

## ADDENDUM 1

### **UNC Pembroke Chavis Building 2<sup>nd</sup> Floor**

#### HVAC Renovation

SCO ID#25-29731-01A / EDi Project No. 071-25

TO: All Prospective Bidders

FROM: John Quioco, Project Manager/Engineer, Engineered Designs

SUBJECT: Addendum 1

DATE: March 24, 2026

The attached information is intended to clarify questions regarding the advertisement for bid.

Please contact John Quioco with Engineered Designs at (919) 307-4844 (d) / (919) 418-6481 (c) with any questions regarding the drawings or specifications.

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Where any article, division or subparagraph of the original contract documents or other addenda is supplemented herein, the provisions of the original documents shall remain in effect. All the supplemental provisions shall be considered as added thereto. Where any such article, division or subparagraphs are amended, voided, or superseded thereby, the provisions of such article, division or subparagraph not so specifically amended, voided or superseded shall remain in effect.

The attention of the Contractor is called to the following clarifications: additions to and changes in the plans and specifications dated March 2, 2026, on the above noted job. It will be the responsibility of each Contractor to call such clarifications, additions and changes in plans and specifications to the attention of subcontractors concerned. The Engineer, his/ her Architect, or Consulting Engineers in no way assume any responsibility for notifying any subcontractor, material dealers or others not having received the original contract documents.

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#### **A. GENERAL CLARIFICATIONS AND QUESTIONS:**

1. Please refer the attached Pre-Bid Meeting minutes and sign-in sheet from March 13, 2026.
2. Per the pre-bid meeting it was requested that we provide the submittal information for the owner pre-purchased air-handling units (AHU-6 and AHU-7). The submittal is included in this Addendum.

#### **B. REVISIONS TO THE DRAWINGS:**

**UNC Pembroke Chavis Building 2<sup>nd</sup> Floor  
HVAC Renovation**

1. None at this time.

**C. REVISIONS TO THE PROJECT MANUAL/SPECIFICATIONS:**

1. See attached for the new specification section “015000 – Temporary Facilities and Controls.” This specification addresses additional general requirements, including the construction requirements for the temporary dust partition.

END OF ADDENDUM No. 1



## PRE-BID MEETING MINUTES

UNC Pembroke Chavis Building

2<sup>nd</sup> Floor HVAC Renovation

March 24, 2026

Meeting Date/Time: March 13, 2026 / 10:00 am

Location: UNC Pembroke – Pinchbeck Maintenance Building – Conference Rm. 141

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### PARTICIPANTS

<i>Name</i>	<i>Company</i>
John R. Quioco	Engineered Designs
Matt Greene	UNC Pembroke
Craymon Strickland	UNC Pembroke
Billy Jacobs	UNC Pembroke

### *Contractor Representative*

(See attached sign-in sheet)

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### TOPICS OF DISCUSSION

- Project Name:** UNC Pembroke Chavis Building  
2<sup>nd</sup> Floor HVAC Renovation  
SCO ID# 25-29731-01A  
(\*Note – All correspondence shall include the SCO ID#)  
  
Mandatory Pre-bid Meeting.
- Project Location:** Chavis Building
- Owner:** UNC Pembroke - Facilities, Planning & Design  
Pinchbeck Maintenance Building  
128A Facilities Drive  
Pembroke, NC 28372  
  
Matt Greene – Project Manager  
Craymon Strickland – Sr. Facilities Planner  
**Billy Jacobs – HVAC/Plumbing Department Supervisor**
- Engineer:** Engineered Designs PLLC  
1151 S E Cary Parkway, Suite 200  
Cary, NC 27518  
Phone: (919) 851-8481  
Fax: (919) 851-9703  
  
John R. Quioco, PE, LEED AP, CxA – Principal Engineer/EOR  
Nick Fain - Senior Mechanical Designer  
Connor Rice – Mechanical Designer  
Dan Holtzclaw, PE – Electrical Engineer  
**Michael Celauro, AIA, NCARB – Architect of Record (Summit)**  
Jesus Figueroa Ayala – Construction Administrator

## PRE-BID MEETING MINUTES

5. **Bids Location and Date:** Bids will be received by Matt Greene and Engineered Designs, Pinchbeck Building, Conference Room 141, 128A Facilities Drive, Pembroke, NC on **Wednesday, April 1<sup>st</sup>, 2026 until 2:00 PM** at which time all bids will be publicly opened and read aloud.
6. **Forms Required for Bids**
  - a. Bid Proposal and Contract
  - b. HUB (W/MBE) Requirements and Forms
    - i. Goal: 10%
    - ii. Forms to be submitted with bid, "Identification of Minority Business Participation."
    - iii. Note that Affidavit A will be required with the bid forms. Backup information on Good Faith Efforts will be required after the bid opening.
    - iv. Affidavit B is not typical for this type of project. There may be exceptions to Affidavit B. Note that if you are planning to self-perform 100% of the work, you will need to provide proof and back up information.
    - v. Affidavit C if HUB participation exceeds 10%. Provide backup information.
    - vi. Affidavit D if cannot achieve the 10% goal. Provide backup information of Good Faith Efforts to contact and solicit HUB subcontractors, vendor and suppliers.
    - vii. Any 1<sup>st</sup> tier subcontractors, vendors, and suppliers that are minority owned, will count towards minority participation. The NC HUB Office / Electronic Vendor Portal (eVP) may have an internal list of approved subcontractors, vendors and suppliers that can be accessed by all interested bidding contractors.
    - viii. HUB participation is very important at UNCP and recommend the contractor do everything you can do to promote HUB participation with good faith effort.
    - ix. The documents are located at the end of the project manual. Note that all backup documents must be provided with the bid documents in accordance with the project manual.
    - x. Owner reserves the right to waive formalities and reject any or all bids
    - xi. The bidders may reach also reach out to Amanda Spayd ([amandao.spayd@uncp.edu](mailto:amandao.spayd@uncp.edu)) for HUB vendors that have worked with the university in the past or are the approved list of HUB vendors.**
  - c. Bid Bond (5%) or Certified Check (5%)
  - d. Bid envelope shall be sealed with the following information on the outside of the envelope:
    - i. Bidder's Name and Address
    - ii. Appropriate North Carolina Contractor's License Number
    - iii. Name of the Project
  - e. Performance and Payment bond will be required on this project due to the size and scope.
  - f. Refer to the Instructions to Bidders section 6 "Opening of Bids," parts a. through b. for reasons that a bid may be rejected.

## PRE-BID MEETING MINUTES

- g. All prospective bidders shall confirm that all required bid forms are provided with the proper corporate seals, witnessed and notarized where applicable. Prospective bidders shall also confirm that all applicable addenda are acknowledged on the bid forms and that all licensee/license numbers for all contractors and sub-contractors are listed on the bid forms, including general, mechanical and electrical. Note that these must be the original stamped, seal or embossed documents. The person(s) authorized to sign the bid forms must be the Owner, President, or officer of the company.

### 7. Bid Opening

#### a. For mailed bids:

- 1) Send to the UNC Pembroke, **1 University Drive**, Pembroke, NC 28372.  
Attention: Matt Greene, Project Manager - **Planning, Design & Construction**.
- 2) Please allow additional time to deliver your bids to the physical address. If you wish to send your bid via US Mail, UPS or FedEx, please allow minimum ten (10) days for delivery since the bid must be received (NOT postmarked) by the date and time stated in the solicitation. Please place your bid in a double envelope with "Sealed Bid – Do Not Open" written on the front of the envelope.
- 3) We recommend that bids are hand delivered on time if at all possible.
- 4) Sealed envelope will remain sealed until the bid opening time.
- 5) Project name must be clearly marked on the outside of the sealed envelope.

#### b. For delivered bids:

- 1) Deliver to the UNC Pembroke Pinchbeck Building, Conference Room 141, 128A Facilities Drive, Pembroke, NC 28372.
- 2) For delivered bids by company staff members or courier service not attending the actual bid opening in-person, we recommend having bids dropped at the front desk approximately 2 hours prior to the bid opening (or 12 pm on April 1<sup>st</sup>, 2026), to allow time to gather all delivered bids for the bid opening. For those attending the bid opening in-person, bids will be accepted up until the bid opening time of 2:00 pm on April 1<sup>st</sup>, 2026.
- 3) For any questions regarding the procedures described above, please contact the project engineer, John Quioco, at (919) 307-4844 or email [jquicho@engineereddesigns.com](mailto:jquicho@engineereddesigns.com).

### 8. Brief Overview of Documents

- a. Project Description: Removing and replacing two (2) existing air-handling units serving the 2<sup>nd</sup> floor. The work includes replacing the existing fan powered terminal units with single duct terminal units, new ductwork, new piping, associated HVAC controls and power connections to the new equipment.

## PRE-BID MEETING MINUTES

**\*The project scope includes the owner pre-purchasing the new air-handling units (AHU-6 and AHU-7). The owner is anticipating completing the order on Friday, March 13<sup>th</sup>. The intent is for the unit to be delivered to the Pinchbeck Maintenance Building. It will be the contractor's responsibility to deliver the unit from the Pinchbeck Maintenance Building to the Chavis Building. It will be the contractor's responsibility to install the units as indicated on the plans.**

- b. Drawings: Titled: "University of North Carolina at Pembroke Chavis Building 2<sup>nd</sup> Floor HVAC Renovation" dated March 2, 2026.
- c. Project Manual: Titled: "University of North Carolina at Pembroke Chavis Building 2<sup>nd</sup> Floor HVAC Renovation" dated March 2, 2026.
- d. Addendum: None issued at this time.

### 9. Bid Alternates

- a. Alternate No. 1: New 2nd Floor Ceiling: State the amount to be added to the Base Bid Contract to replace all acoustical ceiling tiles in the perimeter rooms as indicated on drawing A-110.
- b. \*Alternate No. 2: HVAC Controls by Delta Controls: State the amount to be added to the Base Bid Contract for all associated HVAC controls on the project to be provided by Delta Controls. The existing controls are currently by Delta Controls.
- c. Alternate No. 3: New AHU-7 and Mechanical Room Expansion: State the amount to be added to the Base Bid Contract for the removal and replacement of the existing AHU-7, associated ductwork, piping, controls and power connections as indicated on the plans. The work shall also include the expansion to the existing mechanical room and alternations to the adjacent toilet room.

**\*Preferred Alternate discussion to occur at this meeting. Owner and engineer to present information accordingly.**

### 10. Contract Documents

- a. Proposal and Contract bound in the Project Manual
- b. General Conditions and Supplementary General Conditions bound in project manual
- c. Construction Documents (Drawings and Project Manual)
- d. Addenda

### 11. Construction Schedule:

- Anticipated Start Date: On or before **April 22, 2026 (Letter of Intent to Award)**. **No physical work can begin on the jobsite until after graduation/commencement. Work can begin on the jobsite on May 12, 2026.**
- Anticipated Final Completion Date: **August 7, 2026**. Note that the new Air-handling Units (AHU-6 and AHU-7) are being pre-purchased by the owner. It is anticipated to ship in the next 13-15 weeks.
- Anticipated Final Closeout: We anticipate the Final Closeout will be approximately two (2) weeks after the Final Completion Date.

## PRE-BID MEETING MINUTES

- All prospective bidders should review the documents and let the engineer and owner know if there are any additional long lead items that will affect the projected schedule. The owner may allow updates to the schedule. This will require further discussion and coordination with the awarded contractor.

Note: The successful contractor would need to confirm the lead time of any additional long lead equipment/materials that they plan to submit and determine the exact construction schedule.

12. **Withdrawing Bids:** See Instructions to Bidders for withdrawing bids. Per GS 143-129.1, bids cannot be withdrawn for a period of 30 days following receipt of bids. After the bid opening, the owner may allow a bidder to withdraw their bid if bid was based on a mistake, which constitutes a substantial error, provided bid was submitted in good faith and bidder submits credible evidence that the mistake was clerical in nature, instead of an error in judgment, and request to withdraw is made within 72 hours of the bid opening.
13. **Liquidated Damages** – Within Article 23 of the Supplementary General Conditions, \$500 each calendar day in excess of the stated final completion date. We encourage the contractor NOT to include liquidated damages in the Bid amount if you do not think you can meet the schedule. Again, please communicate any potential issues with the schedule with the engineer and owner.
14. **Substitution Requests** – Must be made in writing to the Project Engineer within 10 days prior to bid date and will only be allowed when approved in an addendum. Refer to section 12 “Substitutions” of the Instructions to Bidders and specification section 012500 Substitution Procedures for additional information. We encourage the prospective bidders to submit any substitution requests as early as possible. It will be critical to provide substitution requests if it is a product/equipment that can potentially reduce lead times.
15. **Communications:**
  - a. All questions shall be directed to the Engineer unless the Engineer states otherwise:  
[jquiocho@engineereddesigns.com](mailto:jquiocho@engineereddesigns.com)  
(919) 307-4844 (direct)  
(919) 851-8481 (office)  
(919) 418-6481 (cell)  
  
Responses will be included in the Addendum. Bidders are not to rely on verbal responses; no verbal response is official or binding until and unless it is reduced to writing in an addendum.
  - b. Ask questions early – The last day for receiving questions is 7 days prior to bids, **Wednesday, March 25<sup>th</sup>, 2026**. Questions will be accepted up to 3 pm.
16. **Addendum**
  - a. We will endeavor to issue last addendum no later than 7 days prior to bid date, **Wednesday, March 25<sup>th</sup>, 2026**. The last addendum will be issued no later than close of business.

## PRE-BID MEETING MINUTES

- b. All addenda will be issued by email and will be sent to everyone on the email distribution list and those in attendance at the pre-bid conference. Verify that email security will allow emails from [jquicho@engineereddesigns.com](mailto:jquicho@engineereddesigns.com).
  - c. An addendum will be generated based on questions raised today/prior to today and will include the pre-bid conference meeting minutes and sign-in sheet.
  - d. All addenda must be acknowledged on the bid form.
17. **Conflicts** In and Between the Construction Documents – That which is shown on the drawings or called for in the specifications shall be binding as if it were both called for and shown. In case of discrepancy or disagreement in the Contract Documents, the order of precedence shall be: Form of Contract, specifications, large-scale detail drawings.
18. **Special Project Considerations/Characteristics**
- a. Work restrictions
  - b. The 2<sup>nd</sup> floor will be completely evacuated and will not be occupied during construction.
  - c. Contractor shall protect existing furniture, walls and flooring to remain during construction. The area of work shall be regularly cleaned in accordance with specification section 017300 “Execution.”
  - d. There will be a separate active project on the first-floor level. Matt Greene to provide a brief summary of this project. Any work on this project that may affect the work on the first-floor level must be closely coordinated with Matt Greene and Engineered Designs. **Matt also mentioned that during the work occurring downstairs, they are still planning to serve food in the dining hall for students and staff. The awarded contractor will need to coordinate any work at the lower level to ensure that they will not impede on the operations on the lower level.**
  - e. A temporary dust partition will be required **on the first-floor level around the area that needs to be accessed for the plumbing lines associated with the janitor’s sink and lavatories on the 2<sup>nd</sup> floor Women’s Room. Furthermore, a temporary dust partition needs to be provided at the mezzanine of the 2<sup>nd</sup> floor level. For areas that are below the open skylights and near the ends of the mezzanines by the open stairwell, provide the temporary dust partition up to a minimum of 10’-0” above the floor height. For all other areas, the temporary dust partition that turns up tight to bottom of the ceiling. The contractor shall refer to the new specification section “015000 – Temporary Facilities and Controls” in the Addendum that the address the specifications of the temporary dust partition.**
  - f. Typical work hours during the week shall be any time between 7 am to 6 pm. **However, Matt noted that the contractor will be allowed to work in the building 24 hours/7 days a week if needed to meet the project schedule.** Any after-hours work shall be closely coordinated with the Owner (Matt Greene) and Engineer (Engineered Designs).
  - g. All required shutdowns will need to be coordinated with the owner and engineer prior to construction. It is preferred that these shutdowns be scheduled early in the project and coordinated on a weekly basis. **The awarded contractor may contact Billy Jacobs, HVAC and Plumbing Supervisor, to coordinate any required shutdowns. Refer to the sign-in sheet for contact information.**

## PRE-BID MEETING MINUTES

- h. Prime contractor does not have to be a licensed General Contractor if the general construction work does not exceed 25% of the total bid price, in accordance with NC G.S. 87-1.1.
- i. Electrical work to be supervised by licensed electrician.
- j. Parking requirements. ~~The contractor will be responsible for all cost associated with parking on campus.~~ During the pre-bid meeting, the owner noted that that the awarded contractor will not be required to pay for parking on campus. They will need to coordinate with owner on how many parking permits are needed. The contractor shall also coordinate the required number of parking spaces required for a connex storage trailer and/or dumpster. Note that the contractor shall not park or use any of the restricted parking spaces.
- k. If required, equipment may be temporarily stored in a bonded warehouse within the state of North Carolina.
- l. The contractor shall review the exam schedule on the 2026 academic calendar. Here is the link to the UNCP academic calendar:

<https://catalog.uncp.edu/content.php?catoid=43&navoid=2655>

Note that there will be no work during UNCP exam week. UNCP reserves the right to cancel any work during exam week.

- m. Safety is extremely important for this project. There are specific safety requirements and guidelines noted in the project manual.
- n. Jesse Ferrell ([jesse.ferrell@doa.nc.gov](mailto:jesse.ferrell@doa.nc.gov), 919-605-6690) will likely be the SCO Electrical Inspector assigned to this project. We recommended that the awarded contractor review any existing code deficiencies that may or may not be addressed on the design documents so they can be discussed with the owner/engineer and addressed prior to the SCO electrical inspection. **Matt noted that Jesse currently visits the campus only on Tuesdays between 9am-11 am.**
- o. The laydown area will be coordinated with the awarded contractor.
- p. **The furniture located in the mezzanine will be relocated outside the general area of work. However, the contractor may need to temporarily relocate furniture and coordinate with the owner if there is still an existing piece of furniture that is impacting on the work in that area.**
- q. **There are two (2) existing flat screen TVs in the corridors of the 2<sup>nd</sup> floor in the area of work. Contractor to provide protective covering over these TVs to prevent damage and to protect the TVs from construction dust and debris.**
- r. **All rooms with existing desks, furniture and carpet will need to be covered during construction and protected from dust and debris.**
- s. **Matt mentioned that the awarded contractor will be allowed to use the toilet facilities in the building as long as they are kept cleaned on a daily basis.**

### 19. Questions/General Discussion

- a. On Sheet A-110, can the engineer confirm if it is the intent for the Base Bid and Alternate Bid for the new ceiling to include both ceiling tile and ceiling grid.

**Response: Yes, it is the intent for any ceilings that are replaced that it includes both the ceiling tile and the ceiling grid.**

## PRE-BID MEETING MINUTES

- b. Can the engineer provide a copy of the AHU-6 and AHU-7 submittal to the contractor for review and coordination.

**Response: Yes, the engineer will provide a copy of the AHU-6 and AHU-7 submittal as an attachment to Addendum 1.**

- c. Who is the current controls provider or who maintains the current Delta controls system in the building?

**Response: The current controls contractor that maintains the system is Champion Systems Inc. The contact person is Robert Amos (336) 687-2011.**

- d. Were the VAV terminal units pre-purchased as well? Or just the new air-handling units (AHU-6 and AHU-7)?

**Response: No. The VAV terminal units were not pre-purchased by the owner. It was only the new AHU-6 and AHU-7.**

20. **Site Tour** – All participants are allowed access to the Facility today. Some areas will require participants to be escorted for security reasons. If contractors or sub-contractors need to visit the site again prior to bids, it is advised that they see John Quioco or Matt Greene to schedule a separate site visit. It is preferred, for anyone requesting a separate site visit that this is done with all interested contractors (and their sub-contractors, manufacturer's representatives, etc.) on the same day for one (1) additional site visit prior to bid. **Matt noted that the awarded contractor could contact him directly to set up a follow-up site visit with the subcontractors and vendors as required.**

End of Meeting Minutes



# Pre-Bid Conference/Preferred Brand Alternates Meeting

UNC Pembroke Chavis Bldg. 2<sup>nd</sup> Floor HVAC Renovation  
SCO ID# 25-29731-01A

Date: March 13, 2026, 10:00 am  
Location: Pinchbeck Conference Room 141  
UNC Pembroke Campus  
Pembroke, NC

<b>ATTENDEES:</b>				
<b>Name</b>	<b>Company</b>	<b>Office Phone</b>	<b>Mobile Phone</b>	<b>E-Mail address</b>
John Quioco	Engineered Designs	919-307-4844	919-418-6481	jquicocho@engineereddesigns.com
Matt Greene	UNC Pembroke	910-775-4576		matt.greene@uncp.edu
Craymon Strickland	UNC Pembroke	910-775-4711		craymon.strickland@uncp.edu
Billy Jacobs	UNC Pembroke	910-775-4658		Billy.jacobs@uncp.edu
Randy Blackwood	HM Kern	336-668-3213	919-209-8258	estimating@hmkern.com
Brian Foshay	PCI	910-610-3545		bfoshay@pcilbg.com
Kedrick Chavis	K+C	910-390-4332		Kedrick.chavis@kandccontractors.com
Nick Chavis	K+C	910-390-4332		Nick.chavis@kandccontractors.com
Thomas Helms	Randolph & Son Builders	704-576-5218		tomy@randolphbuilders.com
Will Ransom	Smith's Refrigeration	910-739-7970		willransom@smithsrefrigeration.com



Project Name: UNC Pembroke Chavis Building 2<sup>nd</sup> Floor HVAC Renovation  
Project Numbers: 071-25  
Submittal: UNC Pembroke Chavis Building AHU Submittal Rev 01 (Pre-purchase)  
Reviewed by Nick Fain/John Quiocho  
Review Date: March 11, 2026

This review is for general compliance with the contract documents. No responsibility is assumed for the correctness of dimensions or details. Quantities of components are the responsibility of the contractor and are not included in Engineered Designs' review. Review of submittal shall not relieve the contractor of the responsibility of complying with the contract documents.

Contractor is responsible for coordination with all other trades any changes necessary due to the substitution of different components, equipment type or manufacturer than that specified on the contract documents. Coordinate all electrical changes of the selected equipment with the appropriate contractor(s) including necessary changes in circuit breaker, wiring and disconnect sizes, etc.

This Submittal Review Comment Sheet shall not be removed from the document attached hereto.

- REVIEWED
- REVIEWED AS NOTED (Re-Submittal is NOT required)
- REVISE AND RESUBMIT (Re-Submittal IS required)
- REJECTED

REMARKS:

1. No exceptions taken.

End of Remarks



## **Response Section**

Engineer comment:

1. Cooling coil condensate on AHU-6 & 7 shall be on same side as piping connections and access doors.

JCI Response:

Drain pan connection has been moved to the right side of the unit to match the piping connections and access doors.



Project Name: UNC Pembroke Chavis Building 2<sup>nd</sup> Floor HVAC Renovation  
Project Numbers: 071-25  
Submittal: UNC Pembroke Chavis Building AHU Submittal Rev 00 (Pre-purchase)  
Reviewed by Nick Fain/John Quioco  
Review Date: March 10, 2026

This review is for general compliance with the contract documents. No responsibility is assumed for the correctness of dimensions or details. Quantities of components are the responsibility of the contractor and are not included in Engineered Designs' review. Review of submittal shall not relieve the contractor of the responsibility of complying with the contract documents.

Contractor is responsible for coordination with all other trades any changes necessary due to the substitution of different components, equipment type or manufacturer than that specified on the contract documents. Coordinate all electrical changes of the selected equipment with the appropriate contractor(s) including necessary changes in circuit breaker, wiring and disconnect sizes, etc.

This Submittal Review Comment Sheet shall not be removed from the document attached hereto.

- REVIEWED
- REVIEWED AS NOTED (Re-Submittal is NOT required)
- REVISE AND RESUBMIT (Re-Submittal IS required)
- REJECTED

REMARKS:

1. Cooling coil condensate on AHU-6 & 7 shall be on same side as piping connections and access doors.

End of Remarks

## EQUIPMENT SUBMITTAL FOR APPROVAL

**PROJECT:** UNC Pembroke Chavis Building AHUs

**LOCATION:** Pembroke, N.C.



**York Solution Indoor Air Handling Unit**

<b>EQUIPMENT</b>	Solution XTI
<b>UNIT TAGS</b>	AHU-6 & AHU-7
<b>QUANTITY</b>	2

**SOLD TO:**

UNC Pembroke  
1 University Dr  
Pembroke, NC 28372

**CONSULTING ENGINEER:**

EDI  
1151 SE Cary Pkwy  
Cary, NC 27518

**PREPARED BY:**

Johnson Controls, Inc.  
540 Civic Blvd  
Raleigh, NC 27610

**DATE:**

March 11, 2026

**REVISION:**

01



# TABLE OF CONTENTS

Lead time Report

Project Coordination Release for Fabrication

BOM Data

Performance Ratings

Unit Drawings

Wiring Diagrams

Unit Specifications Text

Additional Data Sheets

Rigging, Install and Maintenance

Warranty

Submittal Approval Page



## **Notes and Clarifications**

### **Notes:**

1. VFDs are factory mounted and start up is by JCI.
2. MC/Engineer to confirm handing.
3. AFMS provided by others if required.
4. Power wiring is by others.
5. Local disconnects by others.
6. 1 year warranty after start up is provided.
7. 1" Springs on fans. Fan Arrays that are stacked are to be internally isolated using neoprene pads.
8. Standard York fan balance included.
9. 2" MERV 8 pre filters and 12" MERV 11 final filters included with no spare sets.
10. Coil casings are galvanized steel.

## **Lead Time Report**

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**Product Type: Solution XTI**

**Unit Tags: AHU-6 – AHU-7**

**Current Lead Time – 13-14 Weeks from Release**

**Note: All lead times are estimates and can change due to factory loading**

# **Project Coordination Release for Fabrication**

# PROJECT COORDINATION

## Release for Fabrication Notes

### Release for Fabrication Requirements:

1. **Purchase Order (scanned or hard copy).** Document must state "Purchase Order". Purchase Requisition, Purchase Request, and other similar documents which do not reflect "Purchase Order" will not be considered.
2. **Approved Submittals.** Stamped on the submittal or sent through email. Verbal and text message approvals will not be considered.
3. **Release Confirmation.** Stamped on the submittal or sent through email formalizing the release of equipment. Verbal and text message release confirmation will not be considered.
  - a. Any "**SUBMITTAL NOTES**" or "**EQUIPMENT RELEASE APPROVAL FORM**" page(s) must be filled out.
  - b. Any **HANDING COORDINATION** documents must be confirmed and filled out.
  - c. Any **DRAWINGS** or **PERFORMANCE** sheets needs to be verified and signed off.

*Lead times do not start until release requirements are met.*

### Revisions After Release:

1. Equipment will be ordered and manufactured based on the approved submittal.
2. Any **revisions AFTER release** will have to be approved by the corresponding JCI factory.
3. Revision approval will **solely depend on the JCI factory**. The local JCI office does not have the authority to approve any revisions AFTER release.
4. Revisions AFTER release **may incur additional costs for approval**. These costs are not part of the original contract price and will be processed as a Change Order.
5. Revisions AFTER release **may affect lead time**. This impact will be relayed to the customer prior to revision approval. Any lead time estimates/promises made before the revision will be null and void.
6. Revisions AFTER release that require additional costs will not be processed unless a Change Order for the revision is submitted to JCI.
7. Revisions AFTER release include, but are not limited to the following:
  - a. Project name change.
  - b. Unit(s) tag number change.
  - c. Unit(s) performance revisions (includes changes in input parameters such as CFM, temperatures, gpm, capacity, electrical ratings, OSHPD/seismic certifications, etc.)
  - d. Unit(s) drawing revisions (includes changes in nozzle configurations, intake/discharge orientations, dimension modifications, weight reduction, OSHPD/seismic certifications, etc.)
  - e. Change in BOM (includes, scope of work, warranty, items provided, items excluded, quantity, etc.)

## **Long Term Storage**

*If the equipment is not planned to be started before six (6) months from the date of shipment, or if the area they are going to be stored in will be subject to unusual atmospheric conditions (including within 5 miles of salt water/shipped over salt water). If these conditions exist, please contact your JCI representative for JCI's long term storage recommendations and a quote for delayed startup to maintain unit(s) warranty.*

*Units not started up within 6 months will not have warranty, unless notified by customer of needing this requirement prior to 6 months from shipment.*

## **Installation, Operation, & Maintenance Manuals**

*One physical copy of IOMs for detailed information on shipping and receiving ships with unit. Additional digital copies are available upon request.*

## **Shipping & Receiving**

### **Shipping**

JCI consolidates loads and non-standard shipments aren't part of JCI scope, unless specifically included in the quote. All non-standard shipments will require a change order. Non-standard shipment include but are not limited to:

- Shipping units or sections in a certain order
- Shipping 1 unit per truck
- Shipping units by floor

### **Receiving**

It is the installing contractor's responsibility to verify the following prior to signing the bill of lading presented by the transportation company:

- Ensure everything on the bill of lading was delivered
- Visually perform a thorough inspection of all equipment for any signs of shipping damage

***Any short-shipments or shipping damage must be noted on the bill of lading prior to signing.***

## **Loose Items Shipment Notes (If Included with Order, See Bill of Materials)**

Look inside cabinets, base rails, etc for ship loose items that the ship with units. Certain ship loose items may not arrive at the same time as units.

AHUs:

- Filters shipped separately to the units. Customers to direct where and when to ship filters at least 2 weeks prior to unit(s)' shipment. Spare filters ship at the same time as the first set of filters.

## **Start-up and other Included Service Tasks**

Our Service department needs **at least 10 business days** to schedule any quoted service work. For start-ups, a technician will not be dispatched until the completed pre-startup checklist is received by our Service department. The preferred and most efficient way to request start-up is via the **TrueContext Forms app** (see *Startup* section later in the submittal). If the equipment is not ready for start-up when the technician is on the site, a trip charge will be invoiced.

- Any included startup/field work/training must be performed during normal working business hours 7am-3pm (Mon-Fri) and excluding any holidays. Start-up/field work/training requested outside of normal business hours are subject to a change order.
- Any quoted training are NOT videotaped unless explicitly mentioned.

# BOM Data

## BILL OF MATERIAL

ITEM	QTY	TAG	ITEM DESCRIPTIONS
I	1	AHU-6	XTI-66x60
II	1	AHU-7	XTI-66x66

Johnson Controls' standard warranty for chillers and air-handlers begin upon startup or 6 months after shipment, whichever occurs first. If unit startup will occur more than 6 months after shipment, long term storage preparation and periodic inspections may be required at additional cost to the buyer. If these procedures are not followed, the warranty will be voided. Please contact your JCI representative for more details.

**Quantity: 1 XTI-66x60**

**Unit Tag: AHU-6**

**Unit Details**

- 18 Month Parts and Labor Warranty from shipment or 12 months from Startup (whichever occurs first)
- L/240 panel deflection and <1% leakage at ± 8" TSP
- 2" thick Foam Insulated (R16) panels
- Exterior Material: 20 Ga. G90 Galvanized Steel
- Interior Liner Material: 22 Ga. G90 Galvanized Steel
- Floor Material: 20 Ga. G90 Galvanized Steel
- Doors with same construction as unit.
- 6 " High Formed Steel Base
- Unit Voltage/Phase/Hertz: 460/3/60
- VFD (Location: FS Serves: Supply Fan)
- Fused Disconnect (NEMA 1 Enclosure)
- 120V Wiring Type: SJO Cable
- High Voltage Wiring Type: Motor Cable
- Integral LED light(s) wired to single switch on FS segment.

