County of Greene

OFFICE OF THE COUNTY ADMINISTRATOR
POST OFFICE BOX 358
STANARDSVILLE, VIRGINIA 22973
434-985-5201
FAX: 434-985-3705

MEMORANDUM

TO:	Greene County Board of Supervisors
FROM:	Terry Beigie, Deputy Clerk to the Board of Supervisors
SUBJECT:	Courthouse HVAC Replacement
DATE:	April 28, 2026

Recommended action:

Approve the attached resolution to allow the County Administrator to execute the contract with Advanced Environmental Solutions to replace the HVAC system at the Courthouse.

Background:

Greene County released the Invitation for Bid #2026-007 for Heating, Ventilating and Air Conditioning (HVAC) replacement at the Courthouse on March 20, 2026. We held a public opening on April 15, 2026, and had one responsive bid and another submit an invoice, but none of the other information required by the original posting. I've attached the bid tabulation.

Advanced Environmental Solutions was the only responsive bid for the HVAC work at the Courthouse with a bid of $98,974.00. The budget for this work was approved and allocated in the Fiscal Year 2026 budget.

If you have any questions, do not hesitate to reach out to me or Mr. Mike Taylor, Director of Facilities/Maintenance.

RESOLUTION TO AUTHORIZE EXECUTION OF A CONTRACT FOR HVAC REPLACEMENT AT COURTHOUSE

WHEREAS, Greene County has solicited proposals for the contract for the replacement of the HVAC system at the courthouse; and

WHEREAS, two proposals were received and publicly opened on April 15, 2026; and

WHEREAS, Advanced Environmental Solutions was the only responsive bidder; and

WHEREAS, the Board desires to award a contract to replace the HVAC system at the courthouse.

NOW, THEREFORE, BE IT RESOLVED by the Greene County Board of Supervisors that the County Administrator is hereby authorized to execute a contract with Advanced Environmental Solutions for the work outlined in invitation for bid dated March 20, 2026, after the County Attorney has approved it.

ADOPTED BY THE GREENE COUNTY BOARD OF SUPERVISORS ON APRIL 28, 2026.

Motion:
Second:

Votes:

Steve Catalano:	_____
Marie Durrer:	_____
Tim Goolsby:	_____
Matthew Hartung	_____
Davis Lamb:	_____

_____
Steve Catalano, Chair
Greene County Board of Supervisors

ATTEST:_____
Cathy Schafrik, Clerk
Greene County Board of Supervisors

OFFICE OF THE COUNTY ADMINISTRATOR
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NOTICE OF INTENT TO AWARD

DATE: April 28, 2026

COMMODITY: Heating, Ventilating and Air Conditioning (HVAC)

IN RESPONSE TO RFP # 2026-007 ISSUED: March 20, 2026

CONTRACTOR(S)/VENDOR(S): Advanced Environmental Solutions

Records for this procurement are now available for inspection by any bidder on this IFB.

(Purchase officer/contract officer) Cathy Schafrik, County Administrator
Name typed or printed

IFB: #2026-007
Courthouse HVAC Services
Bid Tabulation April 15, 2026

Company	On Time	6 attachments?	Bid Amount
Smooth Heating & Cooling LLC	Yes	No	$28,144.80
Advanced Environmental Solutions	Yes	Yes	$98,974.00*

Notice to Award to Advanced Environmental Solutions at the April 28, 2026, BOS Meeting

County of Greene
COUNTY ADMINISTRATION
PO Box 358
40 Celt Road
Stanardsville, VA 22973

Invitation For Bid

IFB # 2026-007

HVAC Work at Courthouse

This procurement is governed by the Virginia Public Procurement Act and the County of Greene's Procurement Policy. All terms and conditions of those documents are hereby adopted and made a part of this notice.

Contact Information:

Questions concerning sealed bids should be in writing addressed to:

Michael Taylor
Director of Facilities
County of Greene
mstaylor@gcva.us

Date Issued: Friday, March 20, 2026
Date & Time of Closing & Public Opening: April 15, 2026, at 2:00 p.m.

1.0 PURPOSE

Sealed bids, subject to the specifications and conditions contained herein and attached hereto, will be received in the Greene County Administration Building, County Administration Office, until, but no later than, 2:00 p.m., local time prevailing, on Wednesday, April 15, 2026. A public opening of the bids will be held at that day and time at the Greene County Administration Building, 40 Celt Road, Stanardsville, VA 22973. A selection committee shall choose the contractor based on the lowest responsible bid.

PURPOSE

The purpose of this Invitation for Bid (IFB) is to solicit bids through competitive sealed bidding for the purpose of HVAC work at the historic courthouse complex in Stanardsville from qualified contractors. It is anticipated that one contractor will be selected. The work will generally include, but shall not be limited to, labor, equipment, fuel, tools, materials, supervision, and incidentals necessary to provide the timely, safe, and effective execution of the work detailed in this solicitation. Bids are to be inclusive of all costs associated with the work detailed in the scope of work below.

It is the County's intent that this IFB permits competition. It shall be the Bidder's responsibility to advise the Purchasing Agent in writing if any language requirement, specification, etc., or any combination thereof, inadvertently restricts or limits the requirements stated in this IFB to a single source. Such notification must be received by the Purchasing Agent not later than five (5) days prior to the date set for bids to close.

To be considered, the Bidder shall return one copy of bid documents to: Terry Beigie, Greene County Administration, 40 Celt Road, PO Box 358, Stanardsville, VA 22973, in a sealed envelope. Mark the outside of your envelope with Request for Proposals IFB #2026-007. Additionally, proposals may be submitted electronically via eVA and will be opened during the bid opening.

Proposals, to include addenda or changes to a response, shall not be accepted via Fax machine, email, orally, or via telephone.

Time is of the essence and any proposal received after the announced time and date for submittal, whether by mail or otherwise, will be rejected. The time of receipt shall be determined by the Greene County Administrator Office.

All questions regarding this IFB shall be submitted via email to Michael Taylor, Director of Facilities, via phone at (434) 365-0572 or email at mstaylor@gcva.us. Please copy Terry Beigie at tbeigie@gcva.us with the questions as well.

2.0 SCOPE OF WORK

The County of Greene seeks sealed bids for repairs and replacement HVAC work on the AAON HVAC system at the County's courthouse complex, 85 Stanard St. in Stanardsville.

Specific work for the base bid includes, but is not necessarily limited to:

- Replacing existing 10-ton AAON HVAC system due to failing and age of unit
- Add climate control to holding cell area

The Contractor shall provide all labor, equipment, fuel, tools, materials, supervision, and incidentals necessary to provide a timely, safe, and effective execution of the work detailed in this solicitation. Bids are to be inclusive of all costs associated with the work detailed in this scope. There are no plans or drawings of these buildings.

3.0 SPECIAL TERMS AND CONDITIONS

A. See Appendix A for General Terms and Conditions

B. Codes, Permits, Fees, Licenses, and Notices
   a. It is the responsibility of the contractor to maintain all required licensing and training for his/her employees to provide the services as stated in this IFB.
   b. The contractor shall supply copies of all licenses to Greene County, upon request.
   c. A Greene County Business License will be required by the selected vendor. Please contact the Commissioner of Revenue at ktate@gcva.us for more information. A contractor without a Greene County Business License may submit a bid but will be required to get one prior to starting work. The contractor is responsible for the cost to acquire the license.
   d. Insurance: The contractor shall agree to provide a certificate of insurance naming the County of Greene as additional insured, and, if requested, a certified copy of said policy or endorsement(s) before commencement of the contract. All insurance shall be placed with an insurer licensed to do business in the Commonwealth of Virginia. The underwriter shall be subject to the approval of the County of Greene. The contractor shall maintain limits no less than:
      i. General Commercial Liability: $1,000,000 (one million dollars) combined single limit per occurrence for bodily injury, personal injury and property damage.
      ii. Automobile Liability: $1,000,000 (one million dollars) combined single limit per accident for bodily injury and property damage.
      iii. Worker's Compensation and Employer's Liability: Worker's Compensation as required by the Code of the Commonwealth of Virginia and Employer's Liability with limits of $1,000,000 (one million dollars) per accident.
      iv. Professional Liability coverage (errors and omissions), $250,000 per occurrence.

C. Submittals
   a. Qualified contractors shall provide appropriate information in accordance with the content and format requirements of this Invitation for Bid. The contractor's proposal shall be organized in the following order:
      i. Attachment A: Reference Form
      ii. Attachment B: Bid Response Form
      iii. Attachment C: SCC form

ATTACHMENT A – REFERENCE FORM

Vendor to complete all blanks in this document. Please list at least three with whom you have had similar contracts during the past three years. These references must be included with your proposal.

1. Company/County Mt Vernon Estate /George Washington's Home

   Contact Name Joe Sliger

   Telephone Number 703-799-8663 C: 703-303-9898

   Email jsliger@MountVernon.Org

2. Company/County Fibertek/Ft Belvoir

   Contact Name Christopher Herrmann

   Telephone Number 571-334-4377

   Email Christopher.r.herrmann2.civ@mail.mil

3. Company/County Culpeper Parks and Rec

   Contact Name Joe Koontz

   Telephone Number 540-718-1706

   Email JKOONTZ@CULPEPERCOUNTY.GOV

ATTACHMENT B – BID RESPONSE FORM

This form should be completed and returned as part of your bid packet.

1. NAME AND ADDRESS OF FIRM

SIGNATURE: John A. Smith

BY (print name) John A. Smith

TITLE :President DATE : 4/15/26

COMPANY NAME : Advanced Environment Solutions, Inc

STREET ADDRESS: 5 Le Way Dr Ste 109

CITY, STATE, ZIP: Fredericksburg, VA 22406

TELEPHONE703-339-2112 FAX E-MAIL : jsmith@aes-hvac.com

SOCIAL SECURITY OR FEDERAL TAX I.D. # 68-0647403

GREENE COUNTY BUSINESS LICENSE # Will apply as soon as awarded project

VIRGINIA CONTRACTOR'S LICENSE # 2705115117 EXPIRATION DATE 4-30-27 CLASS ELE, HVA, LPG, NGF, PLB

NAME OF INSURANCE CARRIER, BROKER OR AGENCY :Erie Insurance Company

Pursuant to and in accordance with "INVITATION FOR BIDS # 2026-007", the undersigned agrees to provide all equipment, fuel, transportation, insurance, labor, material, and other items as necessary, needed to successfully deliver and install the generators as stated in this IFB.

All prices shall include:
1. all applicable sales and/or use taxes,
2. all insurance premiums required,
3. all applicable allowances of this Bid Response Form

2. BID PRICE

LUMP SUM PRICE: Please provide your lump sum price for the work on the project.

$98,974.00 Ninety Eight Thousand Nine Hundred Seventy Four Dollars
(please write number numerically and then in word form)

The lump sum cost will be used to determine the apparent low bidder.
** Mathematical Errors. Discrepancies between the addition of the unit prices and the lump sum will be resolved by in favor of the unit prices (adding the unit prices to determine the correct lump sum). Discrepancies between words and figures will be resolved in favor of words.*

SUBCONTRACTORS

The following Subcontractors are proposed for the item(s) of work listed. Trade contractors are subject to review per the General Conditions. List only firms that will supply any labor at this site. Submit a reference form for each Subcontractor listed.

