



Robert Burkey
Director of Facilities
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Independence, MO 64050
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District HVAC Turn Key Labor for Replacement Request for Proposal

Proposal Due:

Tuesday, April 18, 2017
2:00 pm

1. Background

1.1. Notice

1.1.1. Independence School District (the "District") seeks a contractor ("Contractor") to provide the following;

1. Design Build Proposal to design and install owner provided HVAC equipment
2. Provide a complete turnkey project that includes Construction Documents for permitting and record, all material, labor, and installation to replace:
 - a. Two multi zone AHUs at Sycamore Hills Elementary School
 - b. One single zone AHU at Truman High School
 - c. One multi zone AHU at Truman High School
 - d. Three rooftop units at Truman High School
3. ISD will provide the air handling units, associated condensing units, and rooftop units. The contractor's proposal shall include all other materials and equipment necessary to complete the scope of work.
4. Refer to the attached scope of work, "Attachment A" for more information and requirements.

1.1.2. If your firm is interested, please submit the information requested in this Request for Proposal (RFP) to the Independence School District office by 2:00 p.m. on Tuesday, April 18, 2017. All information necessary for the submittal is contained in this RFP.

1.2. RFP Schedule

- 1.2.1. Issue RFP: Tuesday, April 4, 2017
- 1.2.2. Mandatory Pre-Bid inspection of property and conference: Tuesday, April 11, 2017 at 8:00 a.m. front of Sycamore Hills Elementary School
- 1.2.3. Deadline to submit written questions: 5:00 p.m., Tuesday, April 11, 2017
- 1.2.4. Questions answered and posted: 5:00 p.m., Wednesday, April 12, 2017
- 1.2.5. Deadline to submit proposals: 2:00 p.m., Tuesday, April 18, 2017
- 1.2.6. Vendor selection date: 6:00 p.m., Tuesday, May 9, 2017

2. Description of Services (or Project)

2.1. Type

- 2.1.1. Design Build Proposal for Labor to Replace Existing HVAC equipment with owner provided equipment.

2.2. Locations

- 2.2.1. Sycamore Hills Elementary School and Truman High School.

2.3. Equipment

- 2.3.1. Multi Zone, Single Zone AHUs and rooftop units.

2.4. Inspection

- 2.4.1. Contractor must visit each site before submitting their proposal and be responsible for all measurements on the project.

2.5. Project Schedule

- 2.5.1. Vendor selection date: 6:00 p.m., Tuesday, May 9, 2017
- 2.5.2. Issue Contract date: May 10, 2017
- 2.5.3. Last Day of School: May 18, 2016
- 2.5.4. Planned commencement of service: May 22, 2017
- 2.5.5. Planned substantial completion of service: July 20, 2017
- 2.5.6. Planned final completion of service: July 31, 2017

3. Scope of Services and General Conditions

3.1. Hours of service

3.1.1. Contractors will have access from 7:00 a.m. till 4:00 p.m. Monday thru Friday excluding District days off.

3.2. Terms and general conditions

This subcontract will be awarded as a design build turnkey mechanical, electrical scope of work including construction documents sealed by an Engineering registered in the state of Missouri. The scope of work shall be inclusive of all construction activities required for complete and functioning systems as outlined in the scope of work that are part of the contract documents. Information included herein or in the contract documents referring to the Contractor, includes any second or third tier contractors employed by the Contractor.

The schematic design documents and scope of work descriptions are diagrammatic and indicate general arrangements, approximate sizes and relative locations of principal equipment and materials to convey the intent of the work. The contractor shall provide construction documents based off the scopes of work and the intent shall be followed as closely as actual building and site conditions, building code, and other work permit. Equipment and material installation will be in complete conformance with Code and the manufacturer recommendations and installation, maintenance and operation instructions. This includes any ancillary parts or equipment required to ensure the recommended operation of the equipment even if they are not shown on the scopes of work. The scopes of work do not represent every offset, fitting accessory, etc. that may be required for the piping or other appurtenances, or is it implied that all conflicts between elements of the Work or building components have been resolved.

All equipment and materials furnished and installed by each Contractor will be new. The equipment and materials to be furnished and installed will be standard cataloged products of manufacturers regularly engaged in the production of this type of equipment/materials and will be of the latest design. Material of the same general type will be of the same make and manufacture throughout the Project. Materials will be properly stored and protected from the elements while on site prior to installation.

The Contractor will be responsible for the physical fit and configuration of the equipment to suit the space available and the intent of the work. The equipment will be installed with proper space allowance for external connections (including power and controls) and service maintenance access to the equipment. The Contractor will also verify the following for the equipment provided under this contract prior to installation:

- The performance ratings meet the specified requirements.
- The mechanical and electrical physical characteristics meet the specified requirements and conform to existing conditions.
- The identification of the material or equipment to catalog data is correct and proper.
- Confirm the quantity required.
- The application of the material or equipment is acceptable to the manufacturer and to the intent of the scope of work.

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- Any inability of material and/or equipment to comply with the aforementioned criteria will be promptly brought to the attention of ISD.

All Contractors are encouraged to include Minority and Women Business Enterprises as may be available.

The scope of work outlined in the contract documents will be completed by the Contractor selected to perform the work, in compliance with local customs and labor trade agreements. Each Contractor will include costs for work considered to be in the jurisdiction of the trades typically performing the scope of work included in each subcontract. Failure to include costs for this work will not relieve responsibility to perform the work.

Coordinate any system or service interruption with ISD to avoid conflicts with Owner's operations or scheduled construction activities. This may require overtime or weekends schedules and will be the responsibility of the Contractor.

Contractor will be asked to coordinate project through a designated Project Manager from manufacturing unit to oversee and be the direct point of contact with the District. This will ensure all installation is per manufacturer specifications as not to void any warranty issues. This will also help avoid any delays.

Cleanup, temporary protection

It is the responsibility of each Contractor and any of their tier Subcontractors to perform cleanup of their own generated debris on a daily basis. Trash generated by the contractors must be cleaned up and removed offsite by their own forces. This includes but is not limited to packaging from material and equipment supplied by the Contractor or supplied by others, debris from demolition, cutting, patching, etc. Each Contractor is responsible for dust protection, protection of adjacent materials, owners' items to remain, etc. to complete the scope of work outlined. The Contractor expressly undertakes at his own expense:

- to take every precaution against injuries to persons or damage to property
- to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors
- to clean up frequently all refuse, rubbish scrap materials, and debris caused by his operations, to the end that at all times the Site of the work will present a neat, orderly, and workmanlike appearance
- before final payment to remove all surplus material, debris of every nature resulting from his operations and to put the site in a neat, orderly condition

Bonds, Licenses, and Permits

All associated bond costs are to be included as a separate line item on the proposal and

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included with no overhead or markup. All proposals require a letter from the contractor's surety company stating that bonding for the amount of the proposal can be provided by the contractor. Upon receipt of a contract and prior to submitting an invoice, Contractor will submit bonding requirements to ISD.

Each Contractor will procure and pay for all permits, licenses, and approvals necessary for the execution of his Contract. The contractor will comply with all laws, ordinances, rules, orders and regulations relating to the performance of the work, the protection of adjacent property, and the maintenance of passageways, guard fences, or other protective facilities. Any building or alteration permits required by the local governing authority will be purchased by the Contractor. The costs for all licenses, design costs required for permitting, and inspections will be the responsibility of the Contractor. Copies of all permits permit entry numbers and inspection reports will be sent to ISD.

Insurance

Prior to issuance of a subcontract the contractor will be required to provide certificates of insurance with the coverage and minimum limits as by ISD and the State of Missouri.

Safety

Each Contractor will be provided with a copy of the Construction Subcontractor General Safety Rules for incorporation into the Contractors project safety program. All work to be performed in strict compliance with all OSHA guidelines and requirements. Contractor will provide a site specific safety control program for this project. An updated MSDS binder will be maintained at each jobsite by the contractor to include all material and equipment used by the contractor as required by OSHA.

Asbestos Policy

Do NOT disturb asbestos and immediately notify ISD or ISD's construction project manager if asbestos is suspected to interfere with the work delineated on the drawings.

Taxes

The contractor shall **exclude** all sales and use tax as required by law.

Schedule of Values, Billing, Lien Releases

Prior to the first billing for this project, a schedule of values will be submitted and agreed to by ISD. The schedule of values will detail each component of work specifically listing equipment, material and labor for each activity. All billings will be submitted for review and approval before any invoices are submitted. Invoices are due by the 10th of each month for work completed the previous month. If the pay requests are not received by the deadline, they will be entered for the following month.

All billings will be submitted using standard AIA Certificate for Payment and Schedule of Values. (Forms G702 and G703).

All billings must include appropriate "waivers of lien" for the Contractor and any tier

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subcontractors. Payments will not be made until such waivers are received.

Meetings

It will be the contractor's responsibility to hold weekly safety meetings for his personnel and/or any subcontractors under contract to the contractor. Safety meeting minutes to include: attendees, subjects covered, and any outstanding issues to be addressed. A copy of the minutes signed by all attendees will be submitted to ISD's project manager on a weekly basis. Failure to comply will result in withholding payments until this requirement is satisfied.

Each contractor is required to attend project progress/coordination meetings. These meetings will be held weekly throughout the duration of the project. ISD will schedule actual meeting dates and times. The project superintendent/project manager, foreman for each trade completing work on the project, must attend progress meetings.

Supervision

Each subcontractor agrees to assign full time supervision responsible for the actions of all workers employed on site by contractor and any tier contractors and who will have full authority to act for the Contractor. The Contractor will at all times coordinate with other trades and with ISD's project manager and superintendent for work to be completed.

Daily Work Reports

To document areas worked in, manpower and job progress, it will be necessary to fill out daily work reports and turn over to the ISD's project manager on a weekly basis. Failure to comply will result in withholding payments until this requirement is satisfied.

Warranty

The Contractor will warranty all material, equipment and workmanship provided for this project by the contractors to be free from defects for a period of one (1) year after final acceptance by ISD. The warranty will include replacement of the defective part(s) and related labor. The contractor's and manufacturer's written warranty will be provided to ISD.

Any obvious defects will be corrected before final acceptance. For additional defects after final acceptance, the Owner will advise the Contractor in writing, unless the situation is urgent, to address the deficiency or malfunction. The contractor will respond promptly and with no additional compensation for a valid guarantee claim.

Longer warranty periods of time or special conditions may be specified. See particular scopes for these requirements.

If a written warranty is offered for conditions or period exceeding specified requirements; this warranty will be included in the Record Drawing and Maintenance submittals.

The Contractor will not qualify the warranty with requirements placed upon the Owner. If the Contractor has concerns with maintenance of a piece of equipment then Contractor will allow for making periodic inspections, adjustments, etc. during the warranty period.

Protection of work and property

The Contractor will at all times safely guard the Owner's property from injury or loss in connection with this Contract. He will at all times safely guard and protect his own work, and that of adjacent property, from damage. The Contractor will replace or make good any such damage, loss or injury unless such he caused directly by error contained in the Contract, or by the Owner or his duly authorized representative (s).

Major Construction Milestones:

The Contractor will furnish sufficient manpower as the schedule dictates and is required to maintain the overall project schedule. Manpower or overtime to meet the project schedule including, but not limited to, premium time, inefficiencies associated with longer days/hours, inefficiencies associated with additional manpower, or other labor burdens will be included in the contract sum.

The Contractor will be responsible for changes required for compliance with codes, standards, regulations, ordinances, etc. and implementing any such change at no change in contract price. In the event of conflict with Project Documents or other requirements, the more stringent will apply. The Contractor will promptly notify ISD of any discrepancy.

The Contractor will be responsible for all aspects of the Work for their respective contractual agreement. The Work of the respective suppliers and subcontractors will be administered properly to assure that all elements thereof have been provided for complete and functioning systems(s).

GENERAL REQUIREMENTS

Contractor Furnished Equipment

The respective contractor will supply the equipment and materials required for a complete and operational system. The Contractor will supply all accessories required for the equipment shown on the drawings unless noted otherwise. Contractor will provide equipment submittals for approval to the ISD's project manager.

All equipment installations must be in conformance with the manufacturer installation, operation and maintenance manuals and are available upon request.

Other Project Requirements

1. Contractor shall provide storage of all equipment from time of delivery until installation and protect all equipment from damage during construction
2. The contractors will provide equipment start-up with the manufacturer representatives supplying assistance during commissioning phase of project. Complete pre-startup (startup request) logs prior to scheduling equipment startup. Startup reports included in the IOM's must be completely filled out and submitted to ISD's project manager.
3. Coordinate any system or service interruptions with ISD to avoid conflicts with the Customer operations or scheduled construction activities. This may require overtime or weekends

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schedules and will be the responsibility of the Contractor.

4. Each Contractor will be responsible for the coordination of their requirements with all other trades. Failure to coordinate with other trades will result in each Contractor making the required corrections at their own cost.
5. Each Contractor will include all supervision, services, labor, materials, equipment and all other items necessary for the complete installation of their work.
6. Each Contractor will be completely familiar with the existing site conditions, construction constraints and project schedule and phasing. No consideration will be granted for failure to do so.
7. Each Contractor will obtain necessary permits and pay all fees associated with their work.
8. Each Contractor will submit to ISD electronic copies of complete shop drawings and descriptive literature on all equipment and devices furnished under their contract. Upon approval, an electronic copy will be returned.
9. **Each Contractor will provide record drawings at the completion of the project to indicate the additions and modifications made to the various systems in this project. Drawings will indicate all systems and accessories installed. Record drawings should be maintained at the jobsite and updated on a daily basis by the onsite supervisor. Within thirty (30) days of the completion of the Project and prior to submitting final invoice, each Contractor will submit the following information to ISD:**
 - 1 set of redlined as-built drawings reflecting any changes or deviations from the original contract documents
 - One electronic set of approved submittals and any operation and maintenance manuals for material supplied by the contractor.
 - Three sets of operation and maintenance binders including equipment installation, operation, and maintenance manuals, test and balance reports, permit approvals, equipment start-up reports, and other project related documentation
 - It is the responsibility of each contractor to maintain the most current copies of equipment submittals and installation, operation and maintenance instructions on site for reference during installation.
10. Each Contractor will provide necessary seismic bracing as directed by applicable codes.
11. Each Contractor will avoid cutting of any part of building insofar as possible. Where cutting is necessary, it will be done by each Contractor. In no case will holes be cut larger than necessary to receive work properly. Holes cut through structural walls or floors must have prior approval from ISD. Any openings must be structurally supported with proper bracing, lintels, beams, shores, etc., and will be provided by each Contractor performing the work.
12. All patching, repairing and refinishing of cuts made by their forces will be the responsibility of each Contractor. Each Contractor shall fire-stop all penetrations through rated assemblies as required by the ratings of the building and by the authorities.
13. Each Contractor will not endanger any work by cutting or altering and will not cut or alter

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work of others except with written consent of ISD.

14. Each Contractor will install all work as required by and in accordance with all applicable codes and regulations, and in the interpretations thereof by local officials.
15. Each Contractor will be responsible for cleaning-up debris generated by their forces and removing them offsite. This includes any equipment and associated material removed under this scope of work.
16. Each Contractor will provide all necessary tests to establish the adequacy, quality, safety, completed status and suitable operation of each system.
17. Each Contractor will provide all necessary fire stopping for any penetrations through fire rated structures.
18. All material and equipment provided by the Contractors will be listed, labeled or certified by Underwriters Laboratories, Inc. where relevant standards have been established. Material and equipment, which are not covered by UL Standards, will be acceptable provided they meet safety requirements of a nationally recognized testing laboratory. Products which no nationally recognized testing laboratory accepts, lists, labels, certifies or determines to be safe will be considered if inspected or tested in accordance with national industrial standards such as NEMA or ANSI. Evidence of compliance will include test reports and definitive submittals.
19. All openings around conduits and all sleeves where floors, rated fired walls and smoke barriers are penetrated will be caulked smoke tight with SpecSeal LCI In tumescent Sealant or approval equal by Hilti meeting ASTM E-1966 (UL 2079) and ASTM E-814 (UL-1479), installed per manufacturer's recommendation for horizontal and vertical penetrations. Fiberglass is not acceptable. Where vapor barriers must be continued on cold piping, they will remain intact through the penetration and sealed per UL 91. Note the UL rated assemblies are required. Products used will be low VOC to contribute to overall LEED targets.
20. Pressure vessels and pressure retaining safety devices will be certified in accordance with applicable requirements of the ASME Boiler Code.
21. The material, workmanship, and systems included will comply with all applicable codes, standards, regulations and laws of the legal governmental jurisdiction at the project site.
22. Should the Contractor perform any work that does not comply with the requirements of the applicable codes, standards, regulations, statues, laws, acts, or which does not receive the approval of the responsible inspection authority, Contractor will bear all costs arising in correcting the deficiencies.
23. All installations will be in conformance with the applicable requirements of the most current and accepted edition of the following industry standards, codes and specifications will apply to the Work outlined:

ANSI	American National Standards Institute
API	American Petroleum Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning
Engineers	

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ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Engineers
AWS	American Welding Society
IMC	International Mechanical Code
NIST	Institute of Science and Technology
NEC	National Electric Code, including amendments by local authority having jurisdiction
NEMA	National Electrical Manufacturers Association
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health ACT
UL	Underwriters Laboratory, Inc.

Applicable requirements of all the relevant Federal laws including current and accepted edition of the Americans with Disabilities Act (ADA).

24. Each trade will be responsible for securing its trailers, lock boxes, materials, supplies, tools, etc. The Contractor will be responsible for any damage, theft, or loss.
25. The Contractor will park in only the designated area assigned to them for use by the Owner and will not park in No Parking Areas, on lawns, or unpaved areas and will not block access to loading docks, fire hydrants, etc.
26. The Contractor will provide their own tools and services to perform their respective Work. Tented or leased services will have proper and adequate insurance in accordance with requirements of the Contract.
27. The Contractor will be responsible for any requirements to temporarily store Owner supplied materials and equipment until it is incorporated into the Project.

3.3. Exclusions

3.4. Term

- 3.4.1. Contract Issued: May 10, 2017
- 3.4.2. Start date: May 22, 2017
- 3.4.3. Date of substantial completion: July 20, 2017
- 3.4.4. Date of final completion: July 31, 2017

4. Required Insurance

4.1. Liability

- 4.1.1. \$100,000 per incident

4.1.2. \$300,000 per year

4.2. Workers Compensation

4.2.1. Statutory limits

4.3. Bond

4.3.1. Payment: Amount of Agreement

4.3.2. Performance: Amount of Agreement

5. Disclosures and notifications

5.1. Conflicts of interest

5.1.1. Proposal must state whether proposer has any professional, business, or familial relationship with any current member of the Board of Education of the District or with any administrator of the District.