**Inlet Plenum Segment**

- Return Air opening (Rear)

**Return Fan Segment**

- Galvanized Steel Bulkhead
- 1x1 Single Fan with Lau Size 200 Model DDPG2 9 blade Direct Drive SWSI Plenum Fan; Class 2
- Isolation: 2" Springs
- Air Flow Measuring: Piezo Ring (transducer not included)
- 5 HP ODP (1800 RPM) Motor with Shaft Grounding Ring

**Discharge Plenum Segment**

- Exhaust Air opening (Front)
- Exhaust Air Damper Ruskin - CD60 (Galvanized) Parallel Blade

**Mixing Box Segment**

- Outside Air opening (Front)
- Return Air opening (Top) with Galvanized Steel Safety Screen
- Outside Air Damper Ruskin - CD60 (Galvanized) Parallel Blade
- Return Air Damper Ruskin - CD60 (Galvanized) Parallel Blade

**Rigid Filter Segment**

- Side Load Filter Bank
- Minihelic (Combined Gauge Range: 0 To 2.0 in. w.g.)
- 2 in. Pleated MERV 8 Filters
- Qty 1 set(s) of spare filters; 2 in. Pleated MERV 8 Filters
- 12 in. Rigid MERV 11 Filters

**Heating Coil Segment**

- Galvanized Steel Bulkhead with Galvanized Steel Coil Supports
- Coil Hand: Right
- 1 Row 8 FPI Heating Coil with 0.008 " Aluminum fins
- 1/2" Tube Diameter with 0.016" Tubewall Thickness
- Standard Return Bends with 0.016" Tubewall Thickness

- Galvanized Casing
- Copper Header; Steel MPT 1.5 " Connection

**Access Segment**

**Cooling Coil Segment**

- Galvanized Steel Bulkhead with Galvanized Steel Coil Supports
- Coil Hand: Right
- 6 Row 10 FPI Cooling Coil with 0.008 " Aluminum fins
- 1/2" Tube Diameter with 0.016" Tubewall Thickness
- Standard Return Bends with 0.016" Tubewall Thickness
- Galvanized Casing
- Copper Header; Steel MPT 2 " Connection
- IAQ Drain Pan with 304 Stainless Steel Liner

**Supply Fan Segment**

- Galvanized Steel Bulkhead
- 1x1 Single Fan with Lau Size 222 Model DDPG2 9 blade Direct Drive SWSI Plenum Fan; Class 2
- Isolation: 2" Springs
- Air Flow Measuring: Piezo Ring (transducer not included)
- 15 HP ODP (1800 RPM) Motor with Shaft Grounding Ring
- Supply Air opening (Rear)

**Items Not Included:**

- Hauling, Unloading, Rigging, Installation and Re-Assembly of Equipment
- Taxes, Delayed Shipment, Expedited Freight, and Long Term Storage
- Extended Warranties beyond length of time shown above
- Any DDC Controls, End Devices, Sensors Actuators, Control Values, etc.
- Power Wiring to Lights and Outlets (Unless specified above)
- Single-Point Power Connection (Unless specified above)
- Factory or Field Leakage and Deflection Testing (Unless specified above); Factory Performance Testing (Units are AHRI Certified)

(Unless specified above)

- Outdoor Airflow Measuring Stations
- Installation of Ship Loose Filters (filters ship loose for installation by others in factory installed racks)
- Smoke Detectors
- Smoke Dampers and/or Fire/Smoke Dampers
- Connecting Wiring between Shipping Splits
- Long Term Storage Maintenance (required if AHU not started up within 6 months of shipment)
- Anything not listed above

**Quantity: 1 XTI-66x66**

**Unit Tag: AHU-7**

**Unit Details**

- 18 Month Parts and Labor Warranty from shipment or 12 months from Startup (whichever occurs first)
- L/240 panel deflection and <1% leakage at ± 8" TSP
- 2" thick Foam Insulated (R16) panels
- Exterior Material: 20 Ga. G90 Galvanized Steel
- Interior Liner Material: 22 Ga. G90 Galvanized Steel
- Floor Material: 20 Ga. G90 Galvanized Steel
- Doors with same construction as unit.
- 6 " High Formed Steel Base
- Unit Voltage/Phase/Hertz: 460/3/60
- VFD (Location: FR Serves: Supply Fan)
- Fused Disconnect (NEMA 1 Enclosure)
- 120V Wiring Type: SJO Cable
- High Voltage Wiring Type: Motor Cable
- Integral LED light(s) wired to single switch on FS segment.

**Inlet Plenum Segment**

- Return Air opening (Rear)

**Return Fan Segment**

- Galvanized Steel Bulkhead

- 1x1 Single Fan with Lau Size 222 Model DDPG2 9 blade Direct Drive SWSI Plenum Fan; Class 2
- Isolation: 2" Springs
- Air Flow Measuring: Piezo Ring (transducer not included)
- 7.5 HP ODP (1800 RPM) Motor with Shaft Grounding Ring

#### **Discharge Plenum Segment**

- Exhaust Air opening (Front)
- Exhaust Air Damper Ruskin - CD60 (Galvanized) Parallel Blade

#### **Mixing Box Segment**

- Outside Air opening (Front)
- Return Air opening (Top) with Galvanized Steel Safety Screen
- Outside Air Damper Ruskin - CD60 (Galvanized) Parallel Blade
- Return Air Damper Ruskin - CD60 (Galvanized) Parallel Blade

#### **Rigid Filter Segment**

- Side Load Filter Bank
- Minihelic (Combined Gauge Range: 0 To 2.0 in. w.g.)
- 2 in. Pleated MERV 8 Filters
- 12 in. Rigid MERV 11 Filters

#### **Heating Coil Segment**

- Galvanized Steel Bulkhead with Galvanized Steel Coil Supports
- Coil Hand: Right
- 1 Row 8 FPI Heating Coil with 0.008 " Aluminum fins
- 1/2" Tube Diameter with 0.016" Tubewall Thickness
- Standard Return Bends with 0.016" Tubewall Thickness
- Galvanized Casing
- Copper Header; Steel MPT 1.5 " Connection

#### **Access Segment**

##### **Cooling Coil Segment**

- Galvanized Steel Bulkhead with Galvanized Steel Coil Supports
- Coil Hand: Right
- 6 Row 9 FPI Cooling Coil with 0.008 " Aluminum fins
- 1/2" Tube Diameter with 0.016" Tubewall Thickness
- Standard Return Bends with 0.016" Tubewall Thickness
- Galvanized Casing
- Copper Header; Steel MPT 2 " Connection
- IAQ Drain Pan with 304 Stainless Steel Liner

##### **Supply Fan Segment**

- Galvanized Steel Bulkhead
- 1x1 Single Fan with Lau Size 245 Model DDPG2 9 blade Direct Drive SWSI Plenum Fan; Class 2
- Isolation: 2" Springs
- Air Flow Measuring: Piezo Ring (transducer not included)
- 15 HP ODP (1800 RPM) Motor with Shaft Grounding Ring
- Supply Air opening (Rear)

#### **Items Not Included:**

- Hauling, Unloading, Rigging, Installation and Re-Assembly of Equipment
- Taxes, Delayed Shipment, Expedited Freight, and Long Term Storage
- Extended Warranties beyond length of time shown above
- Any DDC Controls, End Devices, Sensors Actuators, Control Values, etc.
- Power Wiring to Lights and Outlets (Unless specified above)
- Single-Point Power Connection (Unless specified above)
- Factory or Field Leakage and Deflection Testing (Unless specified above); Factory Performance Testing (Units are AHRI Certified)

(Unless specified above)

- Outdoor Airflow Measuring Stations
- Installation of Ship Loose Filters (filters ship loose for installation by others in factory installed racks)
- Smoke Detectors
- Smoke Dampers and/or Fire/Smoke Dampers
- Connecting Wiring between Shipping Splits
- Long Term Storage Maintenance (required if AHU not started up within 6 months of shipment)
- Anything not listed above

# Performance Ratings

## Job Summary

<b>Project Name:</b>	UNC Pembroke Chavis AHUs		
<b>Unit Tag(s):</b>	AHU-6		
<b>Quantity:</b>	1	<b>Environment:</b>	Indoor



## Unit Overview

Model	Airflow (CFM)	Altitude (ft)	Operating Weight (lbs)
XTI-66x60	8,626	0	5,138

## Segment Sequence

(IP FR DP)(FS CC XA HC RF MB)

## Unit Construction

### Casing Details

Segment(s)	Thickness (in)	Exterior Paint	Exterior Gauge and Material	Interior Gauge and Material	Insulation Thickness and Material	Mylar Lining	Thermal Break	Bulkhead Material
IP, DP, MB, XA	2"	None	Standard Ga. G-90 Galvanized	Standard Ga. G-90 Galvanized	2" Foam	-	-	None
FR, RF, HC, CC, FS	2"	None	Standard Ga. G-90 Galvanized	Standard Ga. G-90 Galvanized	2" Foam	-	-	Galvanized Steel

### Base Details

Segment(s)	Material	Paint
MB, RF, HC, XA, CC, FS	6" Formed Steel	None

### Floor Details

Segment(s)	Gauge and Material	Paint	Insulation	Thermal Break	Attachment	Sub-Floor Gauge and Material
MB, RF, HC, XA, CC, FS	Standard Ga. G-90 Galvanized	None	2"	-	Screw Down	None
IP, FR, DP	Standard Ga. G-90 Galvanized	None	2" Foam	-	-	N/A

## Unit Electrical

### Circuit Details

#	Component(s)	V/Ph/Hz	Full Load Amps (FLA)	Minimum Current Ampacity (MCA)	Maximum Overcurrent Protection (MOP)
1	FS VFD-1 (on FS)	460/3/60	18.90	23.63	40
2	FR VFD-1 (on FR)	460/3/60	6.86	8.58	15
3	Light Switch (on FS)	120/1/60	-	-	15

### Electrical Details

<b>Minimum Unit SCCR</b>	100 kA rms Symmetrical	<b>ETL Label (UL1995/NEC-2002)</b>	Yes
<b>Unit Light Type</b>	LED	<b>Light Switch Enclosure</b>	Indoor

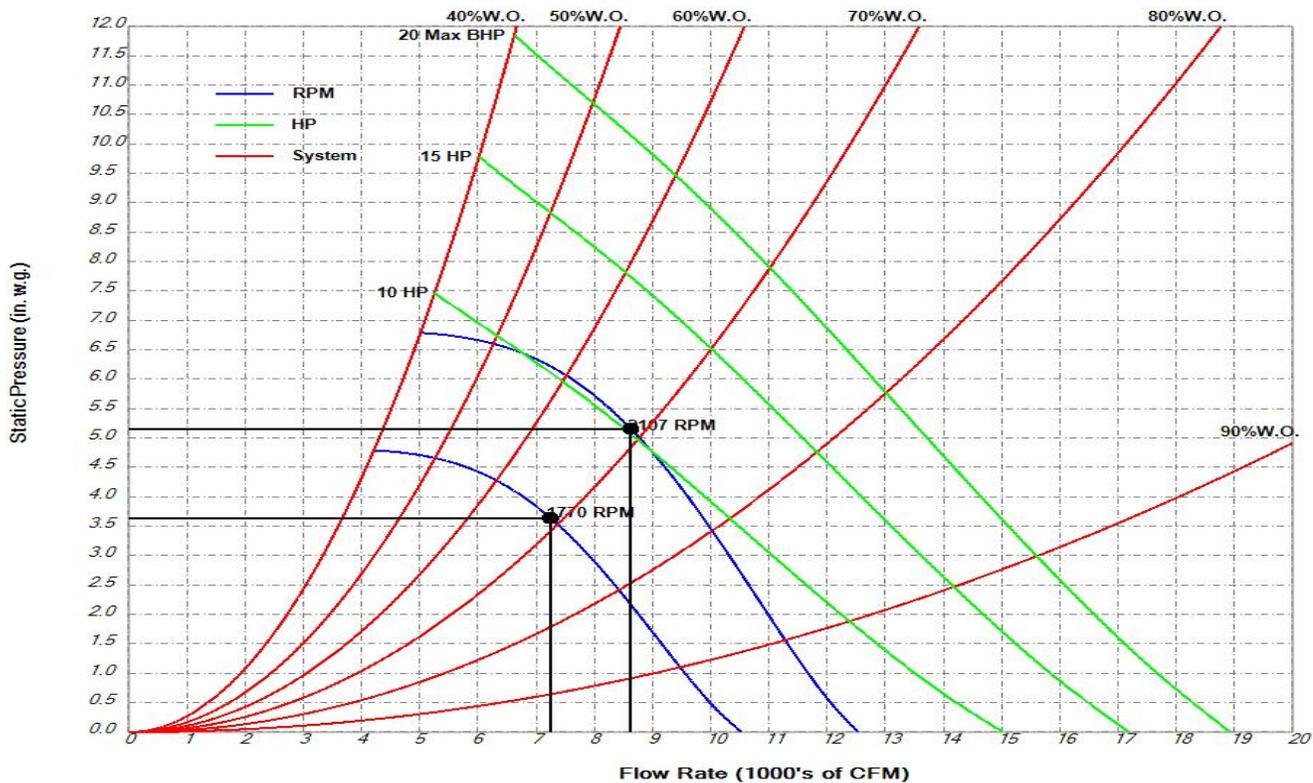
## Supply Fan(s)

Performance Details													
Fan Manufacturer	Model	# Blades	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Airflow per Fan (CFM)	Altitude (ft)	TSP (in w.g.)	ESP (in w.g.)	Fan Speed (RPM)	Fan Power (BHP)
Lau	DDPG2	9	II	222	100	100	1	8,626	0	5.16	2.00	2,107	10.16
Max RPM	Wheel Type	Blade Type	Wheel Material	Base Material		Fan Flow Isolation	AirFlow Monitoring		Inverter Drive Balancing	Isolation Type		Thrust Restraints	
2,454	SWSI	Airfoil	Aluminum	Galvanized Steel		None	Yes (K=2649.00)		-	2" Spring		Yes	
Drive Type		FEI	FEP (KW)		Inlet Screen	Fan Cage	Fan Stand	Motor Removal Rail		Seismic Snubber			
Direct Drive		1.30	8.45		-	-	-	-		-			
Motor Details													
Type / MFG	Motor Power (HP)		V/Ph/Hz	Quantity	Insulation Class	RPM	Frame Size	FLA (Amps)	Efficiency	Location	SGR		
ODP / Baldor	15.0		460/3/60	1	H	1,800	254T	18.93	Premium	Left	Yes		
At Motor Synchronous Details													
TSP (in w.g.)			Total Air Flow (CFM)			Fan Speed (RPM)			Fan Power (BHP)				
3.64			7,246			1,770			6.02				

### Notes

Certified by the AHRI Central Station Air-Handling Unit (AHU) Certification Program, based on AHRI Standard 430/431. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third-party verified. Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org)

Per California Energy Code (C.E.C.), Title 20, the selected fan ratings are only approved for use in equipment outside the state of California. Buyer assumes all liability for non-compliance of the noted regulation.

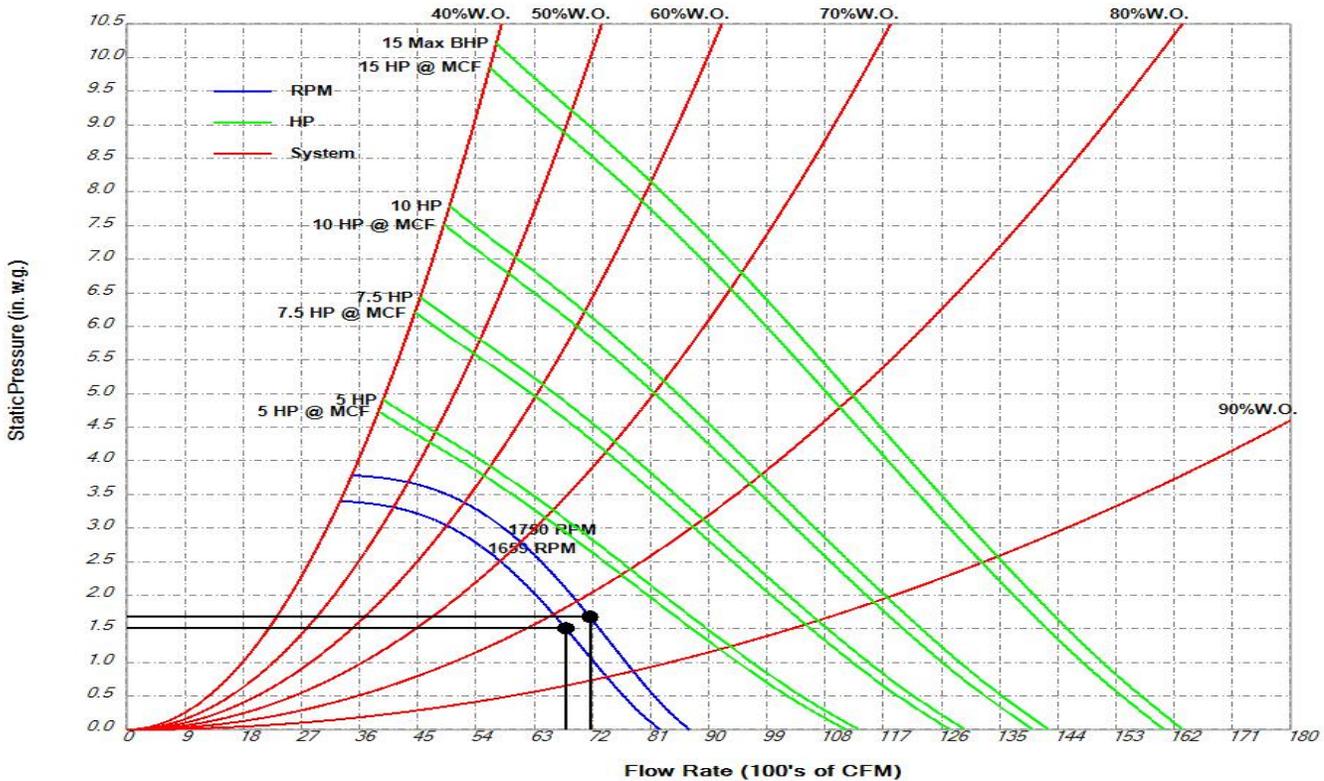


## Return Fan(s)

Performance Details													
Fan Manufacturer	Model	# Blades	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Airflow per Fan (CFM)	Altitude (ft)	TSP (in w.g.)	ESP (in w.g.)	Fan Speed (RPM)	Fan Power (BHP)
Lau	DDPG2	9	II	200	120	100	1	6,791	0	1.51	1.00	1,659	2.94
Max RPM	Wheel Type	Blade Type	Wheel Material	Base Material		Fan Flow Isolation	AirFlow Monitoring		Inverter Drive Balancing	Isolation Type		Thrust Restraints	
2,771	SWSI	Airfoil	Aluminum	Galvanized Steel		None	Yes (K=2136.00)		-	2" Spring		-	
Drive Type		FEI	FEP (KW)		Inlet Screen	Fan Cage		Fan Stand	Motor Removal Rail		Seismic Snubber		
Direct Drive		1.21	2.60		-	-		-	-		-		
Motor Details													
Type / MFG	Motor Power (HP)		V/Ph/Hz	Quantity	Insulation Class	RPM	Frame Size	FLA (Amps)	Efficiency	Location	SGR		
ODP / Baldor	5.0		460/3/60	1	H	1,800	184T	6.86	Premium	Left	Yes		
At Motor Synchronous Details													
TSP (in w.g.)			Total Air Flow (CFM)			Fan Speed (RPM)			Fan Power (BHP)				
1.68			7,164			1,750			3.45				

### Notes

Per California Energy Code (C.E.C.), Title 20, the selected fan ratings are only approved for use in equipment outside the state of California. Buyer assumes all liability for non-compliance of the noted regulation.



## Water Coil(s)

Coil Information							
Segment[Index]	Coil Tag	Coil Duty	Fluid Type	Airflow (cfm)	Flow Direction	Density	Altitude (ft)
HC[1]	-	Heating	Water	4362	Horizontal	Standard	0
CC[1]	-	Cooling	Water	8626	Horizontal	Standard	0

Coil Bank Configuration										
Segment[Index]	Tube Diameter (in) Fin Type	Total Fin Height (in)	Fin Length per Coil (in)	Face Velocity (fpm)	Stacking Rack Material	Coils High	Coils Wide	Coil Configuration	Coil Stagger (in)	Coil Pull Panel
HC[1]	0.500 Corrugated	55.00	48.00	238	-	1	1	Standard	0	Right Side
CC[1]	0.500 Corrugated	55.00	48.00	471	-	1	1	Standard	0	Right Side

Airside Performance							
Segment[Index]	EAT-DB (°F)	EAT-WB (°F)	LAT-DB (°F)	LAT-WB (°F)	TMBH	SMBH	Air Pressure Drop (in w.g.)
HC[1]	20.0	-	67.7	-	225	225	0.01
CC[1]	80.0	67.0	54.4	53.3	362	246	0.63

Fluidside Performance								
Segment[Index]	EFT (°F)	LFT (°F)	Fluid Velocity (fps)	Fluid Flow (gpm)	Fluid Pressure Drop (ft)	Rows	Tubes Per Circuit	Reynolds Number
HC[1]	180.0	160.0	1.8	23.2	1.8	1	2	18412
CC[1]	44.0	56.0	3.1	59.9	8.3	6	8	9132

Fin and Tube Configuration									
Segment[Index]	Fin Thickness (in) / Material	Fin Spacing (fpi)	Tube Thickness (in)	Turbulators	Return Bend Thickness	Casing Material	Coil Coating	Fouling Factor (hr.ft <sup>2</sup> .°F/BTU)	
HC[1]	0.008 Aluminum	8	0.016	No	0.016	Galvanized	None	-	
CC[1]	0.008 Aluminum	10	0.016	No	0.016	Galvanized	None	-	

Header and Connection Configuration						
Segment[Index]	Header Material	Connection Material	Connection Diameter (in)	Connection Offset (in)	Connection Type	Connection Location/Rotation
HC[1]	Copper	Steel	1.5	0	MPT	Right
CC[1]	Copper	Steel	2	0	MPT	Right

Other Performance			
Segment[Index]	Dry Weight (lbs)	Fluid Weight (lbs)	Internal Volume (ft <sup>3</sup> )
HC[1]	87	23	0.4
CC[1]	302	105	1.7

### Notes

- Performance is shown for the entire coil bank. Performance is not per coil.
- Coil index indicates position in segment. Example: CC-1, index 1; Spacer, index 2; CC-1, index 3
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- All Coils: Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program, which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org).
- HC[1]: AHRI Certified:Yes.Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program, which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org).
- CC[1]: AHRI Certified:Yes.Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program, which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org).
- All Coils: BDW Tube Spacing: 1.25 x 1.08
- All Coils: Coil DII Version: 8.12
- CC[1]: Note: When Conditions that produce condensate exist, coil face velocities above 626 fpm may result in condensate carryover.



### Drain(s)

Details			
Segment	Drain Pan		
	Liner Material	Connection Location	Liner Coating
CC	Stainless Steel, 304	Right	None

### Filter(s)

Details								
Segment	Type	Depth	Filter Loading	Media/MERV	# of Spares	Spare Filter Media	Frame Material	
RF	Pre Filter	2"	Side	Pleated 30% Efficiency (MERV 8)	1	Pleated 30% Efficiency (MERV 8)	Galvanized Steel	
RF	Primary Filter	12"	Side	Rigid 60% Efficiency (MERV 11)	-	-		
Sizes				Filter Gauge Details				
Segment	Filter	1 <sup>st</sup> Filter Size H x W (in)	1 <sup>st</sup> Qty	2 <sup>nd</sup> Filter Size H x W (in)	2 <sup>nd</sup> Qty	Location	Type	Range (in w.g)
RF	Pre Filter	12x24	6	20x24	2	Door	Combined Minihelic	0 - 2.0
RF	Primary Filter	12x24	6	20x24	2			

## Damper(s)

Details												
Segment	Air Path	H x W (in)	Qty	Total Face Velocity (ft/min)	Face Area (ft <sup>2</sup> )	Airflow (CFM)	Min Airflow Measurement (CFM)	Type	Config	Model	Material	Blade Orientation
DP	Exhaust Air	26.75 x 31.00	1	1,179	5.8	6,791	-	Control	100%	CD60	Galvanized	Parallel
MB	Outside Air	26.75 x 31.00	1	284	5.8	1,636	-	Control	100%	CD60	Galvanized	Parallel
MB	Return Air	15.25 x 47.00	1	1,364	5.0	6,791	-	Control	100%	CD60	Galvanized	Parallel

## Door(s)

Details												
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	ViewPort Wire	Test Port	Spare Gasket	Thermal Break	Fastener Type	Safety Latch	Noncontact Safety Interlock
MB	Right	Outward	Front	60 x 18 x 2	None	-	-	-	-	Plated	-	-
RF	Right	Outward	Front	60 x 18 x 2	None	-	-	-	-	Plated	-	-
XA	Right	Outward	Front	60 x 18 x 2	None	-	-	-	-	Plated	-	-
CC	Right	Outward	Rear	60 x 18 x 2	None	-	-	-	-	Plated	-	-
FS	Right	Outward	Rear	60 x 19 x 2	None	-	-	-	-	Plated	Yes	-
IP	Right	Outward	Rear	60 x 18 x 2	None	-	-	-	-	Plated	-	-
FR	Right	Outward	Front	60 x 18 x 2	None	-	-	-	-	Plated	Yes	-
DP	Right	Outward	Rear	60 x 18 x 2	None	-	-	-	-	Plated	Yes	-

## Motor Control(s)

VFD Details										
Segment	Type	V/Ph/Hz	Input/Output Amps*	Efficiency (%)	Heat Loss (at 100% load)	Enclosure	Bypass	Disconnect Type	RFI/EMI EMC Filter	
FR	AYK-580	460/3/60	7.6/7.6	98	133	NEMA 1	-	Fused	Yes	
FS	AYK-580	460/3/60	23/23	98	322	NEMA 1	-	Fused	Yes	

### Notes (ABB VFD)

\*Drives are rated for use below 3,000 ft and 104°F. Refer to the Air-Mod Engineering Guide Form 100.42-EGI (813) for additional information. Drives are current rated devices. The HP ratings provided are for reference only and are based on typical 4-pole motors at nominal voltages (NEC Table 430-150). If full motor torque is required, ensure the drive has a continuous current rating equal to, or greater than, the full load amp rating of the motor.

Storage Temperature: -40°F to 158°F (-40°C to 70°C).

Ambient Operating Temperature: Temperate 5°F to 104°F (-15°C to 40°C). De-rating to operate at 122°F (50°C).

Relative Humidity: 5% to 95% non-condensing. Maximum relative humidity is 60% in the presence of corrosive gasses.

Altitude: 100% Load Capacity (No De-rating) up to 3,300 ft. (1,000 m). 1% derating for each 330 ft. above 3,300 ft. Installations above 6,600ft. (2,000 m) require review.

If 8KHZ Switching Frequency is used, de-rate output current to 80%.

Overload Current Rating: 110% for 1 minute every 10 minutes and is capable of 130% short term-overload rating for 2 seconds our of each minute. If applicable, motor overload protection in the bypass mode is provided by a Class 20 motor overload relay.

The customer is responsible for providing either a platform/catwalk or portable means to access the VFD when the VFD is installed where the center of the handle of the disconnecting means in its uppermost position is greater than 78" above the finished floor.

Input line Impedance: 5% Equivalent Input Impedance with internal reactor(s). Patented swinging choke design for superior harmonic mitigation.

Use Copper Conductors Only. Do not use aluminum wire.

## Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (ft <sup>2</sup> )	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
MB	CD60 (Control Damper - Galvanized Airfoil)	5.0	6,791	1,364	0.06	0.00
MB	Safety Cover	5.0	6,791	1,364	0.20	0.00
MB	Return Air Opening	5.0	6,791	1,364	0.31	0.00
RF	2" Pleated 30% Efficiency (MERV 8)	18.7	8,626	462	0.26	0.00
RF	Dirty Filter Allowance - Pre Filter	0.0		0	0.50	0.00
RF	12" Rigid 60% Efficiency (MERV 11)	18.7	8,626	462	0.29	0.00
RF	Dirty Filter Allowance	0.0		0	0.50	0.00
HC	Heating - 1 Row - 8 Fins Per Inch	36.2	8,626	238	0.01	0.00
CC	Cooling - 6 Row - 10 Fins Per Inch	18.3	8,626	471	0.63	0.00
FS	Supply Air Opening	5.6	8,626	1,541	0.40	0.00
FS	External Static - User Entered	0.0		0	2.00	0.00
IP	Return Air Opening	5.6	6,791	1,213	0.00	0.25
FR	External Static - User Entered	0.0		0	0.00	1.00
DP	CD60 (Control Damper - Galvanized Airfoil)	5.8	6,791	1,179	0.00	0.03
DP	Exhaust Air Opening	5.8	6,791	1,179	0.00	0.23
<b>Total</b>					<b>5.16</b>	<b>1.51</b>

## Dimensions and Weight

Details					
Segment	Description	Length <sup>1</sup> (in)	Height (in)	Width <sup>2</sup> (in)	Weight <sup>3</sup> (lbs)
IP	Inlet Plenum	21	66	60	361
FR	Fan (Return)	38	66	60	709
DP	Discharge Plenum	31	66	60	488
MB	Mixing Box	31	66	60	645
RF	Rigid Filter	18	66	60	381
HC	Heating Coil	10	66	60	264
XA	Access	18	66	60	213
CC	Cooling Coil	32	66	60	817
FS	Fan (Supply)	43	66	60	1,260
<b>Overall</b>		<b>152</b>			

### Notes

<sup>1</sup>The length includes bottom tier segments only.

<sup>2</sup>The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

<sup>3</sup>See Shipping Summary for notes on weights.

## Report and Sound Summary:

Unit Sound Power Levels (dBs re 10 <sup>-12</sup> Watts)									
Opening	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Supply Air, Rear, FS-1	85	84	92	89	88	83	81	80	
Outside Air, EE-1	85	82	92	84	82	79	76	74	88
Exhaust Air, EE-1	86	82	91	85	84	82	79	76	90

### Notes

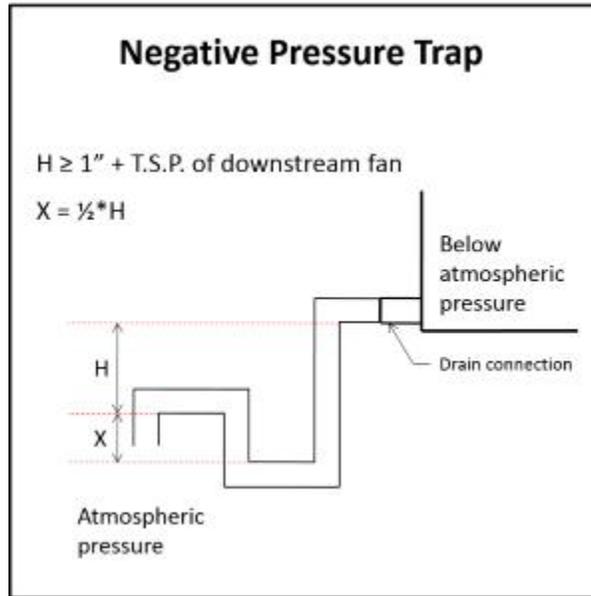
Sound data is determined from interpolation of AHU test data in accordance with the latest version of AHRI Standard 260 Sound Rating of Ducted Air Moving and Conditioning Equipment.. Unit attenuation is calculated based on measured appurtenance insertion loss, and industry accepted acoustic models.

**NOTES:**

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.
2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.
3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

## Recommended Trap Height

Details									
Segment	Applicable Fan	Fan TSP (in w.g.)	Positive or Negative	Calculated Dimensions (in)			Recommended Dimensions (in)		Base Rail Height (in)
				H	X	H + X	H	H + X	
CC	Supply Fan	5.16	Negative	5.76	2.88	8.64	6.00	8.75	6



### Notes

Formulas and calculations are recommendations only. Contractor shall determine actual dimensions required for each trap based on jobsite conditions, and application requirements.

Refer to the Installation Manual of the IOM for more information.

## Statement of Compliance

### Details

Air Handling Unit AHU's meet IBC seismic requirements for non-critical equipment ( $I_p = 1.0$ ) for locations with design spectral response  $S_d \leq 0.43$ . Units must be rigid mounted.

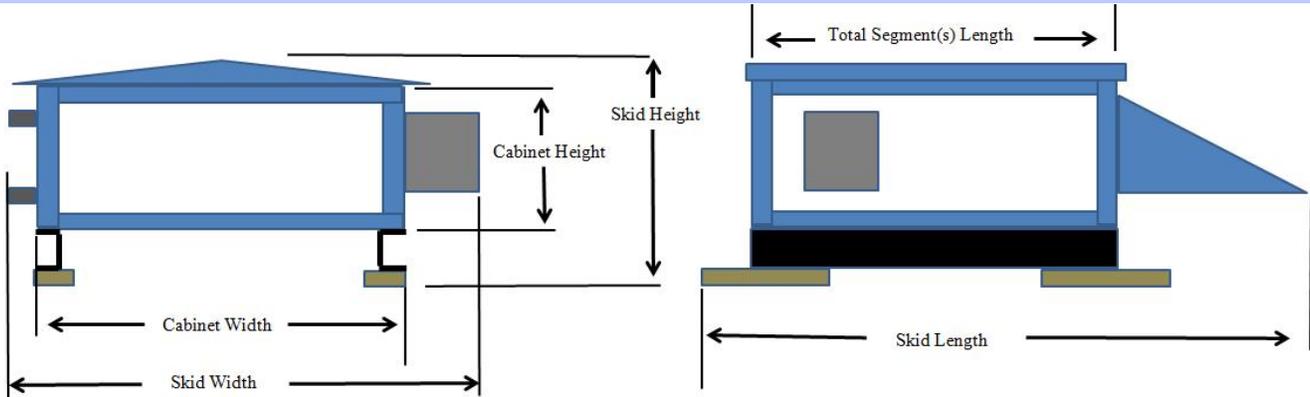
The anchorage of the unit to the ground or building structure needs to be evaluated by and is the responsibility of the engineer of record. Specification of seismic requirements is the responsibility of the project design engineer. If formal certification is required, please contact your sales representative and/or application engineer for review. Certain application and site requirements may require additional cost and/or lead time.

Component locations are listed as Segment Hand (Unit Hand): ex. Left (Right). See Submittal Drawing for additional details.

Air handling unit parameters vary depending on conditions. Parameters such as airflows, air pressure drops, and coil capacities are shown for design conditions.