ITEM OF WORK	SUBCONTRACTOR
All work on site will be performed by Advanced Environment Solutions employees	

BID PRESENTATION

A. The Contractor having carefully examined the Bid Documents and all other related documents, fully reviewed the existing site conditions, and having become familiar with all conditions affecting the proposed work, including the availability of labor, materials and equipment, agrees to perform all Work required by the Bid Documents.

B. The Contractor, if awarded a Contract, agrees to commence the work on the date(s) specified in the Notice(s) to Proceed; to carry the work forward expeditiously with adequate forces; and subject to authorized adjustments, to achieve Interim Milestones, Substantial Completion and Final Completion in accordance with the dates or periods of performance set forth in the Contract Documents.

CONTRACTOR'S ORGANIZATION (strike out all conditions that do not apply)

~~A. An individual or sole proprietorship~~
~~B. A partnership~~
~~C. A joint venture~~
D. A corporation organized under the laws of the State of Virginia S Corp

ATTACHMENTS

The following is a checklist of items that are to be included with the Bid Response Form and shall be completed by the Contractor:

A. _X_ Attachment A: Reference Form
B. _X_ Attachment B: Bid Response Form
C. _X_ Attachment C: SCC Form
D. _X_ Certificate of Insurance
E. _X_ Copies of any required licenses or permits
F. _X_ Copy of State Contractor's License, if applicable

8. SIGNATURE AND SEAL

Signed and sealed this 15 day of April, 2026

BIDDER - SIGNATURE: John A. Smith

NAME: John A. Smith

TITLE: President

ATTACHMENT C-
PROOF OF AUTHORITY TO TRANSACT BUSINESS IN VIRGINIA

THIS FORM MUST BE SUBMITTED WITH YOUR PROPOSAL/BID. FAILURE TO INCLUDE THIS FORM MAY RESULT IN REJECTION OF YOUR PROPOSAL/BID

Pursuant to Virginia Code §2.2-4311.2, an Offeror/Bidder organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50 of the Code of Virginia shall include in its proposal/bid the identification number issued to it by the State Corporation Commission ("SCC"). Any Offeror/Bidder that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 of the Code of Virginia or as otherwise required by law shall include in its proposal/bid a statement describing why the Offeror/Bidder is not required to be so authorized. Any Offeror/Bidder described herein that fails to provide the required information shall not receive an award unless a waiver of this requirement and the administrative policies and procedures established to implement this section is granted by the County Administrator.

If this quote for goods or services is accepted by the County of Greene, Virginia, the undersigned agrees that the requirements of the Code of Virginia Section 2.2-4311.2 have been met.

Please complete the following by checking the appropriate line that applies and providing the requested information.

A. __X__ Offeror/Bidder is a Virginia business entity organized and authorized to transact business in Virginia by the SCC and such vendor's Identification Number issued to it by the SCC is __06748073__.

B. _____ Offeror/Bidder is an out-of-state (foreign) business entity that is authorized to transact business in Virginia by the SCC and such vendor's Identification Number issued to it by the SCC is _____.

C. _____ Offeror/Bidder does not have an Identification Number issued to it by the SCC and such vendor is not required to be authorized to transact business in Virginia by the SCC for the following reason(s): _____.

Please attach additional sheets if you need to explain why such Offeror/Bidder is not required to be authorized to transact business in Virginia.

Legal Name of Company (as listed on W-9) Advanced Environment Solutions, Inc

Legal Name of Offeror/Bidder John A. Smith for Advanced Environment Solutions, Inc

Authorized **Signature** Date John A. Smith Date: 4/15/2026

Print or Type Name and Title John A. Smith, President

Advanced Environment Solutions Inc.
5 Le Way Dr Ste 109
Fredericksburg, VA 22406
Phone: 703-339-2112 Fax: 703-339-2119

AES Solution for Project Staying Within Customer Specs

April 15, 2026

Project: IFB #2026-007 HVAC WORK AT COURTHOUSE
85 Stanard St.
Stanardsville, VA 22973

AES performed a site visit to perform a visual inspection of the existing Aaon split system serving the lower-level courtroom. AES feels we have found a very efficient application for not only comfort, but energy savings for the years of service from the systems. The systems we are submitting are 19-20 SEER2(Cooling efficiency) ratings and 9 to 11.7 HSPF(Heating efficiency). We will be installing a system for each side of the courtroom. AES will supply and install new liquid lines and liquid line filter dryers in both circuits. We will supply and install the breaker and wiring with disconnections and proper junctions as necessary for the proper installation of the system. We will supply and install control wiring as necessary for a proper operating system. We will supply and install a new condensate drain piped to each unit as necessary. These systems will inherently dehumidify and maintain the humidity setting during the cooling season because they can fully modulate for the cooling load and or the humidity control. This will allow the side of the room with the windows on the outside to be able to control to their needs while the other side without that can control to its need as well. We will add a new additional return duct over to the window side and will share with the existing return as well. Once everything is installed AES will perform a pressure test at over 500 PSI for a period of 24 hours for each system. After a successful 24-hour pressure test we will evacuate the systems to under 500 Microns. After a successful evacuation, we will add any calculated addition charge and open the service valves for each system. Once we have opened the service valves and confirm proper voltage, we will power the systems up and perform a proper check test and start-up of the systems. We will complete all warranty paperwork as necessary and send to the owner.

We will install a damper with actuator in the outside air(OA) duct which will be controlled by the existing CO2 sensor. There will be a duct heater installed in the OA duct to temper the air in the winter time. This will be controlled by an OA duct thermostat. AES will install backdraft dampers on the inlets of the AHU's so there is no air bypass through the AHU's if one fan is not operating for any reason.

AES will supply and install a new ductless hybrid system including capping old duct and running the required new duct for the 2 holding cells and hall area outside the cells. We will add a new return for the AHU for the hall and reconnect to the 2 existing registers in the cells. We will supply and install the breaker and wiring with disconnections and proper junctions as necessary for the proper installation of the system. We will supply and install a new condensate drain piped to the AHU as necessary. The system will inherently dehumidify and maintain the humidity setting during the cooling season because it can fully modulate for the cooling load and or the humidity control. Once everything is installed AES will perform a pressure test at over 500 PSI for a period of 24 hours. After a successful 24-hour pressure test we will evacuate the system to under 500 Microns. After a successful evacuation, we will add any calculated addition charge and open the service valves. Once we have opened the service valve and confirm proper voltage, we will power the system up and perform a proper check test and start-up of the system. We complete all warranty paperwork as necessary and send to the owner.

Please let us know if there is anything else we can do for you or answer for you.

Respectfully Submitted By:

John A. Smith

President
Advanced Environment Solutions, Inc.

SYSTXCCITC01-C, SYSTXCCWIC01-C
Infinity® System Control

Carrier
Turn to the experts

Product Data

A240356

A240357

NOTE: Infinity® System Control compatible with Infinity® rated indoor equipment only.

US Patents: Carrier® U.S. Pat No. 7,243,004, Carrier® U.S. Pat No. 7,775,452, pointSET™ U.S. Pat No. 7,415,102

INFINITY® SYSTEM

WORKS WITH amazon alexa

Infinity® System Controls

Carrier specializes in creating a customized home comfort system tailored to your needs with our broad selection of residential heating and cooling products. The Infinity® System Control is the ultimate control center for all of your system components. When you add an Infinity® System Control to a compatible variable speed furnace, fan coil, Infinity® System split product, you will enjoy longer heating and cooling cycles at lower fan speeds for a more consistent temperature throughout your home. By adding a variable speed, multi-stage, or 2-stage outdoor unit, you will enjoy extra benefits which include better humidity and temperature control as well as a more energy efficient comfort system. When paired with Infinity® Zoning controls, the Infinity® System Control allows you to create up to 8 zones of customized comfort.

The Infinity® Zoning system does not require a bypass damper, leaving air temperature (LAT) sensor or field-installed power transformer.

Always install the latest version of software to enable all features of the system.

Over-the-Air software updates for Wi-Fi models connected to the Infinity server are automatically downloaded. Software updates via USB C device are available on HVACpartners, or at www.MyInfinityTouch.com.

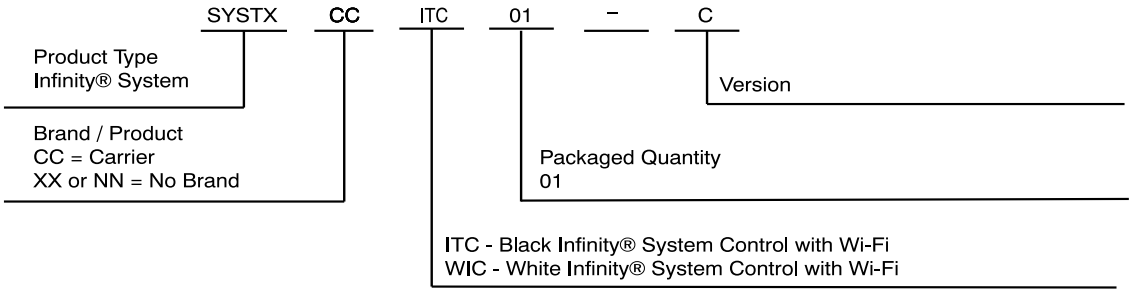
Industry Leading Features/Benefits

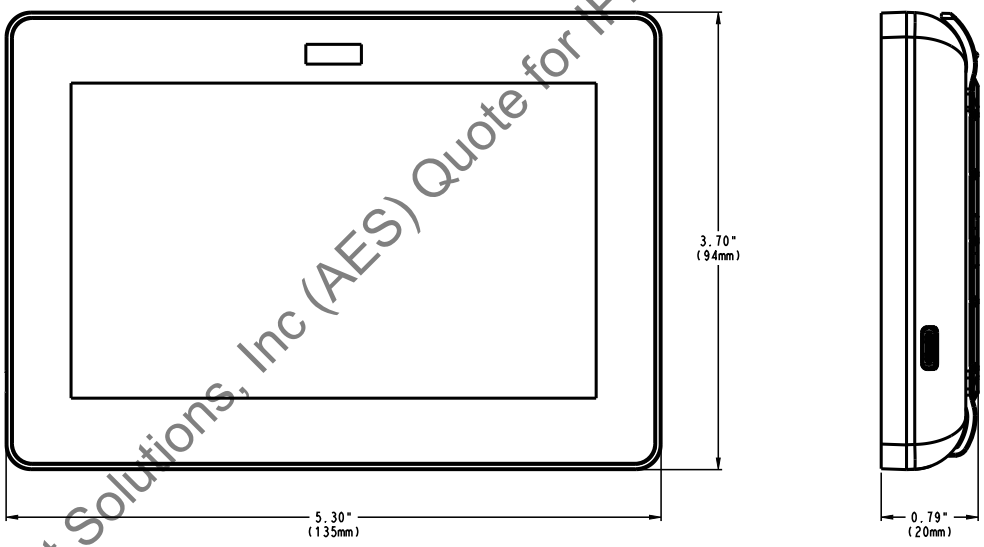
Carrier's revolutionary Infinity® System Control is the smart control of the future. Its unique system self-configuration and diagnostics capabilities make installation and service fast and accurate, helping to avoid costly call-backs. The Infinity® System Control features a high resolution display, making it easier to read. Intuitive prompts let you program everything from humidity levels to fan speeds, giving you the ultimate control over your home comfort. Other features include:

- 4-wire installation from each major component in the system
- 2-wire connection to Infinity® System two or more stage outdoor equipment (including geothermal split units)
- Infinity® Zoning System compatibility
- Proximity Sensor to provide comfort when spaces are occupied and energy savings when they're not
- Intuitive on screen prompts for ease of installation and service
- Ideal Humidity System™ settings are the default; no longer requiring increased system setup
- Complete integration of the temperature, humidity and ventilation in every season
- For Zoned Systems, auto mode selection to satisfy simultaneous heating and cooling demands in different zones via more aggressive Auto Changeover algorithm--installer must enable
- 7-day programmability with Lifestyle Comfort Profiles and Touch-N-Go® features; complies with California Title 24 programmability requirements
- Easy timed-override schedule
- Simplified vacation schedules
- Day-at-a-glance programming for simplified ease of use
- Programmable fan by period
- TrueSense™ Dirty Filter Detection
- Indoor Air Quality pop up service reminders
- General maintenance reminder messaging
- Wi-Fi® remote access capability
- For Series C upload photo, dealer info, and software updates locally via USB C device. Software updates available automatically when connected to the web server
- Series C controls are compatible with home automation through the SYSTXNNRCT01 system access modules, or Amazon ™ Alexa ™ interface.
- Compatible with Infinity® System geothermal products (GC and GZ models). Energy Tracking feature for geothermal systems is available with Entering Water Temperature sensor installed in heat pump.

Wi-Fi® is a registered trademark of Wi-Fi Alliance Corporation.
Amazon Alexa is a trademark of Amazon, Inc. or its affiliates.

Model Number Nomenclature





A240321

Fig. 1 – Unit Dimensions

Product Data Information

Compatible Communicating Products

Compatible with most Infinity® System indoor and outdoor equipment built since 2004; see equipment specifications for details.

Home Automation System Interface

A cloud-to-cloud Open API (Application Program Interface) is available for the Infinity Touch and Infinity System Controls. See the Infinity Systems Open API Getting Started Guide available on www.HVACpartners.com or contact InfinityOpenAPI@carrier.utc.com for more information.

The Infinity® System control may also connect to a variety of Home Automation systems using SAM modules Note that not all Home Automation systems may be compatible. Reference the latest version of the Application Specification titled "SAM Remote Access Application Specification," available on HVACpartners.com to learn more about the latest Home Automation interfaces to the Infinity® systems. Work with the home automation supplier to see if the systems are compatible. If not, you may provide the "Infinity® System Open API Getting Started Guide" or the "SAM Remote Access Application Specification" to the home automation supplier to develop an interface with the Infinity® System. Always be sure to obtain the latest version of the application specification from HVACpartners, as we continually update and add home automation interfaces.

NOTE: The ability to remotely access and adjust the settings of the Infinity® System Control with the Carrier Home™ mobile applications is dependent on the compatibility of the home network and/or mobile device. Carrier Corporation makes no representations or warranties, express or implied, including, to the extent permitted by applicable law, any implied warranty of merchantability or fitness for a particular purpose or use, about the compatibility of the user's home network, and/or mobile device, with the Infinity® System Control, and the availability of, the user's internet service provider or mobile device carrier service, or that the ability to remotely access and adjust the settings of the Infinity® System Control will not be negatively affected by the network-related modifications, upgrades, or similar activity of the user's Internet service provider or mobile device carrier service.

Physical Characteristics

Dimensions: See drawing
Appearance: Black glass front, silver plastic body

Electrical Characteristics/Communication

Input Volts/Amps 24VAC
Each device in the Infinity® System has a four-pin connector labeled ABCD. It is recommended that the following color code be used when wiring each device:
A — Green = Data A+
B — Yellow = Data B-
C — White = 24VAC (Com)
D — Red = 24VAC (Hot)
Always verify that the IDU and ODU are well-grounded, and that there are less than 10 volts AC/DC as measured between the cabinets of the IDU and ODU, while the equipment is operating at full capacity. If there is a larger voltage difference between the cabinets of the IDU and ODU, recheck the equipment grounding.

Environmental Requirements:

Operating Temperature/Relative Humidity:
User interface and all sensors: 32°F to 104°F / °C to 40°C, 95% RH non-condensing
Storage Temperature/Relative Humidity:
User interface: - 40°F to 134°F / -40°C to 56.7°C, 95% RH non condensing

Feature Specifications:

Temperature set point range: 50°F to 90°F / 10.0°C to 32.0°C
Separate heat and cool setpoints
Programming days: 7 day
Programming periods: Up to 5 periods per day
Advanced Smart Setback (with programming)
Touch-N-Go® feature
Proximity Sensor
Non-Programmable (installer selectable)
Auto Changeover* (may be disabled)
Simultaneous Heat Cool Demand Algorithm for zoned systems
Programmable fan (installer selectable)
Humidity Sensor Offsets
Auto Changeover Timer (installer adjustable)
Smart Recovery (in heating and cooling)
Hold function
Copy functions: copy day of week; copy zones
Permanent memory
Humidity display and control
Temperature sensor offsets (indoor and outdoor)
TrueSense™ Dirty Filter Detection with compatible indoor equipment

* See Installation Instructions for details on Auto Changeover and Simultaneous Heat/Cool Demand Algorithm operation.

Wiring Requirements:

Power supply: 24VAC, 40 VA (minimum), 60 Hz, via indoor equipment ABCD connector. Zoning systems with a large number of dampers, especially multiple dampers per zone, may require a separate, dedicated, field-installed 24VAC power supply. The SAM module requires an independent, isolated, field-supplied 24VAC power supply.

Wiring material: Standard thermostat wire 18 to 22 gauge. Use 18 AWG wiring for wire lengths over 25 feet. Shielded, twisted pair cable for the ABCD communication bus is optional, and may be helpful in electrically noisy environments, or for zoning systems with Smart Sensors.

NIM Requirements:

IDU	Non-communicating ODU	NIM Required?
Furnace	1-stage A/C	No
Furnace	2-stage A/C	Yes
Furnace	1-stage HP	Yes
Furnace	2-stage HP	Yes
Fan Coil	1-stage A/C	No
Fan Coil	2-stage A/C	Yes
Fan Coil	1-stage HP	No
Fan Coil	2-stage HP	Yes

27VNA3
Infinity® Variable Speed Heat Pump with Greenspeed® Intelligence and Puron Advance™ (R-454B) Refrigerant 2 to 5 Nominal Tons

PRODUCT DATA

Carrier's 27VNA3 with Greenspeed™ Intelligence is another breakthrough product providing up to 10.5 HSPF2 heating efficiency and up to 23 SEER2 cooling efficiency. The variable speed capacity control results in strong heating capacity as the outdoor temperature drops resulting in less reliance on auxiliary heat. Lower speed operation is available when needed in cooling for enhanced comfort and dehumidification.

This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. Refer to the AHRI directory (www.ahridirectory.org) for the most up-to-date ratings information.

Industry leading Features / Benefits

Energy Efficiency
- Up to 23 SEER2, 13.5 EER2, 10.5 HSPF2
- Microtube Technology™ refrigeration system
- Indoor air quality accessories available

Sound
- Sound level as low as 53 dBA in low speed

Comfort
- Variable speed compressor with capacity range from 20-100%
- Air cooled variable frequency drive
  - Infinity® System Control with Greenspeed™ Intelligence required
  - Energy Tracking capability with the Infinity® System Control and latest software version
    (Energy Tracking has the ability to monitor and estimate the energy consumption of your Infinity® system.)

Reliability
- Non-ozone depleting, low global warming potential Puron Advance™ refrigerant
- Greenspeed Intelligence actively monitors critical system parameters
- High pressure switch
- Suction and discharge pressure transducer
- Electronic expansion valve (EXV) for optimum heating performance
- Filter drier (field installed)
- Internal compressor stator heat standard
- Balanced refrigeration system for maximum reliability

Flexibility and Installation:
- Vertex™ Technology compatible
- 2 control wires to outdoor unit
- Minimum and maximum airflow adjustments
- Compressor heating capacity control
- Hybrid Heat™ Dual Fuel capable

Durability
WeatherArmor Ultra™ Protection Package:
- Solid, durable sheet metal construction
- Steel louver coil guard
- Baked-on, complete outer coverage, powder paint

Applications
- Heating mode operation down to -13°F (-25°C) outdoor ambient temperature.
- Cooling mode operation up to 125°F (51.7°C) outdoor ambient temperature.
- Long-line - up to 250 feet (76.2 m) total equivalent length, up to 200 feet (60.7 m) for 5T and 100 feet (30.5 m) for 2T, 3T and 4T outdoor above indoor, or up to 80 ft. (24.4 m) indoor above outdoor (See Long Line Guide for more information.)
- Low ambient cooling down to 0°F (-17.8°C) when enabled with the Infinity® System Control.

Model Number Nomenclature

1	2	3	4	5	6	7	8	9	10	11	12	13
N	N	A	A	A/N	N	N	N	A/N	A/N	A/N	N	N
2	**7**	**V**	**N**	**A**	**3**	**2**	**4**	**A**	**0**	**0**	**3**	**0**
Refrigerant &OD Type		OD Design type	Tier	Major Series	SEER2	Nominal Cooling Capacity		Variations	Feature	Open	Voltage	Minor Series
27 = Puron Advance™ (R-454B) HP		V = Variable Speed	N= Infinity®	A = Initial Series	3 = 23 SEER2	1,000 Btuh (nominal)		A = Standard HP	0=Standard	0=Not Defined	3=208-230-1	0, 1, 2..

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

Quality ISO 9001

CATALOG ORDERING NUMBERS

Size	Model Number
24	27VNA324A003
36	27VNA336A003
48	27VNA348A003
60	27VNA360A003

STANDARD FEATURES

FEATURES	Unit Size			
	24	**36**	**48**	**60**
Puron Advance™ (R-454B) Refrigerant	X	X	X	X
Variable Speed Rotary Compressor	X	X	X	
Variable Speed Scroll Compressor				X
Air-Cooled Variable Frequency Drive	X	X	X	X
Louvered Coil Guard	X	X	X	X
Factory Provided, Field-Installed Filter Drier	X	X	X	X
Front-Seating Service Valves	X	X	X	X
In-unit Pressure and Temperature Protection	X	X	X	X
Suction and Discharge Pressure Transducers	X	X	X	X
High Pressure Switch	X	X	X	X
Compressor Stator Heat	X	X	X	X
Utility Interface Connections	X	X	X	X
Bluetooth® Module	X	X	X	X
Enhanced Diagnostics using Greenspeed® Intelligence	X	X	X	X
Energy Tracking Capability	X	X	X	X
Sound Blanket	X	X	X	X
Outdoor Air Temperature Sensor	X	X	X	X
Long Line Capability	X	X	X	X

X = Standard

AHRI RATINGS

NOTE: Ratings contained in this document are subject to change at any time.