5.2. Cooperative Procurement

5.2.1. Indicate whether, if the District accepted your proposal, you would provide the same products and services under the same prices and terms to any public school district or any other non-profit organization having membership in the Mid-America Council of Public Purchasing (MACPP) or Mid-America Regional Council (MARC) and/or located within the greater Kansas City metropolitan trade area.

5.2.2. The prices, terms, and conditions of this RFP and any subsequent term agreement would control the terms of any subsequent agreement.

5.2.3. Organizations themselves or organizations represented by MACPP or MARC have no obligation under the cooperative procurement agreement to use the RFP, proposal, or agreement unless they are specifically named in the RFP as a joint respondent.

5.2.4. The ordering jurisdiction will issue purchase orders and be responsible for all receiving, inspection, payments and other agreement administration.

5.2.5. Each jurisdiction that is a party to the joint proposal may act as Administrative Contracting Officer with responsibility to issue purchase orders, inspect and receive goods, make payments, and handle disputes involving shipment to the jurisdiction.

6. Contract terms

6.1. E-Verify

6.1.1. Missouri law requires all companies doing business under contracts greater than \$5,000 with government entities to attest that all their employees and subcontractor's employees are "lawfully present in the United States."

6.2. Prevailing Wage

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6.2.1. Missouri law requires agreements to contain the following prevailing wage terms: “A wage of no less than the prevailing hourly rates of wages for work of a similar character in the locality in which the work is performed shall be paid to all workmen employed by or on behalf of any public body engaged in public works exclusive of maintenance work” (§ 290.220) and “not less than the prevailing hourly rate of wages specified in wage determination as requested from the State shall be paid to all workers performing work under this contract” (§ 290.250). The contractor shall forfeit as a penalty to the State, County, City, and County, City, Town, District or other political sub-division on whose behalf the contract is made or awarded ten (\$10.00) Dollars for each worker employed, for each calendar day, or portion thereof such worker is paid less than the said stipulated rates for any work done under this contract by him or by any sub-contractor under him. § 290.250. All payroll records of the contractor are to be submitted to the School District, with the approved Prevailing Wage Statement, prior to final acceptance of the project.

6.3. Liquidated Damages

6.3.1. The District may assess liquidated damages for work not completed as agreed upon for up to \$500.00 per day.

6.4. Applicable law

6.4.1. Missouri law will govern contracts entered into pursuant to this RFP.

6.5. Termination

6.5.1. The District may terminate contracts entered into pursuant to this RFP without cause upon 30 days notice.

6.6. Compliance with laws and policies

6.6.1. Proposer must comply with all federal and state anti-discrimination laws.

6.6.2. All work shall be done in strict accordance with the provisions of the current edition of the building codes adopted by the City of Independence, Missouri and all city ordinances in effect during performance of this contract.

6.6.3. Contractor must be licensed to do business in the City of Independence.

6.6.4. All work shall meet or exceed the Americans with Disabilities Guidelines.

6.6.5. *A-133 Compliance Supplement*: The contractor must certify that they and their principals are not debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from covered transactions by any Federal Department or Agency.

6.6.6. *Excessive Unemployment*: The Missouri Department of Labor and Industrial Relations has determined that a period of “Excessive Unemployment” remains in effect and will remain in effect if the unemployment rate exceeds 5% in the state of Missouri. Only Missouri laborers and laborers from nonrestrictive states are allowed by law to be

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employed on Missouri's public works projects. (See Sections 290.550 through 290.580 RSMo).

- 6.6.7. *AHERA Notification*: the District has completed the removal of friable asbestos in all District school buildings. In addition, all facilities have now been inspected by a certified asbestos inspector as required under the ASBESTOS HAZARD EMERGENCY RESPONSE ACT OF 1986 (AHERA). A copy of the AHERA Plan has been filed with the State of Missouri and a copy is on file with each building administrator. The AHERA Plan is available for inspection during regular school hours.
- 6.6.8. *OSHA Training*: As a condition of the Contract entered pursuant to this RFP, a Contractor must provide a 10-hour Occupational Safety and Health Administration (OSHA) Construction Safety Program ("Program") for Contractor's on-site employees as mandated by RSMo 292.675. Said Program must include a course in construction safety and health approved by OSHA or a similar program approved by the Missouri Department of Labor and Industrial Relations. This requirement includes the following: All of Contractors' on-site employees must complete the Program within 60 days of beginning work on the Project; any employee found on the work site subject to this requirement without documentation of the successful completion of the Program will be given 20 days to produce such documentation before being subject to removal from the Project; Contractor's failure to comply with these requirements will subject it to penalties. Contractor shall forfeit as a penalty to the Owner \$2,500.00 plus \$100.00 for each employee employed by Contractor or Contractor's Subcontractor, for each calendar day, or portion thereof, such employee is employed to work under this contract without the required training. Said penalty shall not accrue until the period in subsections 1 and 2 have elapsed. Contractor will be subject to said penalties notwithstanding any other provision to the contrary in this Construction Contract. Contractor shall require its contracts with all Subcontractors to contain these provisions. Contractor shall be responsible for penalties to Owner due to any Subcontractor's employees' failure to produce documentary evidence of training in the required Program. Contractor may withhold all sums necessary to cover any penalty from Subcontractor by suing in the circuit court of the county in which the project is located. Contractor shall have no right of recovery against Owner
- 6.6.9. *Lead Paint Guidelines*: After April 22, 2010, contractors and their individual crew members working in pre-1978 school buildings that are child occupied and residential properties will be required to obtain their Renovator Certification by an accredited EPA Training Provider.

6.7. Background Checks

- 6.7.1. Contracts entered pursuant to this RFP must require that all employees who will have unsupervised interaction with students will be fingerprinted and background checked under the background checks required by the District's Board Policies. Results of background checks of employees working directly with students must be provided to District. District reserves the right to refuse to allow any employee access to students if the employee completes no background check acceptable to the District.

6.8. Indemnity

- 6.8.1. The District will not agree to indemnify any contractor for its own negligence, for injuries or damages that do not arise from acts or omission of the District, or for injuries or damages for which the District has sovereign immunity.

6.9. Change orders

- 6.9.1. Change orders that exceed the greater of \$15,000 or 5% of the total originally contracted amount are subject to Board approval prior to performance of the work and are subject to re-bid. (See Board Policy 7210.)

6.10. Proposed contract

- 6.10.1. Proposals must include a copy of proposed contracts or service agreements if available or disclose terms required by the proposer of this RFP.

7. Interpretation, Questions, Withdrawal

7.1. Interpretation

- 7.1.1. The District will make no oral interpretations for proposers of meaning of the terms in this RFP.
- 7.1.2. Requests for interpretations to the meaning of this RFP must also be made in writing to Independence School District not later than 5:00 p.m., Tuesday, April 11, 2017 and failure by the successful proposer to do so shall not relieve the proposer of the obligations to execute such services under a later interpretation by the school district.
- 7.1.3. All interpretations made to the proposers will be issued in addenda to the RFP and will be posted on the District's Website under the RFP.

7.2. Questions

- 7.2.1. Submit written questions to the following person:

Robert Burkey
Director of Facilities
201 N. Forest Avenue
Independence, MO 64050
816-521-5330

7.3. Withdrawal

- 7.3.1. Any Contractor may withdraw his proposal prior to the scheduled closing time for receipt of proposals.
- 7.3.2. No proposal shall be withdrawn for thirty (30) days after the scheduled closing time for receipt of proposals.

8. Quote

8.1. Amount

8.2. Rate

9. Proposal submission and opening

9.1. Submission

- 9.1.1. Submit proposals in a sealed envelope marked "HVAC LABOR PROPOSAL, 2017-FAC 012" to include "**Appendix A**" filled out completely, bonding & insurance information, and deliver to the following address and person:

Robert Burkey
Director of Facilities
201 N. Forest Avenue
Independence, MO 64050
816-521-5330

9.2. Opening

- 9.2.1. The proposals will be opened and publicly read at the following location on the following date and time:

Date: Tuesday, April 18, 2017

Time: 2:00 p.m.

Location: Facilities Office
201 N. Forest Avenue
Independence, MO 64050.

10. Reservation of Rights

10.1. INDEPENDENCE SCHOOL DISTRICT RESERVES THE RIGHT TO ACCEPT OR REJECT ANY OR ALL PROPOSALS AND WAIVE ANY INFORMALITY IN THE PROPOSAL OR REQUEST FOR PROPOSAL.

11. Proposal Evaluation

11.1. Award

- 11.1.1. The contract will be awarded to the firm submitting the best responsible proposal complying with this RFP if the proposal is reasonable and in the best interest of the District to accept. The firm selected will be notified at the earliest practical date. The decision regarding acceptability of any firm's qualifications/proposal shall remain entirely with the District, at the District's sole discretion. The criteria for making this judgment will include but not be limited to price, demonstrated capability and general responsiveness to the RFP.
- 11.1.2. The District notifies all proposers that minority business enterprises will be afforded full opportunity to submit proposals in response to this Request and will not be discriminated against on the grounds of race, color, or national origin in consideration

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of an award. Proposer agrees that, should proposer be awarded this contract, proposer will not discriminate against any person who performs work under it because of race, religion, color, sex, national origin or ancestry.

- 11.1.3. The District reserves the right to reject any or all proposals, to waive any informalities or technical defects in proposals, and unless otherwise specified by the District, to accept any item or groups of items in the proposal, as in the best interest of the District.

11.2. Acceptance Period

- 11.2.1. All proposal offers must be firm for 90 days.

12. Invoicing and Payments

- 12.1.** Invoices shall be prepared and submitted in duplicate to the Independence School District, 201 N Forest Ave., Independence, MO 64050, Attn: Facilities Department. Invoices shall contain the following information; contract number, item number, description of services, unit prices and extended total by location serviced with a grand total at bottom. District shall receive one (1) invoice per month of service.

13. Vendor List

Appendix A

FEDERAL WORK AUTHORIZATION PROGRAM AFFIDAVIT

I, _____, being of legal age and having been duly sworn upon my oath, state the following facts are true:

1. I am over twenty-one years of age; and know of the matters set forth.
2. I am employed by _____ (“Company”) and have authority to issue this affidavit on its behalf.
3. Company is enrolled in and participating in the United States E-Verify federal work authorization program regarding Company’s employees working in connection with the services Company is providing to, or will provide to, the District, to the extent allowed by E-Verify.
4. Company does not knowingly employ any person who is an unauthorized alien in connection with the services the Company is providing to, or will provide to, the District.

FURTHER AFFIANT SAYETH NOT.

By: _____
(individual signature)

For _____
(company name)

Title: _____

Subscribed and sworn to before me on this ____ day of _____, 201__.

NOTARY PUBLIC

My commission expires:

Appendix A
Continued

REFERENCES AND EXPERIENCE

How many years has your firm been in business? _____ years

List references and prior experience; preferably with other school districts or governmental agencies, in the last 3 – 5 year period; work or services in the same type and size to the project being proposed.

School District/Business _____
Address _____
Contact Person _____ Phone# _____
Description of services performed and completion date _____

School District/Business _____
Address _____
Contact Person _____ Phone# _____
Description of services performed and completion date _____

School District/Business _____
Address _____
Contact Person _____ Phone# _____
Description of services performed and completion date _____

Appendix A
Continued

PERSONNEL QUALIFICATIONS

Bidders are REQUIRED to provide the information below in FULL DETAIL.

Indicate the person who will be supervising project and years of experience in similar work.

Name: _____ Number of Years: _____

Type of Experience: _____

Complete the following for employees that would be working on this project. List any previous work directly relating to the scope of this project for other school districts and/or governmental agencies or private companies in the last five years. Attach a separate sheet of paper if needed.

EMPLOYEE NAME	QUALIFICATIONS	EXPERIENCE/TRAINING

Appendix A
Continued

BID PROPOSAL SUBMISSION FORM – ISD **BID NAME**

Proposal of _____ (hereinafter called "Bidder"),
organized and existing under the laws of the State of _____, doing business as
a corporation, a partnership, an individual (circle one) to the Board of Education, School District of
Independence, Missouri (hereinafter called "Owner").

1. In compliance with your Advertisement for Bids, Bidder hereby proposes to perform all work for the INDEPENDENCE SCHOOL DISTRICT – ISD 2017- FAC 012, Labor for Turn Key Replacement of District HVAC Equipment. In strict accordance with the Contract Documents, within the time set forth herein and at the prices stated below, bidder should propose on individual base bids for specific project locations as noted below. Owner will award contract per individual base bid.
2. By submission of this Bid, each Bidder certifies, and in the case of a joint Bid each party thereto certifies as to its own organization, that this Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid with any other Bidder or with any competitor.
3. The undersigned, having familiarized itself with local conditions affecting the cost of the work at the place where the work is to be done and with all Bidding Documents, including the Instructions to Bidders, Plans and Specifications, General and Supplementary Conditions, the Standard Form of Agreement and the other Contract Documents, and having examined the location of the proposed work and considered the availability of labor and materials, hereby proposes and agrees to perform everything required to be performed, and to provide and furnish any and all labor, materials, supervision, necessary tools, equipment, and all utility and transportation service necessary to perform and complete in a workmanlike and timely manner all of the work required for the project, all in strict conformance with the Instructions to Bidders and other Contract Documents (including Addenda noted above, the receipt of which is hereby acknowledged), for the lump sums hereinafter specified.



Appendix A

Continued

BID FORM

Date: April 18, 2017, 2:00 p.m. local time

Project: Labor for District HVAC Replacement
Owner: INDEPENDENCE SCHOOL DISTRICT 201 N Forest Ave, Independence, MO 64050
RFP No: 2017- FAC 012

Contractor	Co-Op Y/N	Add #1		Price for all work
				\$

Signature: _____

Date: _____

Appendix A
Continued

RESPECTFULLY SUBMITTED:

_____	_____
Signature	Title
_____	_____
Name (Please type or write clearly)	Date
_____	_____
Company Name	Telephone Number Fax Number
_____	_____
Street	Email address
_____	_____
City, State, Zip Code	License number (if applicable)

By signing, he/she certifies that they are an authorized agent of said company and has the authority to legally enter into a binding Service Agreement.

SEAL - (if BID is by a corporation)

ATTACHEMENT A
COMPLETE SCOPE of WORK PACKAGE

Independence School District
Independence, MO

Date: 3/31/17

Project: Sycamore Hills Elementary School MZ-1 and MZ-2 Replacement

Problem Definition:

- A. Multizone MZ-1 and MZ-2 are original to the building and at the end of their expected service life. The multizone AHUs shall be replaced with two VAV AHUs with VAV terminal units with reheat.

Owner Provided Equipment:

- 1. (2) Trane DX, hot water air handling units.
- 2. (2) Trane 40-ton condensing units.

General:

- 1. The Contractor is responsible to provide Construction Documents sealed by an Engineer registered in the State of Missouri. The construction documents shall meet the intent of this scope of work and shall be reviewed and approved by ISD.
 - a. Include a complete MEP design, sizing equipment, ductwork, piping, electrical, etc.
 - b. Review the owner provided equipment selections and advise if there are any concerns with equipment sizing. Review shall be completed by mid-May.
 - c. Size the contractor provided equipment immediately for so equipment can be ordered and received in time to meet the construction schedule.
 - d. Provide structural review and design for any changes in roof mounted equipment loads.
 - e. The contractor shall provide the following deliverables:
 - i. 75% construction documents for review.
 - ii. 100% construction documents for review and permitting.
 - iii. Project specifications.
 - iv. Provide three full size printed copies and the electronic PDFs of the construction documents to ISD for record.
 - v. Provide three full size printed copies and the electronic PDFs of the redlined as-built drawings to ISD for record.
- 2. The Contractor shall provide equipment submittals for review by ISD and the owner's representative.
- 3. The Contractor is responsible permitting for their respective scope of work.
- 4. The equipment warranty of all owner provided equipment will be provided by the equipment manufacturer.
- 5. The Contractor shall provide a one year parts and labor warranty on all equipment, material, labor they provide and install.
- 6. The contractors shall provide all materials and labor required to complete this work unless otherwise specified.

7. Any damage caused by contractor during performance of work shall be repaired by the contractor to match existing finishes and be to the satisfaction of ISD.
8. The installation of new equipment shall include, unless specifically stated in this document or associated sketch:
 - a. Mechanical and electrical installations shall comply with local Code and authority having jurisdiction.
 - b. Installation shall be inspected by ISD, their owner's representative, the owner provided equipment manufacturer, and by the authority having jurisdiction.
 - c. Providing new system components including, but not limited to, piping, valves, ductwork, dampers, fittings, transitions, roof curbs, electrical disconnects, circuit breakers, switches, fuses etc. for a complete and functioning system.
 - d. All new work shall be performed by qualified tradesmen.
9. Upon receipt, verify equipment is in accordance with approved equipment submittals. Protect and store equipment on site from damage, vandalism, and theft, weather. Contractor is responsible for equipment after accepting delivery.
10. The contractor shall receive, unload, hoist, assemble and set the new equipment in accordance with manufacturer's recommendations and installation, operation and maintenance manuals. Retain any loose shipped components for installation.
11. Protect the existing building structure, utilities, floors coverings and finishes from damage, dust partitions, separations. Any damage will be repaired by the contractor.
12. Complete pre-startup checklist as required by the manufacturer.
13. Coordinate the installation with other contractors.
14. Verify voltages, amperages are in accordance with approved equipment submittals upon receipt of equipment/materials.
15. Seal all penetrations as they are created.
16. Retain any loose shipped electrical or control components (noted (field) on equipment submittals or as noted on alternate supplier installation manuals).
17. Utilize the operation and installation manuals shipped with the equipment for the installation and immediately submit copy to the Project Manager.

