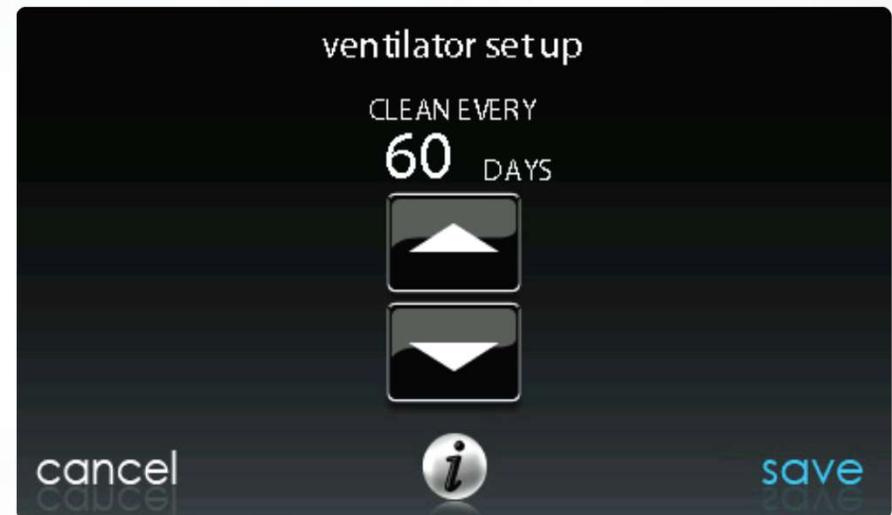
UV Lights

- Change service interval notification to user
 - Change UV lights
 - 6 to 48 months
 - Default 12 months



Ventilator

- Change service interval notification to user
 - Clean ventilator pre-filter
 - 60 to 180 days
 - Default 90 days



Utility Curtailment

- Available only on cooling units and heat pumps
- Requires input from power company
- Limited to:
 - First-stage capacity
 - or
 - Turn off
- Will shut off compressor
 - Hybrid Heat or Hydronic Heat
- Curtailment not available for electric heating operation



Checkout Equipment

checkout

furnace

heat pump heating cooling

humidifier

ventilator



back *i* done

furnace check

make sure the unit is properly installed
before continuing

- make sure gas supply is on
- make sure gas valve is on

back *i* next



Furnace Check

furnace check runtime

LOW HEAT	HIGH HEAT
5 min	5 min
	
	

back  start

modulating furnace check

furnace heat:	low
air flow CFM:	800
leaving air temperature:	65
inducer RPM:	123
blower RPM:	1200
static pressure:	0.66
low heat:	12:14

 stop

*****This applies to Modulating Furnaces as well as Two Stage Furnaces.*****



Heat Pump Check

heat pump check runtime

LOW HEAT	DEFROST	HIGH HEAT
5 min	NO	5 min
		
		

back  start

heat pump check

heat pump	
defrost:	off
airflow:	800
coil temperature:	23
outdoor temperature:	91
static pressure:	0.66
blower RPM	1125
leaving air temperature:	65

 stop



During AC/HP checkout, what airflow should be delivered?

- *Variable speed equipment will run at set parameters (Proprietary) based on several conditions. 100% of current conditions*
- ***Checkout mode should only be used to verify equipment operation.***
 - ***Charging mode should be used to verify refrigerant charge on these types of systems, not checkout!***



Humidifier and Ventilator Check

humidifier check

humidifier is

on

off

i

stop

ventilator check

ventilator speed

high

low

off

i

stop





Commissioning and Charging

There are 2 ways to charge the system

- Weigh-in-method – look at install guide and weigh
 - Calculate the additional needed for the line-set
- Subcooling

- In the User Interface use the “refrigerant charging” function to charge and start the system





Charging

Charge in CHARGING mode

Factory charge amount and desired subcooling are shown in the user interface (UI). To properly check or adjust charge, conditions must be favorable for subcooling charging in cooling mode. Favorable conditions exist when the outdoor temperature is between 65°F and 100°F (18°C and 38°C), and the indoor temperature is between 70°F and 80°F (21°C and 27°C). If the temperatures are outside of these ranges, weigh-in charge only. If confirmation is needed return and check subcooling when the temperatures are within the desired range.

Charging Procedure: Unit is factory charged for 15ft (4.57 m) of lineset and for smaller rated indoor coil combinations. If any refrigerant charge adjustment is required based on the indoor coil combination you select and the line set length you input, the UI will calculate and display the target subcooling and the amount of additional charge to be added. Therefore UI is your source of information for charging the system correctly. Refrigerant charge adjustment amount for adding or removing 0.6 oz/ft (17.74 g/m) of 3/8 liquid line above or below 15ft (4.57 m) respectively, and an additional amount of refrigerant charge adjustment (2 lbs) for a large ID coil if required, is calculated and displayed by the UI.

Perform a final charge check only when in cooling and OD is between 65°F (18°C) and 100°F (38°C).

NOTE: UI indicates acceptable conditions if outside of this range. Do not charge if outside 65°F (18°C) and 100°F (38°C) outdoor temperature.

If the range is acceptable, go the CHARGING screen in the user interface (UI). At cooling conditions, set the user interface (UI) to check the charge in cooling mode. Allow system to operate in cooling mode for the stabilization period as indicated in the user interface (UI). Once conditions are indicated as favorable and stable by the user interface (UI), check the system charge by subcooling method. Compare the subcooling taken at the liquid service valve to the subcooling target (LiqLin SC TGT) listed on the charging screen. Add refrigerant if the subcooling is low and remove charge if subcooling is high. Tolerance should be $\pm 2^{\circ}\text{F}$.

If any adjustment is necessary, add or remove the charge slowly (no greater than 0.5 lb per minute) and allow system to operate for 15 minutes to stabilize before declaring a properly charged system.



Charging



Charging

service valve subcool

please wait...

target service valve subcool:	8.8 F
stabilization time:	1:00 mins
mode//speed:	cool// 4498 rpm
EXV position:	100%
indoor airflow:	852 cfm

back  done





There are 2 ways to charge the system Subcooling

The screenshot shows a mobile application interface for HVAC system service. The main menu includes options like 'service information', 'refrigerant charge', and 'subcool'. The 'subcool' option is highlighted with a red box. Below it, a screen displays technical data for 'target service valve subcool' and 'stabilization time'.

target service valve subcool:	8.3 °F
stabilization time:	0:16 sec
mode//speed:	cool// 3201 rpm
heating EXV position:	100%
vapor injection EXV position:	N/A
indoor airflow:	800 cfm





Heating Check Charge

- Indoor conditions should be between 60-80
- The outdoor coil should be clean and clear of any debris or frost
- Must use the refrigerant charging function
- Then use the heating check charge chart to see if you are within guidelines
- **Do not use the chart to adjust the refrigerant charge**
- If charge is in doubt, remove the charge and weigh-in the correct amount calculated



End of deck 1, change to deck 2

2020 Next Generation Systems & 5 stage part 2