For AHRI ratings certificates, please refer to the AHRI directory www.ahridirectory.org
Additional ratings and system combinations can be accessed via the Ratings Database here: www.MyCarrierRatings.com

MIN/MAX AIRFLOW TABLES

The indoor airflow delivered by this system varies significantly based on outdoor temperature, indoor unit combination, and system demand. The airflows on these tables are for duct design considerations.

Duct systems capable of these ranges will ensure the system will deliver full capacity at all outdoor temperatures.
Minimum and maximum airflows can be adjusted from these numbers in the Infinity® System Control Heat Pump Setup screen.

Size	Cooling - Comfort Mode		Cooling - Efficiency Mode	
	Max Airflow	Min Airflow	Max Airflow	Min Airflow
24	700	300	900	350
36	900	325	1200	550
48	1200	500	1680	615
60	1400	500	1725	850

Size	Heating - Comfort Mode		Heating - Efficiency Mode	
	Max Airflow	Min Airflow	Max Airflow	Min Airflow
24	700	200	900	450
36	1200	325	1400	650
48	1610	500	1610	600
60	1650	500	1650	850

PHYSICAL DATA

UNIT SIZE	24	36	48	60
COMPRESSOR TYPE	Variable Speed Rotary			Variable Speed Scroll
REFRIGERANT	Puron Advance™ (R-454B)			
Charge lb* (kg)	11.8 (5.35)	12.1 (5.49)	12.3 (5.58)	13.0 5.90)
Outdoor Htg Exp. Device	EXV	EXV	EXV	EXV
COND FAN	Forward Swept Propeller Type, Direct Drive			
Air Discharge	Vertical			
Maximum Air Qty (CFM)	5000	4700	5000	5000
Motor HP	1/3	1/3	1/3	1/3
Motor RPM	200-800	200-750	200-800	200-800
COND COIL				
Face Area (sq ft.)	30.1	30.1	30.1	30.1
Fins per In.	20	20	20	20
Rows	2	2	2	2
Circuits	8	8	9	9
VALVE CONNECT. (In. ID)				
Vapor	3/4	7/8	7/8	7/8
Liquid	3/8			
REFRIGERANT TUBES† (In. OD)				
Rated Vapor†	3/4	7/8	1-1/8	1 - 1/8
Max Rated Liquid Line‡	3/8			

*.For 15 ft. lineset
†.Units are rated with 25 ft (7.6 m) of lineset length. See Vapor Line Sizing and Cooling Capacity Loss table when using other sizes and lengths of lineset.
‡.See Liquid Line Sizing For Cooling Only Systems with Puron Advance™ Refrigerant tables.
Note: See unit Installation Instruction for proper installation.

ELECTRICAL DATA

UNIT SIZE	V-PH	OPER VOLTS*		COMPR		FAN	MCA	MAX FUSE† or CKT BRK AMPS	SCCR
		MAX	MIN	MRC	RLA	FLA			
24	208-230-1	253	197	25	11.6	0.88	19.7	25	5kA rms
36				25	14.3	0.88	23.8	25	5kA rms
48				35	20.4	0.88	31.0	40	5kA rms
60				35	27.4	0.88	37.5	40	5kA rms

*. Permissible limits of the voltage range at which the unit will operate satisfactorily
†. Time-Delay fuse.
FLA - Full Load Amps, **MCA**-Minimum Circuit Amps, **MRC** - Maximum Rated Current**, RLA**-Rated Load Amps
SCCR - Short-Circuit Current Rating
NOTE: Control circuit is 24-V on all units and requires external power source. Copper wire must be used from service disconnect to unit.
All motors/compressors contain internal overload protection.

REFRIGERANT PIPING LENGTH LIMITATIONS

Maximum Line Lengths:

The maximum allowable equivalent length for Heat Pumps varies depending on the vertical separation. See the tables below for allowable lengths depending on whether the outdoor unit is on the same level, above or below the outdoor unit.

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	200 (61.0)	250 (76.2)	N/A
Outdoor unit ABOVE indoor unit	200 (61.0)	250 (76.2)	5T - 200 (61.0) 2T/3T/4T - 100 (30.5)
Outdoor unit BELOW indoor unit	200 (61.0)	250 (76.2)	80 (24.4)

*. Maximum actual length not to exceed 200 ft (61 m)
†. Equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

LONG LINE APPLICATIONS

An application is considered Long Line when the refrigerant level in the system requires the use of accessories to maintain acceptable refrigerant management for systems reliability. 27VNA3 Heat Pumps do not require any additional accessories for Long Line applications. Defining a system as long line depends on the liquid line diameter, actual length of the tubing, and vertical separation between the indoor and outdoor units.

For heat pump systems, the chart below shows when an application is considered Long Line.

Refrigerant Long Line Description ft (m)

Liquid Line Size	Units On Same Level ft (m)	Outdoor Above Indoor ft (m)	Outdoor Below Indoor ft (m)
3/8	80 (24.4)	80 (24.4)	20 (6.1) vertical or 80 (24.4) total

NOTE: See Long Line Guideline for details

COOLING CAPACITY LOSS TABLE

Nominal Size (Btuh)	Line OD (in)	Cooling Capacity Loss (%) Equivalent Length (ft)										
		25	50	75	80	100	125	150	175	200	225	250
24000	5/8	0.8	0.7	3.3	3.6	4.7	5.9	7.2	8.3	9.4	10.5	11.5
	3/4	0.0	0.7	1.4	1.6	2.2	2.9	3.6	4.3	5.0	5.6	6.2
36000	5/8	1.7	3.9	6.0	6.5	8.2	10.2	12.0	13.8	15.4	17.0	18.4
	3/4	0.4	1.3	2.3	2.5	3.4	4.4	5.4	6.4	7.3	8.3	9.1
	7/8	0.0	0.6	1.1	1.2	1.8	2.5	3.2	3.9	4.5	5.2	5.8
48000	3/4	1.2	2.6	4.0	4.5	5.7	7.3	8.6	10.0	11.3	12.5	13.7
	7/8	0.5	1.2	2.0	2.3	3.1	4.0	4.9	5.8	6.8	7.6	8.4
	1 1/8	0.0	0.2	0.5	0.7	1.1	1.6	2.1	2.6	3.1	3.5	4.0
60000	3/4	1.6	3.5	5.4	5.8	7.3	9.1	10.8	12.4	13.9	15.3	16.6
	7/8	0.7	1.6	2.8	3.0	3.9	5.0	6.1	7.1	8.1	9.1	10.0
	1 1/8	0.0	0.3	0.8	0.9	1.3	1.8	2.3	2.8	3.3	3.8	4.3

ACCESSORIES

KIT NUMBER	KIT NAME	24	36	48	60
KSASH2601COP	SOUND BLANKET (ACCUMULATOR)	X	X	X	
KSASH2701COP	SOUND BLANKET (ACCUMULATOR)				X
KSASF0201AAA	SUPPORT FEET	X	X	X	X
KHASS0606MPK	SNOW STAND	X	X	X	X

X = Accessory

ACCESSORY USAGE GUIDELINE

ACCESSORY	REQUIRED FOR LOW-AMBIENT COOLING APPLICATIONS (Below 55°F/12.8°C)	REQUIRED FOR LONG LINE APPLICATIONS	REQUIRED FOR SEA COAST APPLICATIONS (Within 2 miles/3.22 km)
Compressor Stator Heat	Standard with Infinity® System Control	No	No
Evaporator Freeze Protection	Standard with Infinity® System Control	No	No
Low-Ambient Control	Standard with Infinity® System Control	No	No
Support Feet	Recommended	No	Recommended
Winter Start Control	Standard with Infinity® System Control	No	No

Accessory Description and Usage

Snow Stand

Coated wire rack which supports unit 18 in. (457.2 mm) above mounting pad to allow for drainage from unit base.

Usage Guideline:

Suggested in the following applications:

- Unit installations in heavy snowfall areas.
- Unit installations in snow drift locations.
- Unit installations in areas of prolonged subfreezing temperatures.
- All commercial installations.

Sound Blanket (Accumulator)

Wraparound sound reducing cover for the accumulator. Reduces possible transient tones that may resonate in the accumulator due to variability in system operation.

Usage Guideline:

Although all units are designed and tested to eliminate unpleasant tones, in the unlikely event a transient tone is experienced, this sound blanket can reduce the tone by up to 10 dB.

Support Feet

Four or five stick-on plastic feet that raise the unit 4 in. (101.6 mm) above the mounting pad. This allows sand, dirt, and other debris to be flushed from the unit base, minimizing corrosion.

Usage Guideline:

Suggested in the following applications:

Coastal installations.

Windy areas or where debris is normally circulating.

Rooftop installations.

For improved sound ratings.

SOUND POWER LEVEL

Unit Size	Typical Octave Band Spectrum (dB, without tone adjustment)	Min Cooling	Nominal* Cooling	Min Heating	Nominal* Heating
24	Speed	900	3600	900	4020
	125	62.8	66.1	62.0	65.7
	250	57.0	61.2	55.1	63.7
	500	48.5	58.4	53.3	61.5
	1000	46.5	55.5	45.2	58.8
	2000	40.5	53.0	39.3	55.1
	4000	36.3	51.0	37.2	54.6
	8000	43.2	48.6	43.9	51.8
	Sound Rating (dBA)	53	62	54	64
36	Speed	900	4200	900	4320
	125	61.3	65.4	65.3	65.6
	250	61.1	61.7	62.0	60.4
	500	51.2	61.4	50.2	58.1
	1000	46.3	56.3	45.5	55.0
	2000	39.9	54.3	37.3	53.8
	4000	36.6	52.8	37.3	53.0
	8000	45.0	53.3	45.6	52.6
	Sound Rating (dBA)	56	64	55	68
48	Speed	900	3300	900	3720
	125	61.3	64.5	65.1	65.8
	250	55.7	68.1	56.3	60.8
	500	53.9	65.2	53.7	60.7
	1000	52.2	61.2	45.1	54.2
	2000	41.5	57.4	39.8	54.1
	4000	37.7	54.7	36.7	53.6
	8000	42.8	56.6	40.1	59.8
	Sound Rating (dBA)	56	67	56	68
60	Speed	960	3540	900	4440
	125	65.4	72.0	61.6	69.2
	250	57.6	69.1	56.4	66.9
	500	56.3	66.1	53.1	65.6
	1000	48.4	64.3	44.9	62.5
	2000	46.1	63.8	44.0	63.0
	4000	43.7	56.8	47.1	62.4
	8000	44.2	58.4	44.9	61.6
	Sound Rating (dBA)	58	72	55	71

*. Nominal condition data taken from maximum speed operating at 95°F in cooling and 47°F in heating.
Note: Tested in compliance with AHRI 270-2008 but not listed with AHRI.

CHARGING SUBCOOLING

UNIT SIZE	NOMINAL SUBCOOLING*	REQUIRED SUBCOOLING °F (°C) - See System Control
24	5	Subcooling recommendation displayed on System Control in Charging Mode must be followed
36	7	
48	7	
60	10	

*. Nominal subcooling targets for use as reference or in specific applications with 25 ft. (7.6 m) lineset, 95°F outdoor ambient, and 80°F/67°F indoor DB/WB.