Mechanical Scope:

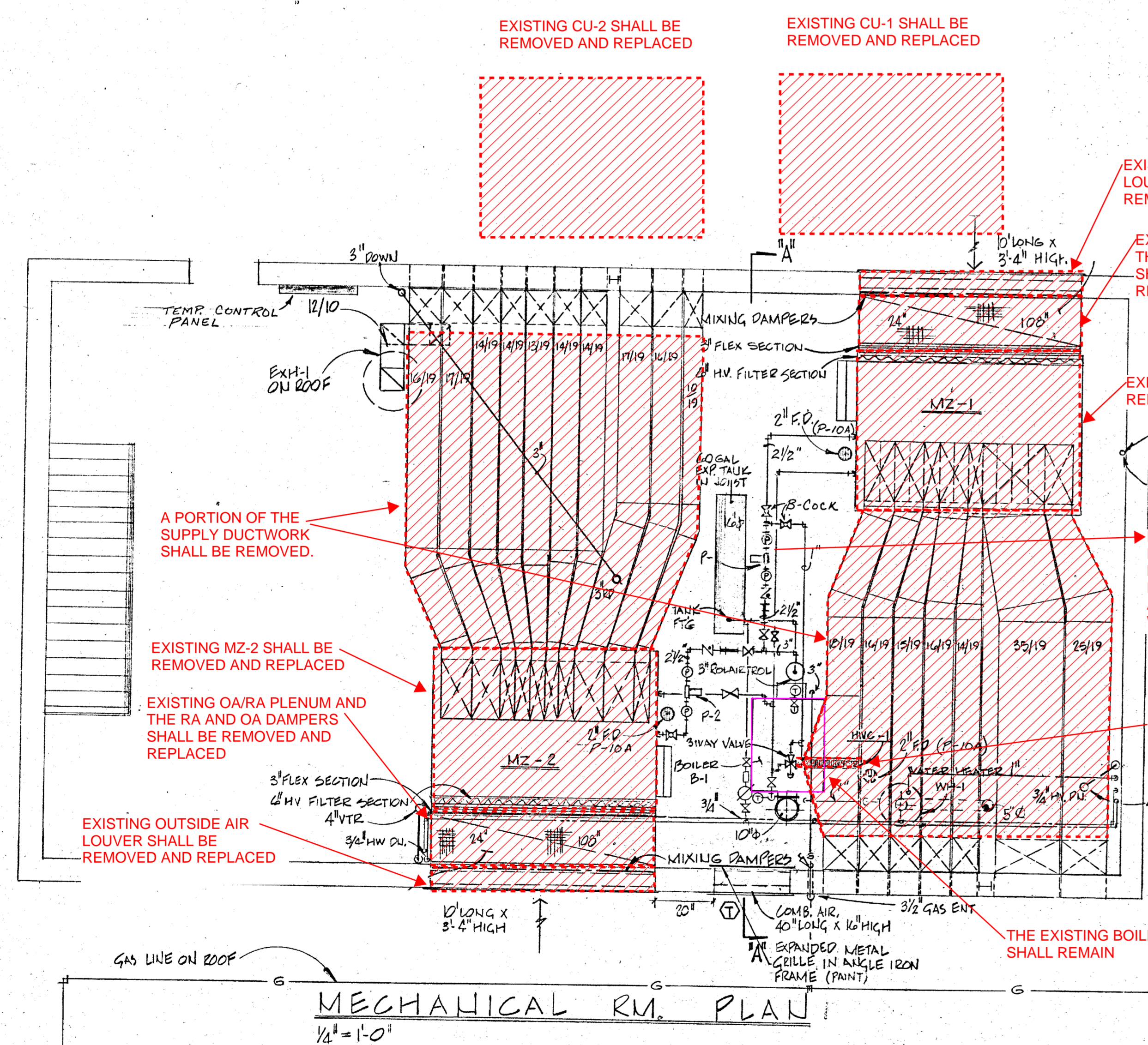
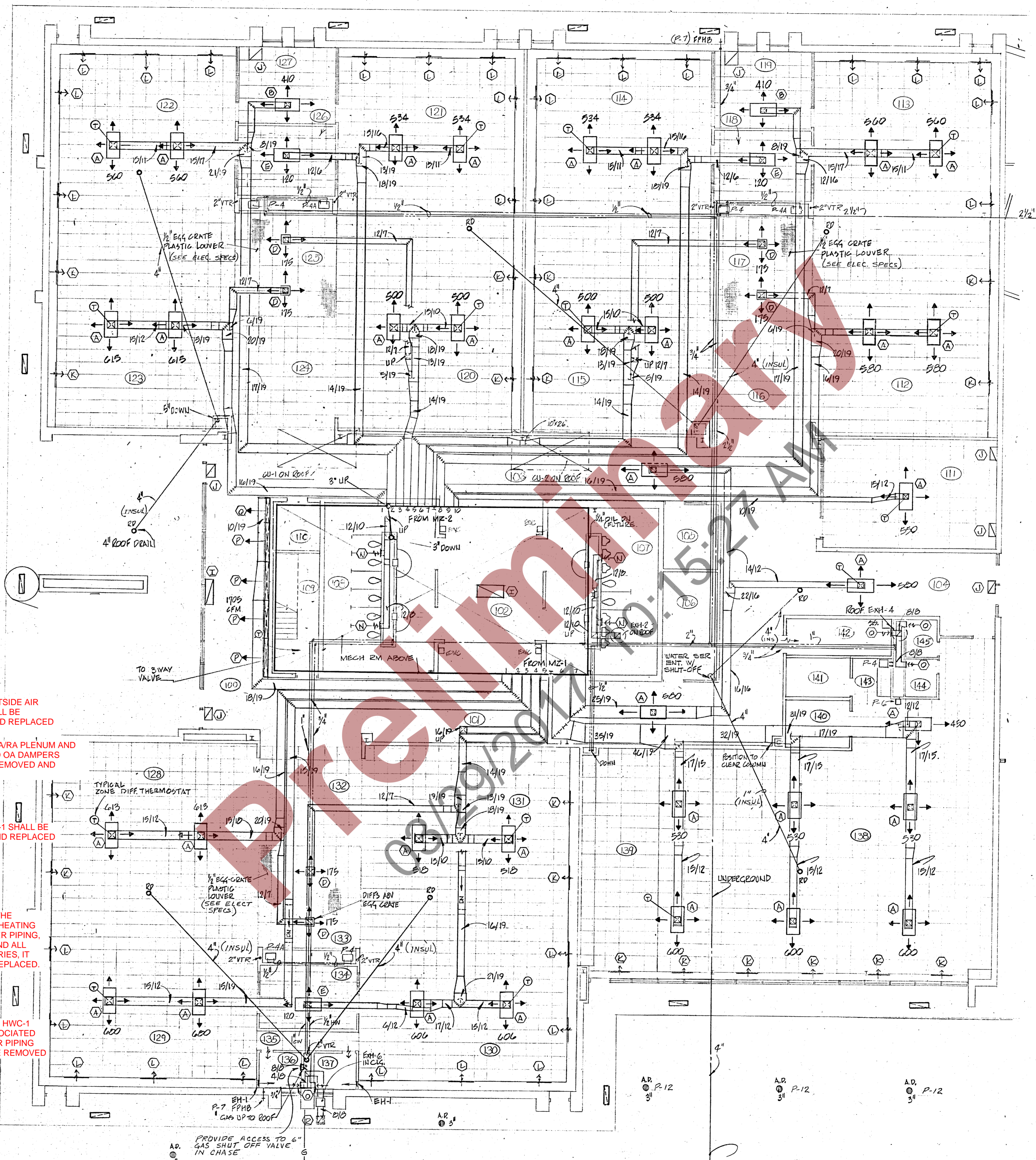
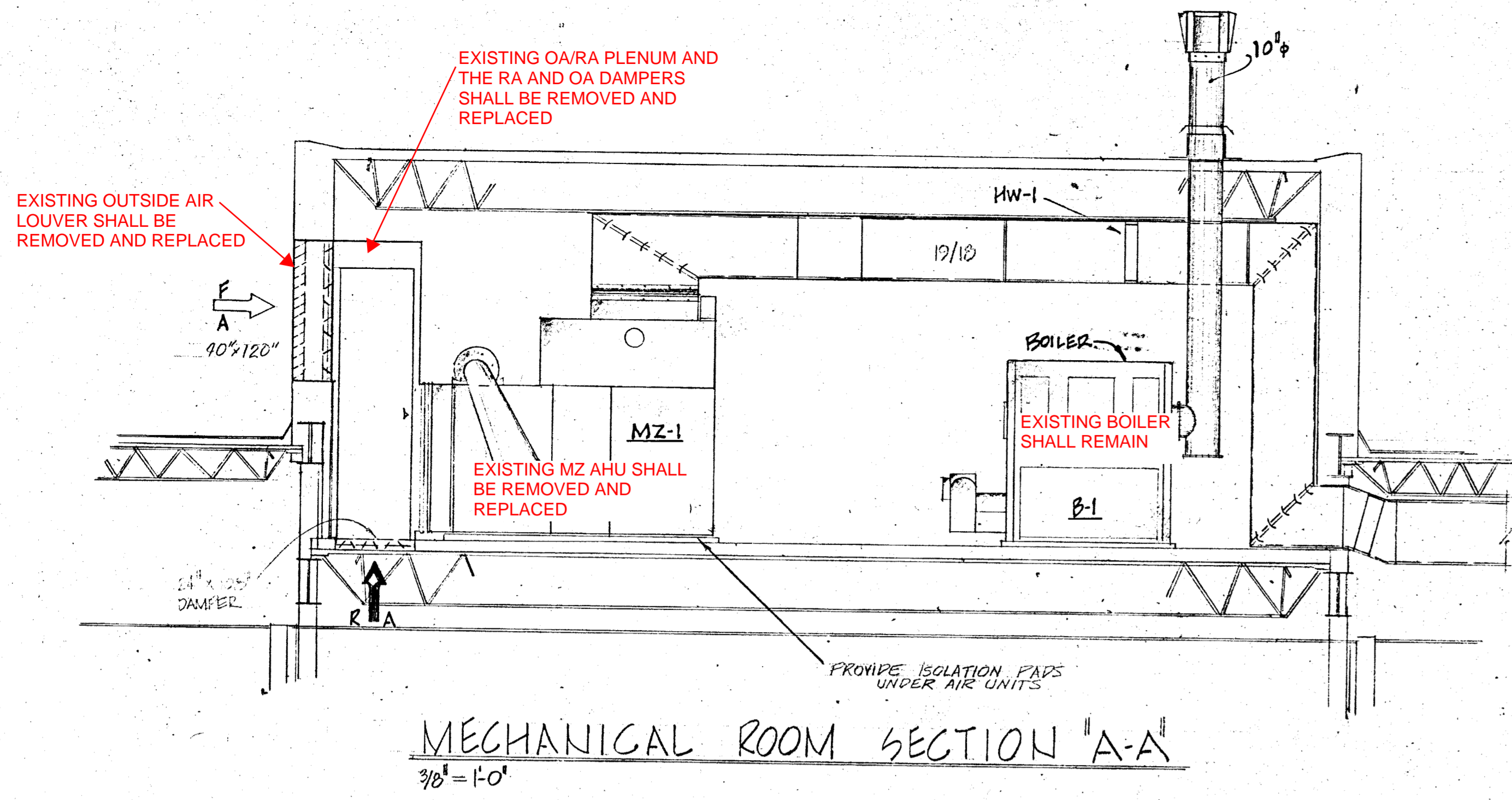
1. The information in the scope of work is schematic in nature and does not show all details or components necessary to complete the system. The contractor's proposal shall include all items necessary to create a complete and operational system.
2. Refer to the schematic drawings attached for more information.
3. Lockout/tagout all equipment prior to service or replacement.
4. Include the crane service and all rigging, hoisting and hauling.
5. The owner will provide the equipment listed above shipped to a location designated by the contractor. The contractor shall inspect the equipment upon receipt and document and notify the shipping company and ISD of any damage.
6. Reclaim the refrigerant from the equipment to be replaced and turn over to the owner. Provide cylinders/tanks to recover and store the refrigerant in.

7. The intent of this scope of work is to replace two multizone air handling units with two VAV air handling units and install VAV terminal units and hot water reheat coils in the existing zone ductwork.
8. The air handling units are located in a penthouse.
9. Remove and replace two AHUs with owner provided AHUs.
 - a. Shutdown the existing AHUs and heating hot water system.
 - b. Drain the heating hot water system.
 - c. Disconnect the ductwork and prepare for connection to new.
 - d. Disconnect and remove the refrigerant piping.
 - e. Disconnect and remove the heating hot water piping.
 - f. Remove the outside air plenums.
 - g. Provide fall protection at return air openings in the mechanical room floor.
 - h. Remove the existing outside air louvers.
 - i. Remove the existing outside air and return air damper assemblies.
 - j. Disassemble the existing AHUs and remove them through the outside air louver.
 - k. Remove the condensing units off the steel support frames.
 - l. Lift the removed equipment off the roof and legally dispose of it.
 - i. The condensing units shall be turned over the owner and not disposed of.
 - m. Remove a portion for the supply zone ductwork as shown and prepare for connection to new.
 - n. Provide a 4" housekeeping pad for the AHUs.
 - o. Disassemble the AHUs and hoist to the roof.
 - p. Move the AHUs into the penthouse via the outside air louver openings.
 - q. Provide and install new 10'x3'-4" outside air louvers in the existing wall and seal water tight. Color of the louver shall match existing.
 - r. Provide and install a new 120x40 control damper at the OA louvers at each AHU.
 - s. Provide and install a new 108x24 control damper at the RA openings of each AHU in the mechanical room floor to replace the existing.
 - t. Control dampers shall be low leakage with jackshaft appropriate for the application. The actuators will be provided by the controls contractor.
 - u. Construct an insulated 30"x120"x92" OA/RA plenum similar to the existing and install it next to the exterior wall/outside air louver. Provide 24x72 double wall access door with quarter turn lever handle latches.
 - v. Locate the AHU filter next to the OA/RA plenum and seal the connection airtight.
 - w. Assemble the AHUs per the IOM and seal the sections air tight.
 - x. Provide I-beams across the top of the existing steel support frames to adapt the frame to the new condensing unit's dimensions. Weld the new steel beams to the existing frame. Paint the new and existing steel frame.
 - y. Lift the condensing units to the roof and set them on vibration springs on the steel support frame.
10. Provide and install 17 new VAV boxes in existing ductwork.

- a. Provide pressure independent VAV terminal units with a controls enclosure, ½” fiberglass liner, a hot water reheat coil and without controls.
 - b. Support the VAVs from the structure above.
 - c. Stack the VAVs as shown, keeping them as high as possible.
 - d. Provide supply duct work from each VAV box to the existing zone ductwork and connect.
 - e. Provide a supply air plenum off each AHU’s discharge as shown.
 - f. Provide spiral duct from the supply plenum to the VAV box inlets.
 - g. Insulate all supply ductwork with external duct wrap.
11. Heating hot water loop:
- a. Remove all the heating hot water piping in the penthouse mechanical room.
 - b. The existing boiler shall remain.
 - c. Provide a new heating hot water loop from the existing boiler to serve each AHU preheat coil and VAV reheat coil.
 - d. Provide and install a new air separator, expansion tank, air vent. Connect the existing system fill piping to the new loop.
 - e. Provide and install two inline heating hot water pumps, HWP1 and HWP2 for a lead/standby pump arrangement.
 - f. Provide and install flexible connectors, isolation valves, a triple duty valve, and pressure gauges at the pumps.
 - g. Provide and install new unions, isolation valves, temperature and pressure gauges at the existing hot water boiler.
 - h. Provide HWS/HWR to each AHU’s heating coil and connect. Provide new isolation valves, temperature gauges, unions, a strainer, and a balance valve.
 - i. Provide heating hot water to each VAV reheat coil and connect. Refer to the schedule below for branch pipe sizes to each coil.
 - j. Provide Nexus valve components at each reheat coil, refer to the detail attached. Route piping as high and tight as possible, leaving room to access each VAV box’s controls.
 - k. Install the 3-way heating hot water control valves, provided by the temperature controls contractor, at each preheat and reheat coil.
12. Provide a full size, trapped condensate drain off the AHU and terminate over the floor drain.
13. Provide and install new refrigerant piping and specialties between the AHU’s cooling coil and new condensing units. Install the piping per the IOM.
14. Insulate and label all new piping and ductwork.
15. Charge the refrigeration circuits per the IOM.
16. Flush and fill the heating hot water system.
17. Start-up the heating hot water system and verify operation.
18. Provide start-up of the VAV boxes and pumps and verify operation.
19. Prepare the owner provided equipment for start-up.
20. Trane will provide start-up of the owner provided equipment.
21. Provide documentation of all start-up activities to ISD.
22. Provide test and balance of the AHU and VAV boxes and heating hot water system to design airflow and submit the report to ISD for review.