## Shipping Summary

Details					
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Shipping Weight (lbs)	Operating Weight (lbs)
FS CC XA HC RF MB	152	79	75	3,454	3,580
IP FR DP	90	72	75	1,629	1,558
<b>Overall</b>					<b>5,138</b>



### Notes

**Skid Width:** Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).

**Skid Height:** Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping wood-blocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).

**Skid Length:** Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping wood-blocks, front dampers, split connectors, electrical/control components, outrigging extensions, isolation dampers, inlet baskets).

**Shipping Weight:** Represents the estimated shipping weight with a tolerance of +/- 10% for values greater than 5,000 lbs. Values less than 5,000 lbs. may have higher percentage variation but not any consequential shipping impact. Shipping weight does not include ship loose and/or field-installed items but does include estimate for shipping materials and/or opening covers.

**Operating Weight:** Represents the estimated operational weight with a tolerance of +/- 10% for values greater than 5,000 lbs. Values less than 5,000 lbs. may have higher percentage variation. Operational weight estimate includes unit shell, internal components and structure, and known ship loose and/or field-installed items (weather hoods, pipe chases, factory-provided filter media and estimated fluid weight in coils). Actual operating weight will be heavier due to additional field installed materials including but not limited to field-provided filter media, piping, control devices, and/or inertia base concrete.

## Job Summary

<b>Project Name:</b>	UNC Pembroke Chavis AHUs		
<b>Unit Tag(s):</b>	AHU-7		
<b>Quantity:</b>	1	<b>Environment:</b>	Indoor



## Unit Overview

Model	Airflow (CFM)	Altitude (ft)	Operating Weight (lbs)
XTI-66x66	10,241	0	5,476

## Segment Sequence

(IP FR DP)(FS CC XA HC RF MB)

## Unit Construction

Casing Details								
Segment(s)	Thickness (in)	Exterior Paint	Exterior Gauge and Material	Interior Gauge and Material	Insulation Thickness and Material	Mylar Lining	Thermal Break	Bulkhead Material
IP, DP, MB, XA	2"	None	Standard Ga. G-90 Galvanized	Standard Ga. G-90 Galvanized	2" Foam	-	-	None
FR, RF, HC, CC, FS	2"	None	Standard Ga. G-90 Galvanized	Standard Ga. G-90 Galvanized	2" Foam	-	-	Galvanized Steel

Base Details		
Segment(s)	Material	Paint
MB, RF, HC, XA, CC, FS	6" Formed Steel	None

Floor Details						
Segment(s)	Gauge and Material	Paint	Insulation	Thermal Break	Attachment	Sub-Floor Gauge and Material
MB, RF, HC, XA, CC, FS	Standard Ga. G-90 Galvanized	None	2"	-	Screw Down	None
IP, FR, DP	Standard Ga. G-90 Galvanized	None	2" Foam	-	-	N/A

## Unit Electrical

Circuit Details					
#	Component(s)	V/Ph/Hz	Full Load Amps (FLA)	Minimum Current Ampacity (MCA)	Maximum Overcurrent Protection (MOP)
1	FS VFD-1 (on FS)	460/3/60	18.90	23.63	40
2	FR VFD-1 (on FR)	460/3/60	9.80	12.25	20
3	Light Switch (on FS)	120/1/60	-	-	15

Electrical Details			
Minimum Unit SCCR	100 kA rms Symmetrical	ETL Label (UL1995/NEC-2002)	Yes
Unit Light Type		Light Switch Enclosure	
LED		Indoor	

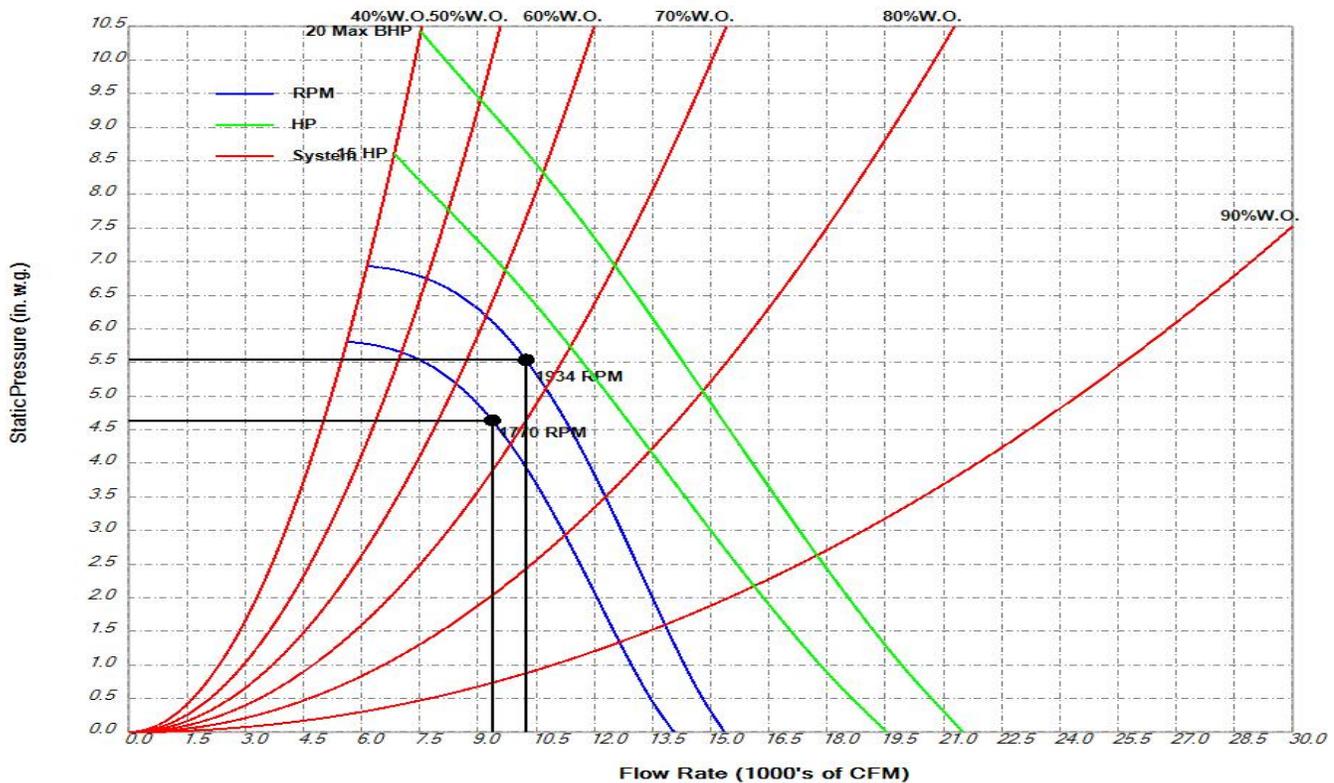
## Supply Fan(s)

Performance Details													
Fan Manufacturer	Model	# Blades	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Airflow per Fan (CFM)	Altitude (ft)	TSP (in w.g.)	ESP (in w.g.)	Fan Speed (RPM)	Fan Power (BHP)
Lau	DDPG2	9	II	245	100	100	1	10,241	0	5.54	2.00	1,934	12.82
Max RPM	Wheel Type	Blade Type	Wheel Material	Base Material		Fan Flow Isolation	AirFlow Monitoring		Inverter Drive Balancing	Isolation Type		Thrust Restraints	
2,269	SWSI	Airfoil	Aluminum	Galvanized Steel		None	Yes (K=3092.00)		-	2" Spring		Yes	
Drive Type		FEI	FEP (KW)		Inlet Screen	Fan Cage		Fan Stand	Motor Removal Rail		Seismic Snubber		
Direct Drive		1.29	10.64		-	-		-	-		-		
Motor Details													
Type / MFG	Motor Power (HP)		V/Ph/Hz	Quantity	Insulation Class	RPM	Frame Size	FLA (Amps)	Efficiency	Location	SGR		
ODP / Baldor	15.0		460/3/60	1	H	1,800	254T	18.93	Premium	Left	Yes		
At Motor Synchronous Details													
TSP (in w.g.)			Total Air Flow (CFM)			Fan Speed (RPM)			Fan Power (BHP)				
4.64			9,373			1,770			9.83				

### Notes

Certified by the AHRI Central Station Air-Handling Unit (AHU) Certification Program, based on AHRI Standard 430/431. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third-party verified. Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org)

Per California Energy Code (C.E.C.), Title 20, the selected fan ratings are only approved for use in equipment outside the state of California. Buyer assumes all liability for non-compliance of the noted regulation.

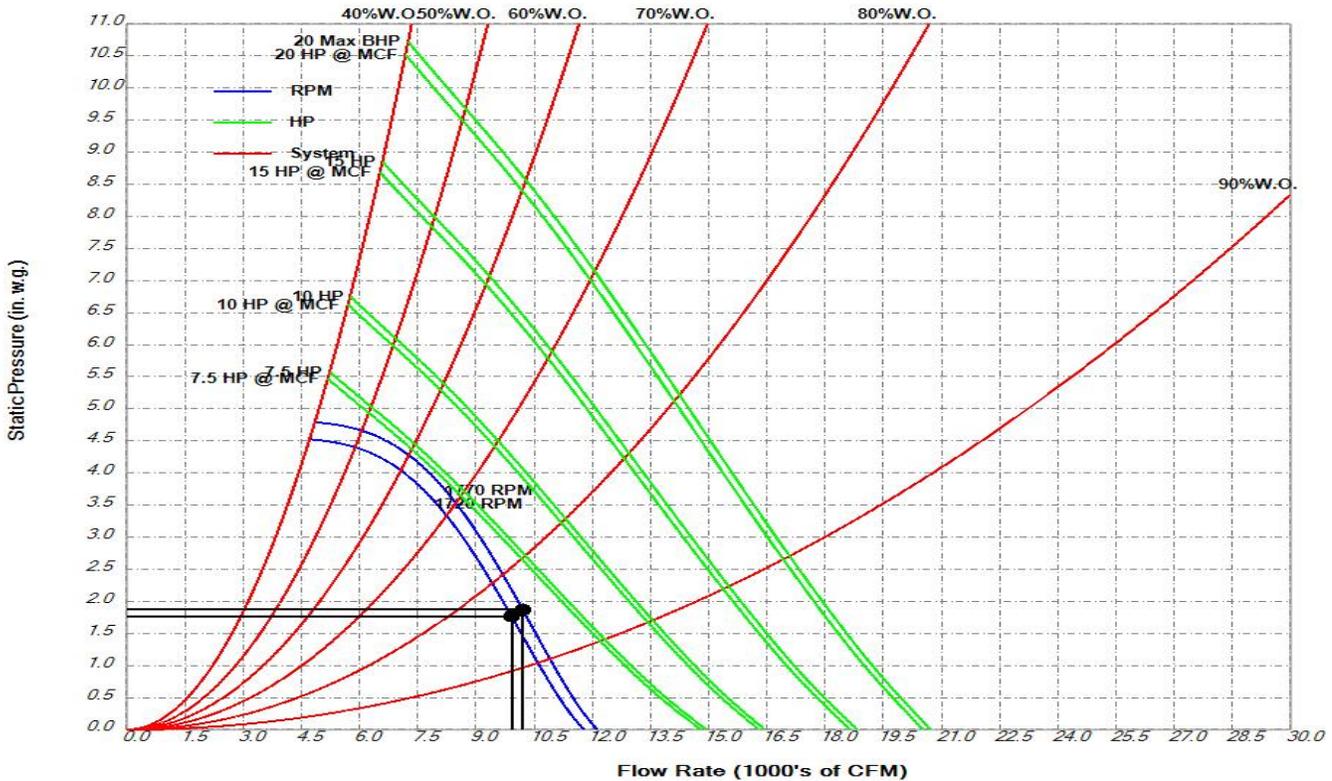


## Return Fan(s)

Performance Details													
Fan Manufacturer	Model	# Blades	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Airflow per Fan (CFM)	Altitude (ft)	TSP (in w.g.)	ESP (in w.g.)	Fan Speed (RPM)	Fan Power (BHP)
Lau	DDPG2	9	II	222	120	100	1	9,920	0	1.77	1.00	1,720	5.41
Max RPM	Wheel Type	Blade Type	Wheel Material	Base Material	Fan Flow Isolation	AirFlow Monitoring	Inverter Drive Balancing	Isolation Type	Thrust Restraints				
2,454	SWSI	Airfoil	Aluminum	Galvanized Steel	None	Yes (K=2649.00)	-	2" Spring	-				
Drive Type	FEI	FEP (KW)	Inlet Screen	Fan Cage	Fan Stand	Motor Removal Rail	Seismic Snubber						
Direct Drive	1.08	4.65	-	-	-	-	-						
Motor Details													
Type / MFG	Motor Power (HP)	V/Ph/Hz	Quantity	Insulation Class	RPM	Frame Size	FLA (Amps)	Efficiency	Location	SGR			
ODP / Baldor	7.5	460/3/60	1	H	1,800	213T	9.80	Premium	Right	Yes			
At Motor Synchronous Details													
TSP (in w.g.)	Total Air Flow (CFM)	Fan Speed (RPM)	Fan Power (BHP)										
1.87	10,208	1,770	5.90										

### Notes

Per California Energy Code (C.E.C.), Title 20, the selected fan ratings are only approved for use in equipment outside the state of California. Buyer assumes all liability for non-compliance of the noted regulation.



## Water Coil(s)

Coil Information							
Segment[Index]	Coil Tag	Coil Duty	Fluid Type	Airflow (cfm)	Flow Direction	Density	Altitude (ft)
HC[1]	-	Heating	Water	6725	Horizontal	Standard	0
CC[1]	-	Cooling	Water	10241	Horizontal	Standard	0

Coil Bank Configuration										
Segment[Index]	Tube Diameter (in) Fin Type	Total Fin Height (in)	Fin Length per Coil (in)	Face Velocity (fpm)	Stacking Rack Material	Coils High	Coils Wide	Coil Configuration	Coil Stagger (in)	Coil Pull Panel
HC[1]	0.500 Corrugated	55.00	54.00	326	-	1	1	Standard	0	Right Side
CC[1]	0.500 Corrugated	55.00	54.00	497	-	1	1	Standard	0	Right Side

Airside Performance							
Segment[Index]	EAT-DB (°F)	EAT-WB (°F)	LAT-DB (°F)	LAT-WB (°F)	TMBH	SMBH	Air Pressure Drop (in w.g.)
HC[1]	20.0	-	62.0	-	306	306	0.02
CC[1]	75.6	65.1	54.9	53.8	349	236	0.60

Fluidside Performance								
Segment[Index]	EFT (°F)	LFT (°F)	Fluid Velocity (fps)	Fluid Flow (gpm)	Fluid Pressure Drop (ft)	Rows	Tubes Per Circuit	Reynolds Number
HC[1]	180.0	160.1	2.5	31.5	3.3	1	2	25082
CC[1]	44.0	56.1	3.0	57.5	8.3	6	8	8775

Fin and Tube Configuration									
Segment[Index]	Fin Thickness (in) / Material	Fin Spacing (fpi)	Tube Thickness (in)	Turbulators	Return Bend Thickness	Casing Material	Coil Coating	Fouling Factor (hr.ft <sup>2</sup> .°F/BTU)	
HC[1]	0.008 Aluminum	8	0.016	No	0.016	Galvanized	None	-	
CC[1]	0.008 Aluminum	9	0.016	No	0.016	Galvanized	None	-	

Header and Connection Configuration						
Segment[Index]	Header Material	Connection Material	Connection Diameter (in)	Connection Offset (in)	Connection Type	Connection Location/Rotation
HC[1]	Copper	Steel	1.5	0	MPT	Right
CC[1]	Copper	Steel	2	0	MPT	Right

Other Performance			
Segment[Index]	Dry Weight (lbs)		Internal Volume (ft <sup>3</sup> )
HC[1]	93		0.4
CC[1]	318		1.9

### Notes

- Performance is shown for the entire coil bank. Performance is not per coil.
- Coil index indicates position in segment. Example: CC-1, index 1; Spacer, index 2; CC-1, index 3
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- All Coils: Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program, which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org).
- HC[1]: AHRI Certified:Yes.Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program, which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org).
- CC[1]: AHRI Certified:Yes.Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program, which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org).
- All Coils: BDW Tube Spacing: 1.25 x 1.08
- All Coils: Coil DII Version: 8.12
- CC[1]: Note: When Conditions that produce condensate exist, coil face velocities above 649 fpm may result in condensate carryover.



### Drain(s)

Details			
Segment	Drain Pan		
	Liner Material	Connection Location	Liner Coating
CC	Stainless Steel, 304	Right	None

### Filter(s)

Details										
Segment	Type	Depth	Filter Loading	Media/MERV	# of Spares	Spare Filter Media	Frame Material			
RF	Pre Filter	2"	Side	Pleated 30% Efficiency (MERV 8)	-	-	Galvanized Steel			
RF	Primary Filter	12"	Side	Rigid 60% Efficiency (MERV 11)	-	-				
Sizes							Filter Gauge Details			
Segment	Filter	1 <sup>st</sup> Filter Size H x W (in)	1 <sup>st</sup> Qty	2 <sup>nd</sup> Filter Size H x W (in)	2 <sup>nd</sup> Qty	3 <sup>rd</sup> Filter Size H x W (in)	3 <sup>rd</sup> Qty	Location	Type	Range (in w.g)
RF	Pre Filter	20x20	4	20x16	2	16x20	2	Door	Combined Minihelic	0 - 2.0
RF	Primary Filter	20x20	4	20x16	2	16x20	2			

## Damper(s)

Details												
Segment	Air Path	H x W (in)	Qty	Total Face Velocity (ft/min)	Face Area (ft <sup>2</sup> )	Airflow (CFM)	Min Airflow Measurement (CFM)	Type	Config	Model	Material	Blade Orientation
DP	Exhaust Air	21.00 x 47.00	1	1,447	6.9	9,920	-	Control	100%	CD60	Galvanized	Parallel
MB	Outside Air	21.00 x 47.00	1	47	6.9	321	-	Control	100%	CD60	Galvanized	Parallel
MB	Return Air	15.25 x 55.00	1	1,703	5.8	9,920	-	Control	100%	CD60	Galvanized	Parallel

## Door(s)

Details												
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	ViewPort Wire	Test Port	Spare Gasket	Thermal Break	Fastener Type	Safety Latch	Noncontact Safety Interlock
MB	Right	Outward	Front	60 x 18 x 2	None	-	-	-	-	Plated	-	-
RF	Right	Outward	Front	60 x 18 x 2	None	-	-	-	-	Plated	-	-
XA	Right	Outward	Front	60 x 18 x 2	None	-	-	-	-	Plated	-	-
CC	Right	Outward	Rear	60 x 18 x 2	None	-	-	-	-	Plated	-	-
FS	Right	Outward	Rear	60 x 19 x 2	None	-	-	-	-	Plated	Yes	-
IP	Right	Outward	Rear	60 x 18 x 2	None	-	-	-	-	Plated	-	-
FR	Right	Outward	Front	60 x 19 x 2	None	-	-	-	-	Plated	Yes	-
DP	Right	Outward	Front	60 x 18 x 2	None	-	-	-	-	Plated	Yes	-

## Motor Control(s)

VFD Details										
Segment	Type	V/Ph/Hz	Input/Output Amps*	Efficiency (%)	Heat Loss (at 100% load)	Enclosure	Bypass	Disconnect Type	RFI/EMI EMC Filter	
FS	AYK-580	460/3/60	23/23	98	322	NEMA 1	-	Fused	Yes	
FR	AYK-580	460/3/60	12/12	98	174	NEMA 1	-	Fused	Yes	

### Notes (ABB VFD)

\*Drives are rated for use below 3,000 ft and 104°F. Refer to the Air-Mod Engineering Guide Form 100.42-EGI (813) for additional information. Drives are current rated devices. The HP ratings provided are for reference only and are based on typical 4-pole motors at nominal voltages (NEC Table 430-150). If full motor torque is required, ensure the drive has a continuous current rating equal to, or greater than, the full load amp rating of the motor.

Storage Temperature: -40°F to 158°F (-40°C to 70°C).

Ambient Operating Temperature: Temperate 5°F to 104°F (-15°C to 40°C). De-rating to operate at 122°F (50°C).

Relative Humidity: 5% to 95% non-condensing. Maximum relative humidity is 60% in the presence of corrosive gasses.

Altitude: 100% Load Capacity (No De-rating) up to 3,300 ft. (1,000 m). 1% derating for each 330 ft. above 3,300 ft. Installations above 6,600ft. (2,000 m) require review.

If 8KHZ Switching Frequency is used, de-rate output current to 80%.

Overload Current Rating: 110% for 1 minute every 10 minutes and is capable of 130% short term-overload rating for 2 seconds our of each minute. If applicable, motor overload protection in the bypass mode is provided by a Class 20 motor overload relay.

The customer is responsible for providing either a platform/catwalk or portable means to access the VFD when the VFD is installed where the center of the handle of the disconnecting means in its uppermost position is greater than 78" above the finished floor.

Input line Impedance: 5% Equivalent Input Impedance with internal reactor(s). Patented swinging choke design for superior harmonic mitigation.

Use Copper Conductors Only. Do not use aluminum wire.

## Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (ft <sup>2</sup> )	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
MB	CD60 (Control Damper - Galvanized Airfoil)	5.8	9,920	1,703	0.09	0.00
MB	Safety Cover	5.8	9,920	1,703	0.31	0.00
MB	Return Air Opening	5.8	9,920	1,703	0.49	0.00
RF	2" Pleated 30% Efficiency (MERV 8)	20.0	10,241	512	0.30	0.00
RF	Dirty Filter Allowance - Pre Filter	0.0		0	0.50	0.00
RF	12" Rigid 60% Efficiency (MERV 11)	20.0	10,241	512	0.33	0.00
RF	Dirty Filter Allowance	0.0		0	0.50	0.00
HC	Heating - 1 Row - 8 Fins Per Inch	31.4	10,241	326	0.02	0.00
CC	Cooling - 6 Row - 9 Fins Per Inch	20.6	10,241	497	0.60	0.00
FS	Supply Air Opening	6.7	10,241	1,536	0.40	0.00
FS	External Static - User Entered	0.0		0	2.00	0.00
IP	Return Air Opening	6.7	9,920	1,488	0.00	0.37
FR	External Static - User Entered	0.0		0	0.00	1.00
DP	CD60 (Control Damper - Galvanized Airfoil)	6.9	9,920	1,447	0.00	0.05
DP	Exhaust Air Opening	6.9	9,920	1,447	0.00	0.35
<b>Total</b>					<b>5.54</b>	<b>1.77</b>

## Dimensions and Weight

Details					
Segment	Description	Length <sup>1</sup> (in)	Height (in)	Width <sup>2</sup> (in)	Weight <sup>3</sup> (lbs)
IP	Inlet Plenum	21	66	66	380
FR	Fan (Return)	39	66	66	798
DP	Discharge Plenum	31	66	66	518
MB	Mixing Box	31	66	66	691
RF	Rigid Filter	18	66	66	382
HC	Heating Coil	10	66	66	280
XA	Access	18	66	66	220
CC	Cooling Coil	32	66	66	861
FS	Fan (Supply)	44	66	66	1,346
<b>Overall</b>		<b>153</b>			

### Notes

<sup>1</sup>The length includes bottom tier segments only.

<sup>2</sup>The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

<sup>3</sup>See Shipping Summary for notes on weights.

## Report and Sound Summary:

Unit Sound Power Levels (dBs re 10 <sup>-12</sup> Watts)									
Opening	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Supply Air, Rear, FS-1	87	86	92	90	88	83	81	80	
Outside Air, EE-1	88	85	94	88	86	82	80	78	91
Exhaust Air, EE-1	90	86	94	90	88	85	83	80	93

### Notes

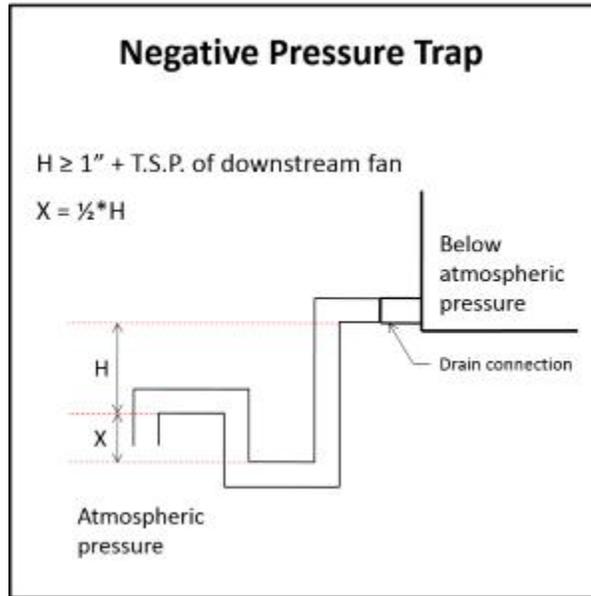
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**NOTES:**

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.
2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.
3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

## Recommended Trap Height

Details									
Segment	Applicable Fan	Fan TSP (in w.g.)	Positive or Negative	Calculated Dimensions (in)			Recommended Dimensions (in)		Base Rail Height (in)
				H	X	H + X	H	H + X	
CC	Supply Fan	5.54	Negative	6.14	3.07	9.21	6.25	9.25	6



### Notes

Formulas and calculations are recommendations only. Contractor shall determine actual dimensions required for each trap based on jobsite conditions, and application requirements.

Refer to the Installation Manual of the IOM for more information.

## Statement of Compliance

### Details

Air Handling Unit AHU's meet IBC seismic requirements for non-critical equipment ( $I_p = 1.0$ ) for locations with design spectral response  $S_d \leq 0.43$ . Units must be rigid mounted.

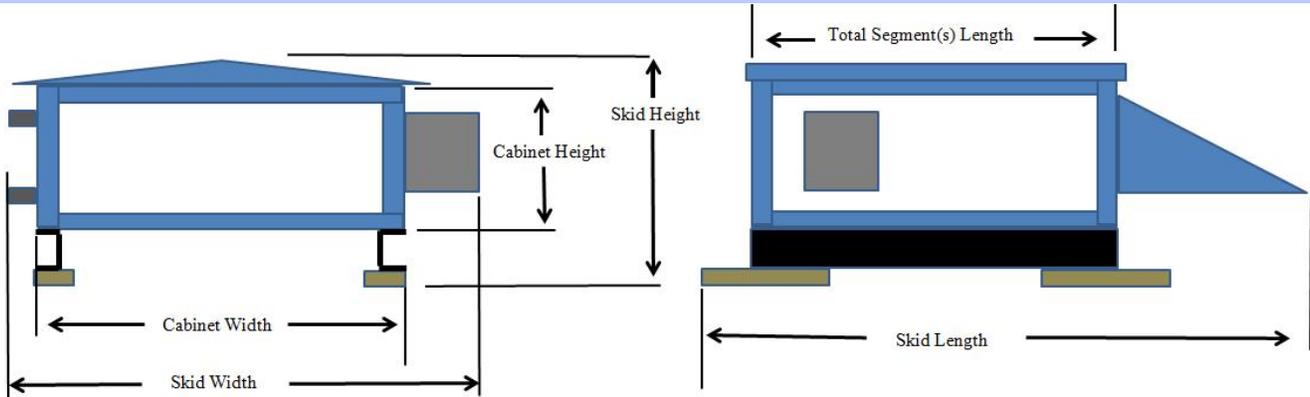
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Component locations are listed as Segment Hand (Unit Hand): ex. Left (Right). See Submittal Drawing for additional details.

Air handling unit parameters vary depending on conditions. Parameters such as airflows, air pressure drops, and coil capacities are shown for design conditions.

## Shipping Summary

Details					
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Shipping Weight (lbs)	Operating Weight (lbs)
FS CC XA HC RF MB	153	79	80	3,642	3,780
IP FR DP	91	72	80	1,769	1,696
<b>Overall</b>					<b>5,476</b>



### Notes

**Skid Width:** Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).

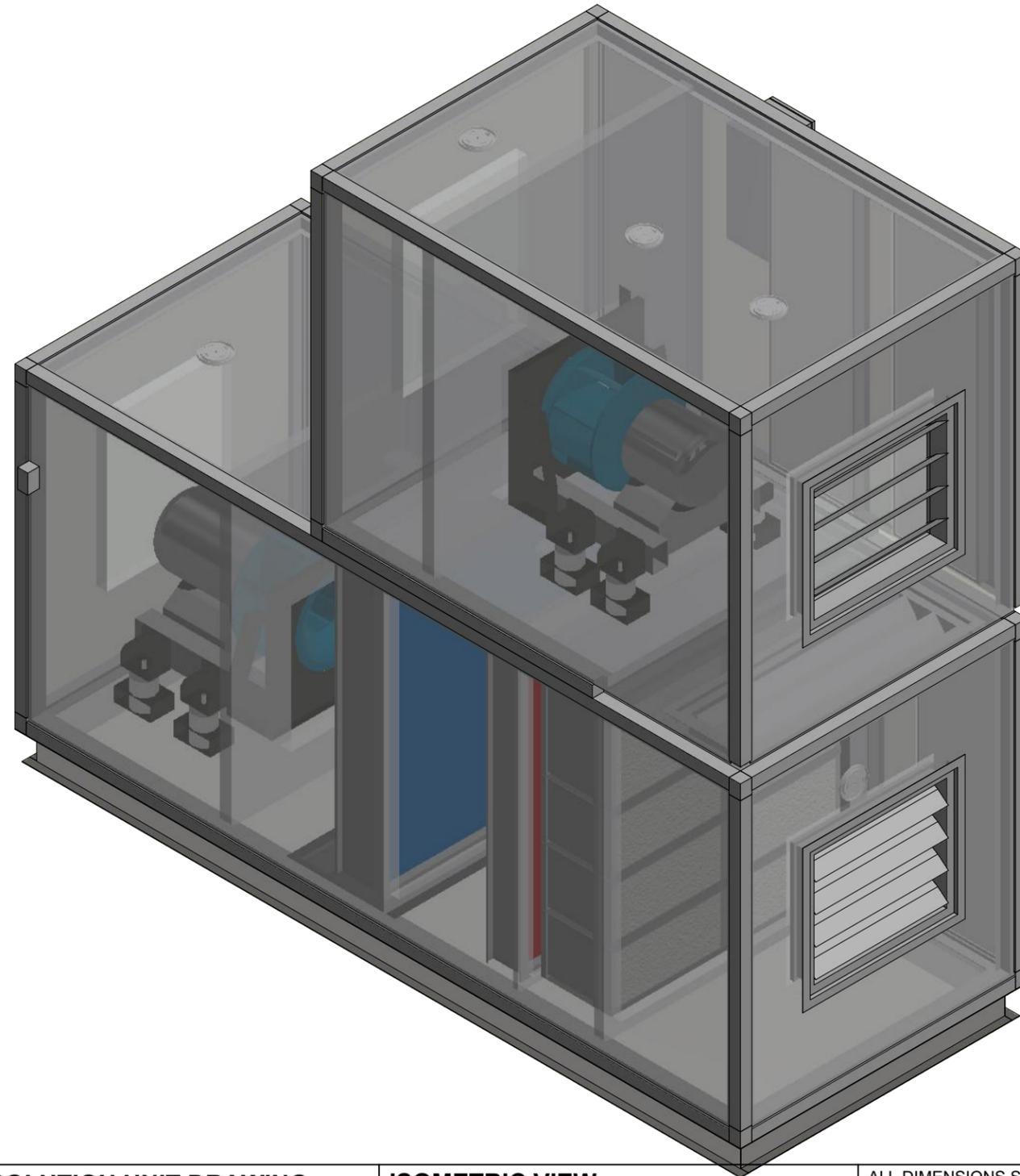
**Skid Height:** Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping wood-blocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).

**Skid Length:** Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping wood-blocks, front dampers, split connectors, electrical/control components, outriggering extensions, isolation dampers, inlet baskets).

**Shipping Weight:** Represents the estimated shipping weight with a tolerance of +/- 10% for values greater than 5,000 lbs. Values less than 5,000 lbs. may have higher percentage variation but not any consequential shipping impact. Shipping weight does not include ship loose and/or field-installed items but does include estimate for shipping materials and/or opening covers.

**Operating Weight:** Represents the estimated operational weight with a tolerance of +/- 10% for values greater than 5,000 lbs. Values less than 5,000 lbs. may have higher percentage variation. Operational weight estimate includes unit shell, internal components and structure, and known ship loose and/or field-installed items (weather hoods, pipe chases, factory-provided filter media and estimated fluid weight in coils). Actual operating weight will be heavier due to additional field installed materials including but not limited to field-provided filter media, piping, control devices, and/or inertia base concrete.