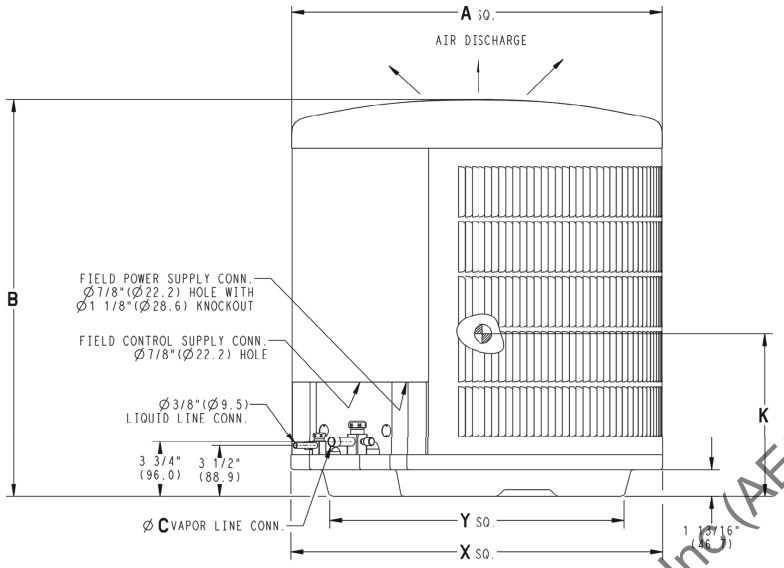
DIMENSIONS

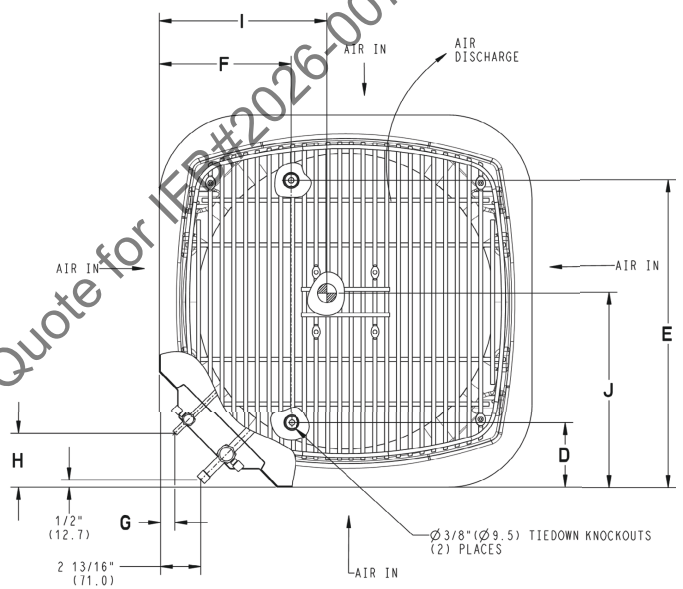
UNIT	SERIES	ELECTRICAL CHARACTERISTICS				A		B		C		D		E		F		G		H		I		J		K		OPERATING WEIGHT		SHIPPING WEIGHT		SHIPPING LENGTH / WIDTH (Sq.)		SHIPPING HEIGHT	
		208-230-1-60	208/230-3-60	460-3-60	575-3-60	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	Lbs	Kgs	Lbs	Kgs	INCH	MM	INCH	MM
27VNA324A*0	0	Y	N	N	N	35	889.0	47 3/16	1199.0	3/4	19.1	6 9/16	166.1	28 7/16	722.3	9 1/8	231.3	1 1/8	28.2	3 13/16	97.4	16 3/4	425.5	16	406.4	25 3/4	654.1	303	137.4	334	151.5	38	965.0	51	1296.0
27VNA336A*0	0	Y	N	N	N	35	889.0	47 3/16	1199.0	7/8	22.2	6 9/16	166.1	28 7/16	722.3	9 1/8	231.3	1 1/8	28.2	3 13/16	97.4	16 1/4	412.8	17 1/4	438.2	23	584.2	320	145.1	351	159.2	38	965.0	51	1296.0
27VNA348A*0	0	Y	N	N	N	35	889.0	47 3/16	1199.0	7/8	22.2	6 9/16	166.1	28 7/16	722.3	9 1/8	231.3	1 1/8	28.2	3 13/16	97.4	15 1/2	393.7	16	406.4	22 1/2	571.5	348	157.9	379	171.9	38	965.0	51	1296.0
27VNA360A*0	0	Y	N	N	N	35	889.0	47 3/16	1199.0	7/8	22.2	6 9/16	166.1	28 7/16	722.3	9 1/8	231.3	1 1/8	28.2	3 13/16	97.4	14 1/2	368.3	16	406.4	22 1/2	571.5	359	167.4	399	181.0	38	965.0	51	1296.0

Y=YES
N=NO

NOTES:

1. CENTER OF GRAVITY .





UNIT SIZE	"X" MINIMUM GROUND MOUNTING PAD APPLICATION DIMENSIONS		"Y" MINIMUM ROOF-TOP MOUNTING PAD APPLICATION DIMENSIONS	
-	23 1/8	587.3	17 7/8	454.6
-	25 3/4	654.0	20 7/16	518.5
-	31 3/16	792.5	22 15/16	583.2
24,36,48,60	35	889.0	26 3/4	679.7

NOTE: ALL DIMENSIONS IN INCH (MM)

U.S. ECCN: Not Subject to Regulation (N.S.R.)

SD6024-4 27VNA3 REV. B

FE5B Infinity® Series

Communicating Variable–Speed Multipoise Fan Coil with Puron Advance™ (R-454B) Refrigerant Sizes 24 thru 60

Product Data

AI10082

PREMIUM ENVIRONMENTALLY RESPONSIBLE FAN COIL

The latest in technology makes the FE5B fan coil models the most advanced air handlers available. With attention to quiet, efficient, and comfortable operation, Carrier has developed a new benchmark for homeowner comfort and ease of installation.

The FE5B utilizes the Infinity Control as a required accessory to enable state of the art smart-diagnostics capability. This enables faster troubleshooting, providing ease of service and repair. The FE5B also provides a 4-wire hook up with matching outdoor unit and the Infinity Control. This makes installation simpler and a lot quicker than with conventional fan coils. The FE5B has advanced technology that allows the fan coil to self-configure with a matching outdoor unit and the Infinity Control, cutting down on installation time. Always update to the latest software version when installing the FE5B fan coil.

The FE5B features Puron Advance refrigerant, the low-GWP (Global Warming Potential) and chlorine-free alternate that is the future for the residential heating and cooling industry. The FE5B using Puron Advance refrigerant maximizes performance for environmentally responsible systems. In addition to environmental safety, these systems are 30 to 40% more efficient than standard heating and cooling systems, thereby combining excellence in efficiency and environmental sustainability.

The FE5B provides these benefits due to Carrier's command of Electronically Commutating Motor (ECM) technology. These motors are extremely efficient at all speeds, and enable the FE5B to operate at the correct speed to deliver airflow precisely, ensuring proper performance across a wide range of duct static pressures. This adaptive efficiency also makes installation quality easier to achieve for today's demanding homeowner.

Carrier's command of ECM technology may be most evident in the comfort advantages that an ECM can deliver. For true comfort, the homeowner can achieve command of both temperature and humidity in cooling and heating modes.

Another feature which sets the FE5B apart is the factory-installed TXV, which enhances efficiency and provides compressor-protecting operation at all recommended conditions. Grooved tubing, louvered aluminum fins, and the large face areas of the FE5B refrigerant coils also provide superior efficiency, for high SEER2 and HSPF2 performance.

Carrier leads the way in condensate control, a hallmark of these multipoise fan coils. All of these featured components are protected within a rugged, pre-painted metal cabinet lined with super-thick, high-density insulation. For neat, high quality installations, the unit exterior features sweat refrigerant connections for simple leak free performance, and multiple electrical entry for both high and low voltage service.

Assembled at the factory compliant with low leak requirements of less than 2% cabinet leakage rate at 1.0 inches W.C. and 1.4% cabinet leakage rate at 0.5 inches W.C. when tested in accordance with ASHRAE 193 standard.

FEATURES

Smart Diagnostics

- Self configuring (ease of installation).
- Easier troubleshooting, providing faster service and repair.
- Energy Tracking capability with the Infinity Wall Control. (Energy Tracking has the ability to monitor and estimate the energy consumption of your Infinity system.)
- Compatibility with wall control depends on software version. Check the installation instructions for minimum requirements.

Environmentally Responsible Refrigerant Technology

- Puron Advance refrigerant – the low-GWP, chlorine-free, non-ozone depleting refrigerant.
- Refrigerant leak detection dissipation system for added safety and peace of mind for the homeowner.
- Thermostatic Expansion Valve (TXV) designed to maximize performance with Puron Advance refrigerant. Bi-flow hard-shutoff with mechanical fittings.

Energy Efficient Operation

- Electronically Commutated Motor (ECM) operates efficiently at all speeds.
- Maximizes efficiency of heating and cooling systems.
- Ultra-low power consumption during fan only operation.

Comfort Control

- Warm, comfortable heating air temperatures.

MODEL NUMBER NOMENCLATURE

1	2	3	4	5	6	7	8	9	10	11	12
F	E	5	B	N	B	C	3	6	L	0	0

Product

F = Fan Coil

Type

E = Infinity, Variable Speed Constant Airflow (VCA) ECM Motor, multipoise

Refrigerant

5 = Puron Advance (R-454B) Refrigerant

Series

Electrical

N = 208/230v, 1 ph-60 Hz

Cabinet Configuration

B = Modular, Hard Shutoff TXV

X = Single Piece, Hard Shutoff TXV

Cabinet Width

B = 17-5/8"; C = 21-1/8"; D = 24-11/16"