Electrical Scope:

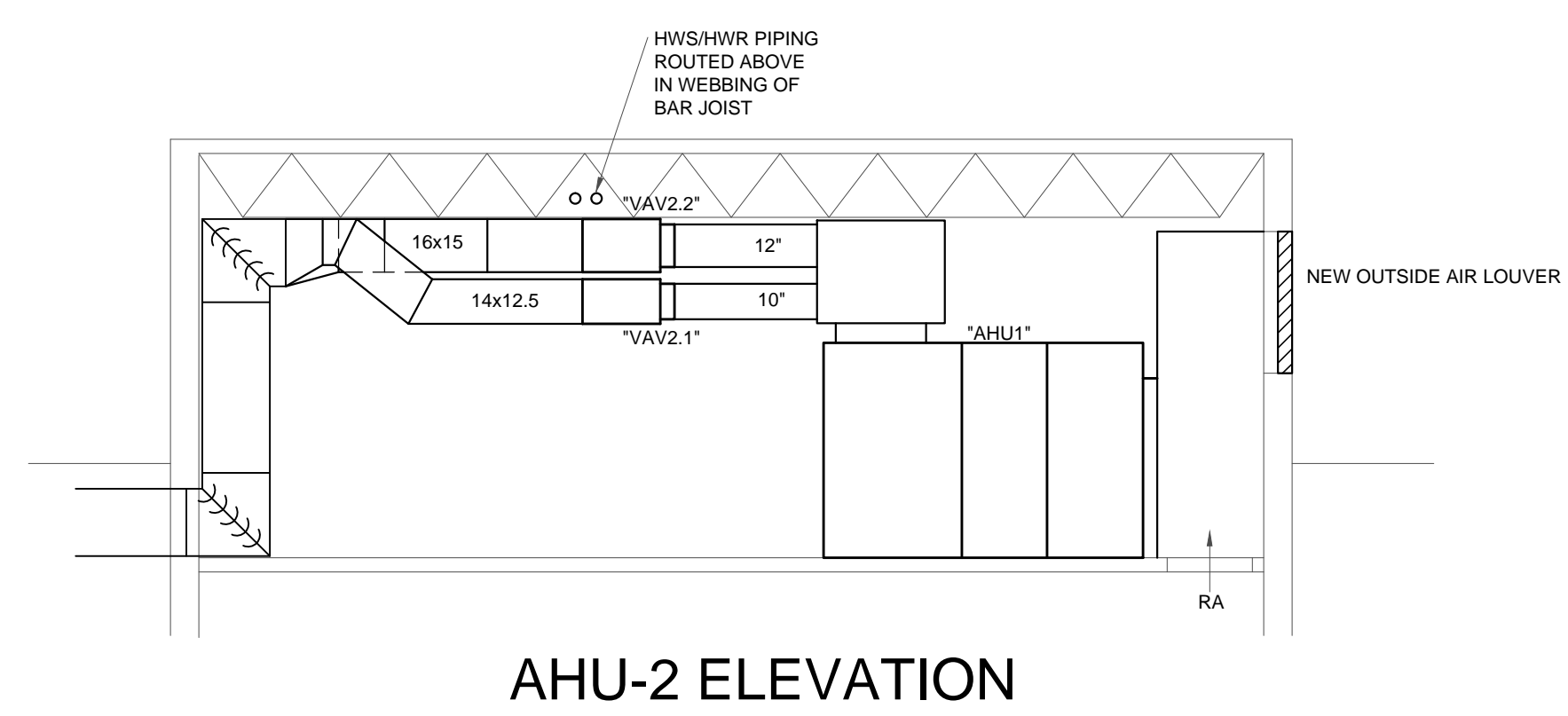
1. The information in the scope of work is schematic in nature and does not show all details or components necessary to complete the system. The contractor's proposal shall include all items necessary to create a complete and operational system.
2. Refer to the schematic drawings attached for more information.
3. Lockout/tagout all equipment prior to service or replacement.
4. Disconnect the electrical feeder to MZ-1, MZ-2, CU-1, CU-2, and the existing hot water pumps and remove back to source.
5. Distribution board "PDP-1" in the penthouse mechanical room shall be replaced.
6. Provide and install a new distribution board with the following loads.
 - a. Existing load: 100A/3P CB transformer T-1.
 - b. Existing load: 100A/3P CB panel L-1.
 - c. Existing load: 30A/3P CB "E-1"
 - d. New load: condensing unit "CU-1".
 - e. New load: condensing unit "CU-2".
 - f. New load: AHU-1 supply fan.
 - g. New load: AHU-2 supply fan.
 - h. New load: "HWP-1" pump.
 - i. New load: "HWP-1" pump.
 - j. Size circuit breakers to protect the new loads.
7. Shutdown and replace distribution board "PDP-1".
8. Secure new panel to the exterior wall.
9. Connect the new distribution board to the existing electrical feeder.
10. Extend the 3 existing electrical feeders serving transformer T-1, panel L-1, and E-1 to the new distribution board and connect.
11. Provide and install VFD with an integral disconnect and without a bypass to control AHU-1 and 2's supply fan.
12. Provide new feeders from the distribution board to the new equipment:
13. Provide a 120V to 24VAC transformer panel to power the 17 new VAV boxes.
Provide power to the transformer panel from 120/208V panel P-2 in the penthouse.
Provide a 24VAC circuit to each VAV terminal unit.
14. Provide 120V, 20 amp circuit from panel P-2 to the temperature controls panel.
15. Provide a weather tight receptacle near CU-1 and CU-2 for maintenance. Connect the receptacle to the existing receptacle circuit serving the penthouse.
16. Provide duct mounted supply and return smoke detectors in AHU-1 and AHU-2.
Interface the duct detectors in to the existing fire alarm system. Connect each AHU fan to the existing fan shutdown circuit for fan shutdown upon alarm. Test and verify proper operation.
17. Start-up and program the VFDs for the application.



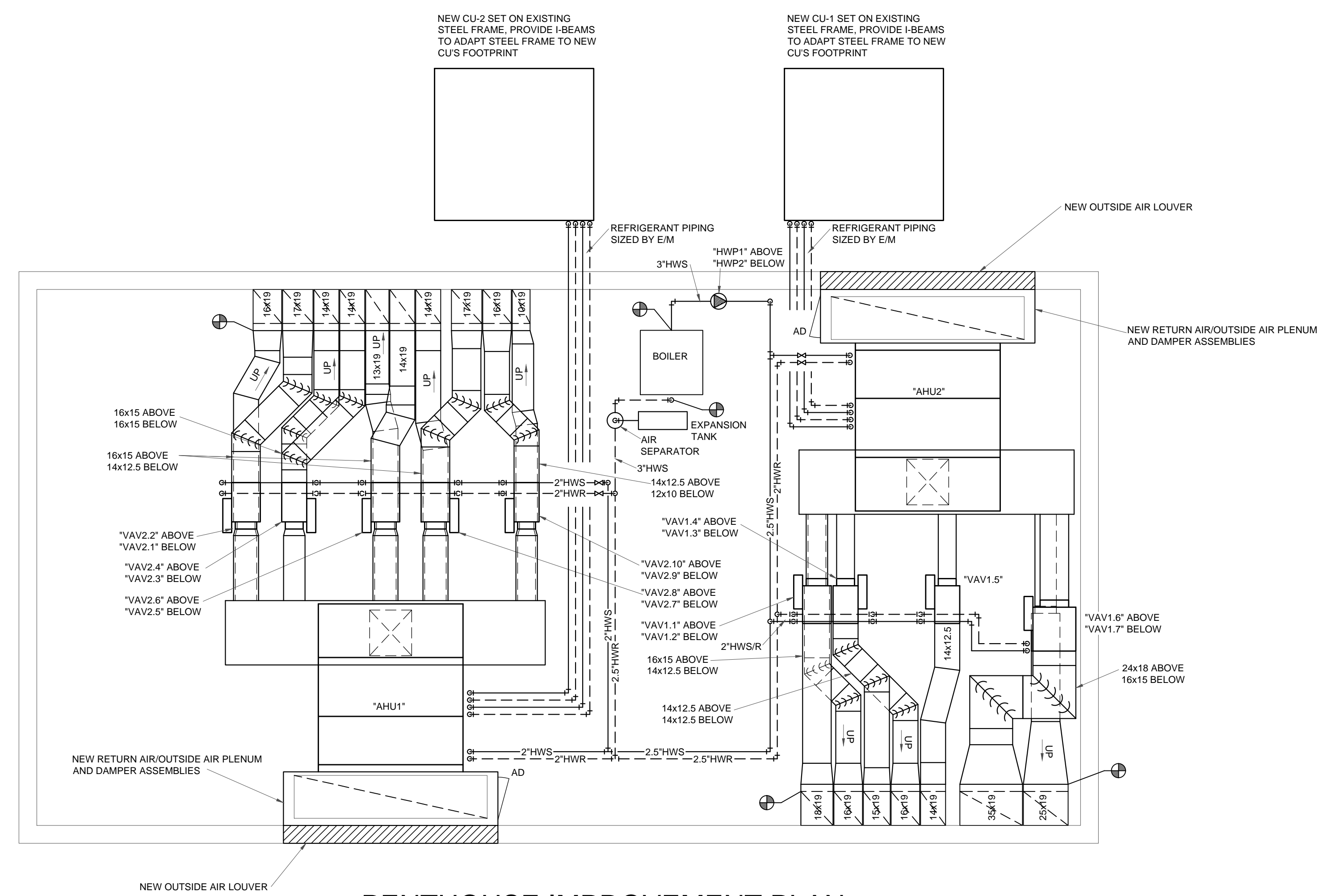
NOTE: SUPPLY & R.A. DUCTS TO HAVE 1" INSUL.

MECHANICAL PLAN AREA 'A'
1/8" = 1'-0"

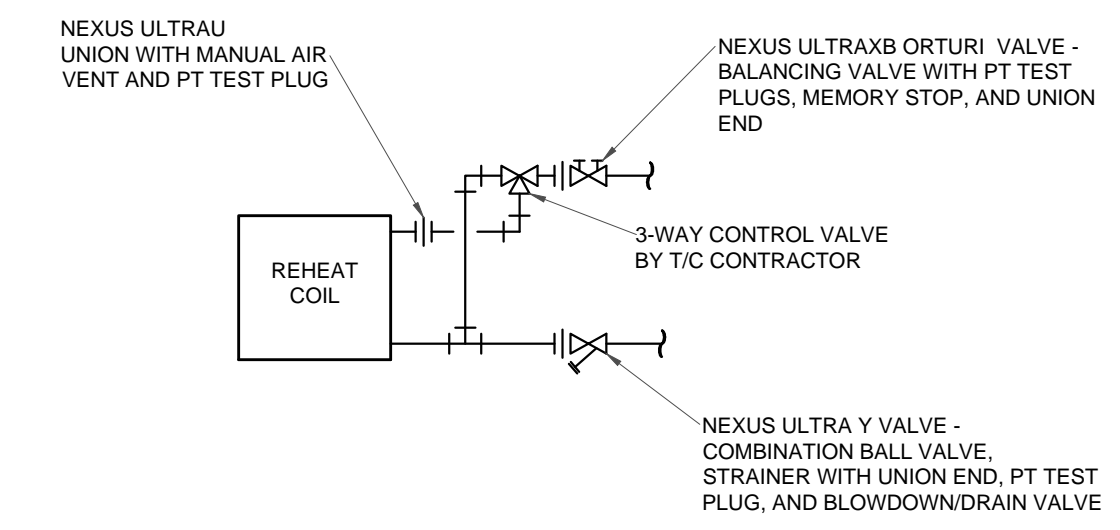
**DEMOLITION PLAN
NOT FOR CONSTRUCTION**



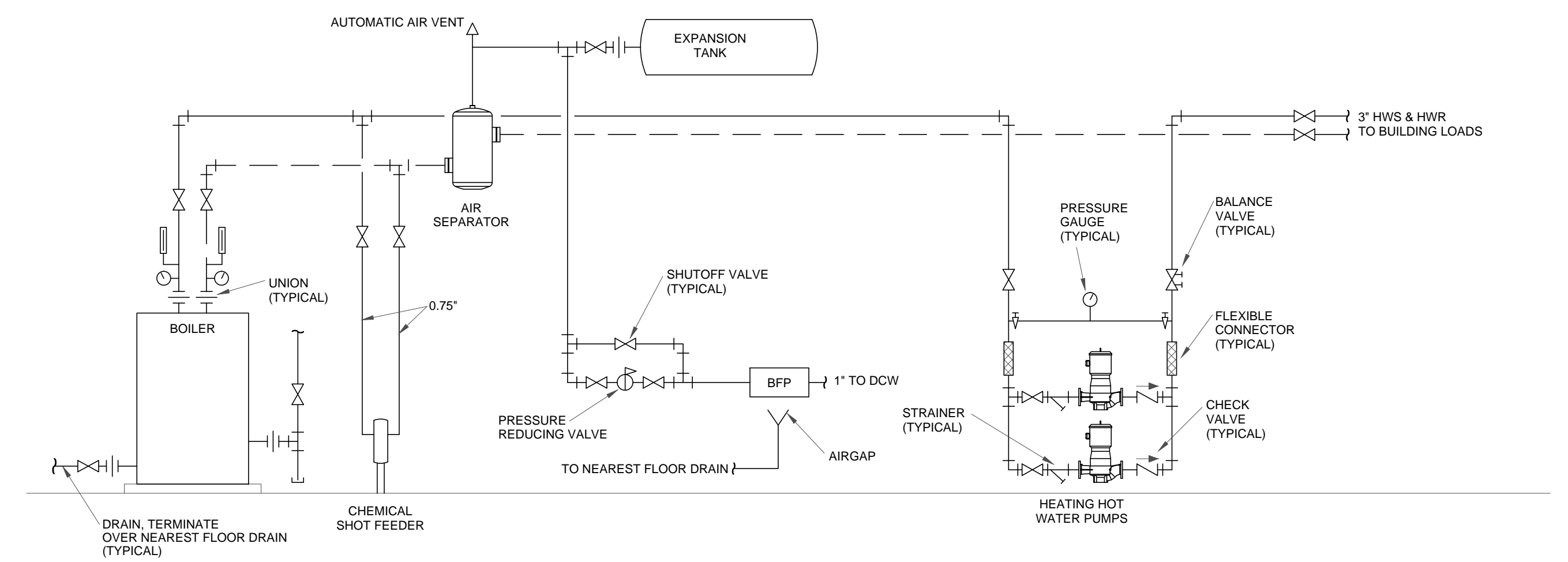
AHU-2 ELEVATION



PENTHOUSE IMPROVEMENT PLAN



TYPICAL REHEAT COIL PIPING DETAIL



HEATING HOT WATER SCHEMATIC

Preliminary

03/29/2017 10:15:39 AM



Submittal

Prepared For:
All Bidders

Date: March 21, 2017

Customer P.O. Number:
Customer Project Number:

Sold To:

Job Number:
Job Name:
ISD Phase III ACQ
201 North Forest
INDEPENDENCE, MO 64050

Trane U.S. Inc. dba Trane is pleased to provide the enclosed submittal for your review and approval.

Product Summary

Qty	Product
2	Performance Climate Changer (UCCA)
2	Air-Cooled Condensing Units (Commercial)

Trane

Phone:
Cell:
Fax:

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.

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Tag Data - Performance Climate Changer (UCCA) (Qty: 2)

Item	Tag(s)	Qty	Description	Model Number
A1	SHE- AHU-1	1	Performance Climate Changer (UCCA)	UCCA25C0A0GA112000003FE867AA0000020
A2	SHE- AHU-2	1	Performance Climate Changer (UCCA)	UCCA30C0A0FAV1200000CFE866AA0000020

Product Data - Performance Climate Changer (UCCA)**All Units**

Performance Climate Changer (UCCA)
 Horizontal DDP fan with top front discharge
 460/60/3
 Indoor unit
 1 row preheat hydronic coil with 9 fins per inch
 Aluminum fins, galvanized coil casing, 1/2" coils
 Terminal block plus starter or disconnect
 7- 1/2 horsepower (5.595 kW) motor per fan (supply)
 FC fan w/fixed sheave or DDP fan w/ field installed VFD and SGR
 Direct drive plenum fan / motorized impeller fan
 2" flat filter rack
 2" MERV 8
 None
 Access section with coil
 Standard - door on motor side
 1st year Labor warr whole unit

Item: A1 Qty: 1 Tag(s): SHE- AHU-1

Unit Size 25 Square Feet of Coil
 Stainless Steel Drain Pan, RH Coil / LH Motor & Drive Location
 6 row DX coil 14 fins per inch
 Intertwined circuit with 2 stage DX, 1/4" distributor
 67 Hz / 1990 RPM

Item: A2 Qty: 1 Tag(s): SHE- AHU-2

Unit Size 30 Square Feet of Coil
 Stainless Steel Drain Pan, LH Coil / LH Motor & Drive Location
 4 row DX coil with 12 fins per inch
 Intertwined circuit with 2 stage DX, 3/16" distributor
 66 Hz / 1960 RPM

Performance Data - Performance Climate Changer (UCCA)

Tags	SHE- AHU-1	SHE- AHU-2
Suction superheat (F)	8.00	8.00
Design airflow (cfm)	12500	13100
Total cooling capacity (MBh)	390.50	467.90
Sensible capacity (MBh)	363.89	395.71
Main coil system type	DX - R410a	DX - R410a
Preheat fluid volume (gal)	3.87	4.29
Cooling EDB (F)	82.50	82.50
Cooling EWB (F)	66.00	66.00
Cooling LDB (F)	56.01	54.98
Cooling LWB (F)	55.86	54.24
Cooling face velocity (ft/min)	522	460
Preheat coil system type	Hydronic	Hydronic
Preheat fluid type	Water	Water
Total preheat capacity (MBh)	636.36	717.47
Preheat coil performance airflow (cfm)	12500	13100
Preheat EAT (F)	10.00	10.00
Preheat LAT (F)	56.94	60.50
Preheat ent fluid temp (F)	180.00	180.00
Preheat lvg fluid temp (F)	160.00	160.00
Preheat fluid temp drop (F)	20.00	20.00
Preheat flow rate (gpm)	63.55	71.65
Preheat fluid PD (ft H2O)	8.18	10.95
Preheat coil face velocity (ft/min)	522	460
Preheat fluid freeze pt (F)	32.00	32.00
Reheat coil type	None	None

Tags	SHE- AHU-1	SHE- AHU-2
Elevation (ft)	0.00	0.00
Supply fan ESP (in H2O)	1.500	1.500
Supply fan TSP (in H2O)	3.287	2.719
Supply fan quantity (Each)	2.00	2.00
Supply total brake hp per fan (hp)	5.534	5.208
Supply fan speed (rpm)	2001	1986
Cooling APD (in H2O)	1.047	0.517
Preheat APD (in H2O)	0.101	0.080
Filter/Mixing section APD (in H2O)	0.639	0.621
Discharge velocity (ft/min)	1515	1252
Supply fan full load amps (A)	11.00	11.00
Supply fan max fuse size (A)	20.00	20.00
Supply fan min circuit ampacity (A)	13.75	13.75
Supply fan motor FLA (A)	11.00	11.00
Control full load amps (A)	0.22	0.22
Control max fuse size (A)	15.00	15.00
Control min circuit ampacity (A)	0.28	0.28
Run acoustics?	No	No
Unit length (in)	93.935	100.560
Unit width (in)	81.000	94.000
Unit height (in)	60.568	60.568
Installed weight (lb)	2056.6	2170.7
Rigging weight (lb)	2025.1	2135.8
Preheat fluid velocity (ft/s)	5.45	6.15

Mechanical Specifications - Performance Climate Changer (UCCA)**Item: A1, A2 Qty: 2 Tag(s): SHE- AHU-1, SHE- AHU-2****GENERAL****Lifting Instructions**

Performance Climate Changer air handlers must be rigged, lifted, and installed in strict accordance with the Installation, Operation, and Maintenance manual (CLCH-SVX009A-EN) for UCCA air handlers. The units are also to be installed in strict accordance with the specifications.

Per ASHRAE 62.1 recommendation, indoor air handling units will be shipped stretch-wrapped to protect unit from in-transit rain and debris.

Installing contractor is responsible for long term storage in accordance with the Installation, Operation, and Maintenance manual (CLCH-SVX009A-EN).

Unit shall be UL and C-UL Listed.

Where applicable air-handling performance data shall be certified in accordance with AHRI Standard 430. For units with housed fans or single direct drive plenum fans, fans shall be certified as complying with AHRI Standard 430. Air handling units with multiple direct drive plenum fans, or direct drive plenum fans incorporated with ECM style motors are outside the scope of AHRI 430. These fans however are rated in accordance with AHRI 430.

Coil performance shall be certified in accordance with AHRI Standard 410.

Unit Construction**Casing Construction**

All unit panels shall be 2-inch solid, double-wall construction to facilitate cleaning of unit interior. All exterior and interior AHU panels will be made of galvanized steel. Motor and drive locations can be on the same side as the unit coil connections or on the opposite side. The casing shall be able to withstand up to 6" w.g. positive or negative static pressure. The unit panels shall not exceed .005 inch deflection per inch of panel span at 6" w.g. positive or negative static pressure.