# Unit Drawings

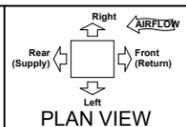


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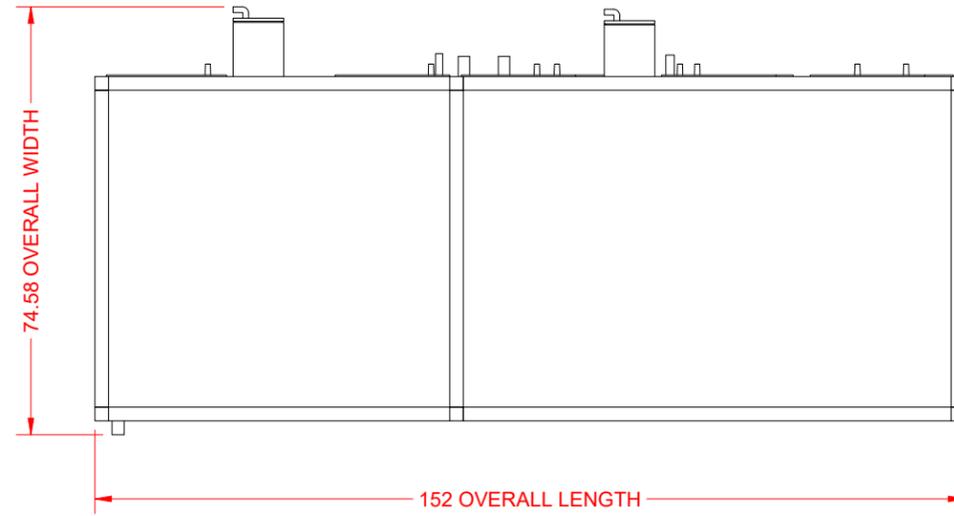
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 MODEL: XT1-66x60      03/11/2026 01:37:56 PM UTC  
 DESIGNATION: AHU-6  
 PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**ISOMETRIC VIEW**  
 SHEET 1 OF 6      CONTRACT#:  
 UNIT TAG: **AHU-6**

ALL DIMENSIONS SHOWN IN: INCHES  
 DRAWING SCALE: NTS  
 DIMENSION TOLERANCES: UNIT (+/- 1/2"); PIPING (+/- 2")  
 WEIGHT: 5138 (+/- 10%)  
**DRAWING NOT TO BE USED FOR CONSTRUCTION**



TOP [PLAN] VIEW



NOTES:

UNITS WITH A BASERAIL AND A BOTTOM OPENING: DUCT CONNECTION FLUSH WITH THE BOTTOM OF UNIT, NOT FLUSH WITH BOTTOM OF BASERAIL.

REFER TO PERFORMANCE REPORT FOR SHIPPING SPLIT DETAILS.

ALLOW SUFFICIENT SPACE AROUND THE UNIT FOR REMOVING THE ACCESS PANELS AND VARIOUS PARTS OF THE UNIT. A MINIMUM CLEARANCE EQUAL TO THE WIDTH OF THE UNIT MUST BE PROVIDED ON ONE SIDE OF THE UNIT FOR REMOVING THE COIL OR FAN ASSEMBLY.

CONTRACTOR RESPONSIBLE FOR PENETRATIONS AND CONNECTIONS OF ALL ELECTRICAL BOXES AND INTERNAL COIL CONNECTIONS (IF PRESENT).

OVERALL DIMENSIONS ACCOUNT FOR COMPONENTS EXTENDING BEYOND UNIT CABINET IN ORDER TO CONVEY THE TRUE SPACE REQUIREMENTS FOR THE UNIT. THESE ITEMS MAY INCLUDE OUTDOOR ROOF PEAK, MOTOR CONTROL AND/OR FACTORY PACKAGE CONTROL BOXES, WEATHER HOODS, PIPE CHASES, DAMPER/LOUVER ASSEMBLIES, AND/OR UNIT BASE RAIL.

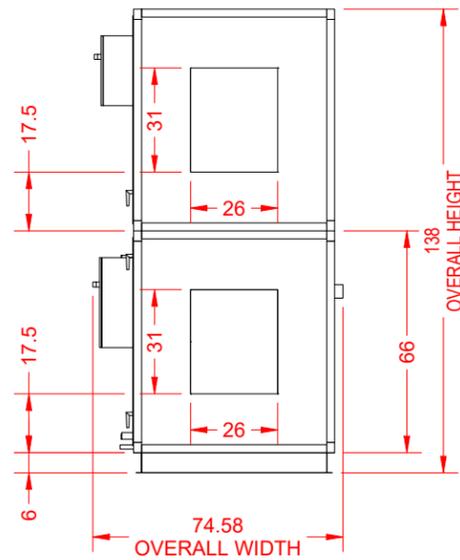
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THE OVERALL UNIT LENGTH MAY INCLUDE ADDITIONAL 1/4" PER SHIPPING SPLIT (IF APPLICABLE) FOR GASKET AND CONNECTION HARDWARE.

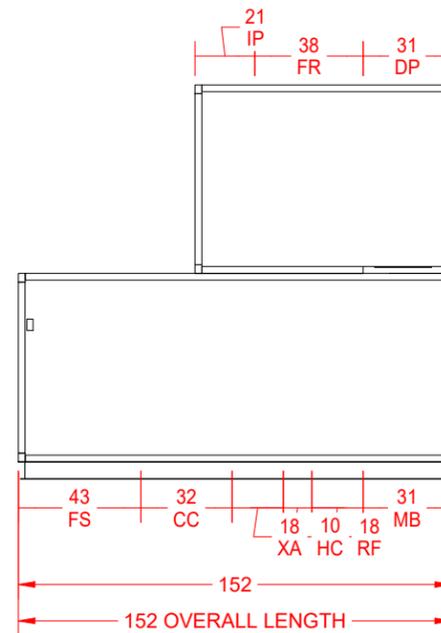
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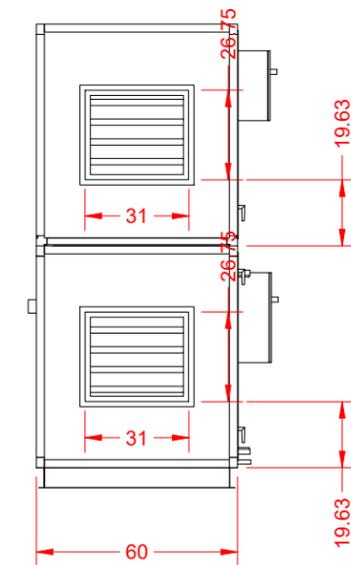
REAR VIEW



LEFT [ELEVATION] VIEW



FRONT VIEW



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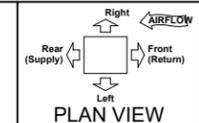
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MODEL: XT1-66x60  
 DESIGNATION: AHU-6  
 PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

EXTENTS VIEW

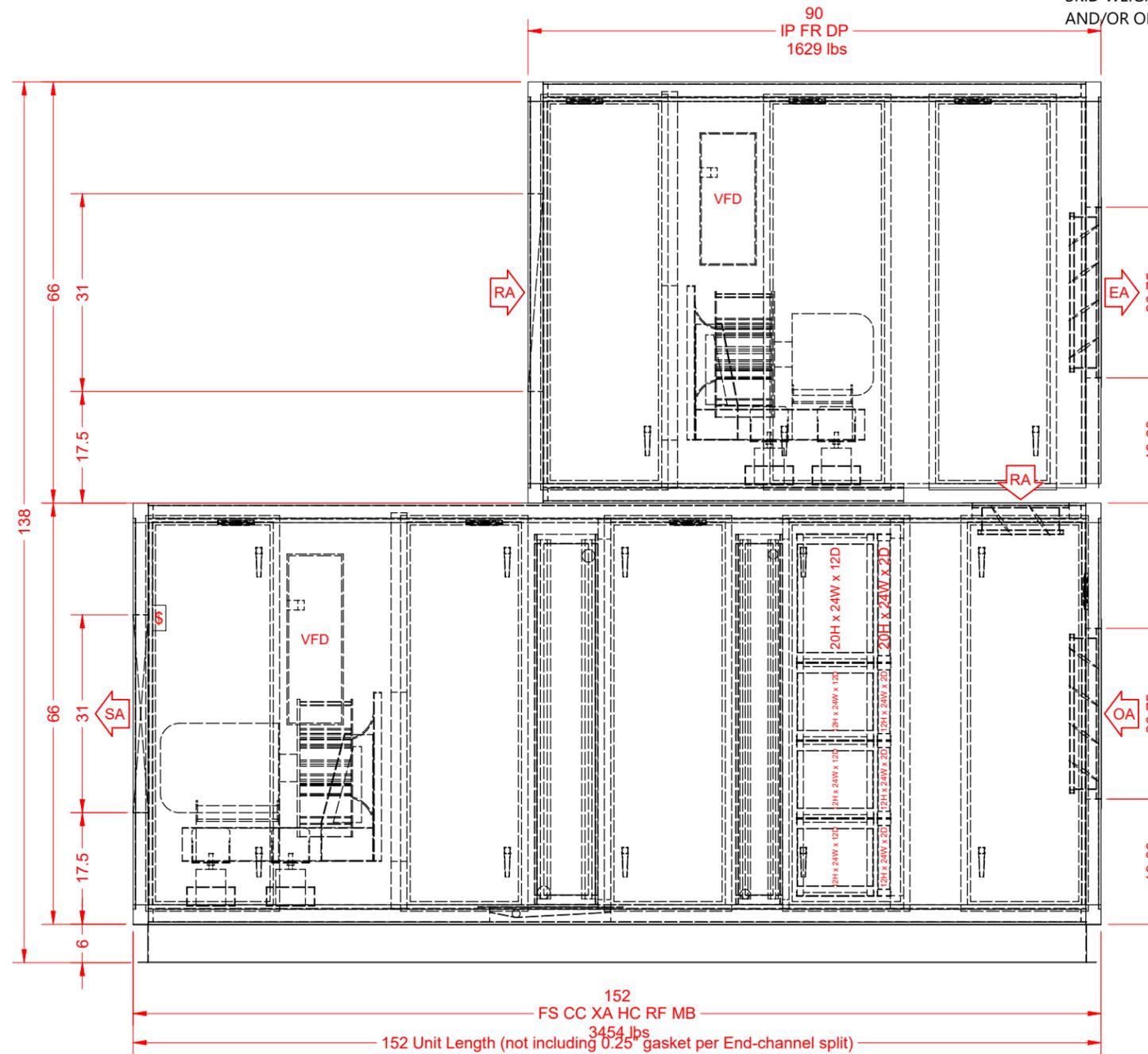
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 UNIT TAG: AHU-6

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 WEIGHT: 5138 (+/- 10%)  
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**NOTE:**

SKID WEIGHTS REPRESENT ESTIMATED SHIPPING WEIGHTS INCLUDING SHIPPING MATERIALS AND/OR OPENING COVERS BUT DO NOT INCLUDE SHIP LOOSE AND/OR FIELD-INSTALLED ITEMS.

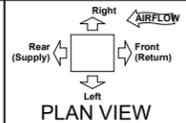


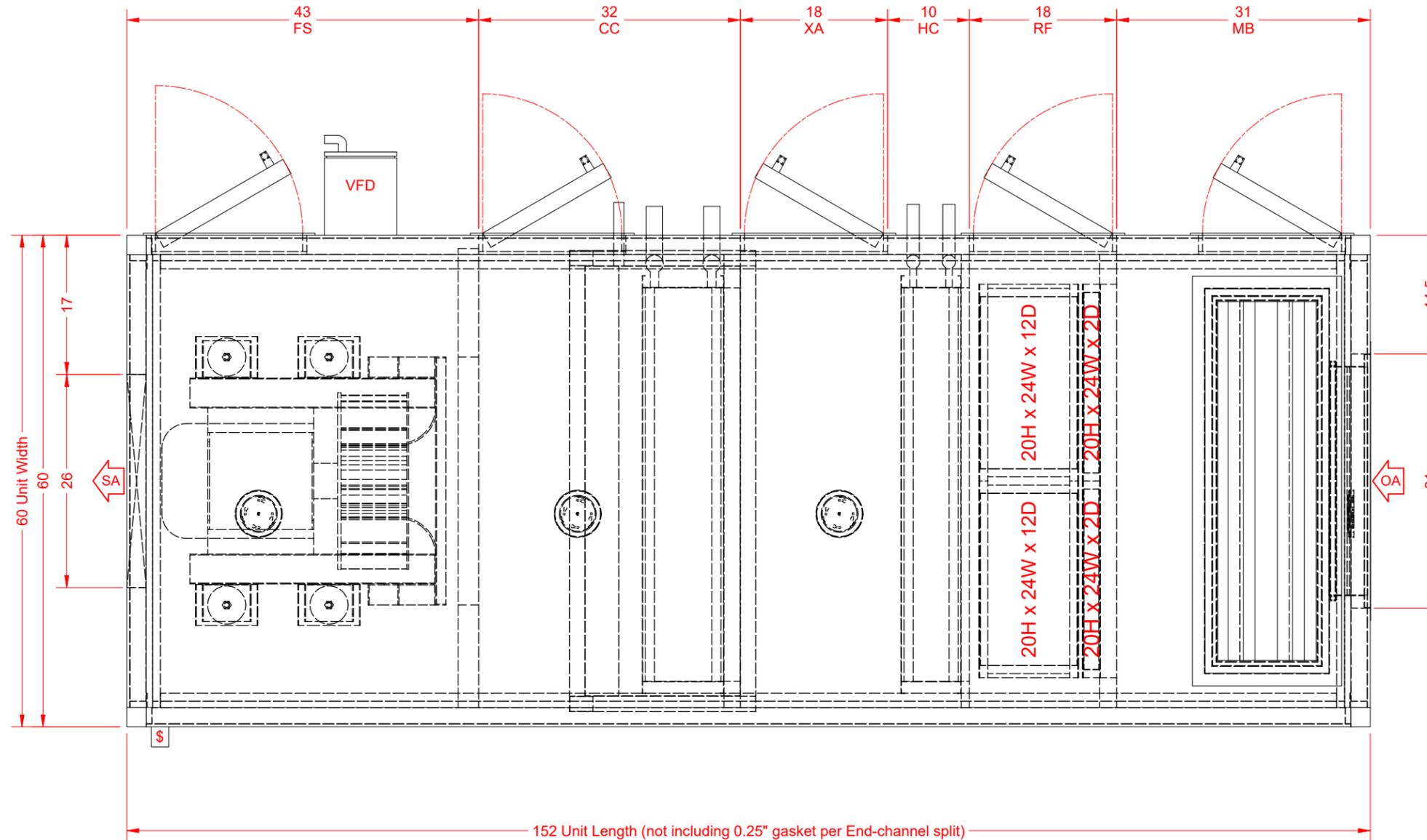
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 DESIGNATION: AHU-6  
 PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**ELEVATION VIEW**  
 SHEET 3 OF 6      CONTRACT#:  
 UNIT TAG: **AHU-6**

ALL DIMENSIONS SHOWN IN: INCHES  
 DRAWING SCALE: NTS  
 DIMENSION TOLERANCES: UNIT (+/- 1/2"); PIPING (+/- 2")  
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**DRAWING NOT TO BE USED FOR CONSTRUCTION**



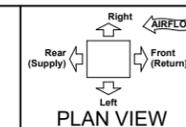


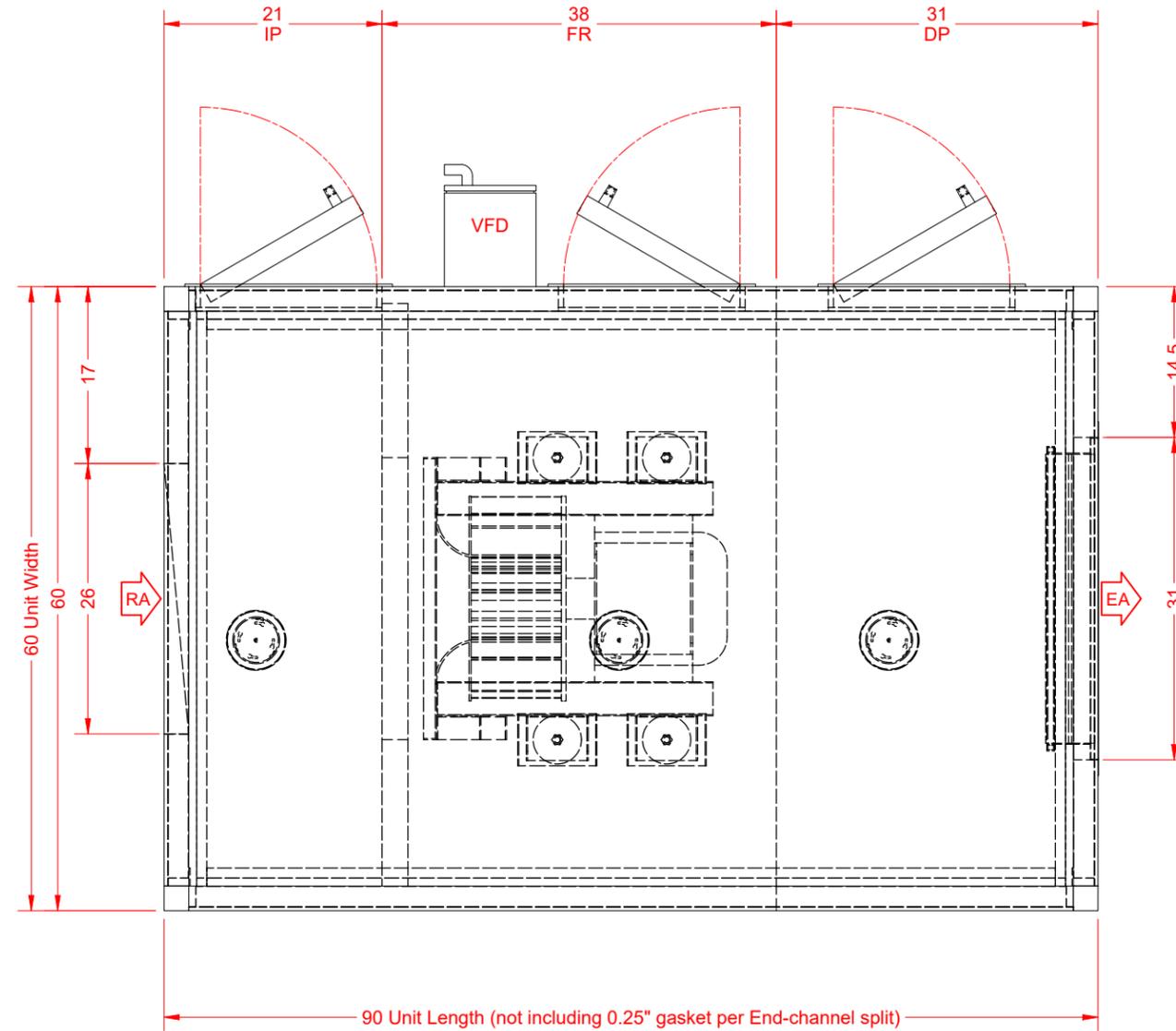
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 DESIGNATION: AHU-6  
 PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**PLAN VIEW (TIER 1)**  
 SHEET 4 OF 6      CONTRACT#:  
 UNIT TAG: **AHU-6**

ALL DIMENSIONS SHOWN IN: INCHES  
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**DRAWING NOT TO BE USED FOR CONSTRUCTION**





REV	DATE	REVISION CHANGE	REV BY

**YORK SOLUTION UNIT DRAWING**

MODEL: XT1-66x60      03/11/2026 01:37:56 PM UTC

DESIGNATION: AHU-6

PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**PLAN VIEW (TIER 2)**

SHEET 5 OF 6      CONTRACT#:

UNIT TAG: **AHU-6**

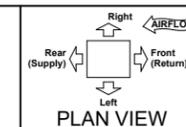
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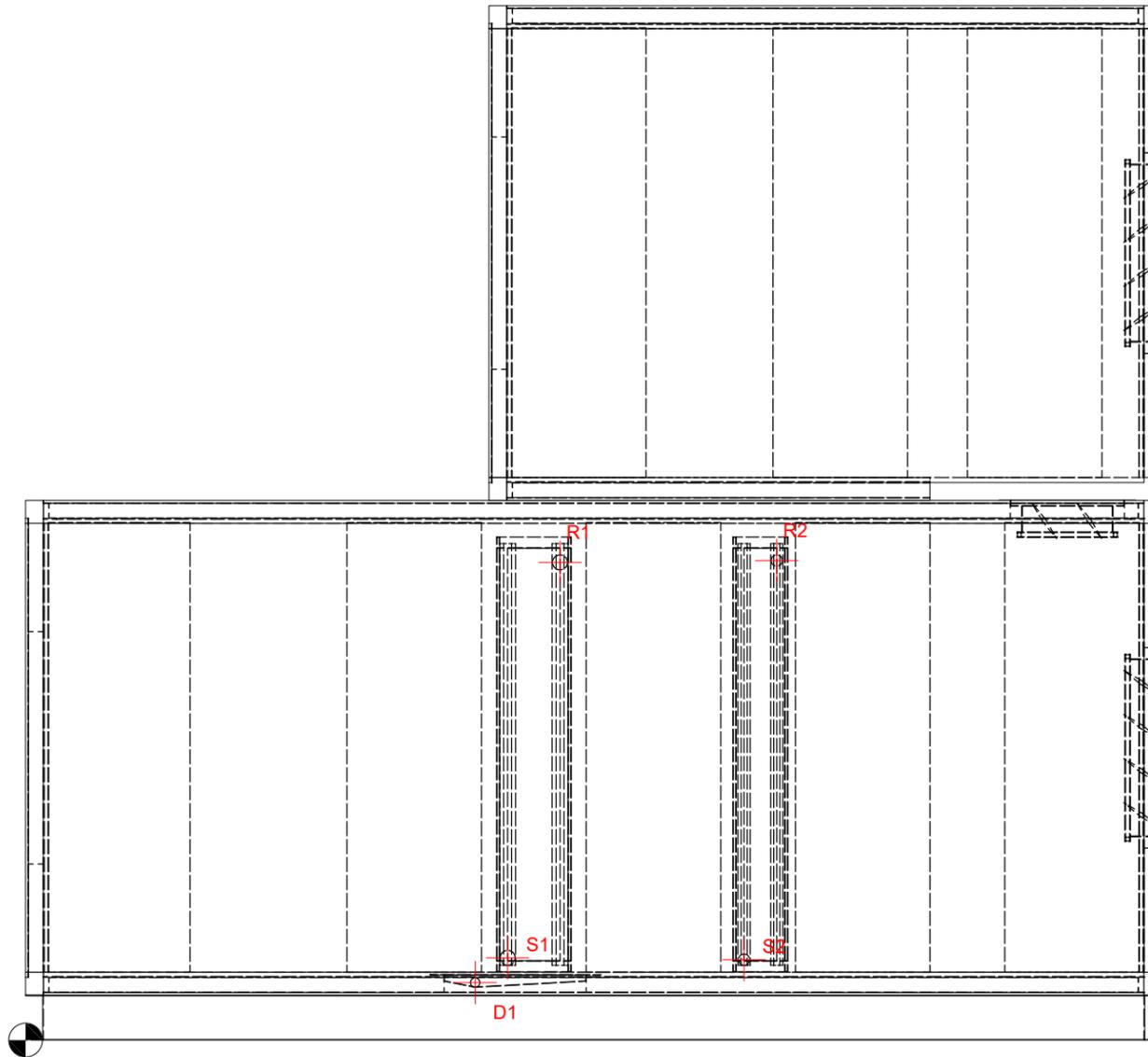
DIMENSION TOLERANCES: UNIT (+/- 1/2"); PIPING (+/- 2")

WEIGHT: 5138 (+/- 10%)

**DRAWING NOT TO BE USED FOR CONSTRUCTION**



COIL CONNECTIONS							
CNCT	XDIM	YDIM	SEG	HAND	TYPE	SIZE	SRVC
S2	96.1	10.7	HC	RIGHT	MPT	1.5	SPLY
S1	64.5	11.0	CC	RIGHT	MPT	2	SPLY
R1	71.5	63.7	CC	RIGHT	MPT	2	RTRN
R2	100.5	64.0	HC	RIGHT	MPT	1.5	RTRN
DRAIN CONNECTIONS							
CNCT	XDIM	YDIM	SEG	HAND	TYPE	SIZE	SRVC
D1	60.2	7.7	CC	RIGHT	-	1.25	DRAIN

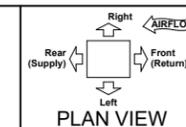


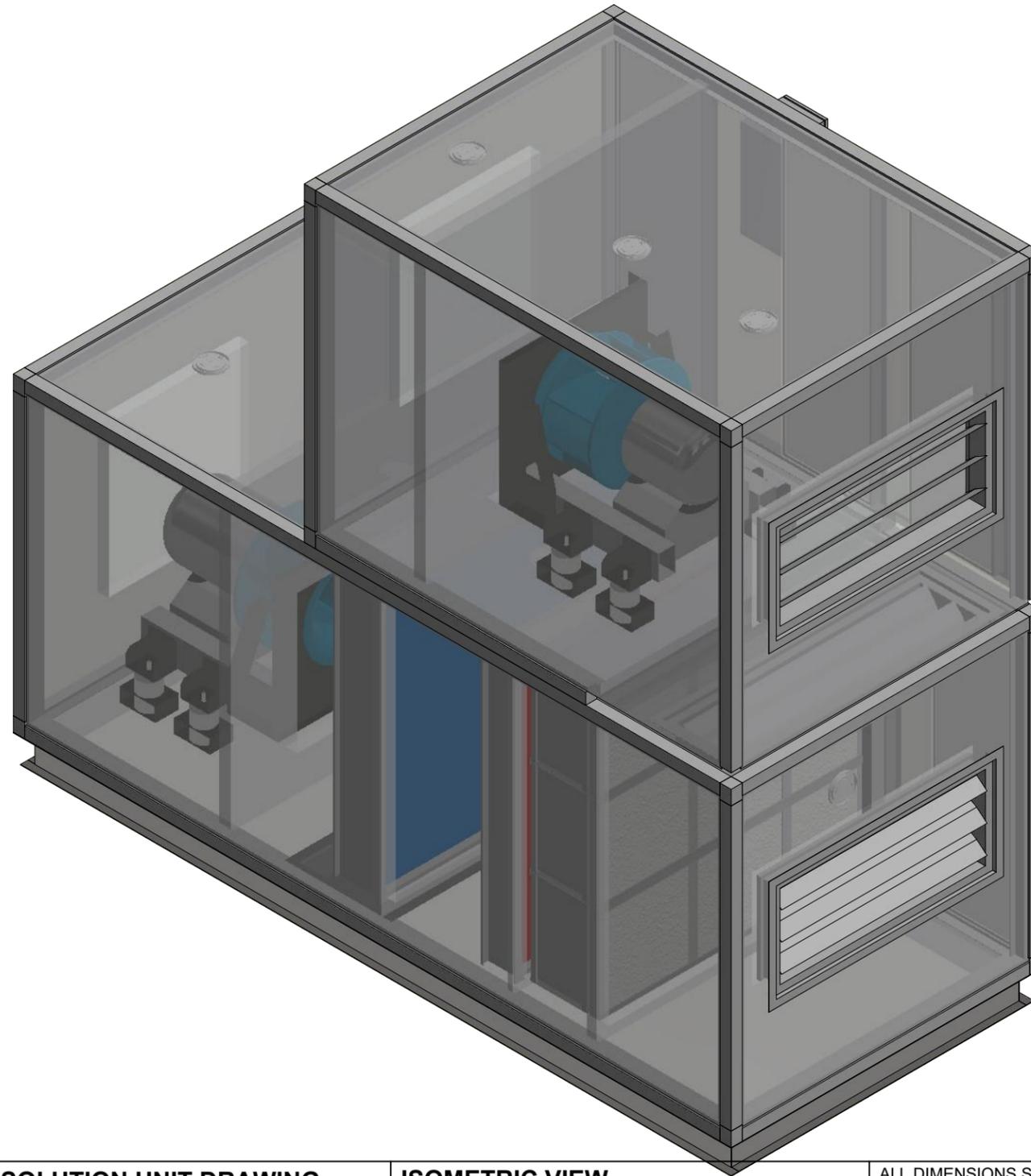
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**YORK SOLUTION UNIT DRAWING**  
 MODEL: XT1-66x60      03/11/2026 01:37:56 PM UTC  
 DESIGNATION: AHU-6  
 PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**PIPING CONNECTIONS**  
 SHEET 6 OF 6      CONTRACT#:  
 UNIT TAG: **AHU-6**

ALL DIMENSIONS SHOWN IN: INCHES  
 DRAWING SCALE: NTS  
 DIMENSION TOLERANCES: UNIT (+/- 1/2"); PIPING (+/- 2")  
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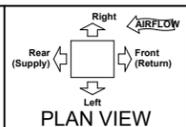


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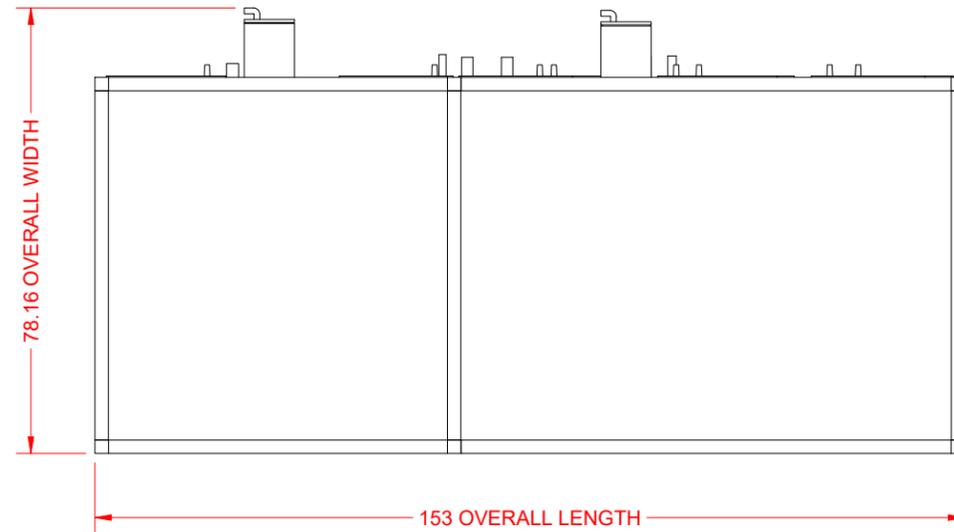
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 DESIGNATION: AHU-7  
 PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**ISOMETRIC VIEW**  
 SHEET 1 OF 6      CONTRACT#:  
 UNIT TAG: **AHU-7**

ALL DIMENSIONS SHOWN IN: INCHES  
 DRAWING SCALE: NTS  
 DIMENSION TOLERANCES: UNIT (+/- 1/2"); PIPING (+/- 2")  
 WEIGHT: 5476 (+/- 10%)  
**DRAWING NOT TO BE USED FOR CONSTRUCTION**



TOP [PLAN] VIEW



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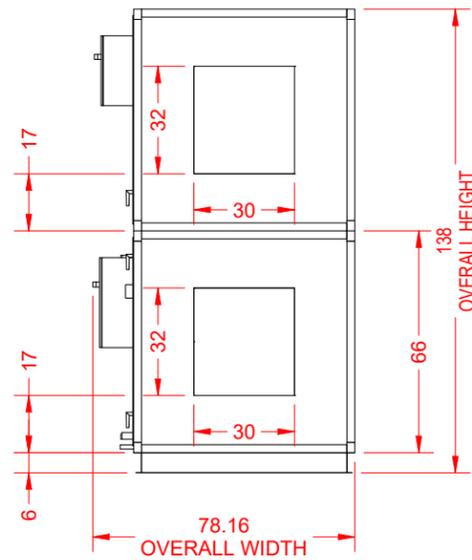
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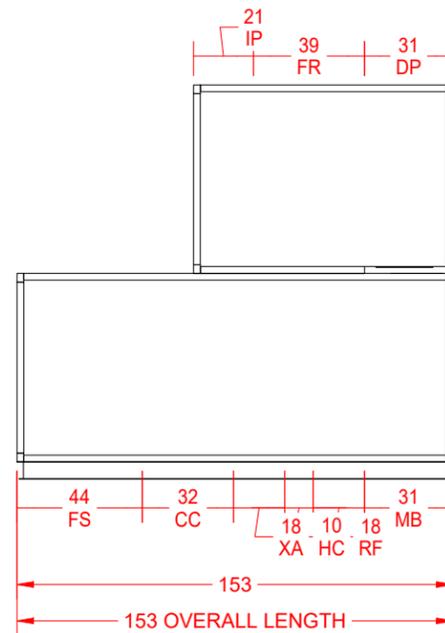
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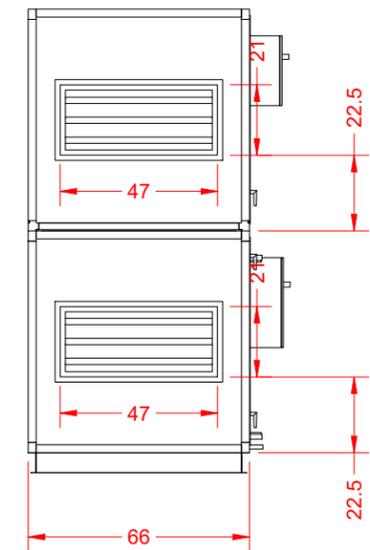
REAR VIEW