Capacity

24 = 24,000

36 = 36,000

48= 48,000

60 = 60,000

Coil Type

L00 = Aluminum

Puron ADVANCE™

ArmorTech

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

ISO 9001

A230445B

Table 1 – Models Available

2 Ton	3 Ton	4 Ton	5 Ton
FE5BNXB24L00	FE5BNXC36L00 FE5BNBC36L00	FE5BNXC48L00 FE5BNBC48L00	FE5BNBD60L00

DIMENSIONS

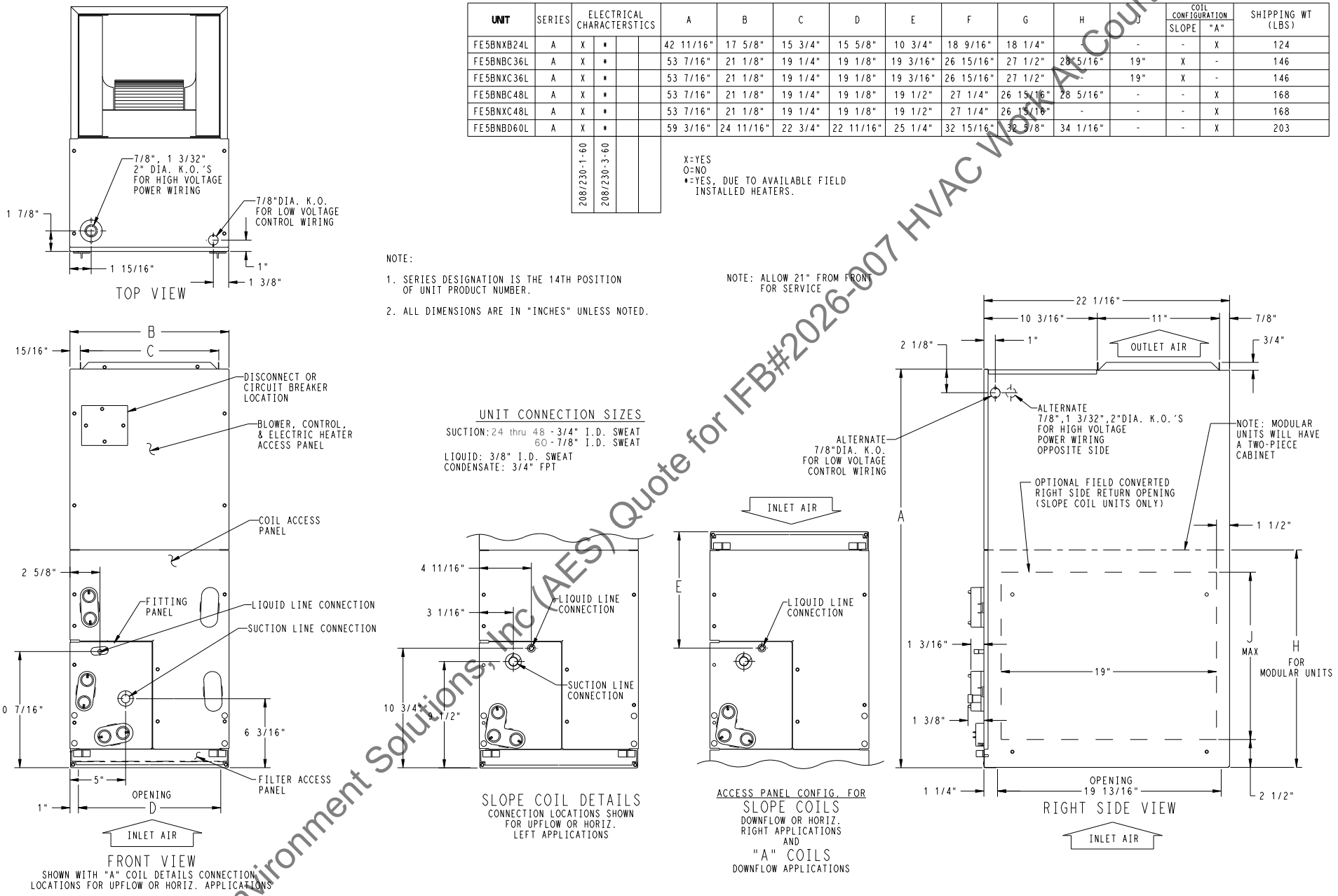
UNIT	SERIES	ELECTRICAL CHARACTERSTICS				A	B	C	D	E	F	G	H	J	COIL CONFIGURATION		SHIPPING WT (LBS)
															SLOPE	"A"	
FE5BNXB24L	A	X	*			42 11/16"	17 5/8"	15 3/4"	15 5/8"	10 3/4"	18 9/16"	18 1/4"	-	-	-	X	124
FE5BNBC36L	A	X	*			53 7/16"	21 1/8"	19 1/4"	19 1/8"	19 3/16"	26 15/16"	27 1/2"	28 5/16"	19"	X	-	146
FE5BNXC36L	A	X	*			53 7/16"	21 1/8"	19 1/4"	19 1/8"	19 3/16"	26 15/16"	27 1/2"	-	19"	X	-	146
FE5BNBC48L	A	X	*			53 7/16"	21 1/8"	19 1/4"	19 1/8"	19 1/2"	27 1/4"	26 15/16"	28 5/16"	-	-	X	168
FE5BNXC48L	A	X	*			53 7/16"	21 1/8"	19 1/4"	19 1/8"	19 1/2"	27 1/4"	26 15/16"	-	-	-	X	168
FE5BNBD60L	A	X	*			59 3/16"	24 11/16"	22 3/4"	22 11/16"	25 1/4"	32 15/16"	32 5/8"	34 1/16"	-	-	X	203
		208/230-1-60	208/230-3-60														

X=YES
O=NO
*=YES, DUE TO AVAILABLE FIELD INSTALLED HEATERS.

NOTE:

1. SERIES DESIGNATION IS THE 14TH POSITION OF UNIT PRODUCT NUMBER.
2. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

NOTE: ALLOW 21" FROM FRONT FOR SERVICE



A240093

Fig. 1 – FE5B Dimensional Drawing, sheet 1

Table 2 – Physical Data

SIZE (TON)	FIELD-INSTALLED HEAT (kW)	NOMINAL COOLING CAPACITY (BTUH)	DIMENSIONS (In/mm)			SHIPPING WEIGHT (LBS / KG)
			HEIGHT	WIDTH	DEPTH	
24 (2)	5, 8, 9, 10, 15, 20	18,000 to 36,000	42-11/16 in 1084.3 mm	17-5/8 in 447.7 mm	22-1/16 in 560.4 mm	124 lbs / 56.3 kg
36 (3)	5, 8, 9, 10, 15, 18, 20	24,000 to 42,000	53-7/16 in 1357.3 mm	21-1/8 in 536.6 mm	22-1/16 in 560.4 mm	146 lbs / 66.3 kg
48 (4)	5, 8, 9, 10, 15, 18, 20, 24, 30	30,000 to 48,000	53-7/16 in 1357.3 mm	21-1/8 in 536.6 mm	22-1/16 in 560.4 mm	168 lbs / 76.3 kg
60 (5)	5, 8, 9, 10, 15, 18, 20, 24, 30	36,000 to 60,000	59-3/16 in 1503.4 mm	24-11/16 in 627.1 mm	22-1/16 in 560.4 mm	203 lbs / 92.2 kg

Table 3 – Specifications

Size	24	36	48	60
COIL				
Refrigerant Metering Device	Puron Advance TXV			
TXV Size	2 Ton	3 Ton	4 Ton	5 Ton
Rows/Fins Per In.	3/14.5			
Face Area (Sq. Ft.)	3.46		5.93	7.42
Configuration	A	Slope	A	
Metering Device Puron Advance® R-454B	TXV			
Refrigerant Sweat Liquid Line Connection, in (mm)	3/8 (9.5) ID			
Refrigerant Sweat Suction Line Connection, in (mm)	3/4 (19.1) ID			7/8 (22.2) ID
TXV Replacement P/N	EA66YP004	EA66YP002	EA66YP005	EA66YP006
BLOWER AND MOTOR				
Air Discharge	Upflow, Downflow, Horizontal			
CFM (Nominal Cooling/Heating)	525	700	875	1050
	700	875	1050	1225
	875	1050	1225	1400
	1050	1225	1400	1750
Motor HP (ECM)	1/2		3/4	
FILTER SIZE (W x L), in (mm)	16 x 20 (406 x 508)	20 x 20 (508 x 508)		24 x 20 (610 x 508)
CABINET CONFIGURATION OPTIONS	1 Piece	1 Piece or Modular		Modular

PERFORMANCE DATA

AIRFLOW DELIVERY — COOLING, HEATING, ELECTRIC HEATING MODES

These fan coils will provide airflow at a rate that is requested by the Integrated System User Interface during air conditioning or heat pump heating (without electric heat) modes. The nominal airflow for both heating and cooling modes is 350 cfm/ton nominal size of the outdoor unit installed. The airflow actually requested by the User Interface is modified by its internal algorithms for zoning, comfort or efficiency concerns. Refer to the documentation for the User Interface for more information on how the User Interface controls the fan coil. Safe operation of electric heaters requires airflow delivery at or above the minimum CFM for electric heater application listed in the chart below. The fan coil will adjust its airflow delivery to maintain safe airflow as operating mode and staging conditions require. See Table 4.

Table 4 – Airflow Delivery (CFM) — Electric Heating Modes

FAN UNIT SIZE (TON)	OUTDOOR UNIT CAPACITY BTUH	ELECTRIC HEATER kW RANGE											
		0-5			0-10			0-15			0-20		
		Lo	Nom	High	Lo	Nom	High	Lo	Nom	High	Lo	Nom	High
24 (2)	18,000	700	700	805	750	750	863	—	—	—	—	—	—
	24,000	700	700	805	750	750	863	1050	1050	1208	—	—	—
	30,000	875	875	1006	875	875	1006	1050	1050	1208	1200	1200	1380
	36,000	1050	1050	1208	1050	1050	1208	1050	1050	1208	1200	1200	1380
36 (3)	24,000	700	700	805	750	750	863	1050	1050	1208	1225	—	—
	30,000	875	875	1006	875	875	1006	1050	1050	1208	1225	—	—
	36,000	1050	1050	1208	1050	1050	1208	1050	1050	1208	1225	1225	1409
	42,000	1225	1225	1409	1225	1225	1409	1225	1225	1409	1225	1225	1409
FAN UNIT SIZE (TON)	OUTDOOR UNIT CAPACITY BTUH	ELECTRIC HEATER kW RANGE											
		0-10			0-15			0-20			0-30		
		Lo	Nom	High	Lo	Nom	High	Lo	Nom	High	Lo	Nom	High
48 (4)	30,000	1000	1000	1150	1200	1200	1380	—	—	—	—	—	—
	36,000	1100	1100	1265	1200	1200	1380	1300	1300	1495	—	—	—
	42,000	1225	1225	1409	1225	1225	1409	1350	1350	1553	—	—	—
	48,000	1400	1400	1610	1400	1400	1610	1400	1400	1610	1500	1500	1725
60 (5)	36,000	1200	1200	1380	1250	1250	1438	1350	1350	1553	—	—	—
	42,000	1225	1225	1409	1300	1300	1495	1350	1350	1553	—	—	—
	48,000	1400	1400	1610	1400	1400	1610	1400	1400	1610	1750	1750	2013
	60,000	1750	1750	2013	1750	1750	2013	1750	1750	2013	1750	1750	2013

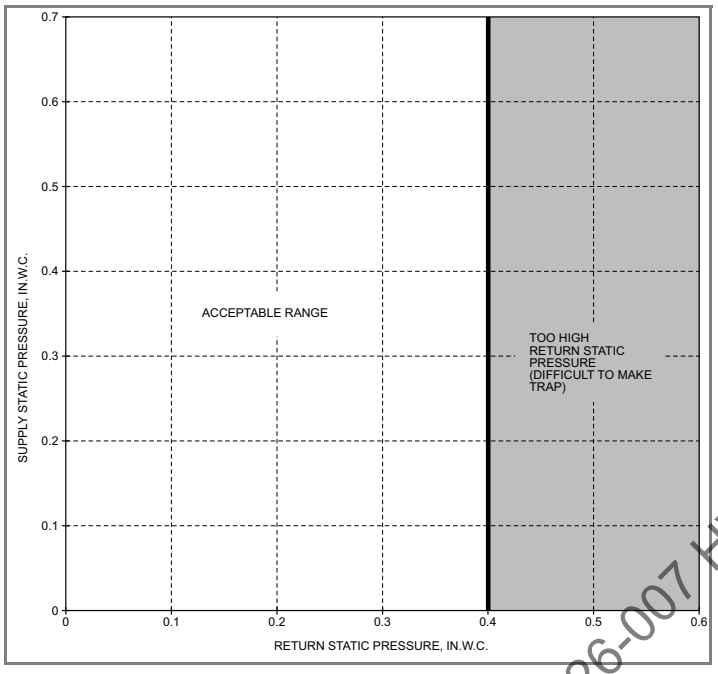
NOTE: Lo, Nom, and Hi refer to AC, HP, CFM ADJUST Section
" — " Airlow not recommended for heater/system size.