Floor Construction

The unit floor shall be of sufficient strength to support a 300.0 lb load during maintenance activities and shall deflect no more than .005 inch per inch of panel span when sitting on a support structure.

Insulation

Panel insulation shall provide a minimum thermal resistance (R) value of 13 ft²*h*°F/Btu throughout the entire unit. Insulation shall completely fill the panel cavities in all directions so that no voids exist and settling of insulation is prevented. Panel insulation shall comply with NFPA 90A.

Drain Pan

All units shall be provided with an insulated assembly of polymer material or stainless steel. To address indoor air quality (IAQ), the drain pan shall be designed in accordance with ASHRAE 62.1 being of sufficient size to collect all condensation produced from the coil and sloped in two planes promoting positive drainage to eliminate stagnant water conditions. The outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition. All drain pan connections shall be visible external to the unit.

Access Door Construction

Access doors shall be 2-inch double-wall construction. Interior and exterior door panels shall be of the same construction as the interior and exterior wall panels, respectively. Surface-mounted handles shall be provided to allow quick access to the interior of the unit. Handle hardware shall be designed to prevent unintended closure. Access doors shall be hinged and removable for quick, easy access. Door handle hardware shall be adjustable and visually indicate locking position of door latch external to the section.

Filters

2-inch pleated media filters made with 100% synthetic fibers that are continuously laminated to a supported steel-wire grid with water repellent adhesive shall be provided. Filters shall be capable of operating up to 625 fpm face velocity without loss of filter efficiency and holding capacity. The filters shall have a MERV 8 rating when tested in accordance

with the ANSI/ASHRAE Standard 52.2.

COIL SECTION

The coil section shall be provided complete with coil and coil holding frame. The coils shall be installed such that headers and return bends are enclosed by unit casings. The drainpan outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition.

No casing penetrations supplied for hydronic drain and vents. If required, piping contractor will need to drill drain and vent penetrations using factory located features provided in coil panel.

Refrigerant Cooling Coils

The coils shall have aluminum fins and seamless copper tubes. The fins shall have collars drawn, belled, and firmly bonded to tubes by mechanical expansion of the tubes. Suction and liquid line connections shall extend to the unit exterior. The coil casing may be galvanized or stainless steel. Refer to the Product Data section of the submittal for the coil casing material.

The coils shall be proof-tested to 450 psig and leak-tested to 300 psig air pressure under water. After testing, the inside of the coils shall be dried, all connections shall be sealed, and the coil shall be shipped with a charge of dry air. Suction headers and liquid connections shall be constructed of copper tubing with connections penetrating unit casings to permit sweat connections to refrigerant lines. The coils shall have equalizing vertical distributors sized according to the capacities of the coils. Coils are 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.

Tubes are 1/2" [13 mm] OD 0.016" [0.406 mm] thick copper.

Water Coils

Hydronic coils have W round seamless copper tubes mechanically bonded to coil fins. Coil fins are aluminum with full fin collars that provide maximum fin-tube contact and accurate spacing. Coils are available with 9, 12, and 14 fins per inch. Manufacturer shall not allow selections where moisture carryover could occur at design conditions. For hydronic coils used in a two-pipe system, the unit manufacturer shall provide performance data in both the cooling and heating mode.

Hydronic coils used as heating only will be available in one or two-row configurations. Hydronic coils used as cooling only will be available in four, six, or eight-row configurations. Multi-row hydronic coils have continuous tube circuits arranged for counterflow (water flow counter to the direction of unit airflow). The coil casing may be galvanized or stainless steel. Coils have round seamless copper pipe headers with NPT external thread steel pipe connections. Coils have one vent and one drain connection consisting of 3/8" NPT internal thread copper adapter with steel square head pipe plug. Supply and return connections are located outside the unit casing (on the same side of the unit) and are clearly labeled to facilitate field piping. Coils are proof-tested to 450 psig and leak-tested under water to 300 psig. Maximum standard operating conditions are 300 psig and 200F. Coil performance data and coils containing water or ethylene glycol shall be certified in accordance with AHRI Standard 410. Propylene glycol and calcium chloride, or mixtures thereof, are outside the scope of AHRI Standard 410 and, therefore, do not require AHRI 410 rating or certification.

Tubes are 1/2" [13 mm] OD 0.016" [0.406 mm] thick copper.

Access Section with Coil

Unit(s) shall include a separate section housing a coil section and access section as one assembly. Refer to drawings to determine which unit(s) include the additional section. Section shall include a stainless steel drainpan and an access door of sufficient size to allow for visual inspection of the leaving face of the first coil in the airstream (if ordered) and entering face of the second coil in the airstream (if ordered). Access door shall be of the same construction as all other doors on the unit.

Fans selected with a shaft grounding ring shall have a maintenance free, circumferential conductive micro fiber ring installed on the fan motor to discharge shaft currents to ground.

DIRECT-DRIVE PLENUM FAN SECTION

The fan shall be a single-width, single-inlet, 10-bladed direct-drive plenum fan. The fan shall consist of a backward-curved, welded steel wheel. Motor bearing life of the direct-drive plenum fan shall be not less than L-10 250,000 hrs.

Units containing multiple fans shall be controlled using a common control signal, such as the duct static control signal, to modulate the fan speed.

Motor Frame

The motor shall be mounted integral to the isolated fan assembly and furnished by the unit manufacturer. The motor is mounted inside the unit casing on an adjustable base to permit adjustment of drive belt tension (not applicable for direct drive plenum fans). The motor shall meet or exceed all NEMA Standards Publication MG 1 requirements and comply with NEMA Premium efficiency levels when applicable except for fractional horsepower motors which are not covered by the NEMA classification. The motor shall be T-frame, squirrel cage with size, type, and electrical characteristics as shown on the equipment schedule. *Refer to the Product Data section for selected fan motors within each unit.*

Fan Isolation

All fans, including direct drive plenum fans, shall be internally isolated to inhibit noise and vibration through the ductwork and building structure. A flexible connection shall be installed between fan and unit casing to ensure complete isolation. If fans and motors are not internally isolated, then the entire unit shall be externally isolated from the building, including supply and return duct work, piping, and electrical connections. External isolation shall be furnished by the installing contractor in order to avoid transmission of noise and vibration through the ductwork and building structure.

Motor Starter

An IEC combination starter shall be provided for each fan motor. Each starter shall be properly sized, factory mounted in a metal enclosure, and wired to the fan motor to facilitate temporary heating, cooling, ventilation, and/or timely completion of the project. Starter shall include one N.C. and one N.O. auxiliary contact, and manual reset overload.

Control Interface

A control interface is available that includes:

- Fan motor disconnect switch
- Fused transformer(s)
- Customer terminal strip for field-provided controls
- For a control interface without a VFD, it will also include a starter with a motor overload and a motor contactor.
- For a control interface with a VFD, it will not include a starter..

Also, various end device options are available with the control interface wired to a terminal strip. Binary end device options include:

- Low limit protection
- Condensate overflow switch
- Fan status switch
- Filter status switch

Analog end device options are:

- Discharge air sensor
- Mixed air sensor
- Return air sensor
- Damper actuator

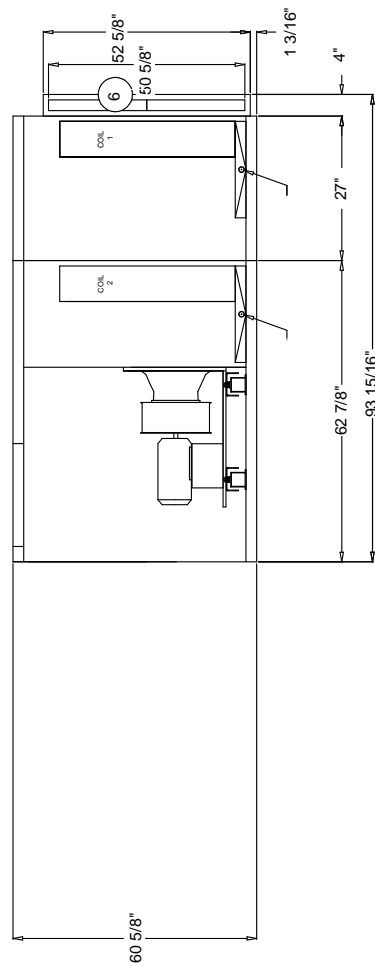
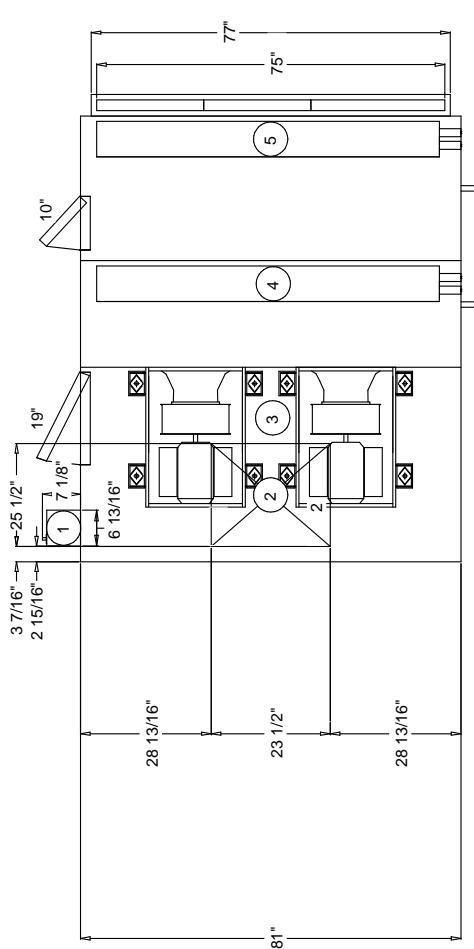
Unit Dimensions - Performance Climate Changer (UCCA)

Item: A1 Qty: 1 Tag(s): SHE- AHU-1

EQUIPMENT LIST

- 1 External unit controller
- 2 TPFT discharge opening
- 25 1/2" x 23 1/2"
- 3 Direct-drive plenum fan - 20" dia.
- 3 Supply fan 7.500 hp 460.0 V
- 4 Cooling coil - 6 row
- 5 Heating coil - 1 row
- 6 Flat filter - 2" MERV 8
- 16 in. x 20 in. (0)
- 16 in. x 25 in. (2)
- 20 in. x 20 in. (0)
- 20 in. x 25 in. (6)

Doors
 19" Width x 57" Height
 10" Width x 57" Height



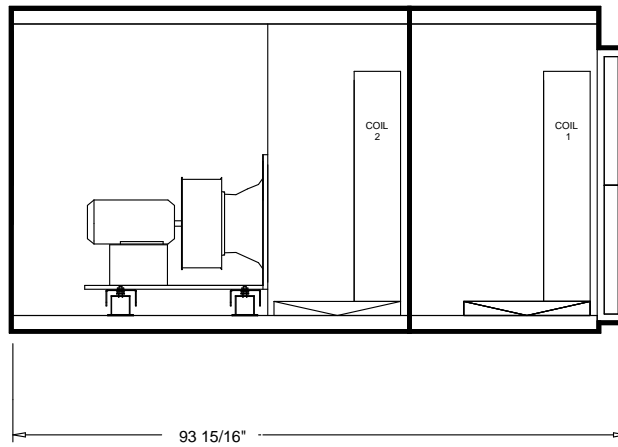
OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE



Unit size:	25	Unit Casing: 2in Double Wall
Product group: Indoor Unit	12500 cfm	Rigging Weight: 2025.1 lb
	Actual airflow:	Installed Weight: 2066.6 lb

Unit Dimensions - Performance Climate Changer (UCCA)


Item: A1 Qty: 1 Tag(s): SHE- AHU-1



Overall Elevation View: Right - Shipping splits indicated by bold outline.

Component	
Main Unit	950.0 lb
Motor	240.0 lb
Coil 1 installed weight	135.2 lb
Coil 2 installed weight	365.5 lb
Access section with coil	339.0 lb
VFD	
Electric Heater	
Filter / Mixbox weight	27.0 lb

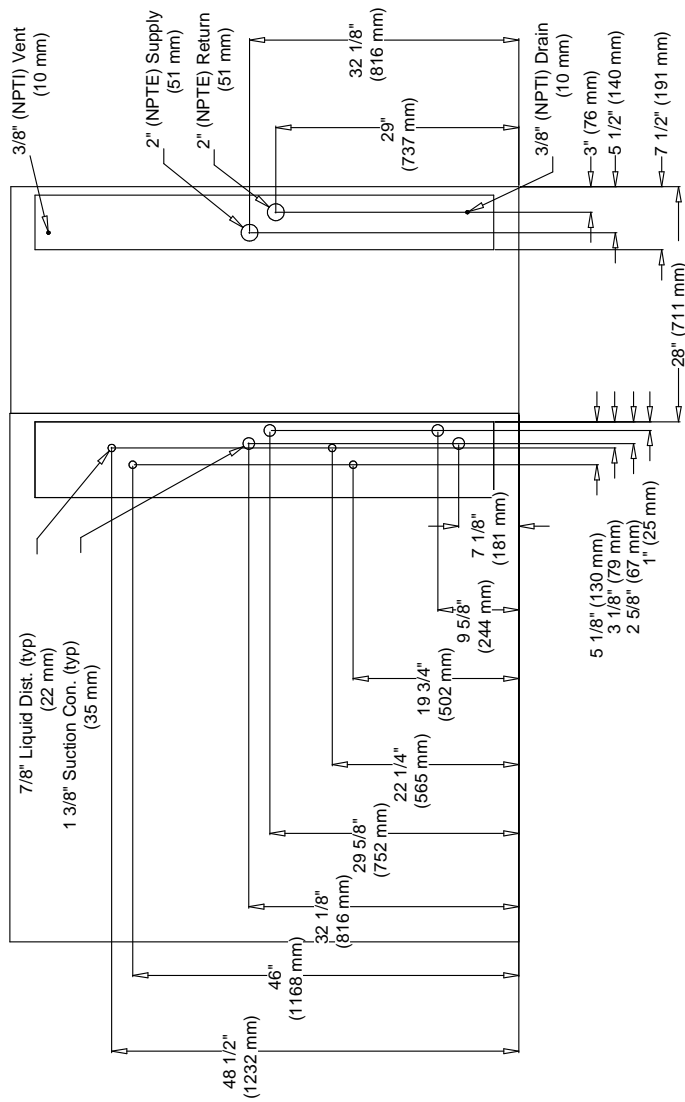
OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 25		Unit Casing: 2in Double Wall	 Performance Climate Changer Air Handlers
Product group: Indoor Unit	Actual airflow: 12500 cfm	Rigging Weight: 2025.1 lb	
		Installed Weight: 2056.6 lb	

Unit Dimensions - Performance Climate Changer (UCCA)

Item: A1 Qty: 1 Tag(s): SHE- AHU-1

Note: Not all components or accessories shown. Main unit shown for reference.



Coil connection view: Right

NPTI: National Pipe Thread Internal Connection
 NPTE: National Pipe Thread External Connection

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE



Unit size:	25	Unit Casing: 2in Double Wall Foam
Product group: Indoor Unit	12500 cfm	Rigging Weight: 2025.1 lb
	Actual airflow:	Installed Weight: 2056.6 lb

Unit Dimensions - Performance Climate Changer (UCCA)

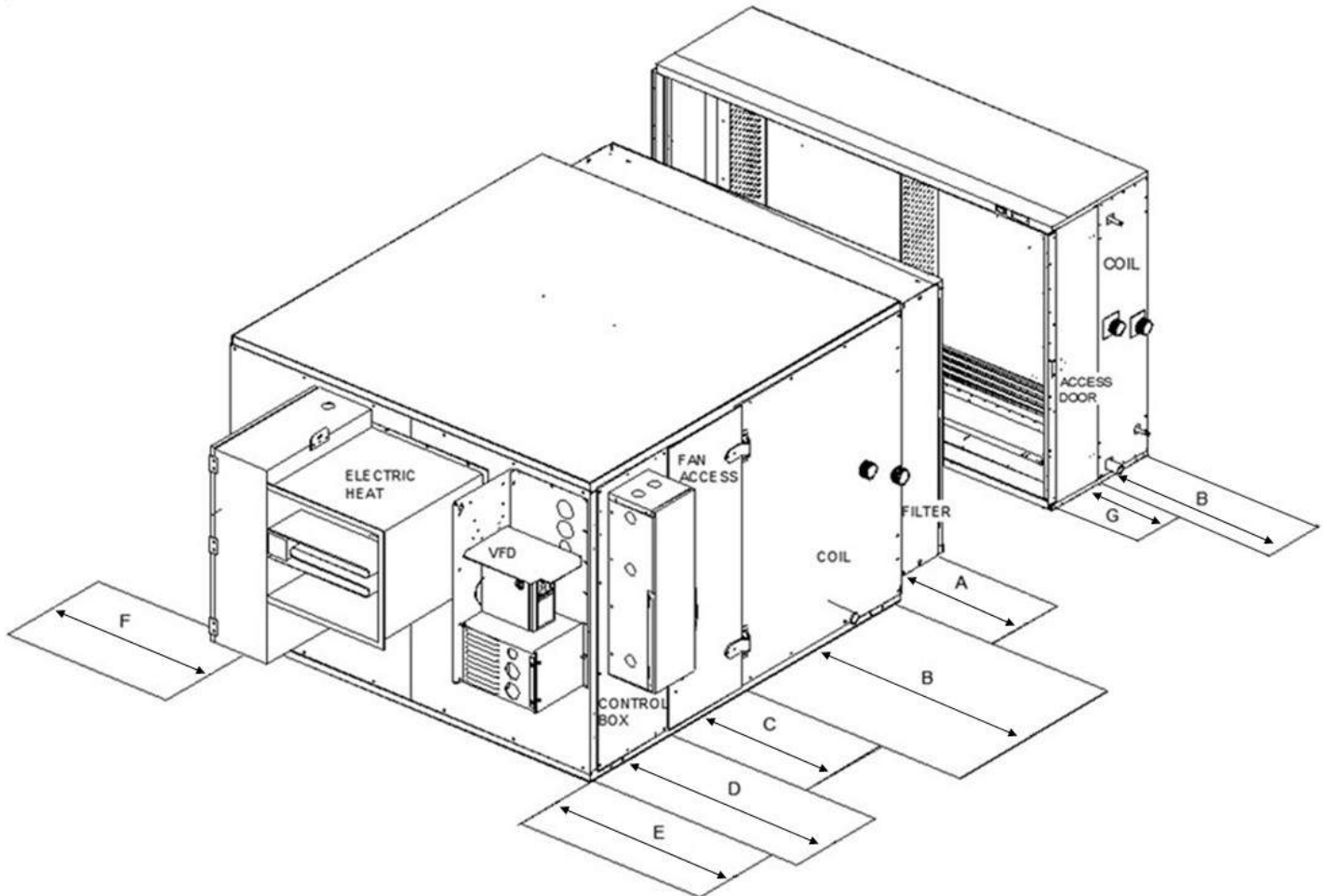
Item: A1, A2 Qty: 2 Tag(s): SHE- AHU-1, SHE- AHU-2

UCCA Service Clearances

Component		UNIT SIZE									
		3	6	8	10	12	14	17	21	25	30
Filter	A	40.0	44.0	42.0	42.0	40.0	45.0	45.0	45.0	51.0	51.0
Coil Pull	B	49.0	62.0	66.0	78.0	86.0	86.0	94.0	94.0	96.0	109.0
Fan Access, horizontal unit (motor side)	C	48.0	48.0	48.0	51.0	54.0	58.0	61.0	61.0	66.0	66.0
Fan access, horizontal unit (opposite motor side)	C	15.0	18.0	15.0	15.0	17.0	18.0	22.0	23.0	24.0	24.0
Fan Access, vertical unit (motor side)	C	48.0	48.0	48.0	51.0	54.0	58.0	61.0	61.0		
Fan access, vertical unit (opposite motor side)	C	25.0	28.0	21.0	23.0	27.0	27.0	31.0	31.0		
Control Box	D	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
VFD	E	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
EH	F	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
Access Door - Access Section	G	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0

Note(s):

At a minimum, the above clearance dimensions are recommended on one side of the unit for regular service and maintenance. Refer to as-built submittal for locations of items such as filter access doors, coil, piping connections, motor locations, etc. Sufficient clearance must be provided on all sides of unit for removal of access panels, plug panels, or section-to-section attachment brackets. Clearance for starters, VFD's, or other high-voltage devices must be provided per NEC requirements.