LEFT [ELEVATION] VIEW



FRONT VIEW

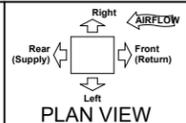


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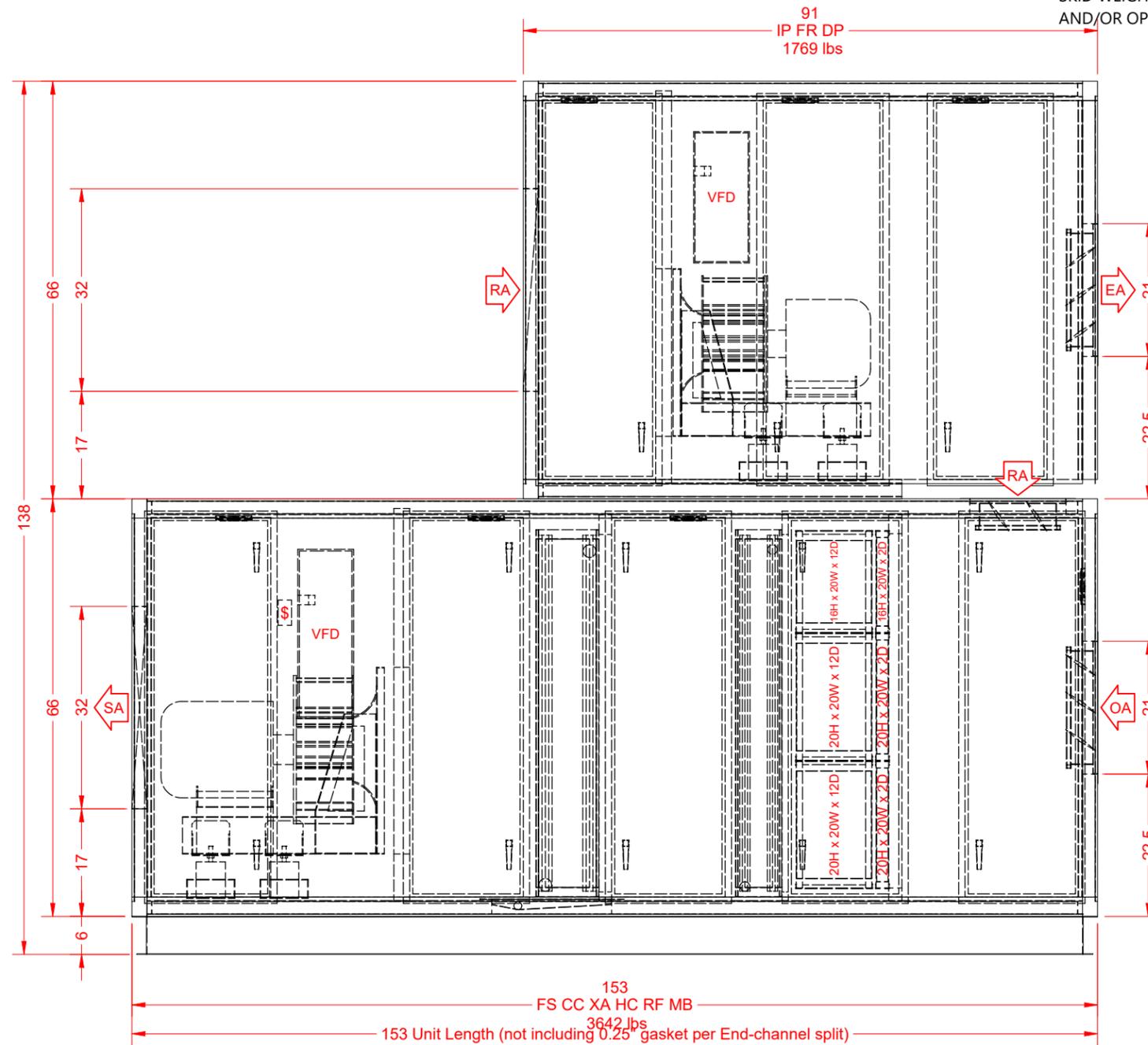
**EXTENTS VIEW**  
 SHEET 2 OF 6      CONTRACT#:  
 UNIT TAG: **AHU-7**

ALL DIMENSIONS SHOWN IN: INCHES  
 DRAWING SCALE: NTS  
 DIMENSION TOLERANCES: UNIT (+/- 1/2"); PIPING (+/- 2")  
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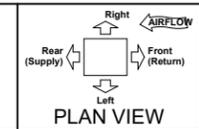
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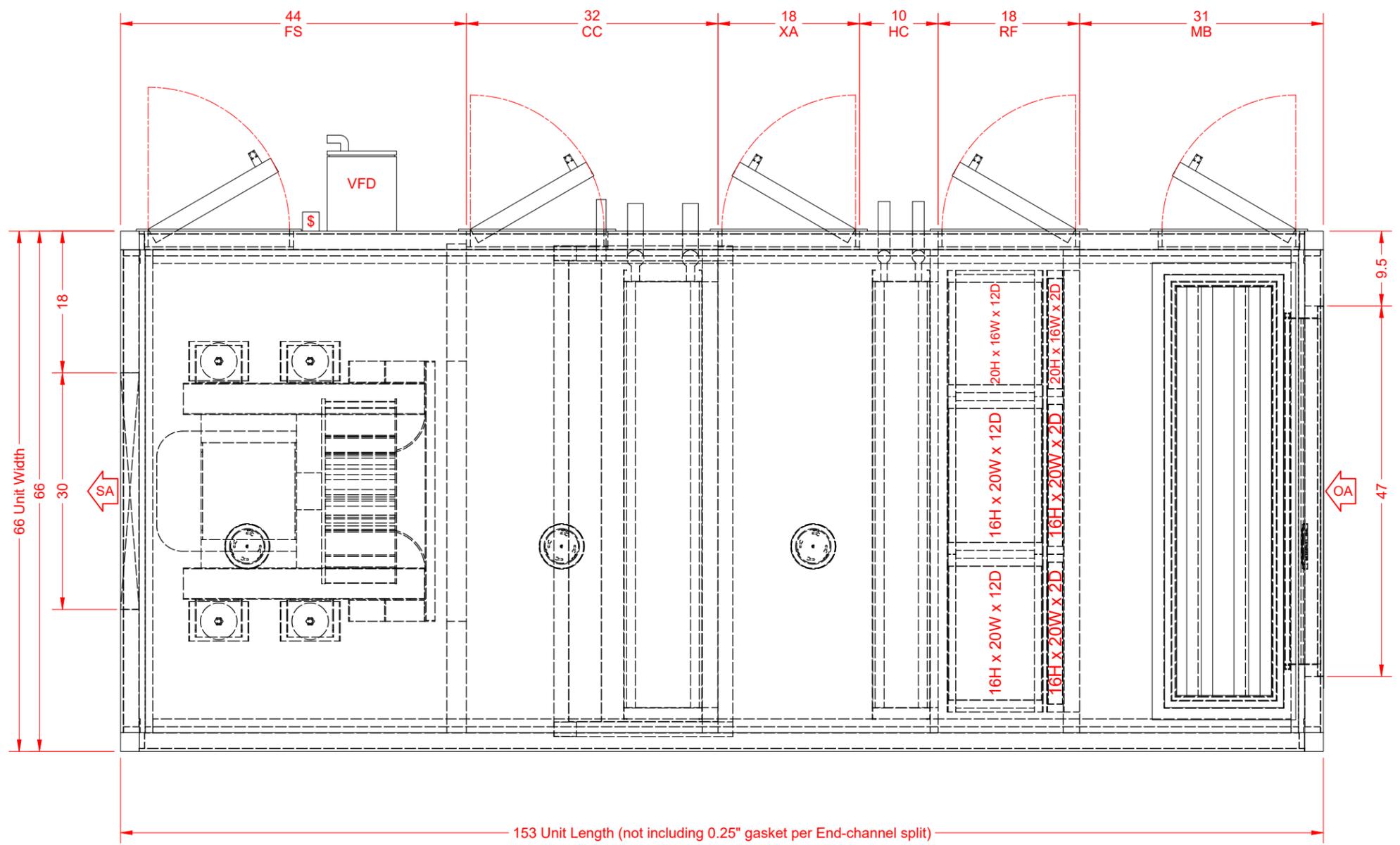
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 DESIGNATION: AHU-7  
 PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**ELEVATION VIEW**

SHEET 3 OF 6      CONTRACT#:  
 UNIT TAG: **AHU-7**

ALL DIMENSIONS SHOWN IN: INCHES  
 DRAWING SCALE: NTS  
 DIMENSION TOLERANCES: UNIT (+/- 1/2"); PIPING (+/- 2")  
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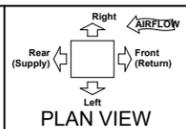


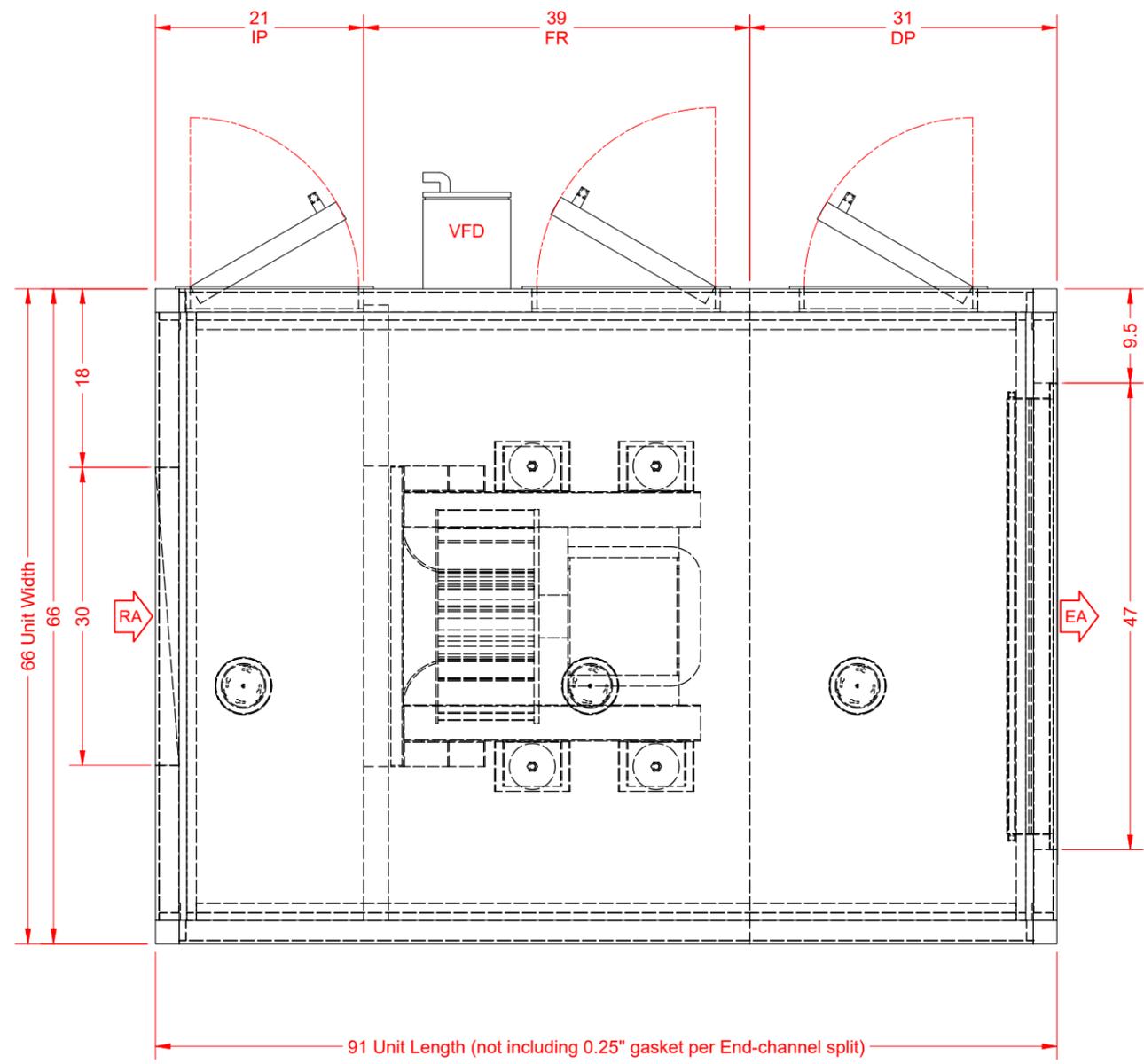
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 MODEL: XT1-66x66      03/11/2026 01:37:11 PM UTC  
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 PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**PLAN VIEW (TIER 1)**  
 SHEET 4 OF 6      CONTRACT#:  
 UNIT TAG: **AHU-7**

ALL DIMENSIONS SHOWN IN: INCHES  
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REV	DATE	REVISION CHANGE	REV BY

**YORK SOLUTION UNIT DRAWING**

MODEL: XT1-66x66      03/11/2026 01:37:11 PM UTC

DESIGNATION: AHU-7

PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**PLAN VIEW (TIER 2)**

SHEET 5 OF 6      CONTRACT#:

UNIT TAG: **AHU-7**

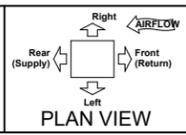
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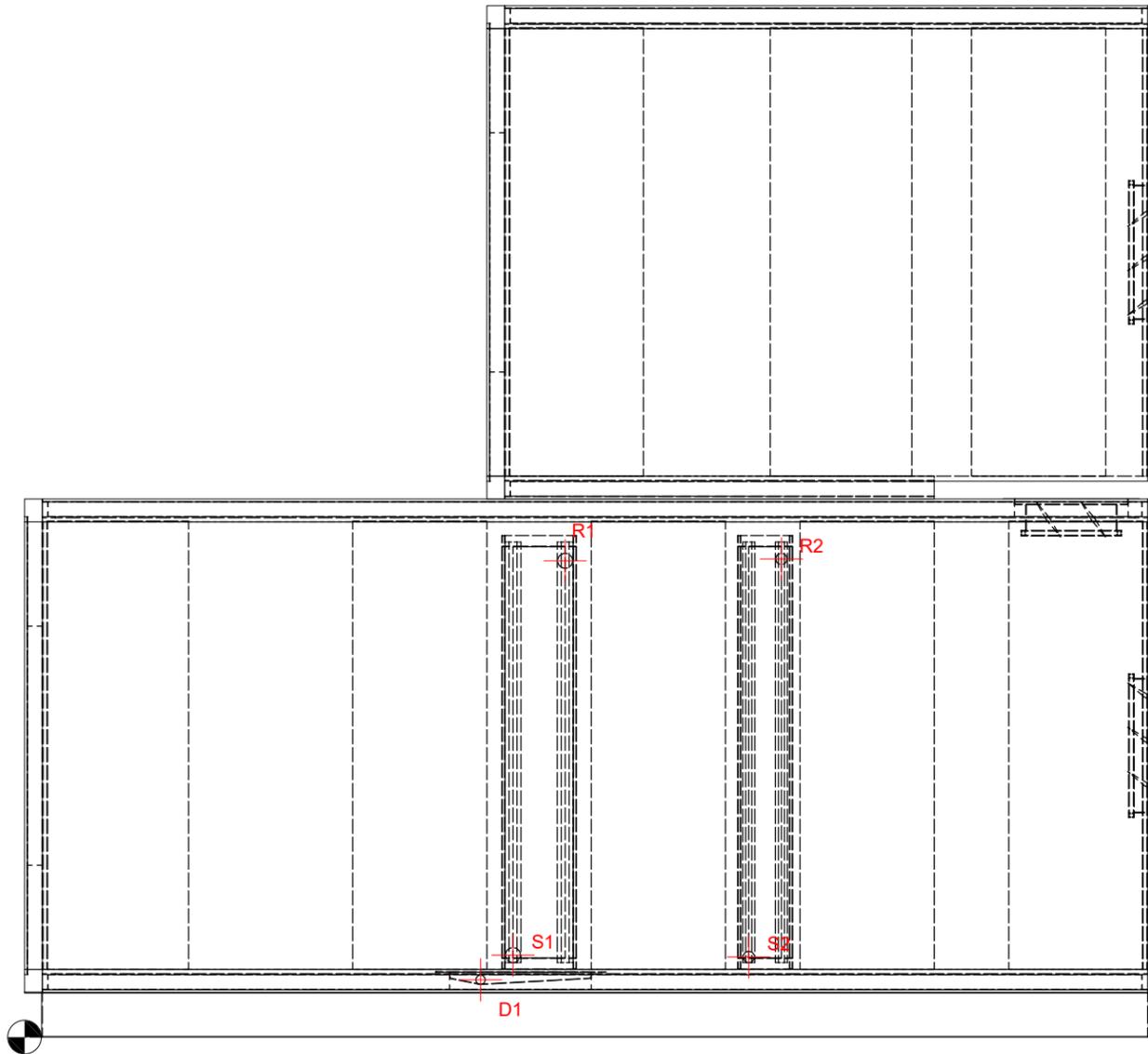
DIMENSION TOLERANCES: UNIT (+/- 1/2"); PIPING (+/- 2")

WEIGHT: 5476 (+/- 10%)

**DRAWING NOT TO BE USED FOR CONSTRUCTION**



COIL CONNECTIONS							
CNCT	XDIM	YDIM	SEG	HAND	TYPE	SIZE	SRVC
S2	97.1	10.7	HC	RIGHT	MPT	1.5	SPLY
S1	65.5	11.0	CC	RIGHT	MPT	2	SPLY
R1	72.5	63.7	CC	RIGHT	MPT	2	RTRN
R2	101.5	64.0	HC	RIGHT	MPT	1.5	RTRN
DRAIN CONNECTIONS							
CNCT	XDIM	YDIM	SEG	HAND	TYPE	SIZE	SRVC
D1	61.2	7.7	CC	RIGHT	-	1.25	DRAIN

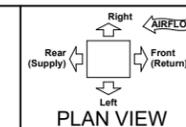


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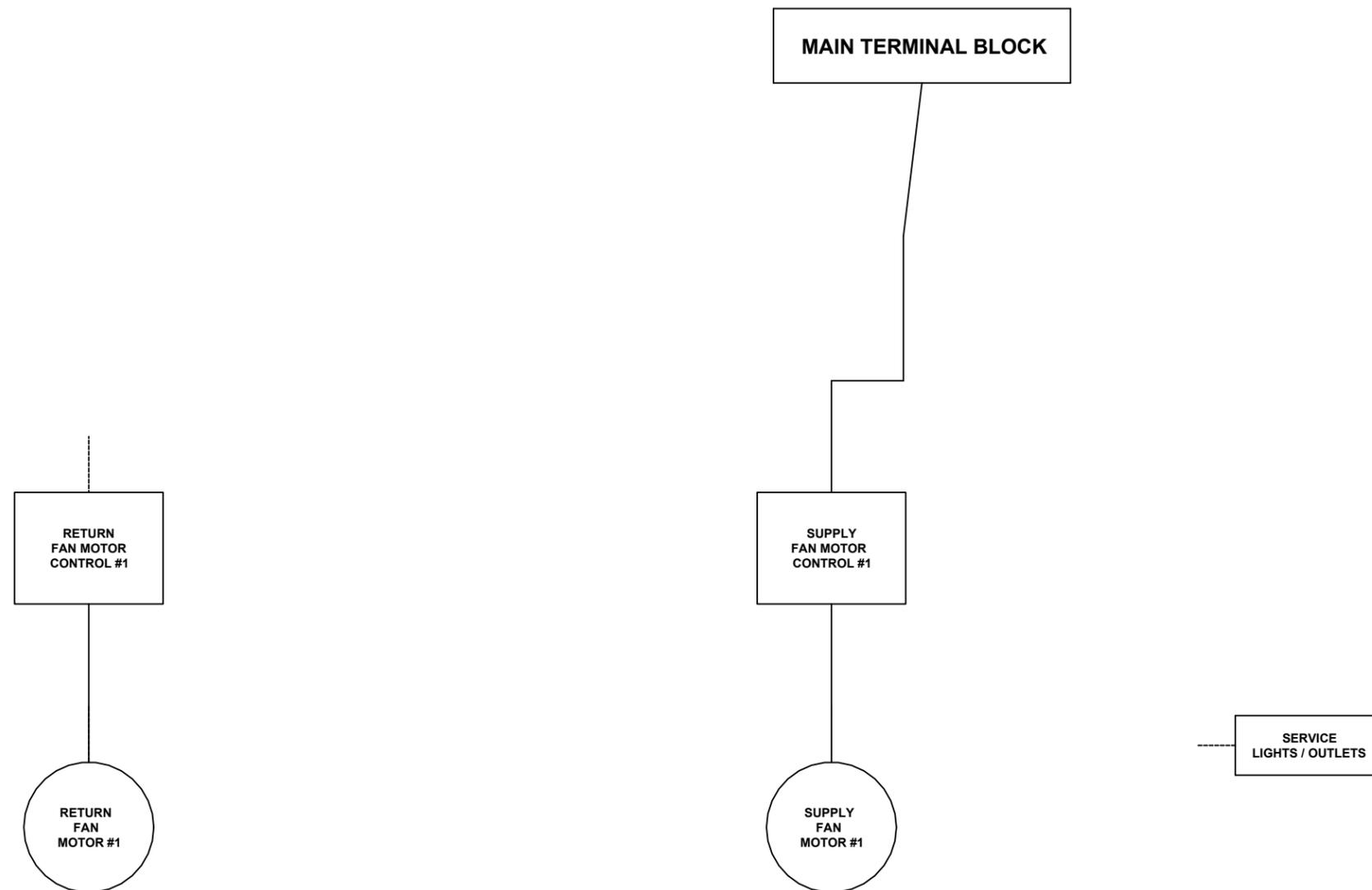
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 DESIGNATION: AHU-7  
 PROJECT NAME: UNC PEMBROKE CHAVIS AHUS

**PIPING CONNECTIONS**  
 SHEET 6 OF 6      CONTRACT#:  
 UNIT TAG: **AHU-7**

ALL DIMENSIONS SHOWN IN: INCHES  
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 DIMENSION TOLERANCES: UNIT (+/- 1/2"); PIPING (+/- 2")  
 WEIGHT: 5476 (+/- 10%)  
**DRAWING NOT TO BE USED FOR CONSTRUCTION**



# Wiring Diagrams



**PRODUCT DRAWING**  
 AHU Field Wiring  
 MODEL:  
**NOT FOR CONSTRUCTION**

Project Name: UNC Pembroke Chavis AHUs  
 Location: ,  
 Engineer:  
 Contractor:  
 For:

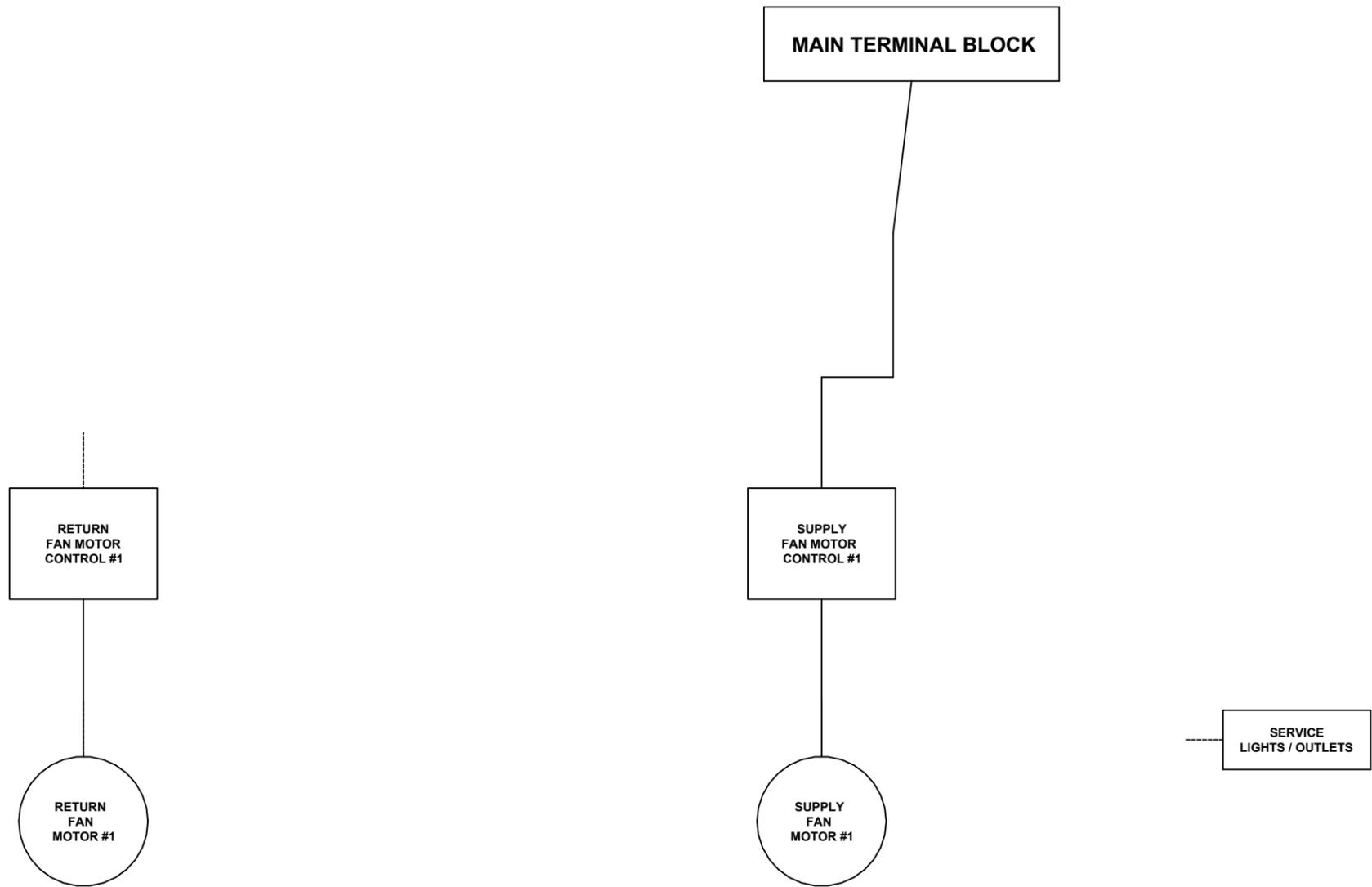
Sold To:  
 Cust Purch Order#:  
 Contract#:

UNIT  
 TAG: **AHU-6 - Sheet 1**

Date: 3/6/2026 4:38:44 PM (UTC)  
 Form No.: 100.09-EG1  
 Dwg. Lev.: 12/03  
 Dwg. Scale: NTS

Serial Number:  
 SQ Database Number:  
 YORKworks Release:  
 Dwg. Name:  
 Dwg. Location:





**PRODUCT DRAWING**

AHU Field Wiring  
 MODEL:  
**NOT FOR CONSTRUCTION**

Project Name: UNC Pembroke Chavis AHUs  
 Location: ,  
 Engineer:  
 Contractor:  
 For:

Sold To:  
 Cust Purch Order#:  
 Contract#:

UNIT  
 TAG: **AHU-7 - Sheet 1**

Date: 3/6/2026 3:32:10 PM (UTC)

Form No.: 100.09-EG1  
 Dwg. Lev.: 12/03  
 Dwg. Scale: NTS

Serial Number:  
 SQ Database Number:  
 YORKworks Release:  
 Dwg. Name:  
 Dwg. Location:



# **Unit Specifications Text**

**UNIT TAG:** AHU-6 & AHU-7

**Date Created: 03/06/2026 (version: 6.0)**

**YORK SOLUTION INDOOR AIR HANDLER  
UNIT SPECIFICATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Indoor air handling units and components as scheduled and shown on drawings.
- B. Motor disconnects, motor starters, and variable frequency drives.

**1.02 RATINGS AND CERTIFICATIONS**

- A. Unit will conform to AMCA 210 for fan performance ratings.
- B. Unit will conform to E.T.L. standards. Unit will be ETL listed.
- C. Unit will conform to AHRI 410 for capacities, pressure drops, and selection procedures of air coils.
- D. Unit will conform to ANSI/AHRI 430 for all fabrication procedures of air handling units. Unit will have airflow performance certified to ANSI/AHRI 430.
- E. Motors covered by the Federal Energy Policy Act (EPACT) will meet EPACT requirements.
- F. Damper performance will comply with AMCA 500.
- G. Unit will be ISO 9001 certified.
- H. Unit will be manufactured in an ISO 9002 certified facility.
- I. Filter media to comply with ANSI/UL 900 listed Class I or Class II.
- J. Control Wiring comply with NEC codes & ETL requirements.
- K. Unit will comply with energy use AHSRAE 90.1.

**1.03 EXTRA MATERIALS**

- A. Provide one set of filters for balancing, and one additional set for final turnover to owner.

**1.04 WARRANTY**

- A. Unit will be covered by a limited parts (18 months (12 months from start-up)) and labor (18 months (12 months from start-up)) warranty from date of shipment . Warranty will cover manufacturer defects. Warranty work will be performed by manufacturer's factory-trained and factory-employed technician.
- B. Include factory-provided controls in the parts warranties.
- C. Parts associated with routine maintenance, such as belts and air filters will be excluded.

**PART 2 PRODUCTS**

**2.01 GENERAL DESCRIPTION**

A. Air Handling Unit (AHU) will consist of a structural base, insulated casing, access doors, fans, motors, motor controls, coils, filters, dampers, controls, components, and accessories; as shown on drawings, schedules, and specifications.

B. Unit will meet the specified levels of performance for scheduled items including airflow, static pressure, cooling capacity, heating capacity, electrical characteristics, sound, casing leakage, panel deflection and casing thermal performance.

C. Unit will maintain structural integrity when wall panels are removed.

D. Internal components and accessories will be as specified and scheduled (unless noted otherwise). Components and accessories will be installed by the AHU manufacturer in an ISO-9002 certified facility.

E. Unit will be shipped in one piece or with shipping splits necessary for shipping and installation.

F. Manufacturer will provide detailed, step-by-step instructions for disassembly and reassembly.

## 2.02 BASE RAIL

A. Unit will be provided with a 6" structural base rail under the full perimeter of the unit, formed from mill galvanized steel.

B. Unit will be provided with base rail and lifting lug system that does not require additional support for rigging. Include base rail lifting lugs at unit corners.

## 2.03 CASING

A. Casing construction will not rely on the casing panels for structural integrity.

B. Casing panels will be 2" double-wall construction with thermal break. Thermal break will be between interior and exterior liner of the panel assembly, and between the panel and casing framework.

C. Provide casing with minimum thermal resistance (R-value) of 16 hr-ft<sup>2</sup>-°F/BTU. Exposed insulation is not acceptable.

D. Casing panel insulation will be injected polyurethane foam. Foam insulation will be manufactured by EcoMate®. Rigid foam board panels will not be used.

E. All exterior casing panels (roof, wall, floor, access door) will be made of G90 galvanized steel. All interior casing panels (roof, wall, floor, access door) will be made of G90 galvanized steel.

F. Panel assembly will meet UL standard 60336-2-40 for fire safety. Panel insulation will comply with the requirements of NFPA 90A.

G. Insulation system provided will be resistant to mold growth in accordance with a standardized test method such as UL 181 or ASTM C 1338.

H. Encapsulate insulation with sheet metal so that air does not contact insulation. Solid lined double-walled panels insulated with injected foam will be hermetically sealed at each corner and around their entire perimeter to eliminate airflow through the panel and to eliminate microbial growth potential within the casing wall.

I. Unit will conform to ASHRAE Standard 111 Class 6 for casing leakage of no more than 1% of design airflow at 1.25 times design static pressure up to a maximum of +8 inches w.g. in positive pressure sections and -8 inches w.g. in negative pressure sections down to a minimum of 50 CFM measurable leakage at or 5,000 design CFM.

J. Unit will be provided with wall panels and access doors that deflect no more than L/240 when subjected to 1.5 times design static pressure up to a maximum of +8 inches w.g. in positive pressure sections and -8 inches w.g. in negative pressure sections. 'L' is the panel-span length and 'L/240' is the deflection at panel midpoint.

K. Unit will be provided with floors and roofs that deflect no more than L/240 when subjected to a 300 lb static load at mid-span. 'L' is the panel-span length and 'L/240' is the deflection at panel midpoint.

## 2.04 ACCESS DOORS

- A. Unit will be provided with double wall access door(s) that meet requirements for the AHU casing.
- B. Unit will be provided with industrial-style stainless steel hinges that permit 180 degrees of door swing.
- C. Unit will be provided with latches with roller cam mechanisms that ensure a tight seal. Rotating knife-edge or "paw" latches are not acceptable.
- D. Unit will be provided with each door with a single handle linked to multiple latching points or a separate handle for each latching point. Doors serving access segments will have an interior latch handle.
- E. Unit will be provided with access doors with a locking hasp to accommodate a lockout device.

## 2.05 COILS: HEATING AND COOLING

### 2.05.01 ACCEPTABLE MANUFACTURER

- A. Coil will be manufactured by the same manufacturer as the AHU manufacturer, except where noted in contract documents.