Table 5 – Minimum CFM for Electric Heater Application*

FAN COIL UNIT SIZE (TON)	HEAT PUMP UNIT SIZE (TON)	CFM				
		HEATER SIZE kW				
		5	8, 9, 10	12, 15	18, 20	24, 30
24 (2)	Emergency	700	750	1050	1200	
	18 (1½)	700	750	1050	1200	—
	24 (2)	700	750	1050	1200	—
	30 (2½)	875	875	1050	1200	—
	36 (3)	1050	1050	1050	1200	—
36 (3)	Emergency	700	750	1050	1225	
	24 (2)	700	750	1050	1225	—
	30 (2½)	875	875	1050	1225	—
	36 (3)	1050	1050	1050	1225	—
	42 (3½)	1225	1225	1225	1225	—
48 (4)	Emergency	1000	1000	1200	1300	1450
	30 (2½)	1000	1000	1200	1300	1450
	36 (3)	1100	1100	1200	1300	1450
	42 (3½)	1225	1225	1225	1350	1450
	48 (4)	1400	1400	1400	1400	1450
60 (5)	Emergency	1200	1200	1300	1350	1750
	36 (3)	1200	1200	1250	1350	1750
	42 (3½)	1225	1225	1300	1350	1750
	48 (4)	1400	1400	1400	1400	1750
	60 (5)	1750	1750	1750	1750	1750

*. These airflows are minimum acceptable airflows as UL listed. Actual airflow delivered will be per airflow delivery chart for Electric Heating Modes.

ACCEPTABLE DUCT CONDITIONS



A02296

Acceptable Duct Conditions

For satisfactory operation (specifically making dry secondary trap), subject fan coils must be installed with duct systems which fall within the "Acceptable Range" illustrated above.

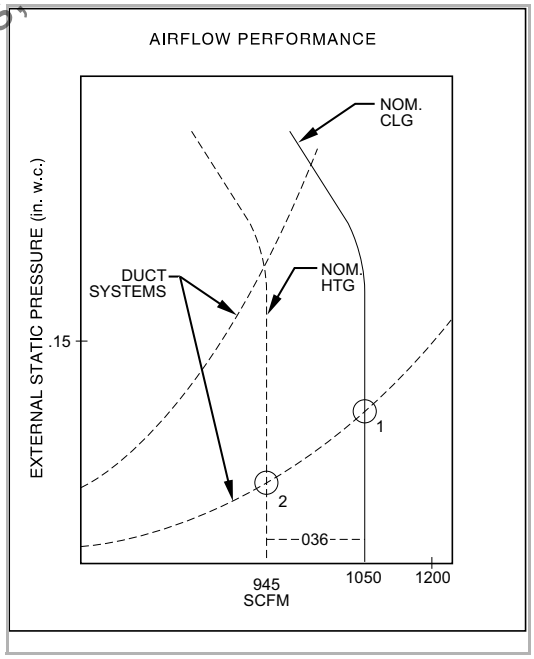
The airflow performance charts for the fan coil depict nominal airflow delivery for heating and cooling mode operation versus duct system static pressure drop. Cooling mode operation is shown as solid vertical lines for all 4 system size selections. Heating mode operation for the 4 system size selections are shown as dashed vertical lines.

The dotted curved lines are static pressure drop characteristics for several fixed-duct systems. These lines can be used to predict the system static pressure drop at any airflow given the actual drop at 1 known point.

For example, a duct system is designed for 0.15 in. water column (in. w.c.) drop at 1200 CFM. The 5-ton unit operating at nominal cooling airflow would deliver 1050 CFM with a duct system drop of 0.11 in. w.c. (See point 1 in the Airflow Performance/Static Pressure figure below.) On the same duct system, the 5-ton unit operating at nominal heating airflow would deliver 945 CFM with a duct system drop of 0.09 in. w.c. (See point 2.)

This example is but one of many possible duct system designs. The 5-ton unit will deliver the above airflows against much higher static pressures.

The following airflow performance data was measured using the standard metal filter as shipped from the factory.



A09339

Split System Ratings

Outdoor Unit:	**27VNA060A*030***
Indoor Unit:	**FE5BNBD60L*+UI**
Furnace:	
AHRI Certified Reference #:	215662628

M1 Cooling Cap (Btuh):	57500
M1 Heating Cap (Btuh) @ 47 F:	57500
SEER2 Rating (Cooling):	20
EER2 Rating (Cooling):	10
Region IV HSPF2 Ratings:	9
M1 Heating Cap(Btuh) @ 17 F:	50000
M1 COP @ 5 F:	2.12
M1 Heating Cap(Btuh) @ 5 F:	40500

Certificate of Product Ratings

AHRI Certified Reference Number : 215662628 Date : 04-15-2026 Model Status : Active

AHRI Type : HRCU-A-CB (Split System: Heat Pump with Remote Outdoor Unit-Air-Source)

Series : Infinity 20 VS Heat Pump

Outdoor Unit Brand Name : CARRIER

Outdoor Unit Model Number (Condenser or Single Package) : 27VNA060A*030*

Indoor Unit Model Number (Evaporator and/or Air Handler) : FE5BNBD60L*+UI

The manufacturer of this CARRIER product is responsible for the rating of this system combination.

Rated as follows in accordance with AHRI 210/240-2024 (I-P), Performance Rating of Unitary Air-Conditioning & Air-Source heat Pump Equipment and subject to rating accuracy by AHRI-sponsored, independent, third party testing:

Cooling Capacity (A_{Full}) – Single or High Stage (95F), btuh : 57500

SEER2 : 20.00

EER2 (A_{Full}) – Single or High Stage (95F) : 10.00

Heating Capacity (H1Nom) - Multi/Variable Stage (47F) : 57500

HSPF2 (Region IV) : 9.00

Cooling Rated Load Power : 5750

Heating Rated Load Power : 5016

†"Active" Model Status are those that an AHRI Certification Program Participant is currently producing AND selling or offering for sale; OR new models that are being marketed but are not yet being produced."Production Stopped" Model Status are those that an AHRI Certification Program Participant is no longer producing BUT is still selling or offering for sale.

Ratings that are accompanied by WAS indicate an involuntary re-rate. The new published rating is shown along with the previous (i.e. WAS) rating.

The Department of Energy has published updated energy efficiency metrics for central air conditioners and heat pumps. This publication reflects both the 1987 metric (SEER) and the 2023 metric (SEER2). Efficiency requirements are published at 10 C.F.R. 430.32(c). Please refer to www.AHRInet.org for more information about updated energy efficiency metrics.

CERTIFICATE NO.: 134207273571919577

Outdoor Unit Heat Pump Ductless System

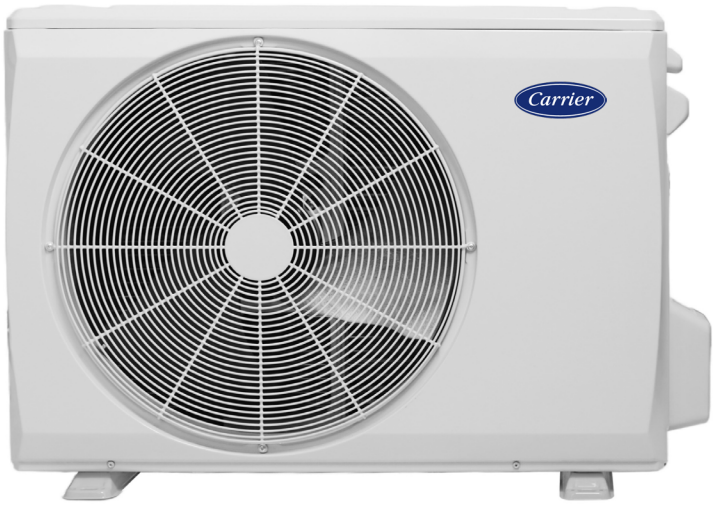
Outdoor Model: 37MAHAQ24AA3

Carrier

Job Data: _____ **Location:** _____

Tag #: _____ **Carrier#:** _____

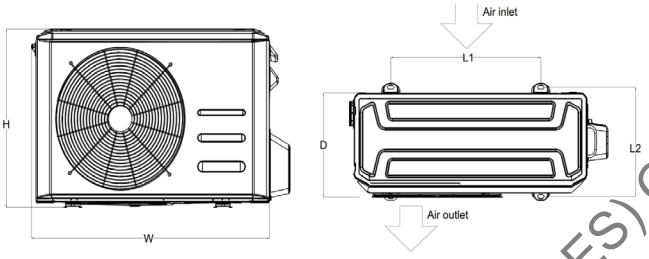
Date: _____



OUTDOOR STANDARD FEATURES
- Variable Speed (Inverter)
- Factory installed Base Pan Heater
- Factory installed Crankcase Heater
- Low Voltage Controls
- Auto-Restart function
- Condenser High Temp Protection
- Quiet operation
- Anti-corrosive fin coating

RESIDENTIAL APPLICATION LIMITED WARRANTY*
- Ten (10) years if properly registered within ninety (90) days after original installation, parts are warranted to the original purchaser for a period of ten (10) years. Otherwise, parts warranty is five (5) years.

NOTE: Images for illustration purposes only. Actual models may be slightly different.