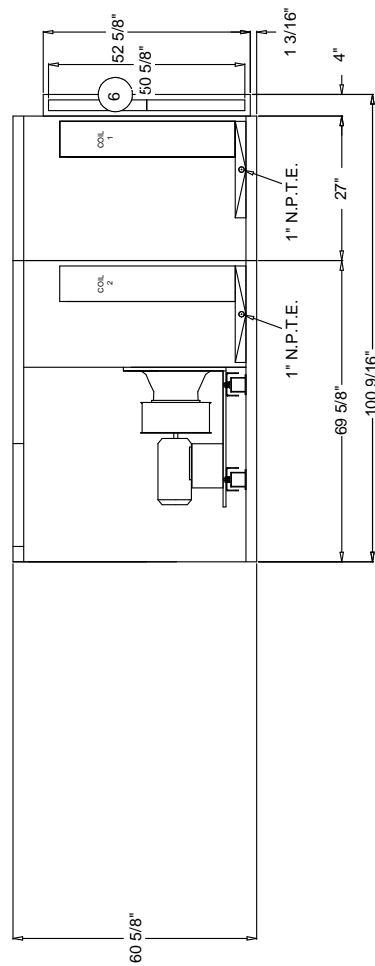
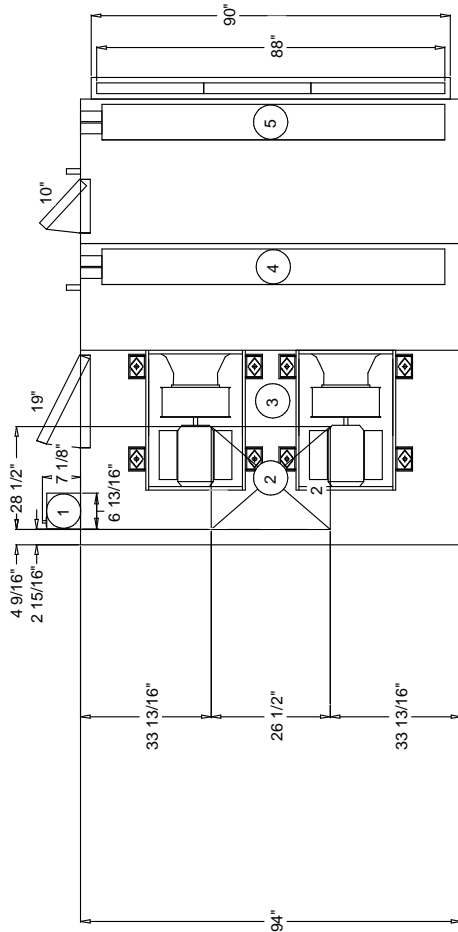
Unit Dimensions - Performance Climate Changer (UCCA)

Item: A2 Qty: 1 Tag(s): SHE- AHU-2

EQUIPMENT LIST

- 1 External unit controller
- 2 TPFT discharge opening
- 28 1/2" x 26 1/2"
- 3 Direct-drive plenum fan - 20" dia.
- Supply fan 7.500 hp 460.0 V
- 4 Cooling coil - 4 row
- 5 Heating coil - 1 row
- 6 Flat filter - 2" MERV 8
- 16 in. x 20 in. (0)
- 16 in. x 25 in. (6)
- 20 in. x 20 in. (0)
- 20 in. x 25 in. (4)

Doors
 19" Width x 57" Height
 10" Width x 57" Height



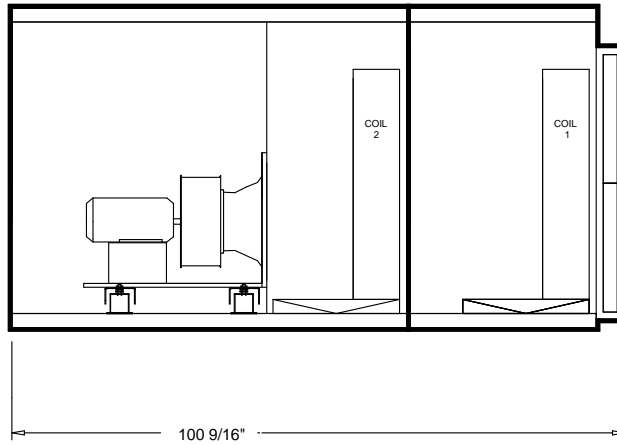
OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE



Unit size:	30	Unit Casing: 2in Double Wall
Product group: Indoor Unit	13100 cfm	Rigging Weight: 2135.8 lb
Actual airflow:	13100 cfm	Installed Weight: 2170.7 lb

Unit Dimensions - Performance Climate Changer (UCCA)


Item: A2 Qty: 1 Tag(s): SHE- AHU-2



Overall Elevation View: Right - Shipping splits indicated by bold outline.

Component	
Main Unit	1083.0 lb
Motor	240.0 lb
Coil 1 installed weight	150.2 lb
Coil 2 installed weight	291.6 lb
Access section with coil	375.0 lb
VFD	
Electric Heater	
Filter / Mixbox weight	31.0 lb

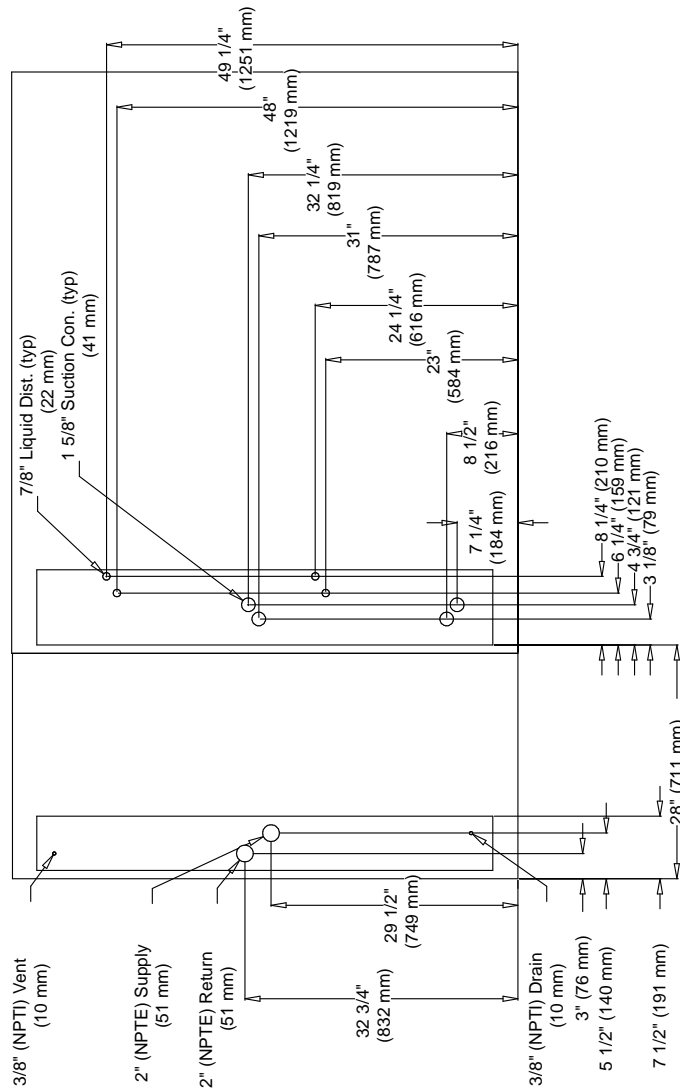
OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 30		Unit Casing: 2in Double Wall	 Performance Climate Changer Air Handlers
Product group: Indoor Unit	Actual airflow: 13100 cfm	Rigging Weight: 2135.8 lb	
		Installed Weight: 2170.7 lb	

Unit Dimensions - Performance Climate Changer (UCCA)

Item: A2 Qty: 1 Tag(s): SHE- AHU-2


Note: Not all components or accessories shown. Main unit shown for reference.



Coil connection view: Left

NPTI: National Pipe Thread Internal Connection
 NPTE: National Pipe Thread External Connection

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

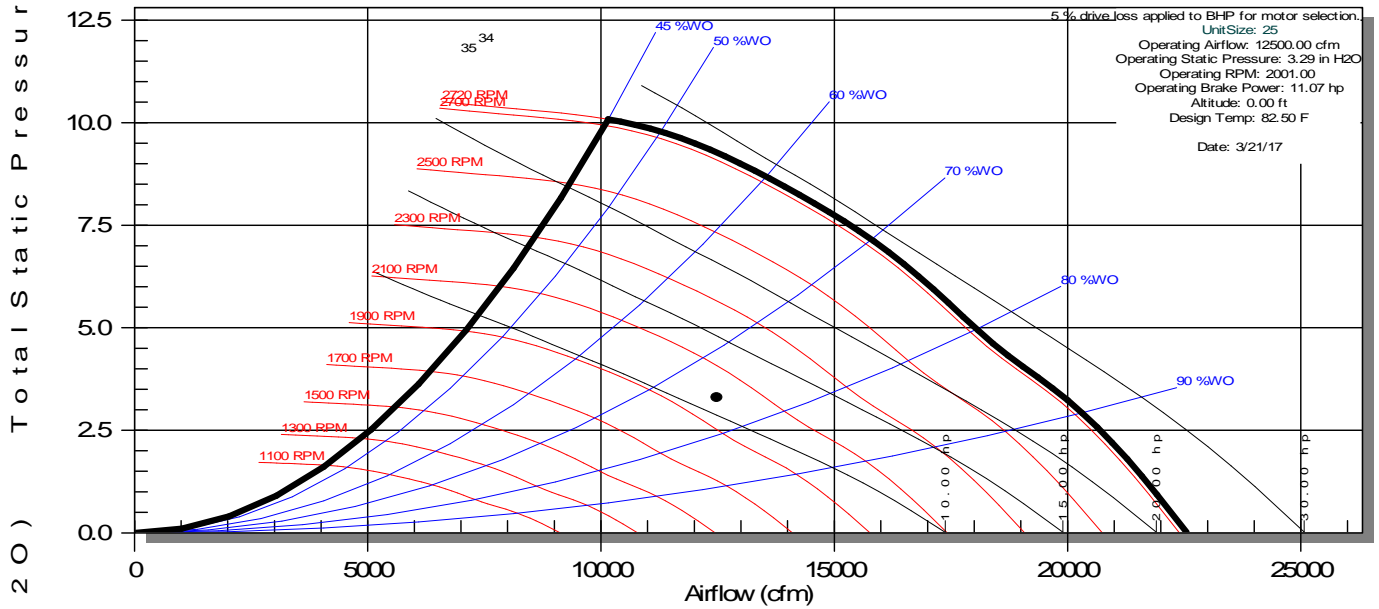
Unit size:	30	Unit Casing: 2in Double Wall Foam
Product group:	Indoor Unit	Rigging Weight: 2135.8 lb
Actual airflow:	13100 cfm	Installed Weight: 2170.7 lb
		 Performance Climate Changer Air Handlers

Fan Curve - Performance Climate Changer (UCCA)

Item: A1 Qty: 1 Tag(s): SHE- AHU-1

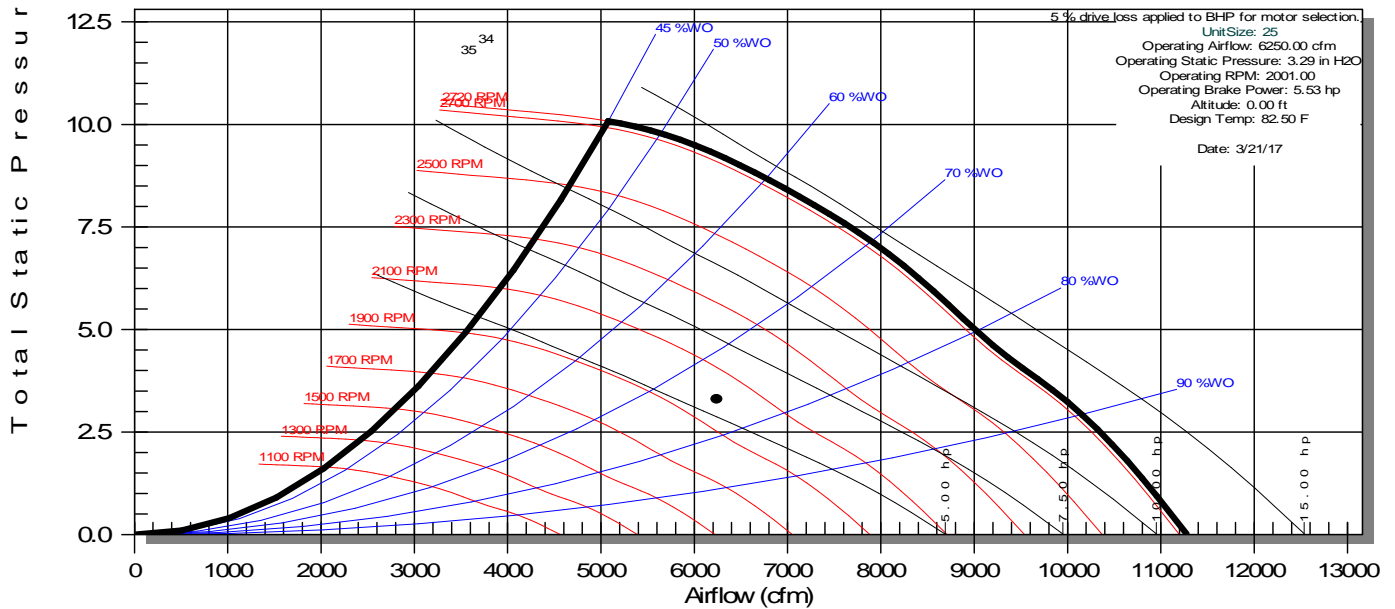
- Supply Fan

Size 25 DDP Front Top Discharge - Dual Fan



- Supply Fan

Size 25 DDP Front Top Discharge - Single Fan

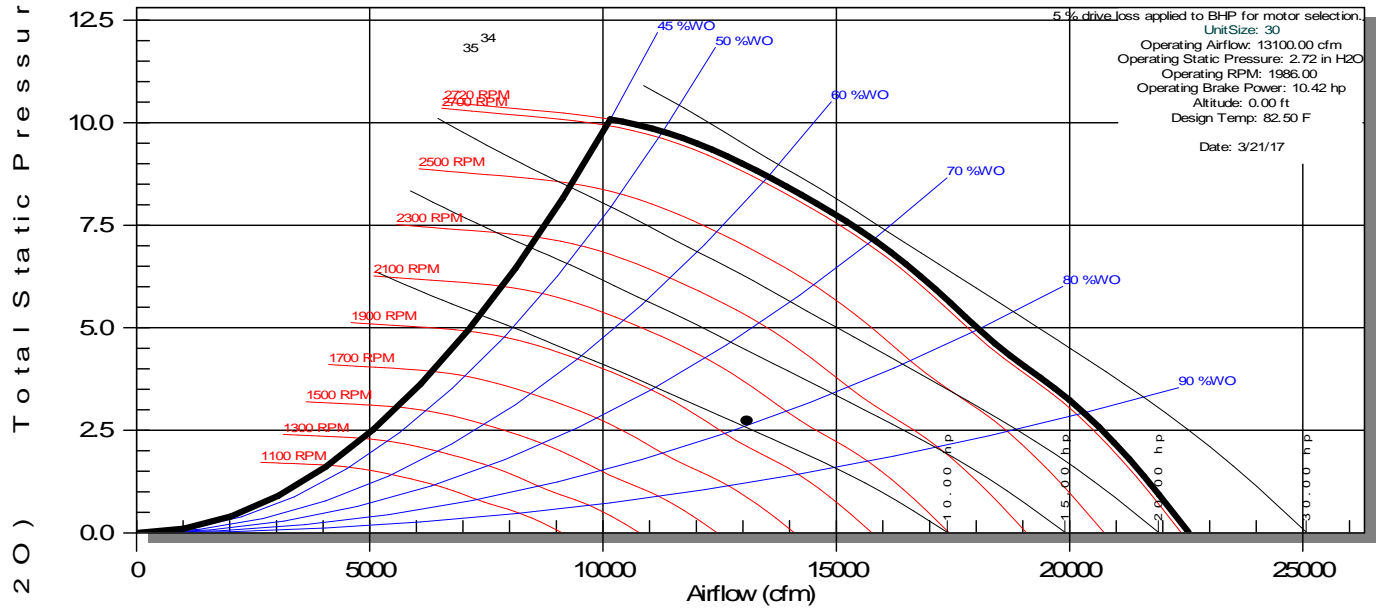


Fan Curve - Performance Climate Changer (UCCA)