### 2.05.02 GENERAL DESCRIPTION

- A. Coil will meet or exceed performance scheduled on drawings.
- B. Coil will be provided with performance certified in accordance with AHRI Standard 410 for coil capacity and pressure drop, wherever applicable. Coils circuits will be designed such that the fluid velocity is within the range of certified rating conditions at design flow.
- C. Cooling coils will be provided with a maximum face velocity as scheduled. Face velocity calculations will be based on the finned area of the coil.
- D. Cooling coil will be provided with drain pan that is sufficient to contain coil condensate. Drain pan will extend a minimum of 6" downstream of the face of the coil.
- E. Coil segment casing will accommodate full-face coils as scheduled.
- F. Access doors will be located to provide clearance for pipe insulation, connectors, and accessories. Space will allow a minimum of 90 degrees of door swing.
- G. Coils will be built in their own G90 galvanized steel full perimeter frame. Tube sheets on each end will have fully drawn collars to support and protect tubes. Horizontal coil casing and support members will allow moisture to drain. Bulkhead support will be G90 galvanized steel and will not block finned area.
- H. Individual coils will be removable from the side of the AHU.
- I. Intermediate drain pan made of 304 stainless steel will be provided on stacked cooling coils or any cooling coil taller than 48 inches finned height. Intermediate drain pan will slope in a minimum of two planes toward a single drain connection. Intermediate drain pan will be provided with downspouts routed to lower drain pan.
- J. A single intermediate vertical coil support will be provided on coils with a finned length greater than 62". Two vertical supports will be provided on coils with a finned length greater than 100", and three vertical supports on coils with a finned length greater than 141". Intermediate vertical coil support will be same material as the casing.
- K. Gap between coil stub out connection and AHU casing, will be insulated with a spool-shaped sleeve grommet. Adhesive rings applied to the casing walls will not be acceptable.
- L. Water coils will be operable at 325 psig working pressure and up to 250 °F. Factory test water coils with 325 psig compressed air under water. Water coils will conform to Subsection 12.3, "Water-Containing Parts," of UL-207, "Standard for Safety: Refrigerant – Containing Components and Accessories, Nonelectrical."
- M. Water will be provided with a tube OD of 1/2 inches. 1/2 inch tube wall thickness will be 0.016 inches. Mechanically expand tubes will form fin bond and provide burnished, work-hardened interior surface.

N. Hairpin return bend thickness on 1/2 inch tube wall thickness will be 0.016 inches as standard. Brazed return bend thicknesses will be equal to or greater than the straight tube wall thickness.

O. Water coil headers will be made of seamless copper tubing. Pipe connections will be steel threaded MPT. Header connections (tubes and piping connections) will be silver-brazed for copper and copper alloy connections and either TIG welded or silver-brazed for steel connections.

P. Provide coils with die-formed, continuous aluminum – 0.008 inch corrugated fins. Fins will have fully drawn collars to accurately space fins and protect tubes.

## 2.06 PRIMARY DRAIN PANS

A. Unit will be provided with a drain pan under each cooling coil.

B. Provide drain pan under the complete width and length of cooling coil sections. Drain pan will be full width, and extend a minimum of 6" downstream of cooling coil.

C. Drain pans for cooling coils will meet the requirements of ASHRAE 62.

D. Drain connection will be made of same material as drain pan. Dissimilar metals will not be used to mitigate risk of galvanic corrosion. Drain connection will be welded to the drain pan.

E. Drain pan will be double wall with an insulation R-value of 6.25 hr-ft<sup>2</sup>-°F/ (BTU-in).

F. Drain pan will allow visual inspection and physical cleaning on 100% of the pan surface without removal of the coil.

G. Drain pan will be provided with a minimum of 1" clearance between the drain pan and any coil casing, coil support or any other obstruction.

H. Drain pan will allow the design rate of condensate drainage regardless of fan status.

I. Drain pan will be sloped in at least two planes by at least 1/8" per foot toward a single drain. Locate drain connection at the lowest point of the pan. Pan will have no horizontal surfaces.

## 2.07 FANS

### 2.07.01 GENERAL DESCRIPTION

A. Unit[s] will be provided with fans as shown on equipment schedule and drawings.

B. Access to the fan section will be provided via an access door on the drive side of the unit.

C. Mount the DDP fan and motor assembly on a common adjustable base. This common base will attach to vibration isolators, which mount to structural support channels. These channels will span the AHU floor and mount directly to the AHU frame. Manufacturers not complying with this requirement must submit detailed structural and weight data to a licensed structural engineer for review and stamped certification. The mechanical engineer will review these engineers' final reports prior to submittal approval.

D. Unit will be provided with vibration isolation, as scheduled.

E. Unit will be provided with horizontal thrust restraints between AHU casing and fan housings with end discharge. This requirement applies to the following cases:

F. Piezometer Ring: Airflow station will be factory installed at fan inlet. The device will have a measurement accuracy of ± 5%. Tubing will be field installed.

### 2.07.02 DIRECT-DRIVE FANS (SINGLE 1x1) MODEL DDPG2, MANUFACTURED BY LAU

A. Plenum (SWSI) Fan

1. Plenum fan wheel will be single-width, single-inlet, with 9 blades.

2. Plenum fan blades will be aluminum backward-inclined airfoil.

3. Plenum fan will be direct-driven.

## 2.08 ELECTRICAL MOTORS

A. Fan motors will be built in accordance and comply with the latest standards of the NEMA and IEEE.

B. AHU and fan motors will comply with ASHRAE 90.1.

C. Fan motors will be provided with the following characteristics:

1. Voltage, Frequency and Phase, as scheduled.
2. Motor RPM, as scheduled
3. Minimum service factor of 1.15
4. Premium efficiency, or as required to meet ASHRAE 90.1
5. NEMA design ball bearing type
6. Rated for continuous duty at full load in a 104°F [40°C] ambient
7. Suitable for use in variable frequency application, per NEMA MG-1 Part 30

## 2.09 FAN-MOTOR VARIABLE FREQUENCY DRIVES (VFDS)

A. Manufacturer will provide UL or ETL listed VFDs and associated components, as scheduled and shown on drawings. VFDs will comply with applicable provisions of the National Electric Code.

B. VFDs will be mounted in a dedicated NEMA 1 compartment located on the primary access side of its associated fan section and wire VFD to motor, unless otherwise indicated on drawings.

C. VFDs on outdoor units will be suitable for use in ambient temperatures from 5°F to 104°F:

D. After unit installation, VFD will be started and programmed by a factory trained and employed service technician. Refer to Section 3.05.

E. Unit(s) will be provided with following VFD disconnect and bypass optional:

1. Fused main disconnect

F. Unit(s) will be provided with harmonic distortion feedback protection:

1. Equivalent 5% impedance input line reactor
2. Integral RFI/EMI filtering to meet EMC EN61800-3 for First Environment

G. Unit(s) will be provided with a user interface consisting of following features:

1. 30 Character multi-lingual alphanumeric display
2. Parameter set-up and operating data
3. Display data will include:
  - a. output frequency (Hz)
  - b. speed (RPM)
  - c. motor current
  - d. calculated % motor torque
  - e. calculated motor power (kW)

- f. DC bus voltage
- g. output voltage
- h. heat sink temperature
- i. elapsed time meter (re-settable)
- j. kWh (re-settable)
- k. input / output terminal monitor
- l. PID actual value (feedback) & error
- m. fault text
- n. warning text
- n. scalable process variable display

H. VFD will be provided with the following protection circuits:

1. over current
2. ground fault
3. over voltage
4. under voltage
5. over temperature
6. input power loss of phase
7. loss of reference/feedback
8. adjustable current limit regulator

I. VFD will be UL 508C approved for electronic motor overload (12t).

J. VFD will be provided with features for high input transient protection and surge suppression, such as

1. 4 MOVs ahead of diode bridge
2. 120 Joule rated 1600V diode module
3. Compliant with UL 1449 / ANSI 61.4

K. VFD will be provided with the following communication features:

1. Two programmable analog inputs
2. Six programmable digital inputs
3. Two programmable analog output
4. Three programmable digital relay outputs
5. Modbus RTU Communications protocol
6. Adjustable filters on analog inputs and outputs
7. Input speed signals, including 4-20 mA and 0-10 VDC
8. Accel/Decel contacts [floating point control]

9. Auto restart [customer selectable and adjustable]

10. Start/Stop options will include [2 wire dry contact closure], [3 wire momentary contacts], application of input power, and application of reference signal (PID sleep/wake-up).

11. Integrated control interface for Siemens FLN, Johnson N2, Modbus RTU, BACnet MS/TP or LONWorks over RS-485.

L. VFD will consist of the following functions:

1. Pre-magnetization on start

2. DC braking/hold at stop

3. Ramp or coast to stop

4. Seven preset speeds

5. Three critical frequency lockout bands

6. Start function will include ramp, flying start, automatic torque boost, and automatic torque boost with flying start

## 2.10 FACTORY INSTALLED ELECTRICAL ACCESSORIES

A. In addition to motor power terminals, unit(s) will be provided with an independent power terminal for convenience receptacles and lights.

B. All switches will be provided as shown on drawings.

C. Unit[s] will be provided with integral LED (light emitting diode) lights in segments as scheduled or shown on drawings.

## 2.11 FILTERS

A. Unit[s] will be provided with filter segments consisting of filters and frames as scheduled.

B. Class 2 or Class 1 filter media will be provided per U.L. 900 and as required by local codes.

C. Filter types, efficiencies, and nominal depths will be as follows:

D. A pre-filter rack will be provided in rigid filter segments. Pre-filters will have 2" pleated MERV 8, as scheduled.

E. Flush mounted, factory installed differential pressure gauge on the drive side of unit will be provided to measure pressure drop across filters. Manufacturer will provide fully functional gauges, complete with tubing.

## 2.12 DAMPERS

A. Control Dampers: Will be Ruskin Model CD60.

1. Type: Parallel-blade.

2. Tested according to AMCA 500, "Laboratory Methods for Testing Dampers for Rating."

3. Leakage: Class 1A. Leakage Rate: Not exceeding 3 cfm/sq. ft. (15 L/s· m<sup>2</sup>) at 1 inch w.g. (249.09 Pa) pressure differential.

4. Damper Blades: Galvanized-steel airfoil-shaped, single-piece with flexible metal compressible jamb seals, extruded Ruskiprene blade edge seals, and stainless-steel sleeve bearings mounted in a single galvanized-steel frame.

5. Axles: Hexagonal. Positively locked into the damper blade.

6. Dampers are to be provided with a jackshaft.

## 2.13 APPURTENANCES

- A. Safety grates over bottom openings will be provided, as shown on drawings. Safety grates will be capable of supporting a 300 lb. center load.
- B. Lifting lugs will be provided where required.

## 2.14 EXTERIOR FINISHES

- A. Unpainted air-handling units constructed of galvanized steel will show a breakdown of less than 1/8" on either side of a scribed line when subjected to ASTM B117 220 hour, 5% salt spray conditions. This is equivalent to an ASTM D1654 rating of '6.' Also, per ASTM D610, degree of rusting to meet #8-G and per ASTM D714 degree of blister to meet #6 medium.

## 2.15 LIGHTS AND OUTLETS

### A. Lights

1. Factory will provide integral LED lighting fixture located in segments and quantity as indicated on the drawings.
2. Factory will wire all light fixtures to a common 120v switch located on the supply fan segment.

END OF SECTION

## **Additional Data Sheets**

## CD60 LOW LEAKAGE CONTROL DAMPER

High Performance Airfoil  
Class 1A Leakage Rated

### APPLICATION

The CD60 is a low leak, galvanized steel damper designed with airfoil blades for higher velocity and pressure HVAC systems. It meets the leakage requirements of the International Energy Conservation Code by leaking less than 3 cfm/sq. ft. at 1" of static pressure and is AMCA licensed as a Class 1A damper.

### STANDARD CONSTRUCTION

#### FRAME

5" x 1" x 16 gage (127 x 25 x 1.6) galvanized steel hat channel reinforced with corner braces for structural strength equal to 11 gage (3.05) channel frames. Low profile 3½" x ⅜" x 16 gage (89 x 10 x 1.6) galvanized steel channel top and bottom frame on dampers under 12" (305) high.

#### BLADES

Galvanized steel airfoil shaped, double skin construction of 14 gage (2.0) equivalent thickness, 6" (152) wide. Parallel or opposed action.

#### SEALS

Ruskiprene blade edge seals and flexible metal compressible jamb seals.

#### BEARINGS

Stainless steel sleeve.

#### LINKAGE

Concealed in frame.

#### AXLES

½" (13) plated steel hex. Removable control shaft extends 6" (152) beyond frame.

#### MAXIMUM SIZE

Single section – 60"w x 72"h (1524 x 1829).  
Multiple section assembly – Unlimited size.

#### MINIMUM SIZE

Single blade – 8"w x 6"h (203 x 152).  
Two blades, parallel or opposed action: 8"w x 10"h (203 x 254).

#### TEMPERATURE LIMITS

-72°F (-60°C) minimum and +275°F (+135°C) maximum.

### FEATURES

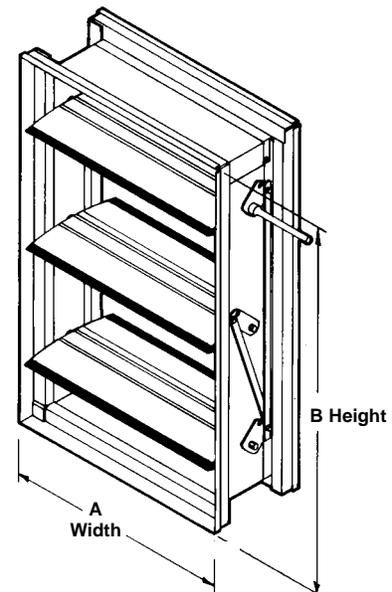
- Airfoil blade design for low pressure drop and less noise generation.
- One piece interlocking frame design to reduce racking.
- Positive lock axles, noncorrosive bearings and shake proof linkage for low maintenance operation.
- Blade edge seals mechanically lock into the blade for superior sealing.

### OPTIONS

- Factory-installed, pneumatic and electric actuators.
- Enamel and epoxy finishes.
- SP100 Switch Package to remotely indicate damper blade position.
- Heavier frame construction with U-channel frame.
- Front, rear or double flange frame with or without bolt holes.
- Face and bypass configurations.

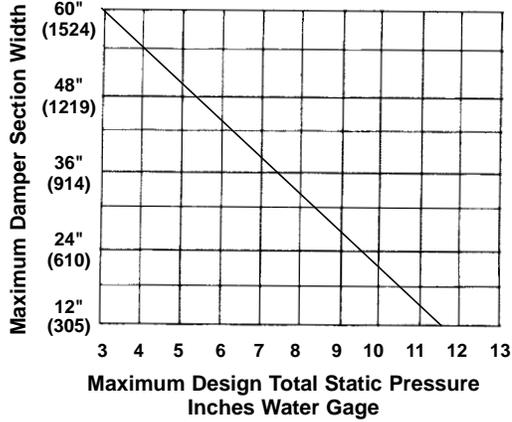
**NOTE:** Dimensions shown in parenthesis ( ) indicate millimeters.

\*Units furnished approximately ¼" (6) smaller than given opening dimensions.



# CD60 AMCA LICENSED PERFORMANCE DATA

## CD60 PRESSURE LIMITATIONS



The CD60 may be used in systems with total pressures exceeding 3.5" by reducing damper section width as indicated. Example: Maximum design total pressure of 8.5" w.g. would require CD60 damper with maximum section width of 36" (914). Pressure limitations shown above allow maximum blade deflection of 1/180 of span on 60" (1524) damper widths. Deflections in other damper widths (less than 48" [1219]) at higher pressures shown will result in blade deflection substantially less than 1/180 of span.



Ruskin Company certifies that the CD60 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA International Certified Ratings Seal applies to Air Performance and Air Leakage.

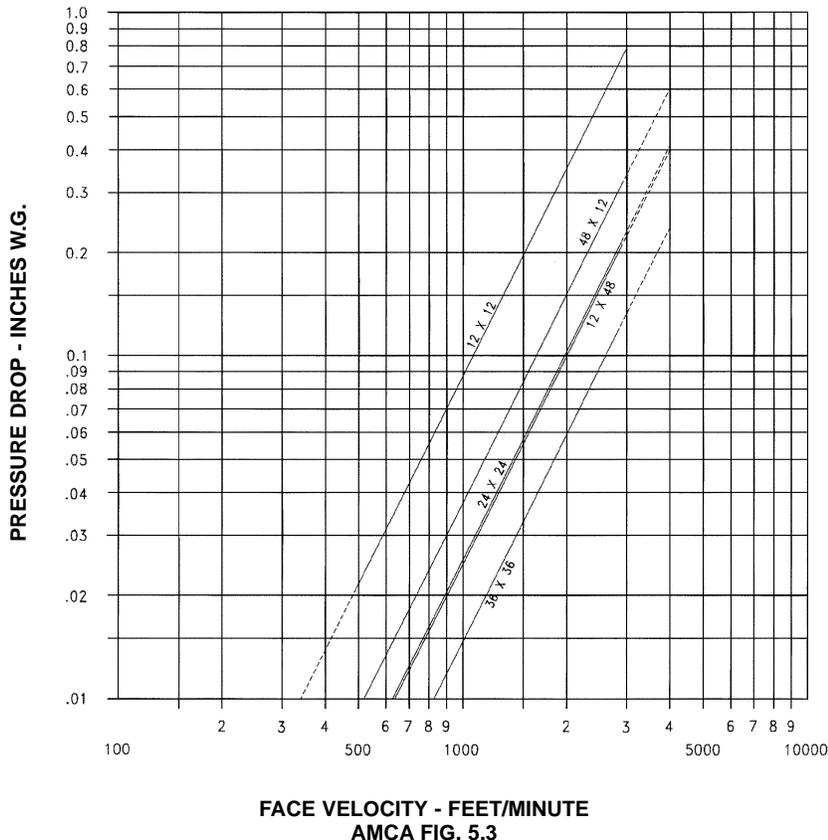
Pressure/Class	Leakage, L/s/m <sup>2</sup> (ft <sup>3</sup> /min/ft <sup>2</sup> )			
	Required Rating		Extended Ranges (Opt.)	
	1" (0.25 kPa)	4" (1.0 kPa)	8" (2.0 kPa)	12" (3.0 kPa)
1A	3 (15.2)	N/A	N/A	N/A
1	4 (20.3)	8 (40.6)	11 (55.9)	14 (71.1)
2	10 (50.8)	20 (102)	28 (142)	35 (178)
3	40 (203)	80 (406)	112 (569)	140 (711)

DAMPER WIDTH (INCHES)	1 IN. W.G.	4 IN. W.G.	8 IN. W.G.
12" (305)	IA	I	II
24" (610)	IA	I	II
36" (914)	IA	I	NA
48" (1219)	IA	I	NA
60" (1524)	IA	I	NA

Leakage testing conducted in accordance with AMCA Standard 500-D-98. Torque applied holding damper closed, 5 in. lbs./sq. ft. on opposed blade dampers and 7 in. lbs./sq. ft. on parallel blade

dampers. Air leakage is based on operation between 50°F to 104°F. All data corrected to represent standard air density 0.075 lbs/ft<sup>3</sup>.

## VELOCITY VS. PRESSURE DROP



CD60 sizes 12 x 12, 24 x 24, 48 x 12, 12 x 48, 36 x 36 (305 x 305, 610 x 610, 1219 x 305, 305 x 1219, 914 x 914)

All data corrected to represent standard air at a density of 0.075 lbs/ft<sup>3</sup>.

## CD60 SUGGESTED SPECIFICATION

Furnish and install, at locations shown on plans, or in accordance with schedules, control dampers that meet the following minimum construction standards. Frame shall be 16 gage (1.6) galvanized steel structural hat channel with tabbed corners for reinforcement for 11 gage (3.05) structural equivalence. Blades shall be 14 gage (2.0) equivalent thickness galvanized steel, roll-formed airfoil type for low pressure drop and low noise generation. Blade edge seals shall be Ruskiprene type or equivalent suitable for -72°F (-60°C) to +275°F (+135°C) mechanically locked into the blade edge. Adhesive or clip-on type seals are unacceptable. Jamb seals shall be flexible metal, compression type to prevent leakage between blade end and damper frame. Blade end overlapping frame is unacceptable.

Bearings shall be corrosion resistant, permanently lubricated stainless steel sleeve type turning in an extruded hole in the damper frame. Axles shall be hexagonal positively locked into the damper blade. Linkage shall be concealed out of airstream, within the damper frame to reduce pressure drop and noise. Submittal must include leakage, maximum air flow and maximum pressure ratings

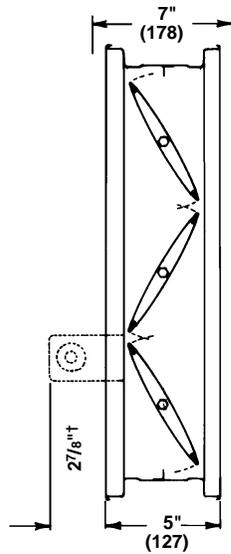
based on AMCA Publication 500. Damper shall meet the leakage requirements of the International Energy Conservation Code by leaking less than 3 cfm/sq. ft. at 1" of static pressure and shall be AMCA licensed as a class 1A damper. Dampers shall be Ruskin CD60 model.

### Specifier Select Options.

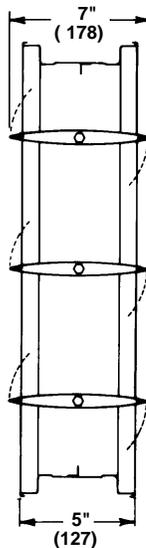
**SP100:** Dampers shall be equipped with factory installed damper position indication switch package. The switch package shall include two position indication switches linked directly to the damper blade to provide full open and full closed damper blade position. The switch package shall be capable of interfacing with the HVAC control system and provide remote damper blade position status. Switch package shall be Ruskin Model SP-100.

**Factory Mounted Damper Actuators:** If control damper actuators are required, they shall be furnished and mounted by the damper manufacturer in their factory. Each damper shall be cycle tested at the factory prior to shipment.

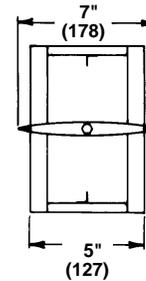
## DIMENSIONAL INFORMATION



**OPPOSED  
BLADE**



**PARALLEL  
BLADE**



Low profile frame  
illustrated is typical for  
units under 12" (305) high.

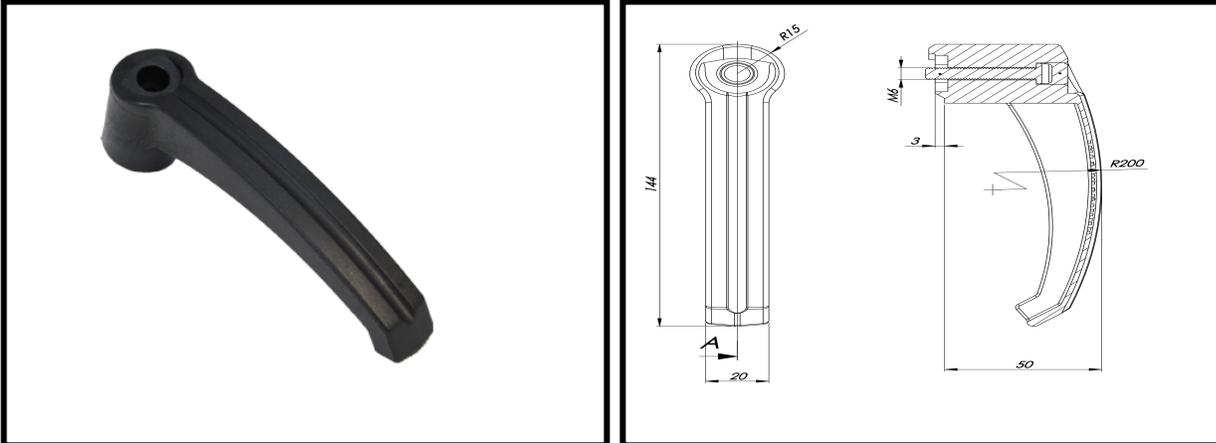
# Allegis Product Detail

# 1-866-378-7550

**Allegis Part Number: 265076-00P**

Description: NON-LOCKING VENTILATION L-HANDLE

Print



- Designed for the HVAC industry
- Can be used as part of a complete latching system (KlimaFlex)
- Nylon 6 construction
- Supplied with screw and plastic cover plug
- Black finish
- **Individually Packaged**



**Koch Filter Corporation**  
Filtration Products Crafted with Pride

# Multi-Pleat Elite™

*Self-Supporting Extended Surface Pleated Filter*



**High performance MERV 8 mechanical air filter media** is self-supporting and requires no metal support grid downstream. No metal components means the filter is completely incinerable after use.

**Exclusive vForm™ Pleating Technology** maintains uniform pleat spacing in every filter. In addition, vForm™ Pleating Technology insures the same pleat configuration used for decades in our original Multi-Pleat products. Same aerodynamic v-shaped pleat design, same superior performance.

**Sturdy, moisture-resistant, beverage board perimeter frame and cross-braces** provide structural integrity even in difficult operating conditions.

The media used in the Multi-Pleat Elite is extraordinarily resilient and is engineered to endure the rigors of shipping, handling, installation and operation.



*Multi-Pleat Elite earns the Koch Green Icon for one or more following categories: Earns LEED Points, Reduces Energy Costs, Extends Filter Lifecycles, Conserves Resources, and Improves Indoor Environmental Quality.*

## Features:

- Exclusive vForm™ Pleating Technology
- MERV 8 performance rating
- Self-supporting pleats requires no metal reinforcement
- Low resistance to airflow reduces energy costs
- Moisture-resistant beverage board frame
- Completely incinerable

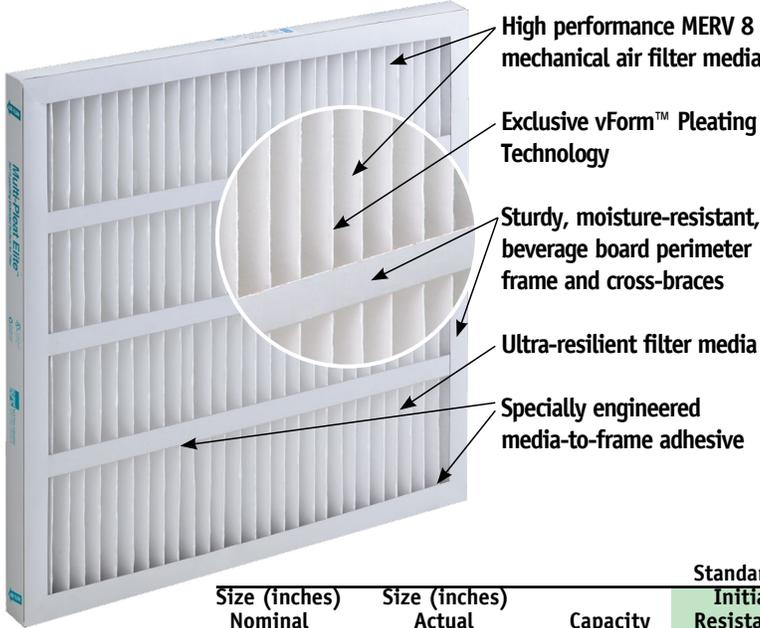
**Koch Filter Corporation...Durable. Reliable. Versatile.**

Bulletin No. K-MPE10

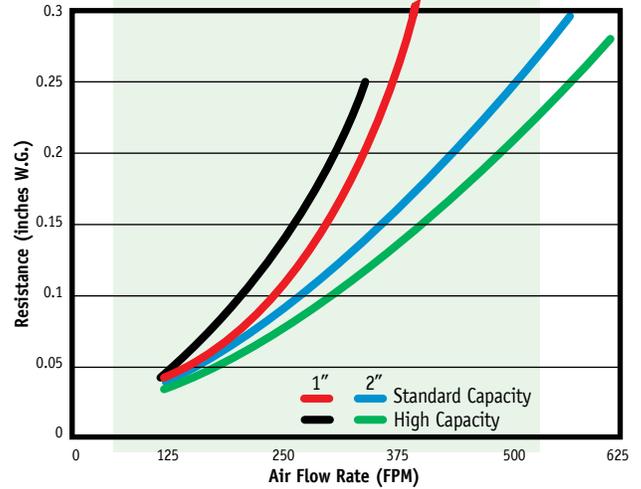


**Koch Filter Corporation**  
 Filtration Products Crafted with Pride

## Multi-Pleat Elite Technical Data



Initial Resistance vs. Filter Face Velocity



Additional Multi-Pleat Elite Product Information

ASHRAE Test Standard 52.2-2007.

Recommended maximum continuous operational temperature is 150° F (93° C).

Multi-Pleat Elite filters are classified as Underwriter's Laboratories Class 2 according to U.L. Standard 900.