OUTDOOR UNIT DIMENSIONS						
Capacity	Unit	W	D	H	L1	L2
6K	mm	765	303	555	452.4	313.82
	inch	30.12	11.93	21.85	17.81	12.36
9K/12K	mm	805	330	554	511	317.2
	inch	31.69	12.99	21.81	20.1	12.5
18K	mm	890	342	673	663	379.59
	inch	35.04	13.46	26.5	26.1	14.94
24K/33K	mm	946	410	810	672.96	402.6
	inch	37.24	16.14	31.89	26.49	15.85

Outdoor - Heat Pump			
System	**Outdoor Model #**		37MAHAQ24AA3
	Outdoor Size		24000
Electrical	Voltage, Phase, Cycle	V/Ph/Hz	208-230/1/60
	MCA	A.	24.9
	MOPA	A.	25
	SCCR	kA	5K
Operating Range	Cooling Outdoor DB Min - Max	°F(°C)	-22~122 (-30 ~ 50)
	Heating Outdoor DB Min - Max	°F(°C)	-22~75 (-30 ~ 24)
Piping	Min. Piping Length	ft (m)	9.8 (3)
	Standard Piping Length	ft. (m)	24.6 (7.5)
	Total Piping Length	ft (m)	164.04(50)
	Piping Lift*	ft (m)	82.02(25)
	Pipe Connection Size - Liquid	in (mm)	3/8in(9.52mm)
	Pipe Connection Size - Suction	in (mm)	5/8in(15.9mm)
Refrigerant	Refrigerant Type		R454B
	Charge	lbs (kg)	3.97(1.80)
	Add'l Refrigerant (between Std & Max Piping Lengths)	Oz/ft (g/m)	0.32(30)
Outdoor Coil	Face Area	Sq. Ft.	8.16
	No. Rows		2
	Fins per inch		20
	Circuits		8
Compressor	Type		ROTARY
	Model		KTM240D46UKT2
	Oil Type		ESTER OIL
	Oil Charge	Fl. Oz.	20.96719648
	Rated Current	RLA	4.15/9.30
Airflow & Sound	Airflow	CFM	2235.29
	Sound Pressure	dB(A)	61.5
Dimensions	Height	in (mm)	31.89(810)
	Width	in (mm)	37.24(946)
	Depth	in (mm)	16.14(410)
	Net Weight	lbs (kg)	130.29(59.1)
	Shipping Height	in (mm)	34.84(885)
	Shipping Width	in (mm)	42.91(1090)
	Shipping Depth	in (mm)	19.69(500)
	Shipping Net Weight	lbs (kg)	141.31(64.1)

*** Condensing unit above or below indoor unit**

AHRI CERTIFIED www.ahridirectory.org Unitary Small HP AHRI Standard 210/240

Puron Advance™

High Static Ducted Slim Heat Pump Ductless System

Indoor Model: 45MBDAQ24XH3

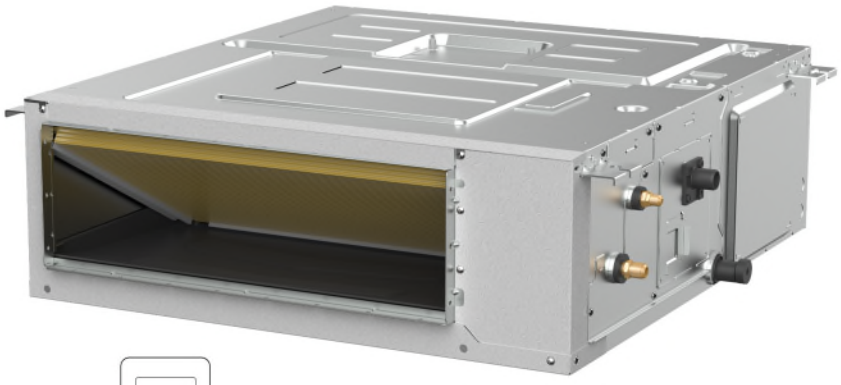
Job Data:

Tag #:

Date:

Location: Holding Cells

Carrier#:



INDOOR STANDARD FEATURES

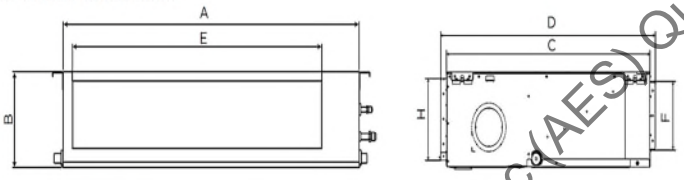
- Modes: Cool, Heat, Dry, Fan, Auto
- Vertical or Horizontal Installation
- Rear or Bottom Return
- Outside Air Intake
- Condensate Lift pump shipped with the unit
- Follow Me (senses temperature at handheld remote)
- Refrigerant Leak Detection Sensor
- Auto-Restart function
- Quiet indoor operation
- Anti-corrosive fin coating

RESIDENTIAL APPLICATION LIMITED WARRANTY*

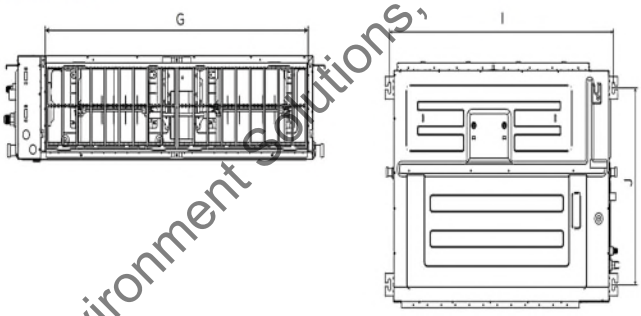
- Ten (10) years if properly registered within ninety (90) days after original installation, parts are warranted to the original purchaser for a period of ten (10) years. Otherwise, parts warranty is five (5) years.

NOTE: Images for illustration purposes only. Actual models may be slightly different.

Air outlet dimensions



Air inlet dimensions



45MBDAQ24XH3			
System	Indoor Model #		45MBDAQ24XH3
	Indoor Size		24000
Electrical	Voltage, Phase, Cycle	V/Ph/Hz	208/230-1-60
	Power Supply		Indoor unit powered by outdoor unit
	MCA	A.	3
Piping	Pipe Connection Size - Liquid	in (mm)	3/8(9.52)
	Pipe Connection Size - Suction	in (mm)	5/8(15.9)
Operating Range	Cooling Indoor DB Min - Max	°F(°C)	60~90 (16～32)
	Heating Indoor DB Min - Max	°F(°C)	32~86 (0～30)
Indoor Coil	Face Area	Sq. Ft.	3.12
	No. Rows		3
	Fins per inch		22
	Circuits		9
Indoor Unit	Number of Fan Speeds		920/835/750
	Airflow (highest to lowest)	CFM	853.47 / 706.32 / 618.03 / 500.31 / /
	Sound Pressure (highest to lowest)	dB(A)	N\A/40.0/37.0/35/29.5
Dimensions	Height	in (mm)	9.65(245)
	Width	in (mm)	39.37(1000)
	Depth	in (mm)	29.53(750)
	Net Weight	lbs (kg)	80.47(36.5)
	Shipping Height	in (mm)	11.97(304)
	Shipping Width	in (mm)	48.23(1225)
	Shipping Depth	in (mm)	33.86(860)
	Shipping Net Weight	lbs (kg)	91.93(41.7)
CONTROLS			
Standard	Wireless Remote Controller (°F/°C Convertible)		
	Wired Remote Control 7 Day Programmable		KSACN1401AAA
Optional	Wired Remote Control with Timer Function		KSACN1201AAA
	24V Mini Interface		KSAIC0601230
	24V GEN 3 Interface		KSAIC0501230

INDOOR UNIT DIMENSIONS

Capacity	Unit	OUTLINE DIMENSION				AIR OUTLET OPENING SIZE		AIR RETURN OPENING SIZE		SIZE OF MOUNTED LUG	
		A	B	C	D	E	F	G	H	I	J
9K/12K	mm	700	245	750	795	527	178	592	212	740	640
	inch	27.6	9.6	29.5	31.3	20.7	7.0	23.3	8.3	29.1	25.2
18K/24K	mm	1000	245	750	795	827	178	892	212	1040	640
	inch	39.4	9.6	29.5	31.3	32.6	7.0	35.1	8.3	40.9	25.2

Certificate of Product Ratings

AHRI Certified Reference Number : 215323817 Date : 04-15-2026 Model Status : Active

AHRI Type : HRCU-A-CB (Mini-Split System: Heat Pump with Outdoor Unit-Air-Source, Ducted)

Series Name : 45M Series

Outdoor Unit Brand Name : CARRIER

Outdoor Unit Model Number : 37MAHAQ24AA3

Indoor Type : Mini-Splits (Ducted)

Indoor Model Number(s) : 45MBDAQ24XH3

Rated as follows in accordance with AHRI 210/240-2024 (I-P), Performance Rating of Unitary Air-Conditioning & Air-Source heat Pump Equipment and subject to rating accuracy by AHRI-sponsored, independent, third party testing:

Cooling Capacity (A_{Full}) – Single or High Stage (95F), btuh : 24000

SEER2 : 19.20

EER2 (A_{Full}) – Single or High Stage (95F) : 12.00

Heating Capacity (H1Nom) - Multi/Variable Stage (47F) : 26000

HSPF2 (Region IV) : 11.70

Sold in? : USA, Canada

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The Department of Energy has published updated energy efficiency metrics for central air conditioners and heat pumps. This publication reflects both the 1987 metric (SEER) and the 2023 metric (SEER2). Efficiency requirements are published at 10 C.F.R. 430.32(c). Please refer to www.AHRInet.org for more information about updated energy efficiency metrics.

CERTIFICATE NO.: 134207271476078530

COMMONWEALTH of VIRGINIA

Department of Professional and Occupational Regulation
9960 Mayland Drive, Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

EXPIRES ON
04-30-2027

NUMBER
2705115117

BOARD FOR CONTRACTORS
CLASS A CONTRACTOR
CLASSIFICATIONS ELE HVA LPG NGF PLB

ADVANCED ENVIRONMENT SOLUTIONS INC
5 LE WAY DRIVE
SUITE 109
FREDERICKSBURG, VA 22406

DPOR

BRIAN WOLFORD, DIRECTOR

Status can be verified at http://www.dpor.virginia.gov

(SEE REVERSE SIDE FOR PRIVILEGES AND INSTRUCTIONS)

DPOR-LIC (02/2017)

(DETACH HERE)

DPOR COMMONWEALTH of VIRGINIA
Department of Professional and Occupational Regulation

CLASS A BOARD FOR CONTRACTORS
CONTRACTOR

CLASSIFICATIONS ELE HVA LPG NGF PLB
NUMBER: 2705115117 EXPIRES: 04-30-2027

ADVANCED ENVIRONMENT SOLUTIONS INC
5 LE WAY DRIVE
SUITE 109
FREDERICKSBURG, VA 22406

(FOLD)

Status can be verified at http://www.dpor.virginia.gov

DPOR-PC (02/2017)

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 9/21/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: John Toepfer	
ACO Insurance Group 8609 Westwood Center Dr Suite 110 Vienna VA 22182	PHONE (A/C, No, Ext): 888 772 6553	FAX (A/C, No):
	E-MAIL ADDRESS: customercare@acoinsgrp.com	
	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A : ERIE INS EXCH	26271
INSURED AES & ENDT #1 5 LE WAY DR STE 109 FREDERICKSBURG VA 22406-1090	INSURER B : FLAGSHIP CITY INS CO	35585
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☒ PRO-JECT ☐ LOC ☐ OTHER:	Y	Y	Q42-1750955	06/17/2022	06/17/2023	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 1,000,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
A	AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ OWNED AUTOS ONLY ☐ SCHEDULED AUTOS ☒ HIRED AUTOS ONLY ☒ NON-OWNED AUTOS ONLY	Y	Y	Q06-1740059	06/17/2022	06/17/2023	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
A	☒ UMBRELLA LIAB ☒ OCCUR EXCESS LIAB ☐ CLAIMS-MADE ☐ DED ☒ RETENTION $ 0	Y	Y	Q30-1770314	06/17/2022	06/17/2023	EACH OCCURRENCE AGGREGATE	$ 2,000,000 $ 2,000,000
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N: N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		Q90-6700267	06/17/2022	06/17/2023	☒ PER STATUTE ☐ OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 500,000 $ 500,000 $ 500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

Coverage Verification

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

John Toepfer