Item: A2 Qty: 1 Tag(s): SHE- AHU-2

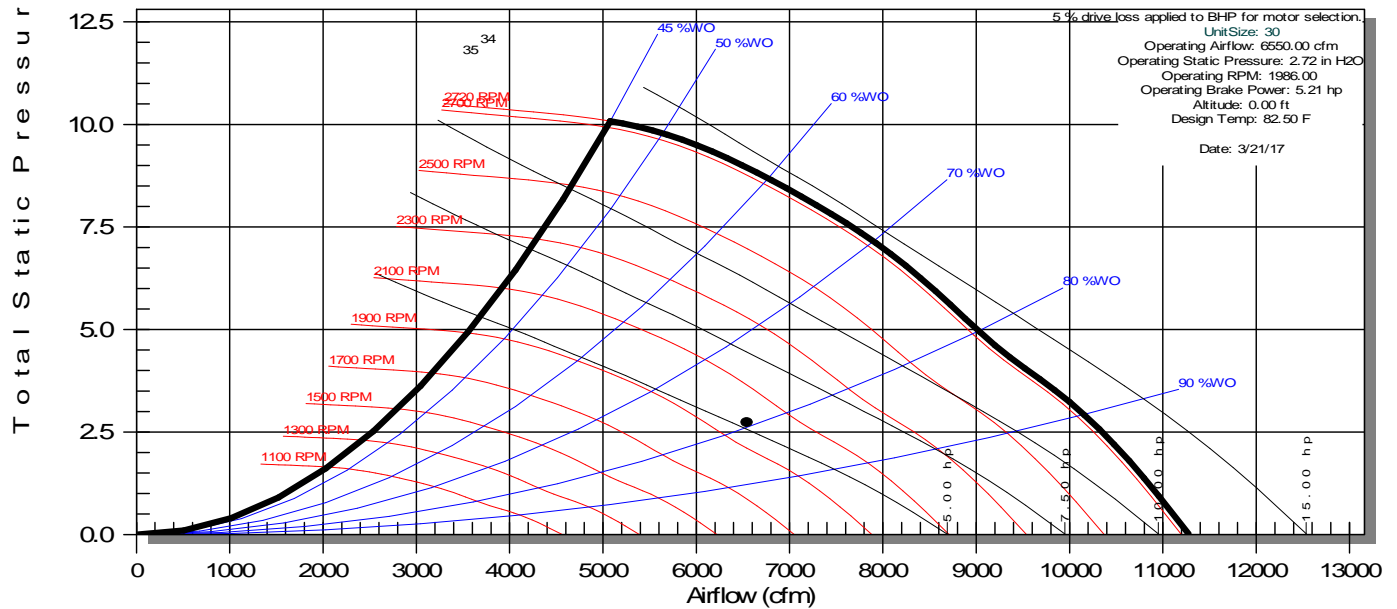
- Supply Fan

Size 30 DDP Top Front Discharge - Dual Fan



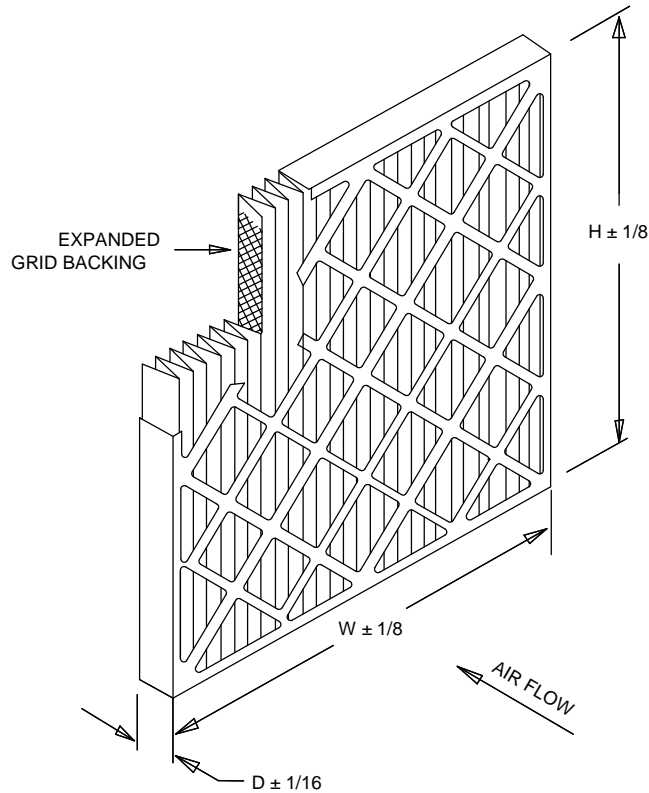
- Supply Fan

Size 30 DDP Top Front Discharge - Single Fan



Accessory - Performance Climate Changer (UCCA)

Item: A1, A2 Qty: 2 Tag(s): SHE- AHU-1, SHE- AHU-2



STANDARD CONSTRUCTION

1. 100 % Synthetic White Un-Dyed Media
2. 10.0 Pleats Per Foot
3. Expanded Metal Pleat Supports
4. Moisture Resistant Beverage Board Frame
5. Double Wall Frame

NOTES

1. MERV 8-A Per ASHRAE 52.2-2007 Appendix J.
2. Final Resistance: 1/0" W.G.
3. Rated Velocity: 500 FPM
4. Class 2 Filter Per U.L. Standard 900
5. Maximum Operating Temperature: 225 DEG. F

MODEL NUMBER	NOMINAL SIZE IN. W X H X D	ACTUAL SIZE IN. W X H X D	RATED AIR FLOW CFM	INITIAL RESISTANCE IN. W.G.	MEDIA AREA SQ. FT.
MX40-STD2-217	10 X 20 X 2	9-1/2 X 19-1/2 X 1-3/4	700	0.29	4.7
MX40-STD2-220	12 X 20 X 2	11-1/2 X 19-1/2 X 1-3/4	840	0.29	5.5
MX40-STD2-210	12 X 24 X 2	11-3/8 X 23-3/8 X 1-3/4	1000	0.29	6.2
MX40-STD2-239	14 X 20 X 2	13-1/2 X 19-1/2 X 1-3/4	980	0.29	5.7
MX40-2TD2-241	14 X 25 X 2	13-1/2 X 24-1/2 X 1-3/4	1220	0.29	7.1
MX40-STD2-245	15 X 20 X 2	14-1/2 X 19-1/2 X 1-3/4	1050	0.29	6.2
MX40-STD2-201	16 X 20 X 2	15-1/2 X 19-1/2 X 1-3/4	1120	0.29	6.7
MX40-STD2-216	16 X 24 X 2	15-3/8 X 23-3/8 X 1-3/4	1340	0.29	8.0
MX40-STD2-202	16 X 24 X 2	15-1/2 X 24-1/2 X 1-3/4	1400	0.29	8.0
MX40-STD2-280	15 X 20 X 2	17-1/2 X 19-1/2 X 1-3/4	1250	0.29	7.8
MX40-STD2-212	18 X 24 X 2	17-3/8 X 23-3/8 X 1-3/4	1500	0.29	9.3
MX40-STD2-285	18 X 25 X 2	17-1/2 X 24-1/2 X 1-3/4	1570	0.29	9.7
MX40-STD2-203	20 X 20 X 2	19-1/2 X 19-1/2 X 1-3/4	1400	0.29	8.3
MX40-STD2-211	20 X 24 X 2	19-3/8 X 23-3/8 X 1-3/4	1670	0.29	9.9
MX40-STD2-204	20 X 25 X 2	19-1/2 X 24-1/2 X 1-3/4	1750	0.29	10.3
MX40-STD2-205	24 X 24 X 2	23-3/8 X 23-3/8 X 1-3/4	2000	0.29	11.7
MX40-STD2-225	25 X 25 X 2	24-1/2 X 24-1/2 X 1-3/4	2170	0.29	13.6

Accessory - Performance Climate Changer (UCCA)

Filter Schedule

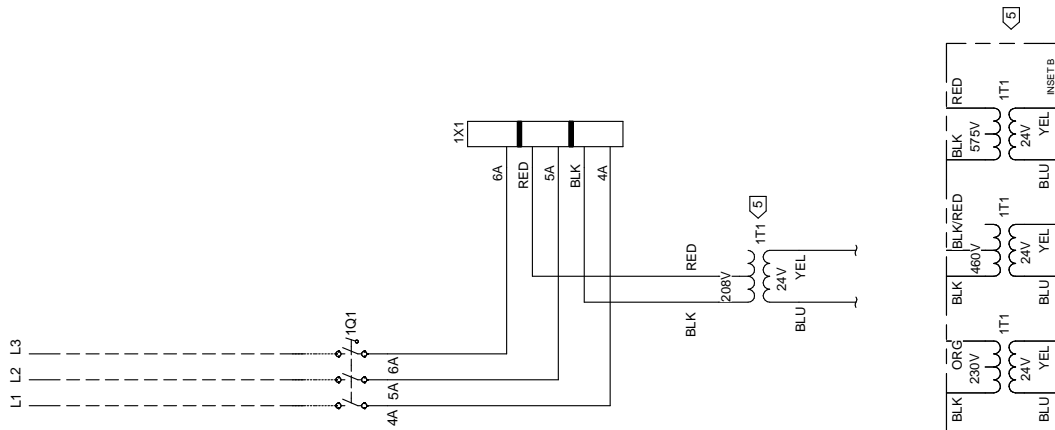
Item: A1, A2 Qty: 2 Tag(s): SHE- AHU-1, SHE- AHU-2

Unit Tag(s)	Unit Size	Filter Arrangement	Filter Type \ MERV Rating	Filter Quantity	Filter Size
			2" MERV 8	0 2 0 6	16 in. x 20 in. 16 in. x 25 in. 20 in. x 20 in. 20 in. x 25 in.
			2" MERV 8	0 6 0 4	16 in. x 20 in. 16 in. x 25 in. 20 in. x 20 in. 20 in. x 25 in.

Field Wiring - Performance Climate Changer (UCCA)
Item: A1, A2 Qty: 2 Tag(s): SHE- AHU-1, SHE- AHU-2

POWER SCHEMATIC PAGE 1 OF 2

DEVICE	DESCRIPTION	ZONE
1Q1	UNIT DISCONNECT SWITCH	15
1T1	CONTROL TRANSFORMER	31
1X1	POWER DISTRIBUTION BLOCK	20



<p>CAUTION</p> <p>USE COPPER CONDUCTORS ONLY. OTHER TYPES MAY BE DAMAGED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.</p> <p>ATTENTION</p> <p>N'UTILISER QUE DES CONDUCTEURS EN CUIVRE! LES BORNES DE L'UNITÉ NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS. L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT ENDOMMAGER L'ÉQUIPEMENT.</p> <p>PRECAUCION</p> <p>UTILICE ÚNICAMENTE CONDUCTORES DE COBRE! LAS TERMINALES DE LA UNIDAD NO ESTÁN DISEÑADAS PARA RECIBIR OTROS TIPOS DE CONDUCTORES. SI NO LO HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.</p>	<p>WARNING</p> <p>HAZARDOUS VOLTAGE. SERIOUS INJURY OR DEATH MAY RESULT FROM CONTACT WITH ENERGIZED ELECTRICAL COMPONENTS. FOLLOW LOCK-OUT AND TAG PROCEDURES INCLUDING REMOTE DISCONNECTS AND MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVES MAY STORE HIGHER VOLTAGE. FOLLOW ALL MANUFACTURER'S INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE BEFORE SERVICING MAY RESULT IN DEATH OR SERIOUS INJURY.</p> <p>AVERTISSEMENT</p> <p>TENSION DANGEREUSE! NE PAS RESPECTER CES MESURES DE SÉCURITÉ PEUT ENTRAÎNER DES BLESSURES GRAVES, MÊME LA MORT. DÉCHARGER LES CONDENSATEURS AVANT DE RÉPARER L'ÉQUIPEMENT. LA VITESSE VARIABLE SE REPORTER AUX MANUELS D'INSTRUCTIONS POUR PLUS DE DÉTAILS. NE PAS RESPECTER CES MESURES DE SÉCURITÉ PEUT ENTRAÎNER DES BLESSURES GRAVES, MÊME LA MORT.</p> <p>ADVERTENCIA</p> <p>¡VOLTAJE PELIGROSO! INCLUIDO LAS DESCONECCIONES REMOTAS Y LOS CONDENSADORES DE LOS MOTORES, LOS CAPACITORES DEL MOTOR ALMACENAN ENERGÍA EN SU CARCASA. SI NO SE SIGUEN LOS PROCEDIMIENTOS DE CIERRE Y SERVICIO, ASEGÚRESE QUE TODOS LOS CAPACITORES DEL MOTOR HAYAN SIDO DEBIDAMENTE DESCARGADOS. PARA LAS UNIDADES CON CEE DE VELOCIDAD VARIABLE, VERIFICAR EL MANUAL PARA LA DESCARGA DEL CONDENSADOR. EL NO REALIZAR LO ANTERIORMENTE PUEDE RESULTAR EN LA MUERTE O SERIAS LESIONES PERSONALES.</p>
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Field Wiring - Performance Climate Changer (UCCA)
Item: A1, A2 Qty: 2 Tag(s): SHE- AHU-1, SHE- AHU-2

POWER SCHEMAIC PAGE 2 OF 2

NOTES:

1. UNLESS OTHERWISE NOTED ALL SWITCHES ARE SHOWN AT 25 C (77 F), AT ATMOSPHERIC PRESSURE, AT 50 PERCENT RELATIVE HUMIDITY, WITH ALL UTILITIES TURNED OFF, AND AFTER A NORMAL SHUTDOWN HAS OCCURRED.
2. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. PHANTOM LINE ENCLOSURES INDICATE ALTERNATE CIRCUITRY OR AVAILABLE SALES OPTIONS. SOLID LINES INDICATE WIRING BY TRANE.
3. NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF CONTACTS BY LINE NUMBER. AN UNDERLINED NUMBER INDICATES A NORMALLY CLOSED CONTACT. AN OPEN ARROWHEAD BELOW THE LINE NUMBER POINTING UPWARD INDICATES A TIMED CONTACT WHICH BEGINS TIMING WHEN ENERGIZED.
4. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, STATE, AND LOCAL REQUIREMENTS. OTHER COUNTRIES APPLICABLE NATIONAL AND/OR LOCAL REQUIREMENTS SHALL APPLY. FIELD CONDUCTORS SHALL HAVE INSULATION RATING NOT LESS THAN 600V COPPER CONDUCTORS ONLY.
5. CONTROL TRANSFORMER SHOWN FOR 208V PRIMARY. FOR 230V, 460V, OR 575V PRIMARY REFER TO INSET "B".

AREA	DEVICE PREFIX	LOCATION CODE
1		LOCATION
2		MAIN CONTROL PANEL
3		SUPPLY FAN & COIL SECTION
4		ELECTRIC HEAT CONTROL BOX
5		FILTER SECTION
6		MIXING BOX SECTION
7		COIL ACCESS SECTION
8		EXTERNAL PIPING
9		FIELD INSTALLED DEVICE
		VFD CONTROL PANEL

⚠ WARNING
HAZARDOUS VOLTAGE!
 DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE BEFORE SERVICING COULD RESULT IN DEATH OR SERIOUS INJURY.

⚠ AVERTISSEMENT
TENSION DANGEREUSE!
 COUPER TOUTES LES TENSIONS ET OUVRIR LES SECTIONNEURS A DISTANCE PUIS SUIVRE LES PROCEDURES DE VERIFICATION DE LA VERIFICATION DE LA TOUTE INTERVENTION. VERIFIER QUE TOUTS LES CONDENSATEURS DES MOTEURS SONT DECHARGES. DANS LE CAS D'UNITES COMPORTANT DES ENTRAINEMENTS A VITESSE VARIABLE, SE REPORTER AUX INSTRUCTIONS DE L'ENTRAINEMENT POUR DECHARGER LES CONDENSATEURS.

⚠ ADVERTENCIA
¡VOLTAJE PELIGROSO!
 DESCONECTE TODA LA ENERGIA ELECTRICA, INCLUIDO LAS DESCONEXIONES REMOTAS Y OBRAS DE VERIFICACION DE LA VERIFICACION Y ETIQUETADO ANTES DE PROCEDER AL SERVICIO. ASEGURESE DE QUE TODOS LOS CAPACITORES DEL MOTOR HAYAN DESCARGADO EL VOLTAJE ALMACENADO. PARA LAS UNIDADES CON EJE DE DIRECCION DE VELOCIDAD VARIABLE, CONSULTAR LAS INSTRUCCIONES PARA LA DESCARGA DEL CONDENSADOR.

NE PAS RESPECTER CES MESURES DE SECURITE EN CAS D'INTERVENTION. LES BLESSURES GRAVES POUVAIENT ETRE MORTELLES.

NO RECARAR LO ANTERIORMENTE INDICADO SIN SERVICIO DE UN TECNICO O SERIAS LESIONES PERSONALES.

CAUTION
 USE COPPER CONDUCTORS ONLY!
 UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.
 FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

ATTENTION
 N'UTILISER QUE DES CONDUCTEURS EN COUVRÉ!
 LES BORNES DE L'UNITÉ NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS.
 L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT ENDOMMAGER L'ÉQUIPEMENT.

PRECAUCION
 ¡UTILICE ÚNICAMENTE CONDUCTORES DE COBRE!
 LAS TERMINALES DE LA UNIDAD NO ESTÁN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES.
 SI NO LO HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.

Field Wiring - Performance Climate Changer (UCCA)
Item: A1, A2 Qty: 2 Tag(s): SHE- AHU-1, SHE- AHU-2

⚠ WARNING
 HAZARDOUS VOLTAGE!
 DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE BEFORE SERVICING COULD RESULT IN DEATH OR SERIOUS INJURY.

⚠ AVERTISSEMENT
 TENSION DANGEREUSE!
 COUPER TOUTES LES TENSIONS ET OUVRIRE LES SECTIONNEURS A DISTANCE. PUIS SUIVRE LES PROCEDURES DE VERROUILLAGE ET DES ETIQUETTES AVANT TOUTE INTERVENTION. VERIFIER QUE TOUTS LES CONDENSATEURS DES MOTEURS SONT DECHARGES. DANS LE CAS D'UNITES COMPORTANT DES ENTRAÎNEMENTS A VITESSE VARIABLE, SE REPORTER AUX INSTRUCTIONS DE L'ENTRAÎNEMENT POUR DECHARGER LES CONDENSATEURS. NE PAS RESPECTER CES MESURES DE PRECAUTION PEUT ENTRAÎNER DES BLESSURES GRAVES POUVANT ETRE MORTELLES.