Size (inches) Nominal W x H x D	Size (inches) Actual W x H x D	Capacity (CFM)	Standard Capacity Elite		High Capacity Elite	
			Initial Resistance (in. W.G.)	Media Area (Sq. Ft.)	Initial Resistance (in. W.G.)	Media Area (Sq. Ft.)
12 x 24 x 1	11 <sup>3</sup> / <sub>8</sub> x 23 <sup>3</sup> / <sub>8</sub> x 3 <sup>3</sup> / <sub>4</sub>	600	0.29	3.3	0.20	3.8
14 x 20 x 1	13 <sup>1</sup> / <sub>2</sub> x 19 <sup>1</sup> / <sub>2</sub> x 3 <sup>3</sup> / <sub>4</sub>	590	0.29	3.4	0.20	3.8
14 x 25 x 1	13 <sup>1</sup> / <sub>2</sub> x 24 <sup>1</sup> / <sub>2</sub> x 3 <sup>3</sup> / <sub>4</sub>	730	0.29	4.3	0.20	4.8
15 x 20 x 1	14 <sup>1</sup> / <sub>2</sub> x 19 <sup>1</sup> / <sub>2</sub> x 3 <sup>3</sup> / <sub>4</sub>	630	0.29	3.6	0.20	4.1
16 x 20 x 1	15 <sup>1</sup> / <sub>2</sub> x 19 <sup>1</sup> / <sub>2</sub> x 3 <sup>3</sup> / <sub>4</sub>	670	0.29	3.8	0.20	4.3
16 x 24 x 1	15 <sup>1</sup> / <sub>2</sub> x 23 <sup>3</sup> / <sub>8</sub> x 3 <sup>3</sup> / <sub>4</sub>	800	0.29	4.6	0.20	5.2
16 x 25 x 1	15 <sup>1</sup> / <sub>2</sub> x 24 <sup>1</sup> / <sub>2</sub> x 3 <sup>3</sup> / <sub>4</sub>	840	0.29	4.8	0.20	5.4
20 x 20 x 1	19 <sup>1</sup> / <sub>2</sub> x 19 <sup>1</sup> / <sub>2</sub> x 3 <sup>3</sup> / <sub>4</sub>	840	0.29	4.7	0.20	5.4
20 x 24 x 1	19 <sup>1</sup> / <sub>2</sub> x 23 <sup>3</sup> / <sub>8</sub> x 3 <sup>3</sup> / <sub>4</sub>	1000	0.29	5.7	0.20	6.5
20 x 25 x 1	19 <sup>1</sup> / <sub>2</sub> x 24 <sup>1</sup> / <sub>2</sub> x 3 <sup>3</sup> / <sub>4</sub>	1050	0.29	6.0	0.20	6.8
24 x 24 x 1	23 <sup>3</sup> / <sub>8</sub> x 23 <sup>3</sup> / <sub>8</sub> x 3 <sup>3</sup> / <sub>4</sub>	1200	0.29	7.1	0.20	8.1
12 x 24 x 2	11 <sup>3</sup> / <sub>8</sub> x 23 <sup>3</sup> / <sub>8</sub> x 1 <sup>3</sup> / <sub>4</sub>	1000	0.26	5.4	0.20	7.8
14 x 20 x 2	13 <sup>1</sup> / <sub>2</sub> x 19 <sup>1</sup> / <sub>2</sub> x 1 <sup>3</sup> / <sub>4</sub>	980	0.26	5.5	0.20	7.9
14 x 25 x 2	13 <sup>1</sup> / <sub>2</sub> x 24 <sup>1</sup> / <sub>2</sub> x 1 <sup>3</sup> / <sub>4</sub>	1215	0.26	6.9	0.20	9.9
15 x 20 x 2	14 <sup>1</sup> / <sub>2</sub> x 19 <sup>1</sup> / <sub>2</sub> x 1 <sup>3</sup> / <sub>4</sub>	1050	0.26	6.0	0.20	8.4
16 x 20 x 2	15 <sup>1</sup> / <sub>2</sub> x 19 <sup>1</sup> / <sub>2</sub> x 1 <sup>3</sup> / <sub>4</sub>	1115	0.26	6.5	0.20	8.8
16 x 24 x 2	15 <sup>1</sup> / <sub>2</sub> x 23 <sup>3</sup> / <sub>8</sub> x 1 <sup>3</sup> / <sub>4</sub>	1340	0.26	7.8	0.20	10.6
16 x 25 x 2	15 <sup>1</sup> / <sub>2</sub> x 24 <sup>1</sup> / <sub>2</sub> x 1 <sup>3</sup> / <sub>4</sub>	1400	0.26	8.1	0.20	11.0
18 x 24 x 2	17 <sup>1</sup> / <sub>2</sub> x 23 <sup>3</sup> / <sub>8</sub> x 1 <sup>3</sup> / <sub>4</sub>	1500	0.26	8.4	0.20	12.3
20 x 20 x 2	19 <sup>1</sup> / <sub>2</sub> x 19 <sup>1</sup> / <sub>2</sub> x 1 <sup>3</sup> / <sub>4</sub>	1400	0.26	8.0	0.20	11.1
20 x 24 x 2	19 <sup>1</sup> / <sub>2</sub> x 23 <sup>3</sup> / <sub>8</sub> x 1 <sup>3</sup> / <sub>4</sub>	1675	0.26	9.6	0.20	13.4
20 x 25 x 2	19 <sup>1</sup> / <sub>2</sub> x 24 <sup>1</sup> / <sub>2</sub> x 1 <sup>3</sup> / <sub>4</sub>	1740	0.26	10.0	0.20	14.0
24 x 24 x 2	23 <sup>3</sup> / <sub>8</sub> x 23 <sup>3</sup> / <sub>8</sub> x 1 <sup>3</sup> / <sub>4</sub>	2000	0.26	11.4	0.20	16.2
25 x 25 x 2	24 <sup>1</sup> / <sub>2</sub> x 24 <sup>1</sup> / <sub>2</sub> x 1 <sup>3</sup> / <sub>4</sub>	2170	0.26	12.5	0.20	17.4

### Corporate Offices

P.O. Box 3186 • 625 West Hill Street (40208)  
 Louisville, KY 40201 • 502.634.4796  
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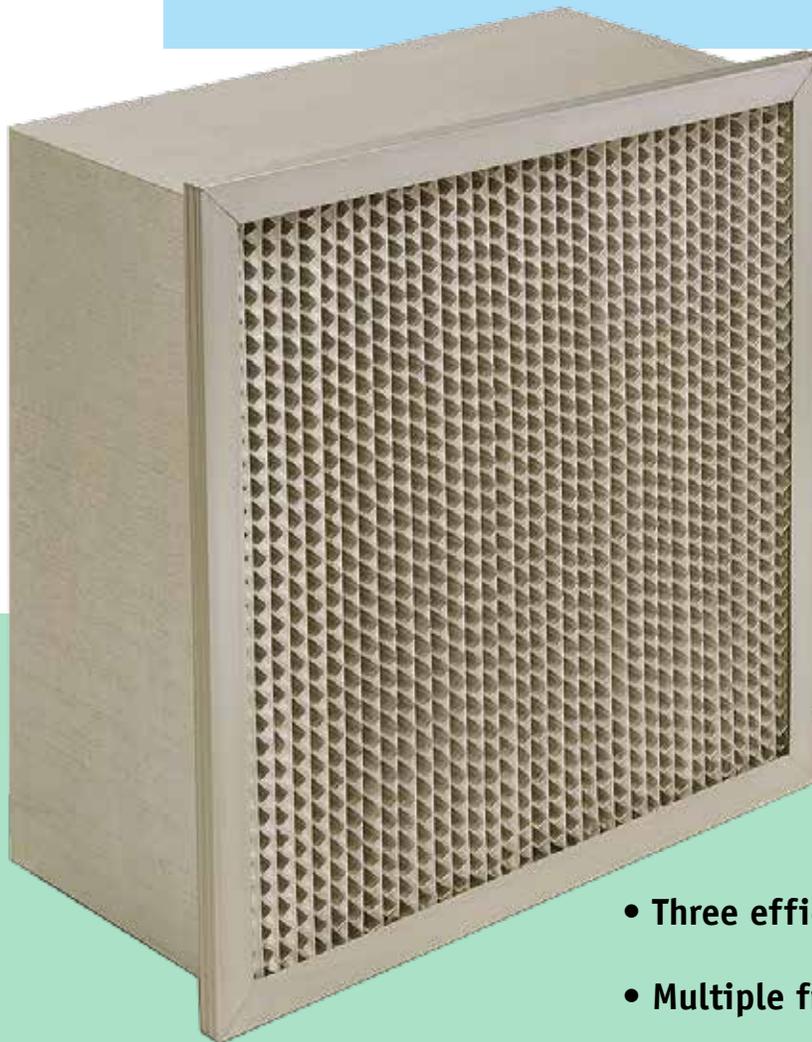
Look for the Koch Green icon! Whenever you see the Koch Green icon, we are identifying a product that meets or exceeds our criteria in one or more of the following categories: **Earns LEED Points, Reduces Energy Costs, Extends Filter Lifecycles, Conserves Resources, and Improves Indoor Environmental Quality.**



**Koch Filter Corporation**  
Filtration Products Crafted with Pride

# ***Multi-Cell™***

*Medium and High Efficiency  
Extended Surface Air Filters*



- **Three efficiency ranges**
- **Multiple frame and header options**
- **Designed for Variable Air Volume systems**



# Multi-Cell

## Medium and High Efficiency Extended Surface Air Filters

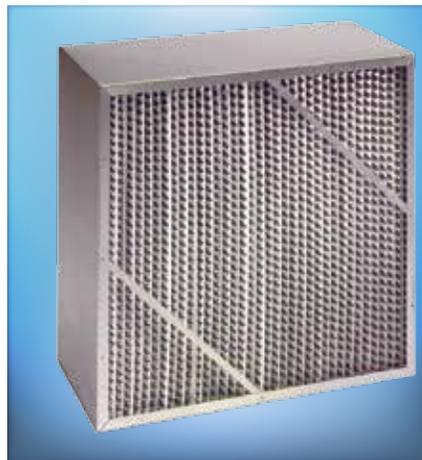
The Koch Multi -Cell is a high efficiency, extended surface air filter designed for use in HVAC applications of all types. Rigid construction makes the Multi-Cell a superior filter in variable-air-volume (VAV) systems, or in any application where extreme conditions require additional filter strength and reliability.

To meet the requirements of various filtration systems, Multi-Cells are offered in multiple standard face sizes, two depths, and three different efficiencies. Five unique frame and header styles are available to insure that each unit fits properly into the existing filter housing or framework. Contact your Koch Filter Corporation representative to determine which style your system requires.

### Multi-Cell Style Description



Style FM  
Cell Sides - Galvanized Steel  
Header location - Single header air entry side  
UL Class 1  
Temperature rating - 180°



Style NHM  
Cell Sides - Galvanized Steel  
Header location - No header  
UL Class 1  
Temperature rating - 180°



Style SBM  
Cell Sides - Galvanized Steel  
Header location - Double header, air entry and air exit sides  
UL Class 1  
Temperature rating - 180°

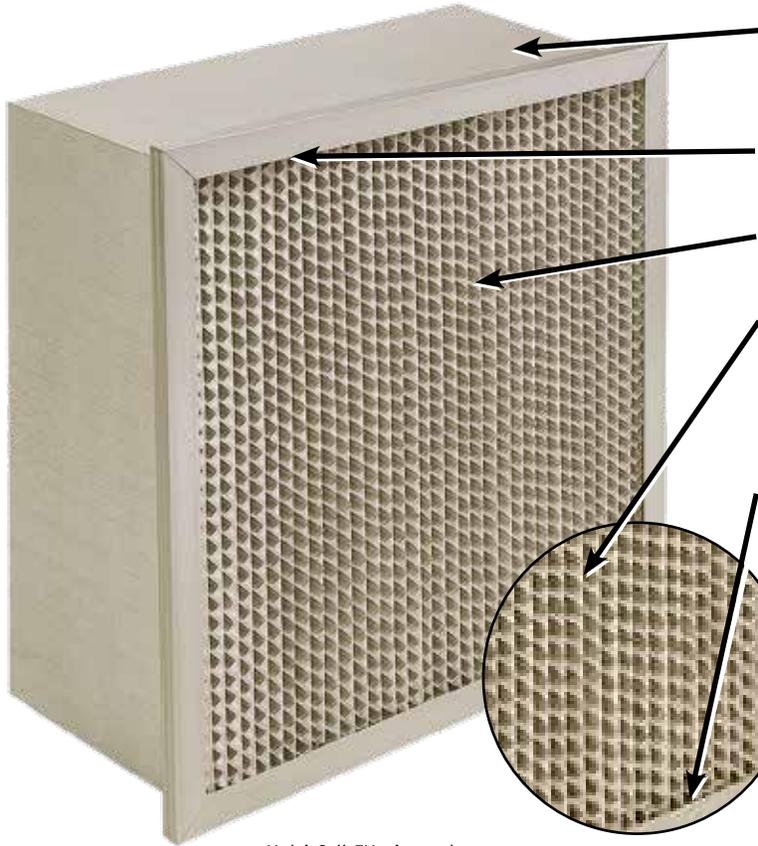


Style FW  
Cell Sides - Particle Board  
Header location - Single galvanized steel header, air entry side  
UL Class 2  
Temperature rating - 180°



Style SBW  
Cell Sides - Particle Board  
Header location - No header  
UL Class 2  
Temperature rating - 180°

# Multi-Cell Construction



Multi-Cell FM pictured

**Cell Sides** on Styles FM, NHM and SBM are constructed with heavy-duty galvanized steel. Styles SBW and FW are constructed with 3/4" Particle Board.

**Header** on Models FM, SBM, and FW is constructed with galvanized steel for problem-free installation into the filter housing.

**Filter Media** is produced from glass fibers and is formed into a durable, graded-density micro-glass paper mat.

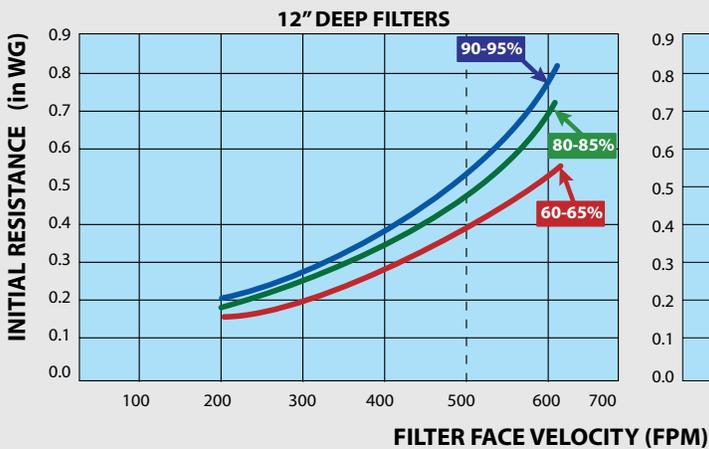
Corrugated aluminum separators provide proper media spacing and additional strength to the media pack. Each separator is folded on the leading edge to make it twice as durable and to prevent damage to the filter media. (Separators are also available with protective coating for highly corrosive atmospheres).

**Media-to-Frame Sealant** in galvanized steel models (FM, NHM, and SBM) is a specialized thermoplastic hot-melt adhesive. The sealant in Particle Board models (FW and SBW) is a durable polyurethane material. Both adhesive sealants have been engineered specifically for superior durability in high efficiency air filtration applications.

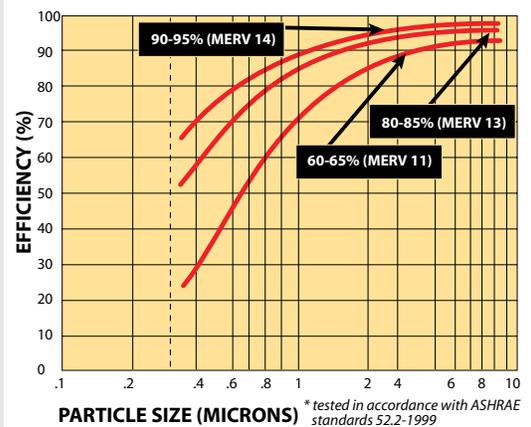
**Special Construction Features** are available for applications where environmental conditions may require additional filtration efficiency or durability.

- Protective faceguards can be secured to one or both sides of the filter.
- Protective gaskets for side-access or front-loading housings are available for normal and high temperature conditions.
- Multi-Cell filters are available with antimicrobial-treated filter media when required.

## Initial Resistance vs. Filter Face Velocity



## Efficiency by Particle Size\*



## Multi-Cell High Capacity



Multi-Cell filters are available in a High Capacity configuration with 30% more media area than the standard model. The additional surface area provides longer service life and enhanced filtration capabilities. Multi-Cell HC is an ideal choice for applications where maximum service life is of paramount concern. See Bulletin No. K-1105A for additional information.

## Multi-Cell HT For High Temperature Applications



Multi-Cell HT filters are constructed with aluminized steel frames designed for operation in applications with temperatures ranging from 750°F to 900°F, and are ideal for use in paint ovens where high temperatures may cause galvanized steel to scale or flake. Each filter has aluminized steel faceguards on both sides to protect the media against damage in shipping, handling, and actual operation. Three standard sizes, 24X24X12, 20X24X12 and 12X24X12, are available in two efficiencies, 90-95% and 60-65%. See Bulletin No. K-1205B for additional information.



## Multi-Cell Operational Data

Multi-Cell Operational Data					
Model No. <sup>1</sup>	Nominal Size <sup>2</sup> HXWXD	Rated Air Flow Capacity (CFM)	Initial Resistance (in W.G.)	Recommended Final Resistance (in W.G.)	Media Area (Sq. Ft.) <sup>5</sup>
Multi-Cell™ 95 (90-95%) <sup>4</sup> MERV 14					
K9242412-*	24X24X12	2000	.55	1.5	125
K9252012-*	25X20X12	1750	.55	1.5	107
K9242012-*	24X20X12	1650	.55	1.5	106
K9202012-*	20X20X12	1400	.55	1.5	87
K9241812-*	24X18X12	1500	.55	1.5	92
K9251612-*	25X16X12	1400	.55	1.5	84
K9201612-*	20X16X12	1100	.55	1.5	68
K9241212-*	24X12X12	1000	.55	1.5	63
K9243012-*	24X30X12	2500	.55	1.5	150
K924246-*	24X24X6	1000	.33	1.5	64
K925206-*	25X20X6	875	.33	1.5	55
K924206-*	24X20X6	825	.33	1.5	54
K920206-*	20X20X6	700	.33	1.5	45
K924186-*	24X18X6	750	.33	1.5	47
K925166-*	25X16X6	700	.33	1.5	43
K920166-*	20X16X6	550	.33	1.5	35
K924126-*	24X12X6	500	.33	1.5	32
Multi-Cell™ 85 (80-85%) <sup>4</sup> MERV 13					
K8242412-*	24X24X12	2000	.54	1.5	125
K8252012-*	25X20X12	1750	.54	1.5	107
K8242012-*	24X20X12	1650	.54	1.5	106
K8202012-*	20X20X12	1400	.54	1.5	87
K8241812-*	24X18X12	1500	.54	1.5	92
K8251612-*	25X16X12	1400	.54	1.5	84
K8201612-*	20X16X12	1100	.54	1.5	68
K8241212-*	24X12X12	1000	.54	1.5	63
K8243012-*	24X30X12	2500	.54	1.5	150
K824246-*	24X24X6	1000	.28	1.5	64
K825206-*	25X20X6	875	.28	1.5	55
K824206-*	24X20X6	825	.28	1.5	54
K820206-*	20X20X6	700	.28	1.5	45
K824186-*	24X18X6	750	.28	1.5	47
K825166-*	25X16X6	700	.28	1.5	43
K820166-*	20X16X6	550	.28	1.5	35
K824126-*	24X12X6	500	.28	1.5	32
Multi-Cell™ 65 (60-65%) <sup>4</sup> MERV 11					
K6242412-*	24X24X12	2000	.39	1.5	125
K6252012-*	25X20X12	1750	.39	1.5	107
K6242012-*	24X20X12	1650	.39	1.5	106
K6202012-*	20X20X12	1400	.39	1.5	87
K6241812-*	24X18X12	1500	.39	1.5	92
K6251612-*	25X16X12	1400	.39	1.5	84
K6201612-*	20X16X12	1100	.39	1.5	68
K6241212-*	24X12X12	1000	.39	1.5	63
K6243012-*	24X30X12	2500	.39	1.5	150
K624246-*	24X24X6	1000	.15	1.5	64
K625206-*	25X20X6	875	.15	1.5	55
K624206-*	24X20X6	825	.15	1.5	54
K620206-*	20X20X6	700	.15	1.5	45
K624186-*	24X18X6	750	.15	1.5	47
K625166-*	25X16X6	700	.15	1.5	43
K620166-*	20X16X6	550	.15	1.5	35
K624126-*	24X12X6	500	.15	1.5	32

### Additional Information:

(1) Insert frame/header style designation "-\*" to complete model numbers.

Example: K9242412-SBW=Particle Board Cell Sides with No Header. See style descriptions on page two of this brochure.

(2) Sizes listed above are nominal. Actual sizes are:

- a) Nominal 12" units – Less 5/8" on height & width and less 1/2" on depth
- b) Nominal 6" units - Less 5/8" on height & width and less 1/8" on depth

(3) Multi-Cell filters are capable of operation up to 125% of rated face velocity.

(4) Multi-Cell Operational Data is based on ASHRAE Test Standard 52.1 and 52.2.

(5) Media area will vary slightly depending on the header configuration.

A) Standard Multi-Cells may be installed with pleats vertical or horizontal. Multi-Cell HT should be installed with pleats vertical.

B) Standard header thickness on Styles FM, SBM and FW is 13/16". 1-1/8" thickness is available if required.

C) UL Classification:

- 1) UL Class 1- Styles FM, SBM, NHM, HT
- 2) UL Class 2 - Styles FW and SBW
- 3) Testing conducted according to UL Standard 900.

D) Product design and specification are subject to change without notice.



**Koch Filter Corporation**  
Filtration Products Crafted with Pride

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### Regional Sales Offices/Distribution Centers

Atlanta, GA • Detroit, MI • East Greenville, PA\* • Houston, TX\* • Indianapolis, IN • Kansas City, MO • Louisville, KY\* • Madbury, NH • Nashville, TN • Mira Loma, CA\*  
\* Denotes manufacturing site

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# **Rigging, Install and Maintenance**

## RECEIVING / RIGGING INSTRUCTIONS

---

The installing contractor is responsible to provide Johnson Controls / YORK with a contact to coordinate the delivery of the equipment in this submittal. Please fill out the information requested in the Submittal Approval Form section in this submittal.

It is the installing contractor's responsibility to verify the following prior to signing the bill of lading presented by the transportation company:

- Ensure everything on the bill of lading was delivered.
- Visually perform a thorough inspection of all equipment for any signs of shipping damage

***Any short-shipments or shipping damage must be noted on the bill of lading prior to signing.***

The transportation company will provide you with instructions for filing a claim. It is the installing contractor's responsibility to work directly with the transportation company to resolve any shipping claims.

## SECTION 3 - HANDLING, STORAGE, AND INSTALLATION

### DELIVERY AND STORAGE

To ensure consistent quality and maximum reliability, all AHUs are tested and inspected before leaving the factory.

#### Short Term



**Indoor AHUs: Under no circumstances should outdoor storage be used.**

- **Remove ventilate wrapping to prevent condensation.**

**Outdoor AHUs: Recover AHUs after inspection or use tarps during storage.**

Short term storage is six months or less from date of shipment. Storage maintenance during this time is usually limited to the following:

- Rotate fans every four weeks, starting on the delivery date to prevent moisture from damaging the bearing.

- If the AHUs are going to be stored out-of-doors, prior to installation, special care must be taken to cover and protect the AHUs from:

- Dust
- Rain and snow
- Rodents
- Construction vehicles and personnel.
- Condensation / Ventilation required

- Protect all parts and porous materials from rain and other sources of moisture. Decontaminate or replace parts as needed to make sure microbial growth is not introduced to the AHU.

- Store the AHU on a firm, flat surface to prevent distortion. Block the AHU off the ground to protect components from water or ground moisture.

# WARNING

Failure to follow these instructions could result in death, serious injury or equipment damage.

**Follow all warnings and instructions in the unit's Manual(s).**

<table border="0"> <tr><td><b>EN</b></td><td>Installation Instructions for the technician / fitter</td></tr> <tr><td><b>PL</b></td><td>Instrukcja instalacji dla technika / monter</td></tr> <tr><td><b>SV</b></td><td>Installationsguide för installatör / montör</td></tr> <tr><td><b>CS</b></td><td>Pokyny k instalaci pro techniky a montéry</td></tr> </table>	<b>EN</b>	Installation Instructions for the technician / fitter	<b>PL</b>	Instrukcja instalacji dla technika / monter	<b>SV</b>	Installationsguide för installatör / montör	<b>CS</b>	Pokyny k instalaci pro techniky a montéry	<table border="0"> <tr><td><b>IT</b></td><td>Istruzioni d'installazione per il personale specializzato</td></tr> <tr><td><b>NL</b></td><td>Installatiehandleiding voor de vakman / monteur</td></tr> <tr><td><b>DE</b></td><td>Installationsanleitung für die Fachkraft / Monteur</td></tr> <tr><td><b>ES</b></td><td>Instrucciones de instalación para el técnico / contratista especializado</td></tr> </table>	<b>IT</b>	Istruzioni d'installazione per il personale specializzato	<b>NL</b>	Installatiehandleiding voor de vakman / monteur	<b>DE</b>	Installationsanleitung für die Fachkraft / Monteur	<b>ES</b>	Instrucciones de instalación para el técnico / contratista especializado	<table border="0"> <tr><td><b>JA</b></td><td>一般仕様・取扱説明書</td></tr> <tr><td><b>FR</b></td><td>Manuel d'installation pour le spécialiste / monteur</td></tr> <tr><td><b>RU</b></td><td>Инструкция по установке для техника/монтажника</td></tr> <tr><td><b>ZH</b></td><td>适用于技术人员与安装人员的 安装说明书</td></tr> </table>	<b>JA</b>	一般仕様・取扱説明書	<b>FR</b>	Manuel d'installation pour le spécialiste / monteur	<b>RU</b>	Инструкция по установке для техника/монтажника	<b>ZH</b>	适用于技术人员与安装人员的 安装说明书
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1. Follow all applicable regulations and safety practices during rigging and lifting.
2. Prepare and follow written rigging and lifting plan.
3. Rigging must be directed by trained professional rigger.
4. Spreader bars must be used and be long enough to prevent rigging from contacting unit.
5. Use all and only designated lift points according to units manual(s).
6. Locate center of gravity through trial lifts to account for possible variations in unit configuration.
7. Use rigging and lifting techniques that keep unit stable and level.
8. Keep clear of unit when lifted.

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**Rigging and lifting must only be done by a professional rigger in accordance with a written rigging and lifting plan. The most appropriate rigging and lifting method will depend on job specific factors, such as the rigging equipment available and site needs. Therefore, a professional rigger must determine the rigging and lifting method to be used, and it is beyond the scope of this manual to specify rigging and lifting details.**

## Protecting the Roof Membrane



*Ensure that all traffic, ladders, screws, and sharp objects are securely installed. Unsecured items may damage the roof.*



*Do not use a top strap during transport as it may damage the roof membrane.*



*The roof membrane load limit is 20 lbs per square inch. Items supported by the roof membrane must have a rubber isolation pad between the material and the membrane to prevent wear and tear.*



*Do not use chemicals with a petroleum ingredient on the roof as they may attack or stain membrane roofing. This includes:*

- *paint thinner*
- *mineral spirits*
- *turperntine*
- *acetone*
- *citrus products.*



*Do not use wire brushes, metal scrapers, and sharp-edged tools on the roof membrane.*



*Do not store self-adhesive seam tape on its edge as it will adhere to whatever it is sitting on and may cause damage to the product upon removal.*



*Do not use citrus based soaps or cleaners on the roof membrane as they may stain or damage the product.*

## Long Term

Long term storage is more than six months from the date of shipment. If long term storage is anticipated, contact the Johnson Controls sales representative for the correct instructions and requirements.

It is mandatory that a detailed record be maintained during this long term period, such as, but not limited to the following:

- Correct sealing of the cabinet,
- Rotation of the blowers and bearings, and
- Protection of all motors from moisture.

Refer to *Long Term Storage Requirement - Field Preparation (Form 50.20-NM3)* and *Long Term Storage Periodic Checklist and Logs (Form 50.20-CL3)* for more information.



***Failure to fulfill the long term storage requirements will void the warranty.***

### Receiver's Responsibility

The receiver is solely responsible for noting the freight bill and filling out the freight claims IMMEDIATELY. In addition, the receiver must:

- Note the visible damage on the signed and dated bill of lading with a request that the carrier inspect the damage within 72 hours of notification.
- Remove the shipping wrapper, and replace it with a tarp or similar protective covering. Any concealed damage reported after 15 days will compromise a claim settlement.
- Request inspections by telephone or in person, but confirm in writing. If assistance is needed with the claim process, contact a Johnson Controls sales representative and refer to the shipping damage form.

## INSPECTION, DAMAGE, AND SHORTAGE

Check the AHU shipment on arrival to make sure that all major pieces, boxes, and crates are received. Check each AHU on the trailer or rail car when received, before unloading, for any visible signs of damage. Report any damage or signs of possible damage to the transportation company immediately for its inspection.

After inspecting the AHU for damage, open all containers and check the contents against the packing list. Report any material shortage to Johnson Controls immediately.



**Johnson Controls is not responsible for any damage or loss of parts in shipment or at job site. Refer to Shipping Damage Claims (Form 50.15-NM).**

### Preventive Maintenance Prior to Long Term Storage

Take the following precautions prior to extended storage:

- Grease the fan and motor bearings per the manufacturer's specifications.
- Protect the motors and sheaves from free moisture or high humidity, which may be accomplished by:
  - Spraying components with an anti-rust solution (P/N 026-37707-000).
  - Disconnecting the belts. Wrapping the sheaves and motor and sealing them with plastic. Inserting a desiccant to absorb moisture that may penetrate the plastic protection.
- Meg the fan motor windings and record for comparison prior to placing the AHU in service.
- If the fan housing was supplied with a drain connection, remove the plug to prevent moisture from accumulating in this part of the fan during storage.

### Periodic Fan Check

On a monthly basis, perform the following tasks:

- Rotate the fan and motor several times to replenish the bearing surfaces with fresh grease.
- Turn the fan impeller 180° from the previous month's position to prevent the belts from taking a set position.

### Monthly Log Sheet

It is the customer's responsibility to submit a monthly log sheet from the *Long Term Storage Periodic Checklist and Logs (Form 50.20-CL3)* that shows the condition of the AHU and to note any discrepancies. Send a copy of the log sheet to the Johnson Controls Field Service Office for its records.

### Check Solution Doors and Latches

Refer to the service manual for adjusting and replacing the doors.

Solution doors are shipped with metal shipping spacers glued onto the edges of each door. They are located on three edges of each door. The spacers should be left in place until the AHU is placed in its final location and multiple skid AHUs are fully assembled. After AHU installation, use a channel lock pliers or a screwdriver to remove the spacers. Do not damage the metal door panel. Slight impressions left on the door gasket by the spacers will rebound in approximately a week.



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**FIGURE 9 - METAL SPACERS ON SOLUTION DOORS**

### Indoor AHUs

It is Johnson Controls' intention that a shipping wrapper be applied to unpainted indoor AHUs for protection from weather, road dirt, etc. during inland transit. Remove the wrapper at the time of delivery to allow for a thorough inspection, both inside and out. Under no circumstances should outdoor storage be used.

### Outdoor AHUs

Generally, outdoor AHUs are not fully wrapped. Exposed openings will be covered for protection from weather, road dirt, and so on during inland transit. Conduct a thorough inspection, inside and out, at the time of delivery.

**Access** - All AHU doors have a small clip, which is located on the door frame, and crosses over the edge of the door. This clip is a safety device to prevent injury when the AHU is operating. Remove the clip to inspect the AHU, and replace it when inspection is completed.

Occasionally, an outdoor Solution AHU may be entirely wrapped in plastic. This plastic should not be removed until the Solution AHU is installed in order to prevent damage from job site dirt and various weather conditions. If the Solution AHU is covered with plastic,

cut the wrap in the outline of the door(s), and proceed to access the Solution AHU using the above information. Close the cut with duct tape.

### Shipped Loose Parts

Check the packing list, which notes the number and types of parts, for non-mounted shipped loose parts in all segments of the AHU. Report shortages within 10 days after receipt of the order. For more information about the shipped loose parts, refer to *Figure 22 on page 31* through *Figure 37 on page 34*.

### LIFTING WEIGHTS

AHU section weights are furnished on the job submittal form. Due to the variance in weight of each AHU design, it is not possible to list AHU weights in these instructions. Refer to the job submittal form when selecting a crane for rigging and figuring out roof weight loads. Weights can also be found on skid ID label for each section. Contact a Johnson Controls sales representative, if there are questions regarding the AHU weights.

### MOVING THE AHU

Prior to moving the AHU, make sure that the installation site is suitable for installing the AHU, and is easily capable of supporting the weight of the AHU and all associated services.

### Rigging

Some AHUs are shipped completely assembled. When large AHUs are ordered with multi-zone (MZ) segments in rear discharge location (end of the AHU), the AHUs will ship with the top section (hot deck) separated. In these cases, the complete MZ damper assembly (hot and cold decks) will ship loose.

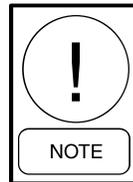


***All lifting points must be used to avoid personal injury, death, or damage to the equipment.***

Use all lifting lugs to avoid damage to the AHU. If the AHU is not equipped with lifting lugs, use bottom corner connectors as shown in *Figure 12 on page 25*, and raceway lifting lugs as shown in *Figure 14 on page 25*. Do not use top corner connectors. Use come-alongs as shown in *Figure 11 on page 25*.

An experienced and reliable rigger must handle the unloading and final placement of the AHU, and must be advised of the following:

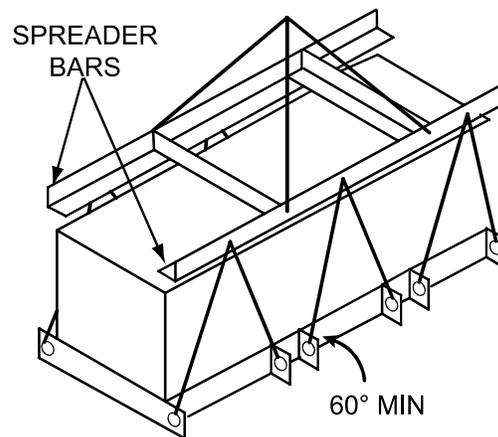
- AHU contains internal components and should be handled in an upright position.
- Care must be exercised to avoid twisting the equipment structure.
- Prevent unnecessary jarring or rough handling.



***Correct rigging and handling of the equipment is mandatory during unloading and setting it into position to prevent voiding the warranty.***

Use the correct spreader bars and hoisting lines when rigging to prevent damage to the AHU casing.

When lifting long AHUs, a special system must be used to ensure a minimum 60° angle between the lifting lugs and spreader bar/frame.



LD13765b

**FIGURE 10 - RECOMMENDED LIFTING WITH MULTIPLE POINTS**

### Using Fork Lift in Special Circumstances

Forklifts should not be used to off-load AHUs except in special circumstances. If moving an AHU with a fork lift or similar equipment becomes necessary, make sure the lifting forks are long enough to reach from the fork truck to the opposite side and slightly beyond the AHU. Leave the shipping blocks attached to the bottom of the AHU until it is moved to its final location. There is no structural support under the equipment except what is visible from the perimeter.

### Come-A-Longs (Power Pulls)

If the AHU has multiple sections, use come-a-longs, also known as power pulls, as shown in *Figure 11* on page 25 to pull the sections or skids together.



LD09613a

**FIGURE 11 - TYPICAL COME-A-LONGS**

### Proper Lifting with Shackles

Fasten shackles to a sling or chain and use them to safely lift and lower the sections of a tiered AHU. Refer to the following figures for correct lifting:

- *Figure 12* on page 25 for correct lifting with a hook and shackle at the corners.
- *Figure 13* on page 25 for correct lifting with a hook and shackle at the lifting lugs.
- *Figure 14* on page 25 for lifting with a base rail.



LD13767

**FIGURE 12 - PROPER LIFTING WITH SHACKLE WITH CORNER CONNECTOR CORNERS**



AL13768

**FIGURE 13 - CORRECT LIFTING WITH SHACKLE AT LIFTING LUG**



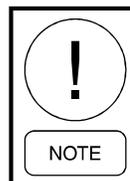
LD13766

**FIGURE 14 - CORRECT LIFTING WITH BASE RAIL**

### PREPARING THE SITE



***Do not weld or use torches on the exterior or interior of the AHU housing. The housing contains polyurethane insulation, which, under combustion, produces harmful, toxic gases which may result in personal injury or death.***



***Never use silicone caulk or sealant in or on any AHU.***

## **Short Term & Long Term Storage Requirements**

---



# Service Information

File In/With: –

SI0510

New

422

Equipment Affected: Airside Products XT and Custom AHU

AHU Short-Term Storage Requirements

## Introduction

This document is intended to assist in the field in maintaining quality and dependability of Air Handling Units (AHUs) which are placed in short-term storage before start-up. Short-term storage is defined as storage for 6 months or less from the date of shipment.



*Failure to comply with the guidelines listed in this document and failure to file dated and signed documentation may void the entire unit warranty. Contact the Airside PTS team if you have any questions.*

## Inspecting the unit

At the time of delivery, inspect the shipping container for any damage. Remove any shrink wrap and inspect the air handler for any damage. Any damage must be reported within 72 h of receipt.

## Storing the unit

**The AHU must be stored either indoors or under a tarp or covering to protect from external elements.**

**Note:** Avoid the use of plastic sheeting in order to prevent moisture buildup and the formation of rust in the unit.

Work on this equipment should only be done by properly trained personnel who are qualified to work on this type of equipment. Failure to comply with this requirement could expose the worker, the equipment and the building and its inhabitants to the risk of injury or property damage.

The instructions on this service information letter are written assuming the individual who will perform this work is a fully trained HVAC & R journeyman or equivalent, certified in refrigerant handling and recovery techniques, and knowledgeable with regard to electrical lock out/tag out procedures. The individual performing this work should be aware of and comply with all Johnson Controls, national, state and local safety and environmental regulations while carrying out this work. Before attempting to work on any equipment, the individual should be thoroughly familiar with the equipment by reading and understanding the associated service literature applicable to the equipment. If you do not have this literature, you may obtain it by contacting a Johnson Controls Service Office.

Should there be any question concerning any aspect of the tasks outlined in this bulletin, please consult a Johnson Controls Service Office prior to attempting the work. Please be aware that this information may be time sensitive and that Johnson Controls reserves the right to revise this information at any time. Be certain you are working with the latest information.

## Indoor AHUs

The following is a list of requirements for the short-term storage of Indoor AHUs:

- Under no circumstances must the unit be stored outside.
- Store the AHU on a firm, flat surface to prevent distortion.
- Storage temperatures must be between -4°F (-20°C) and 113°F (45°C).
- Storage relative humidity must be less than 95%, with no condensation. Maximum relative humidity is 60% if corrosive gasses are present.
- Store in an area away from vibration or shock loading. Place on dampening material as required.
- Store at atmospheric pressure of 70 kPa to 106 kPa or 0.7 atmospheres to 1.05 atmospheres.
- Ensure that all electrical components are stored in a clean, dry environment.
- Rotate fans before placing in storage.
- Cap the water coil inlet and the outlet connections to prevent foreign materials and liquids from entering the unit.

## Outdoor AHUs

The following is a list of requirements for the short-term storage of Outdoor AHUs:

- Recover AHUs after inspection and before storage outdoors.
- Store the AHU on a firm, flat surface to prevent distortion.
- Place the AHU on blocks to protect all parts and porous materials from snow, rain, and moisture.
- Storage temperatures must be between -4°F (-20°C) and 113°F (45°C).
- Storage relative humidity must be less than 95%, with no condensation. Maximum relative humidity is 60% if corrosive gasses are present.
- Store in an area away from vibration or shock loading. Place on a dampening material, as required.
- Store at atmospheric pressure of 70 kPa to 106 kPa or 0.7 atmospheres to 1.05 atmospheres.
- Ensure that all electrical components are stored in a clean, dry environment.
- Rotate fans before placing in storage.
- Decontaminate or replace parts as required to ensure that microbial growth is not introduced to the AHU.
- Cap the water coil inlet and outlet connections to prevent foreign materials and liquids from entering the unit.

## Storage maintenance

<b>Contract number</b>							
<b>Job name</b>							
<b>Delivery date</b>							
<b>Serial number</b>							
<b>Model number</b>							
<b>Condition of the unit on delivery</b>							
<b>Date of storage preparation</b>							
<b>Component</b>	<b>Check</b>	<b>Month 1</b>	<b>Month 2</b>	<b>Month 3</b>	<b>Month 4</b>	<b>Month 5</b>	<b>Month 6</b>
<b>AHU</b>	Inspect for damage						
<b>Fans</b>	Inspect for damage						
<b>Refrigerant coils</b>	Check hold charge pressure *						
<b>Direct drive fan</b>	Rotate fan impeller and leave at 180° from the previous month						
	Grease bearings **						
<b>Belt driven fan</b>	Remove tension from belt						
	Rotate fan and motor shaft to distribute grease						
<b>ECM fan</b>	Rotate fan impeller						

\* If pressure drops by more than 2 psi, pressure test the unit to locate the leak. Repair the leak, recharge with nitrogen to 5 psi. Note any repairs made.

\*\* **Motor Bearing Lubricant** – Use a high-grade ball or roller bearing grease. Recommended grease for standard service conditions is Polyrex EM (Exxon Mobil). The maximum operating temperature for standard motors is 230°F (110°C). The shutdown temperature in case of a malfunction is 239°F (115°C).

\*\*\* **Fan Bearing Lubricant** – Use a lithium or petroleum based grease conforming to an NLGI Grade II consistency. The lubricant must be free of any chemical impurities such as free acid or free alkali, dust, rust, metal particles, or abrasives. This light viscosity, low torque grease is rust inhibited and water resistant, and has a temperature range of -30°F (-34.4°C) to 200°F (93.3°C), with intermittent highs of 250°F (121°C).

Signed: \_\_\_\_\_

Date \_\_\_/\_\_\_/\_\_\_



# Service Information

File In/With: –

SI0511

New 422

Equipment Affected: Airside Products XT and Custom AHU

AHU Long-Term Storage Requirements

## Introduction

This document is intended to assist the field in maintaining quality and dependability of Air Handling Units (AHUs) which are placed in long-term storage before start-up. Long-term storage is defined as storage for 6 months or greater from the date of shipment.



*Failure to comply with the guidelines listed in this document and failure to file dated and signed documentation may void the entire unit warranty. Contact the Airside PTS team if you have any questions.*

## Inspecting the unit

At the time of delivery, inspect the shipping container for any damage. Remove any shrink wrap and inspect the air handler for any damage. Any damage must be reported within 72 hours of receipt.

## Storing the unit

**The AHU must be stored either indoors or under a tarp or covering to protect from external elements. Do not store for longer than 36 months.**

**Note:** Avoid the use of plastic sheeting in order to prevent moisture buildup and the formation of rust in the unit.

Work on this equipment should only be done by properly trained personnel who are qualified to work on this type of equipment. Failure to comply with this requirement could expose the worker, the equipment and the building and its inhabitants to the risk of injury or property damage.

The instructions on this service information letter are written assuming the individual who will perform this work is a fully trained HVAC & R journeyman or equivalent, certified in refrigerant handling and recovery techniques, and knowledgeable with regard to electrical lock out/tag out procedures. The individual performing this work should be aware of and comply with all Johnson Controls, national, state and local safety and environmental regulations while carrying out this work. Before attempting to work on any equipment, the individual should be thoroughly familiar with the equipment by reading and understanding the associated service literature applicable to the equipment. If you do not have this literature, you may obtain it by contacting a Johnson Controls Service Office.

Should there be any question concerning any aspect of the tasks outlined in this bulletin, please consult a Johnson Controls Service Office prior to attempting the work. Please be aware that this information may be time sensitive and that Johnson Controls reserves the right to revise this information at any time. Be certain you are working with the latest information.

## Indoor AHUs

The following is a list of requirements for the long-term storage of Indoor AHUs:

- Under no circumstances must the unit be stored outside.
- Store the AHU on a firm, flat surface to prevent distortion.
- Storage temperatures must be between -4°F (-20°C) and 113°F (45°C).
- Storage relative humidity must be less than 95%, with no condensation. Maximum relative humidity is 60% if corrosive gasses are present.
- Store in an area away from vibration or shock loading. Place on dampening material as required.
- Store at atmospheric pressure of 70 kPa to 106 kPa or 0.7 atmospheres to 1.05 atmospheres.
- Ensure that all electrical components are stored in a clean, dry environment.
- Rotate fans before placing in storage.
- Cap the water coil inlet and the outlet connections to prevent foreign materials and liquids from entering the unit.

## Outdoor AHUs

The following is a list of requirements for the long-term storage of Outdoor AHUs:

- Recover AHUs after inspection and before storage outdoors.
- Store the AHU on a firm, flat surface to prevent distortion.
- Place the AHU on blocks to protect all parts and porous materials from snow, rain, and moisture.
- Storage temperatures must be between -4°F (-20°C) and 113°F (45°C).
- Storage relative humidity must be less than 95%, with no condensation. Maximum relative humidity is 60% if corrosive gasses are present.
- Store in an area away from vibration or shock loading. Place on a dampening material, as required.
- Store at atmospheric pressure of 70 kPa to 106 kPa or 0.7 atmospheres to 1.05 atmospheres.
- Ensure that all electrical components are stored in a clean, dry environment.
- Rotate fans before placing in storage.
- Decontaminate or replace parts as required to ensure that microbial growth is not introduced to the AHU.
- Cap the water coil inlet and outlet connections to prevent foreign materials and liquids from entering the unit.

## Storage maintenance

Contract number							
Job name							
Delivery date							
Serial number							
Model number							
Condition of the unit on delivery							
Date of storage preparation							
Component	Check	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
AHU	Inspect for damage						
Fans	Inspect for damage						
Refrigerant coils	Check hold charge pressure *						
Direct drive fan	Rotate fan impeller and leave at 180° from the previous month						
	Grease bearings **						
Belt driven fan	Remove tension from belt						
	Rotate fan and motor shaft to distribute grease						
ECM fan	Rotate fan impeller						
	Consult manufacturer before start-up						
Component	Check	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
AHU	Inspect for damage						
Fans	Inspect for damage						
Refrigerant coils	Check hold charge pressure *						
Direct drive fan	Rotate fan impeller and leave at 180° from the previous month						
	Grease bearings **						
Belt driven fan	Remove tension from belt						
	Rotate fan and motor shaft to distribute grease						
ECM fan	Rotate fan impeller						
	Consult manufacturer before start-up						

Component	Check	Month 12 of storage	Month 24 of storage
Electrical cabinets	Install new vapor emitters and reseal *** YORK P/N 026-37705-000		
Shafts and sheaves	Spray with anti-corrosion spray *** YORK P/N 026-37707-007		
VFDs	Energize for 1 hour		
Capacitors	Reform annually		

\* If pressure drops by more than 2 psi, pressure test the unit to locate the leak. Repair the leak, recharge with nitrogen to 5 psi. Note any repairs made.

\*\* **Motor Bearing Lubricant** – Use a high-grade ball or roller bearing grease. Recommended grease for standard service conditions is Polyrex EM (Exxon Mobil). The maximum operating temperature for standard motors is 230°F (110°C). The shutdown temperature in case of a malfunction is 239°F (115°C).

\*\*\* **Fan Bearing Lubricant** – Use a lithium or petroleum based grease conforming to an NLGI Grade II consistency. The lubricant must be free of any chemical impurities such as free acid or free alkali, dust, rust, metal particles, or abrasives. This light viscosity, low torque grease is rust inhibited and water resistant, and has a temperature range of -30°F (-34.4°C) to 200°F (93.3°C), with intermittent highs of 250°F (121°C).

\*\*\*\* Purchased at any local HVAC controls supply house.

Signed: \_\_\_\_\_

Date \_\_\_/\_\_\_/\_\_\_



# Service Information

File In/With: –

Supersedes SI0489 (1221)

SI0489

REV

222

Equipment Affected: Airside Products XT and Custom AHUs

VFD Storage Requirements

## General

Having a spare VFD on the shelf is not always practical for keeping the spare drive ready to use in an emergency. The customer must ensure that VFDs are stored in a clean, dry location and conduct periodic inspections to prevent contamination issues, which may include mice and insects. Other storage requirements include energizing the VFD at least once a year, for a period of 1 hour. Refer to the *Reforming* section below.

## Storage requirements

Storage temperature	-40°C to 70°C or -40°F to 158°F
Relative humidity	Less than 95% no condensation allowed Max RH is 60% in the presence of corrosive gasses
Free fall	Maximum of 10 in.
Vibration	ISTA or the minimum vibration possible
Atmospheric pressure	70 kPA to 106 kPA or 0.7 atmospheres to 1.05 atmospheres

Work on this equipment should only be done by properly trained personnel who are qualified to work on this type of equipment. Failure to comply with this requirement could expose the worker, the equipment and the building and its inhabitants to the risk of injury or property damage.

The instructions on this service information letter are written assuming the individual who will perform this work is a fully trained HVAC & R journeyman or equivalent, certified in refrigerant handling and recovery techniques, and knowledgeable with regard to electrical lock out/tag out procedures. The individual performing this work should be aware of and comply with all Johnson Controls, national, state and local safety and environmental regulations while carrying out this work. Before attempting to work on any equipment, the individual should be thoroughly familiar with the equipment by reading and understanding the associated service literature applicable to the equipment. If you do not have this literature, you may obtain it by contacting a Johnson Controls Service Office.

Should there be any question concerning any aspect of the tasks outlined in this bulletin, please consult a Johnson Controls Service Office prior to attempting the work. Please be aware that this information may be time sensitive and that Johnson Controls reserves the right to revise this information at any time. Be certain you are working with the latest information.

## Energizing VFDs

Electrolytic capacitors are used in almost all low and some medium voltage drives. These capacitors are filled with an electrolytic gel. As these capacitors sit without being used, the gel starts to dry up and may result in issues.

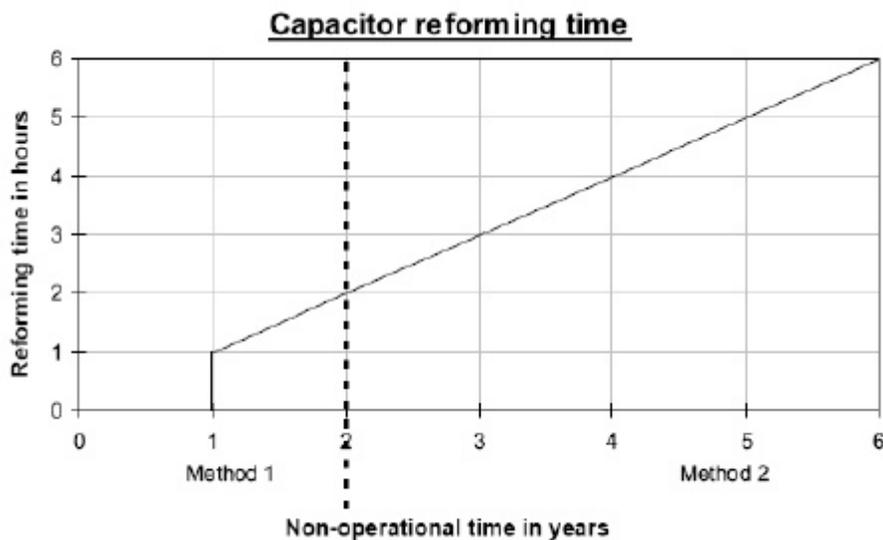
1. It is suggested that you energize the VFD yearly for 1 hour. When you perform the annual preventative maintenance on drives, energize any stored VFD. If electrolytic capacitors sit for more than a year without being energized, make sure to reform the capacitors before placing in service. This takes valuable time and may occur at a moment in which your process is down. Most electrolytic capacitors only have a 5 year to 7 year shelf life. If you go too long without energizing or reforming the capacitors, you may find it is too late to save the VFD without performing actual repairs.
2. Another issue with just reforming the capacitors on VFDs is that you can only reform the DC bus capacitors. Capacitors that are on the printed circuit boards are not reformed. It is best practice to energize stored VFDs every year or if the VFD is a spare, rotate out equipment during annual preventative maintenance service in order to keep all VFDs in ideal running shape.

## Reforming

The drive DC link capacitors need to be reformed, or re-aged, if the drive has been non-operational for more than one year. Without reforming, capacitors may be damaged when the drive starts to operate. The reforming methods introduced in this set of instructions require that the drive has been stocked in a clean and dry manner. Capacitors must be reformed once a year.

### Reforming time

The intermediate circuit of the drive is kept in its nominal voltage for the reforming time in order to wake up the capacitors. The reforming time required is dependent on how long the drive has been stocked or in a non-operational setting. Refer to *Figure 1 – Capacitor reforming time*.



**Figure 1 - Capacitor reforming time**

**Note:** Please refer to *Form 50.20-NM12* on the JCI portal for additional information.

## Summary

This warranty provides coverage for replacement parts only and does not cover failure or damage due to storage. Installation, operation, or maintenance which is not in compliance with Johnson Controls' specifications and industry standard practice due to accident, misuse, abuse, or negligence may void the factory warranty. In addition, this warranty does not cover reimbursement for labor, including any removal or installation expenses which may be incurred in connection with repair or replacement, unless otherwise agreed upon by Johnson Controls.

## **Startup Checklist(s)**

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REFER TO INSTALLATION, OPERATIONAL, MAINTENANCE MANUAL(S) FOR FULL MANUFACTURER'S  
INSTRUCTIONS



## Pre-Startup Checklist

### PURPOSE

- A pre-startup checklist of any Johnson Controls equipment, that eliminates the need for complicated paperwork on site, and help avoid scheduling delays and project timeline impacts.

### GETTING STARTED

- You should have received an email from [donotreply@truecontext.com](mailto:donotreply@truecontext.com) with your username and a link to set up a password. If you have not received/have misplaced this email or are unsure if you have been given access, provide the following information to [bsna.quality.feedback@jci.com](mailto:bsna.quality.feedback@jci.com)
  - a. Contractor name and email address
  - b. Physical address and phone number
- Download the **TrueContext** App on your iOS or Android device.



- Login with your firm's username and password.
- Select "Pre-Start Up Checklist" under "Forms".
- Fill out the form, upload site pictures, and sign.
- Submit your forms, then notify your cooperating branch of your submission, and to schedule a full startup.

TECHNICAL ISSUES? Contact Database Manager at [bsna.quality.feedback@jci.com](mailto:bsna.quality.feedback@jci.com)

 <b>BY JOHNSON CONTROLS</b>	<b>AIR HANDLING UNITS</b>
<b>START-UP CHECKLIST</b>	Supersedes: 100.00-CL1 (909) <span style="float: right;">Form 100.00-CL1 (313)</span>

## AIR HANDLER START-UP CHECKLIST

OFFICE LOCATION _____	UNIT TAG # _____
QUALIFIED TECHNICIAN _____	UNIT MODEL # _____
JOB NAME _____	UNIT SERIAL # _____
YORK JOB ID OR CONTRACT # _____	START DATE _____
JOB SITE LOCATION _____	
JOB SITE CONTACT AND PHONE # _____	

***IMPORTANT SAFETY REQUIREMENT: FOLLOW THE LATEST "LOCK OUT TAG OUT" PROCEDURE.***

### PRE START-UP

#### GENERAL UNIT INSPECTION

Identify and perform appropriate “lock out/tag out” and safety rules. For details on points below see appropriate section of the Installation Instruction provided with each air handler.

For VFD equipped air handlers, refer to the VFD forms for additional requirements.



***Serious damage to the AHU and/or system is eminent if the AHU is operated under any of the following conditions:***

- ***Without proper control of dampers.***
- ***With smoke dampers closed.***
- ***During a fire alarm or smoke purge test.***
- ***Any airflow restriction greater than normal.***

Solution	AH Units	Form	102.20-OM1	Air Modulator	VFD Quick Start	Form	100.42-NO1
Custom	AH Units	Form	100.31-NOM1				
<input type="checkbox"/>	Equipment received as ordered.	<input type="checkbox"/>	Unit installed with proper clearances.	<input type="checkbox"/>	Unit checked for damage to interior and exterior.	<input type="checkbox"/>	Visually inspect roof curb for tight seal around unit.
<input type="checkbox"/>	Unit installed on flat and level surface. Outdoor unit mounted within roof slope limitations where applicable.	<input type="checkbox"/>	All penetrations MUST be sealed. All conduits MUST be sealed internally.	<input type="checkbox"/>	Terminal screws and wiring connections secure in control, electric and Air Modulator panels.	<input type="checkbox"/>	Clean air filters installed properly and secured.
<input type="checkbox"/>	Air hoods installed properly.	<input type="checkbox"/>	Filter gauge set to zero.	<input type="checkbox"/>	Condensate drain properly trapped.	<input type="checkbox"/>	All field wiring complete and inspected.
<input type="checkbox"/>	All wiring and tubing connections made at shipping splits.	<input type="checkbox"/>	All shipping splits sealed and secured properly.	<input type="checkbox"/>	All field piping connections complete.	<input type="checkbox"/>	Pipe chase floor sealed at penetrations.
<input type="checkbox"/>	All shipped loose parts installed.	<input type="checkbox"/>	All shipping bolts and other material have been removed. (Fan, VIFB, Energy Recovery Wheel, Damper).	<input type="checkbox"/>	All shipped loose parts installed.	<input type="checkbox"/>	Damper linkage is tight and in correct "power off" position.
<input type="checkbox"/>	Installer has cleaned out interior.	<input type="checkbox"/>	Controls installation complete.	<input type="checkbox"/>	Verify all plug-ins and wire connections are tight on UV equipment.	<input type="checkbox"/>	Verify all spacers removed from door edges.
<input type="checkbox"/>	Verify Energy Recovery Wheel turns freely and wheel segments are fully engaged.	<input type="checkbox"/>	Verify correct piping of split system. Reference Section 2 of Solution IOM & Split System Application Guide (050.40-ES3).	<input type="checkbox"/>	Verify all ductwork is complete and available for full air flow.		

FAN INSPECTION	
<input type="checkbox"/> Check bearings and locking collars for properly tightened setscrews, bolts and nuts.	<input type="checkbox"/> Fan wheel properly aligned, tight on shaft and freely moving.
<input type="checkbox"/> Sheaves properly aligned and tight on shaft.	<input type="checkbox"/> Check fan base isolators and thrust restraints for proper adjustment. <b>Note: Do not remove functional bolts from seismic isolators.</b>
<input type="checkbox"/> Belt tension adjusted properly per drive pkg. label on fan.	
<input type="checkbox"/> Check fan alignment with unit discharge. Adjust with isolation.	<input type="checkbox"/> Fan bearings have been re-lubricated properly.

## START-UP

### PERFORM THE FOLLOWING STEPS IN ORDER:

Refer to safety standards. Ensure all door latches are secured before starting.

<input type="checkbox"/> 1. With all Electric Power off, all disconnect switches open and fuses removed, check each circuit with an Ohm meter to ground observing no continuity. Reinstall fuses.	<input type="checkbox"/> 8. Immediately check current draw of each leg of each motor.
<input type="checkbox"/> 2. Energize power to the unit disconnect switch.	<input type="checkbox"/> 9. VFD, refer to manufactures start up guide
<input type="checkbox"/> 3. Verify correct voltage, phase and cycles.	<input type="checkbox"/> 10. Check doors and latches for air leaks.
<input type="checkbox"/> 4. Energize fan motor(s) briefly (bump) and check for correct fan rotation.	<input type="checkbox"/> 11. Check for obvious audible leaks.
<input type="checkbox"/> 5. Check operation of dampers. Insure unit will not operate with all dampers closed.	<input type="checkbox"/> 12. Apply steam to cold coils slowly to prevent damage.
<input type="checkbox"/> 6. Energize fan motor(s). Observe fan(s) for smooth operation.	<input type="checkbox"/> 13. Observe energy recovery wheel rotation is correct.
<input type="checkbox"/> 7. Check motor nameplate Full Load Amp rating.	<input type="checkbox"/> 14. Purge on energy recovery wheel is set to specification.

### RECORD DATA

**POWER SUPPLY:** Unit Nameplate V\_\_\_ PH\_\_\_ CYC, \_\_\_ Verify V \_\_\_/\_\_\_/\_\_\_

#### DATA

	SUPPLY FAN MOTOR	EXHAUST/RETURN FAN MOTOR
Nameplate	Volts _____ Amps _____	Volts _____ Amps _____
Run Amps	_____ / _____ / _____	_____ / _____ / _____
Catalog Number	_____	_____
Spec Number	_____	_____
Horse Power	_____	_____
RPM	Nameplate _____ Actual _____	Nameplate _____ Actual _____
Frame size	_____	_____
Service Factor	_____	_____
Jump (Skip) Frequencies	_____ / _____ / _____	_____ / _____ / _____
	SUPPLY FAN	EXHAUST/RETURN FAN
Manufacture Name	_____	_____
Type or Model Number	_____	_____
Code or Shop Order Number	_____	_____
Serial Number	_____	_____
	SUPPLY FAN DRIVE KIT	EXHAUST/RETURN FAN DRIVE KIT
Belts (Qty & ID #)	_____	_____
Belt Tension	Tag _____ Actual _____	Tag _____ Actual _____
Fan RPM (DN)	Tag _____ Actual _____	Tag _____ Actual _____

#### OTHER UTILITIES

Steam Pressure	Heating Coils ___PSI,	Humidifier ___PSI
Hot Water Pressure/Temp.	Supply ___PSI, ___°F,	Return ___PSI, ___°F
Chilled Water Pressure/Temp.	Supply ___PSI, ___°F,	Return ___PSI, ___°F
Potable Water Pressure	___PSI,	Pneumatic Air Pressure ___PSI

**MAINTENANCE**

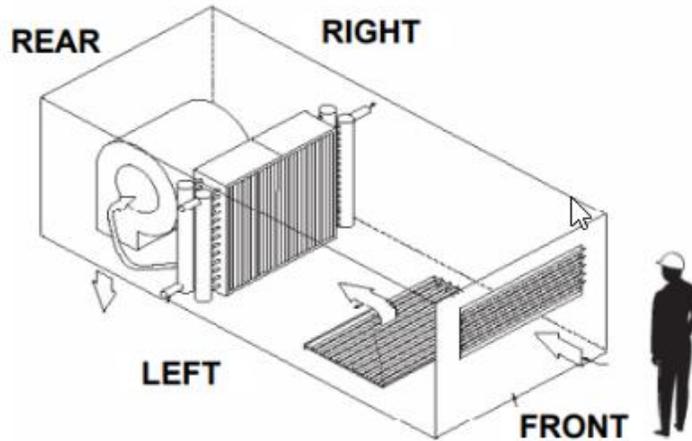
Upon completion of start-up the customer assumes responsibility for periodic maintenance of this equipment in order to continue warranty. Refer to the Installation Operation and Maintenance Manual (Form 102.20-OM1).

**Customer's agent signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_



# Equipment Release Approval Forms

The following table must be completed prior to releasing the equipment for fabrication. Please initial the column indicating the information contained in this submittal has been verified or indicate to refer to a marked-up page.



**NOTE:** Drive hand and coil hand determined by facing the inlet section

<b>SUBMITTAL VERIFICATION</b>	
	<b>Purchaser Initials</b>
Electrical voltage and electrical connections are compatible with jobsite requirements.	
Piping / Ductwork connections shown in this submittal are correct.	
Unit tag designations are correct.	
Equipment dimensions (length, width, and height) and weights have been verified to comply with jobsite conditions and rigging requirements. Please indicate approval by your initials on all included drawings.	
Verify "Unit Hand" of any Air Handling Equipment per the definition provided on the " <b>Equipment Release / Configuration Process</b> " form.	
Indicate equipment configuration choices on the <b>Equipment Release / Configuration Process</b> form (if included on this Submittal package) and sign the form.	

# Equipment Release Approval Forms

## Important Notes:

- 1) Actual fabrication release cannot commence until this form is signed by the customer and returned to JCI along with a release notification want date and ship to address.
- 2) Equipment "lead-time" does not start until confirmed release documentation is received, and the order is actually released to the factory.
- 3) Modifications to equipment configurations after fabrication release may impact cost and lead-time
- 4) Attached configurations are as shown in the approved equipment submittals or as defined in superseding customer correspondence.
- 5) AHU "Side" / "Hand" orientation is relative to a person standing inside an AHU with air hitting the back of the head.
- 6) Note that once this document is confirmed, the equipment configurations defined by this document take precedence over all other documents.
- 7) "Want date" and/or "ship to address" changes made after this document is confirmed may impact cost and lead-time.
- 8) Air handler drawings also include shipping split explosions with corresponding weights and dimensions. If additional splits are required, there will be additional costs and the unit length will increase.

# Equipment Release Approval Forms

Please fill out the following table and refer to the receiving/rigging instructions in this submittal to help ensure a smooth delivery and installation of the equipment.

<b>DELIVERY INFORMATION</b>	
	<b>Please fill out information below</b>
Contact name for coordinating delivery of equipment with transportation company	
Contact phone number	
Advance notice required from transportation company prior to delivering equipment (typically 48 hours)	
Ship to address:	
Other special shipping instructions or requirements	

# Equipment Release Approval Forms

Please fill out the following table for timely delivery of the filters and ensure they are not lost or damaged until it is time for unit startup.

<b>FILTER DELIVERY INFORMATION</b>	
	<b>Please fill out information below:</b>
Primary contact name, number, and email for coordinating delivery of filters with transportation company	
Alternate delivery contact name, phone number, and email (if applicable)	
Advance notice required from transportation company prior to delivery (typically 48 hours)	
Ship-to address	
Requested delivery date (NOTE: Subject to factory lead time)	
Other special shipping instructions or requirements	
Has the site agreed to accept the delivery of the filters? (YES or NO)	
Will the delivery truck be required to have a lift gate? (YES or NO)	

# CUSTOMER APPROVAL

**CUSTOMER APPROVAL:**

Customer Name: \_\_\_\_\_

Signature (\*) \_\_\_\_\_

Date: \_\_\_\_\_

**END OF SUBMITTAL**

## SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary Controls: Barriers, enclosures, and fencing.
- C. Security requirements.
- D. Waste removal facilities and services.
- E. Project identification sign.
- F. Interior temporary partitions, dust barriers, and isolation enclosures necessary to separate construction activities from occupied or sensitive areas.

#### 1.02 REFERENCE STANDARDS

- A. Comply with applicable codes and standards including:
  - 1. OSHA requirements for fall protection, barricades, and worker safety.
  - 2. NFPA requirements for fire-resistance and egress.
  - 3. Local building and fire codes governing temporary partitions and enclosures.
  - 4. ANSI standards for safety signage and barriers.
- B. Where requirements differ, the most stringent shall apply.

#### 1.03 TEMPORARY UTILITIES

- A. Owner will provide the following:
  - 1. Electrical power, consisting of connection to existing facilities.
  - 2. Water supply, consisting of connecting to existing facilities.
- B. Existing facilities may be used.
- C. New permanent facilities may be used.

#### 1.04 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect

existing facilities and adjacent properties from damage from construction operations and demolition.

- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

#### **1.05 INTERIOR ENCLOSURES**

- A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
- B. Construction: Framing, plywood, and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:
- C. Provide pollution control measures to prevent contamination of air and water.
- D. Paint surfaces exposed to view from Owner-occupied areas.

#### **1.06 SECURITY**

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

#### **1.07 WASTE REMOVAL**

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

#### **1.08 PROJECT IDENTIFICATION**

- A. Provide project identification sign of design and construction at interior locations facing the public access side of partitions.
- B. No other signs are allowed without Owner permission except those required by law.

#### **1.09 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

- B. Restore existing facilities used during construction to original condition.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.
- E. Restore new permanent facilities used during construction to specified condition.

## PART 2 - PRODUCTS

### 2.01 MATERIALS - GENERAL

- A. Provide materials that are durable, non-toxic, and suitable for intended use and exposure conditions.
- B. Use fire-retardant materials where enclosures are located within buildings or where required by code.
- C. Provide materials that can be installed without damage to existing construction unless otherwise permitted

### 2.02 TEMPORARY PARTITIONS AND DUST BARRIERS

- A. Interior Partitions:
  - 1. Construct of metal studs with gypsum board or rigid panels where long-term or high-performance separation is required.
  - 2. Provide airtight construction with sealed joints to prevent dust migration.
    - a. Use non-staining, non-abrasive materials compatible with surfaces being protected.
  - 3. Provide protective coverings for floors, walls, ceilings, and equipment subject to damage.
  - 4. Maintain protection in place until risk of damage has passed.
- B. Plastic Dust Barriers:
  - 1. Minimum 6-mil fire-retardant polyethylene sheeting.
  - 2. Seal all edges, penetrations, and joints to maintain effective containment.
- C. Screening:
  - 1. Provide privacy or debris screening where required to control dust, debris, or visual impact.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install barriers and enclosures prior to commencing work in affected areas.
- B. Coordinate installation to maintain continuous protection and separation.
- C. Provide tight-fitting construction to eliminate gaps that could allow dust, debris, or unauthorized access. Items affixed to ceilings are to be connected in such a way that active fire suppression system are still functional in occupied areas for the duration of the project.
- D. Do not attach barriers to existing construction in a manner that causes damage unless approved.

### 3.02 MAINTENANCE

- A. Maintain all barriers and enclosures in effective condition throughout the project duration.
- B. Inspect daily and after adverse weather; tighten, repair, or replace components as necessary.
- C. Clean barriers regularly to prevent accumulation of dust and debris.

### 3.03 ADJUSTMENT AND RELOCATION

- A. Modify and relocate barriers as required to accommodate construction progress.
- B. Maintain continuous protection during all transitions; do not leave areas exposed.
- C. Coordinate changes with Owner and other trades to avoid disruption.

### 3.04 REMOVAL

- A. Remove temporary barriers and enclosures when no longer required or prior to Substantial Completion.
- B. Remove anchorage, fasteners, and associated materials completely.
- C. Do not remove barriers protecting incomplete or unsafe conditions.

### 3.05 RESTORATION AND CLEANING

- A. Repair damage to existing construction caused by installation or removal of barriers.
- B. Restore surfaces to original condition, including patching, refinishing, and cleaning.
- C. Remove all debris and leave areas clean and ready for final use.

END OF SECTION