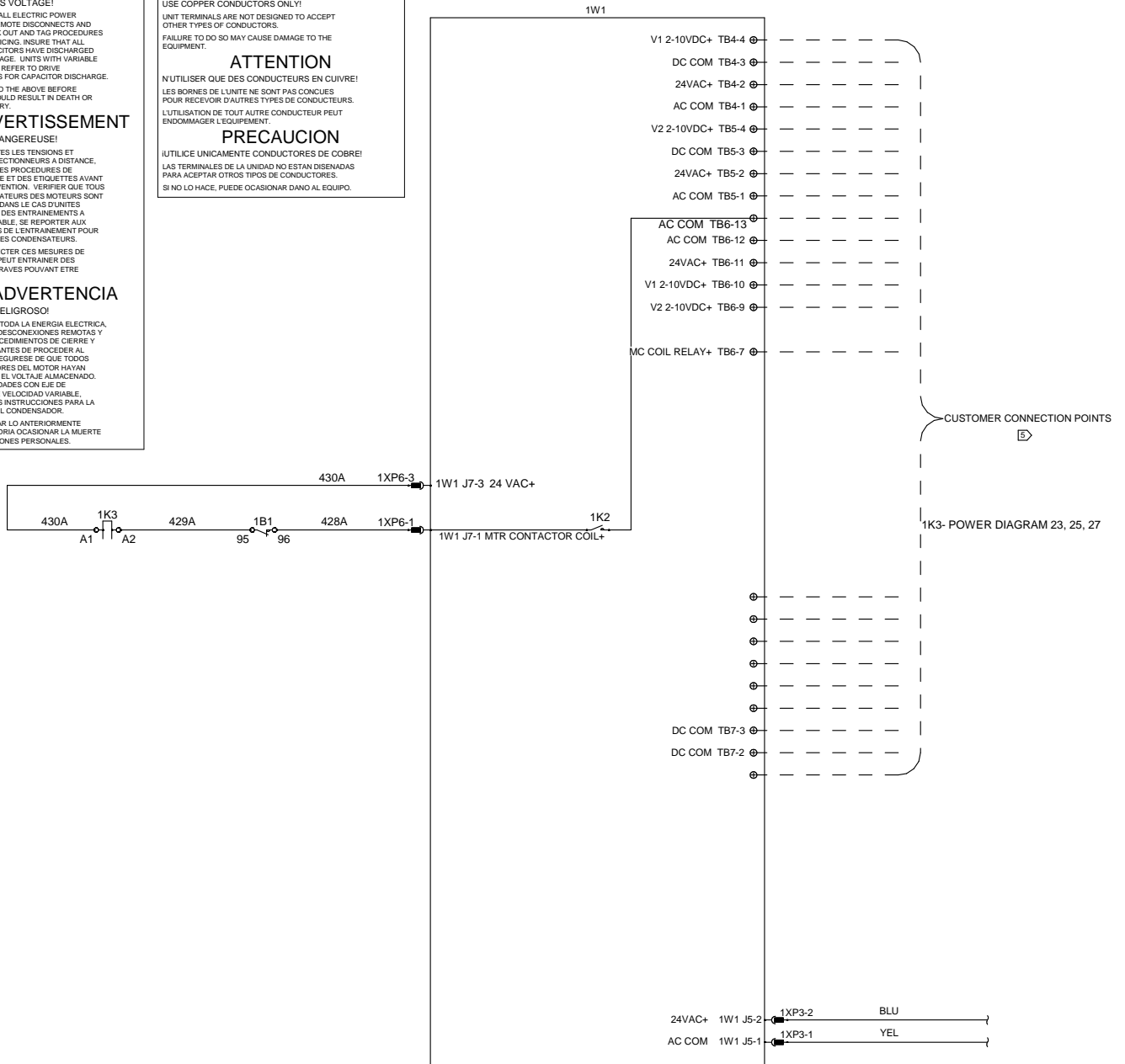
⚠ ADVERTENCIA
 ¡VOLTAJE PELIGROSO!
 DESCONECTE TODA LA ENERGIA ELECTRICA INCLUIDO LAS DESCONEXIONES REMOTAS Y SIGA LOS PROCEDIMIENTOS DE CIERRE Y ETIQUETADO ANTES DE PROCEDER AL SERVICIO. ASEGURESE DE QUE TODOS LOS CAPACITORES DEL MOTOR HAYAN DESCARGADO EL VOLTAJE ALMACENADO. PARA LAS UNIDADES CON EJE DE DIRECCION DE VELOCIDAD VARIABLE, CONSULTE LAS INSTRUCCIONES PARA LA DESCARGA DEL CONDENSADOR. EL NO REALIZAR LO ANTERIORMENTE INDICADO, PODRIA OCASIONAR LA MUERTE O SERIAS LESIONES PERSONALES.

CAUTION
 USE COPPER CONDUCTORS ONLY!
 UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

ATTENTION
 N'UTILISER QUE DES CONDUCTEURS EN CUIVRE!
 LES BORNES DE L'UNITE NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS. L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT ENDOMMAGER L'EQUIPEMENT.

PRECAUCION
 ¡UTILICE UNICAMENTE CONDUCTORES DE COBRE!
 LAS TERMINALES DE LA UNIDAD NO ESTAN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES. SI NO LO HACE, PUEDE OCASIONAR DANO AL EQUIPO.

CONTROL SCHEMATIC



NOTES:

- UNLESS OTHERWISE NOTED ALL SWITCHES ARE SHOWN AT 25 C (77 F), AT ATMOSPHERIC PRESSURE, AT 50 PERCENT RELATIVE HUMIDITY, WITH ALL UTILITIES TURNED OFF, AND AFTER A NORMAL SHUTDOWN HAS OCCURRED.
- DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. PHANTOM LINE ENCLOSURES INDICATE ALTERNATE CIRCUITRY OR AVAILABLE SALES OPTIONS. SOLID LINES INDICATE WIRING BY TRANE.

- NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF CONTACTS BY LINE NUMBER. AN UNDERLINED NUMBER INDICATES A NORMALLY CLOSED CONTACT. AN OPEN ARROWHEAD BELOW THE LINE NUMBER POINTING UPWARD INDICATES A TIMED CONTACT WHICH BEGINS TIMING WHEN ENERGIZED.
- ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, STATE, AND LOCAL REQUIREMENTS. OTHER COUNTRIES APPLICABLE NATIONAL AND/OR LOCAL REQUIREMENTS SHALL APPLY. FIELD CONDUCTORS SHALL HAVE INSULATION RATING NOT LESS THAN 600V COPPER CONDUCTORS ONLY.

- 5** USE CLASS 2 WIRING.
- 6** ALL AVAILABLE END DEVICES SHOWN. SEE UNIT CONFIGURATION FOR END DEVICES ON UNIT.

DEVICE PREFIX LOCATION CODE	
AREA	LOCATION
1	MAIN CONTROL PANEL
2	SUPPLY FAN & COIL SECTION
3	ELECTRIC HEAT CONTROL BOX
4	FILTER SECTION
5	MIXING BOX SECTION
6	COIL ACCESS SECTION
7	EXTERNAL PIPING
8	FIELD INSTALLED DEVICE
9	VFD CONTROL PANEL

DEVICE	DESCRIPTION	ZONE
1B1	RELAY; OVERLOAD	38
1K2	RELAY; MTR CONTACTOR COIL	38
1K3	MOTOR CONTACTOR	38
1W1	ADAPTER BOARD	34
2R1	MIXED AIR SENSOR	51
2R2	DISCHARGE AIR SENSOR	53
2S1	LOW LIMIT SWITCH	55
2S2	CONDENSATE OVERFLOW SWITCH	57
2S3	FAN STATUS SWITCH	59
2S4	FILTER STATUS SWITCH	61
5M1	DAMPER ACTUATOR	47

Field Wiring - Performance Climate Changer (UCCA)**MCA - MOP Schedule****Item: A1, A2 Qty: 2 Tag(s): SHE- AHU-1, SHE- AHU-2**

Unit Tag(s)	Circuit	Circuit Description	Voltage/Phase/Hz	MCA (A)	MOP (A)
	1	Single point power	460/60/3	-	-

Tag Data - Air-Cooled Condensing Units (Commercial) (Qty: 2)

Item	Tag(s)	Qty	Description	Model Number
B1	SHE- CU-1	1	20-60 Ton Air-Cooled Condensing Unit	RAUJC404B
B2	SHE- CU-2	1	20-60 Ton Air-Cooled Condensing Unit	RAUJC404B

Product Data - Air-Cooled Condensing Units (Commercial)**All Units**

Condenser Air-Cooled
 R410A Development Sequence
 40 Ton Unit
 460 Volt 60 Hertz 3 Phase
 No controls
 Standard ambient control
 cULus approval
 Unit disconnect switch (nonfused)
 Hot gas bypass valve (Fld)
 Suction service valve
 Unit neoprene isolators (Fld)
 1st Year Labor Warranty Whole Unit

Performance Data - Air-Cooled Condensing Units (Commercial)

Tags	SHE- CU-1	SHE- CU-2
Gross total capacity (MBh)	499.85	503.96
Gross sensible capacity (MBh)	415.31	425.73
Net total capacity (MBh)	485.98	488.59
Net sensible capacity (MBh)	401.44	410.36
Latent capacity (MBh)	84.54	78.23
Leaving coil DB (F)	53.45	54.06
Leaving coil WB (F)	52.81	53.35
Design airflow (cfm)	12500	13100
Cooling EDB (F)	82.50	82.50
Cooling EWB (F)	66.00	66.00
Ambient (F)	100.00	100.00
Compressor power (kW)	44.83	44.95
Cond fan motor power (kW)	3.56	3.56
Total power (Cond only) (kW)	52.45	53.01
EER @ AHRI (Cond only) (EER)	11.7	11.7
IEER @ AHRI (Cond Unit Only) (EER)	15.4	15.4
Min circuit ampacity (A)	87.00	87.00
Max overcurrent protection (A)	100.00	100.00
Recommended dual element (A)	100.00	100.00
Compressor 1 RLA (A)	18.60	18.60
Compressor 1 count (Each)	4.00	4.00
Compressor 2 RLA (A)	0.00	0.00
Compressor 2 count (Each)	0.00	0.00
Condenser motor FLA (A)	1.80	1.80
Condenser motor count (Each)	4.00	4.00
Line length - actual (ft)	50.00	50.00
Cond location to AHU	Same	Same
Suction line size-horizontal	1-5/8 in.	1-5/8 in.
Suction line size - vertical	1-5/8 in.	1-5/8 in.
Liquid line size	5/8 in.	5/8 in.
Est refrigerant charge per ckt. (lb)	28.2	28.3
Refrigerant type	R410a	R410a
Refrigerant charge(no evap) - 50 ft (lb)	25.0	25.0
Refrigerant charge(no evap) - 100 ft (lb)	37.0	37.0
Refrigerant charge(no evap) - 150 ft (lb)	50.0	50.0
Indoor coil	Size 25 unit coil	Size 25 unit coil
ID coil, fin spacing (Per Foot)	144	144
ID coil, fin type	Delta flo H	Delta flo H
ID coil, fin material	Aluminum	Aluminum
ID coil, coil type	UF coil	UF coil

Tags	SHE- CU-1	SHE- CU-2
ID coil, circuiting type	Intertwined circuits	Intertwined circuits
ID coil, # of distr-ent coil type #1 (Each)	4.00	4.00
ID coil, distributor size-ent air side	3/16" (5mm) Dia.	3/16" (5mm) Dia.
ID coil, DX circuits-ent air side	Half	Half
Liquid temp ent expansion device (MBh)	1312.64	1314.55
Suction temp leaving ID coil (F)	43.95	44.45
Min operating weight (lb)	2632.0	2632.0
Max operating weight (lb)	3120.0	3120.0
Application type	Performanc e Climate Changer	Performanc e Climate Changer

Mechanical Specifications - Air-Cooled Condensing Units (Commercial)**Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2****General - R410**

All condensing units are factory assembled and wired. Unit frames are constructed of 14 gauge welded galvanized steel with 14 and 16 gauge galvanized steel panels and access doors. The unit surface is phosphatized and finished with an air-dry paint to withstand 500 hours of continuous salt spray solution in accordance with ASTM B117. Decorative louvered panels provide condenser coil protection.

Compressors - R-410A

Trane 3-D Scroll compressors have simple mechanical design with only three (3) major moving parts. Scroll type compression provides inherently low vibration. 3-D compressors provide a completely enclosed compression chamber with no leakage paths. The compressor is suction gas cooled, direct drive, 3600 RPM hermetic motors. The Scroll compressor includes a centrifugal oil pump, oil level sight glass, and an oil charging valve.

Refrigerant Management - R410A

Split systems can have significantly more refrigerant than packaged systems and thus require controls to reliably manage this excess refrigerant. Each compressor shall have crankcase heaters installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. Additionally, the condensing unit shall have controls to initiate a liquid line solenoid closure when each refrigerant circuit shuts down. To be operational, the liquid line requires a field supplied and installed isolated solenoid valve within 10 feet of the evaporator

Note: Under extreme conditions, R410a refrigerant can present special challenges with piping and system design. Whenever refrigerant line set lengths approach 150 equivalent feet and/or design ambient temperature exceeds 115 degrees F, contact your Trane Account Executive to review application requirements.

Unit Control - R410A

Factory provided 115-volt control circuit includes fusing and control power transformer. The unit is wired with magnetic contactors for compressor and condenser motors, three-leg solid-state compressor overload protection, and high/low pressure cutouts. Charge isolation, reset relay and anti-recycle compressor timer is provided. Across-the-line start is standard.

Dual Circuit, Condenser Coils for 40-60 Ton Units - R-410A

Condenser coils are dual circuited having an Aluminum Microchannel design. The coils are burst tested and leak tested. Factory installed liquid line service valves are standard.

Dual Refrigerant Circuit w/Four Capacity Stages for 40-60 Ton Units - R410A

Each unit has dual refrigeration circuits. Each circuit has two (2) compressors manifolded together utilizing a passive oil system. Each unit has four capacity stages. Capacity modulation is accomplished by turning compressors on and off.

Condenser Fans - R-410A

Condenser fans are direct driven with motors having thermal overload protection and permanently lubricated ball bearings.

No System Control - R-410A

No System Control provides a terminal strip for step control provided by others. The system provides internal 3 minute fixed on and 5 minute fixed off time delays and compressor contactors. Each unit is equipped with a phase loss/reversal/low voltage monitor which protects 3-phase equipment from phase loss, phase reversal, and low voltage. Any fault condition will produce a Failure Indicator LED, and send the unit into an emergency stop condition. The system temperature ?step? controller must be field provided and installed.

Note: For No Controls units with system temperature ?step? controllers provided by others, the controller must include 5 minute on/off interstage timers to coordinate with the units fixed on/off time delay relays.

Standard Ambient Control - R-410A

Standard ambient control allows unit operation from 40 F to 115 F [4.5 to 46.1 C].

Non-Fused Unit Disconnect Switch - R-410A

A non-fused disconnect switch is mounted in the control box and provides for interruption of power for servicing the unit. Lugs are suitable for copper wires only. No overcurrent or short circuit protection is provided for unit by this switch.

Hot Gas Bypass Valve R-410A

Hot gas bypass valves will be shipped with the unit for field installation (Model: Sporlan, SHGBE-8)

Note: For 40T to 120T, No Control and CV systems; 2 valves will need be field installed (1 per circuit) to enable use of lead/lag. For all other systems, 1 valve will need to be field installed.

Suction Service Valve - R-410A

This valve isolates the compressor for servicing. The valve is a refrigerant shut off valve.

Neoprene Vibration Isolators - R-410A

Neoprene-in shear isolators are supplied for field installation under the unit base to minimize transmission of unit vibration. The isolators consist of a steel top plate and base completely imbedded in color coded oil-resistant neoprene stock. Mountings have deflection of 1/4".

Field Installed; 30% Bleed Valve TXV

Installation shall require use of 30% bleed, Thermal Expansion Valves. Valves shall be field supplied and field installed. Quantity and size shall be determined by the application.

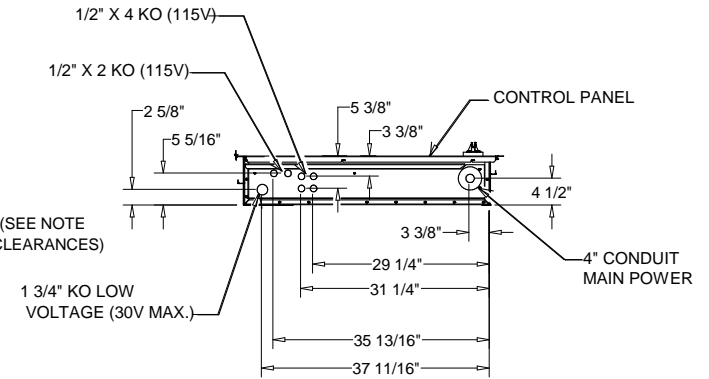
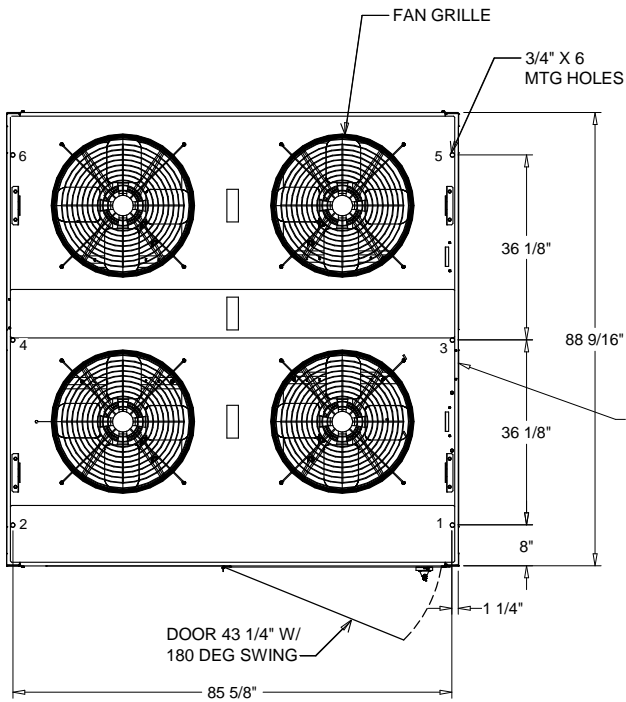
Note: Liquid line solenoids are required for all applications. Trim solenoids cannot be used.

Unit Dimensions - Air-Cooled Condensing Units (Commercial)

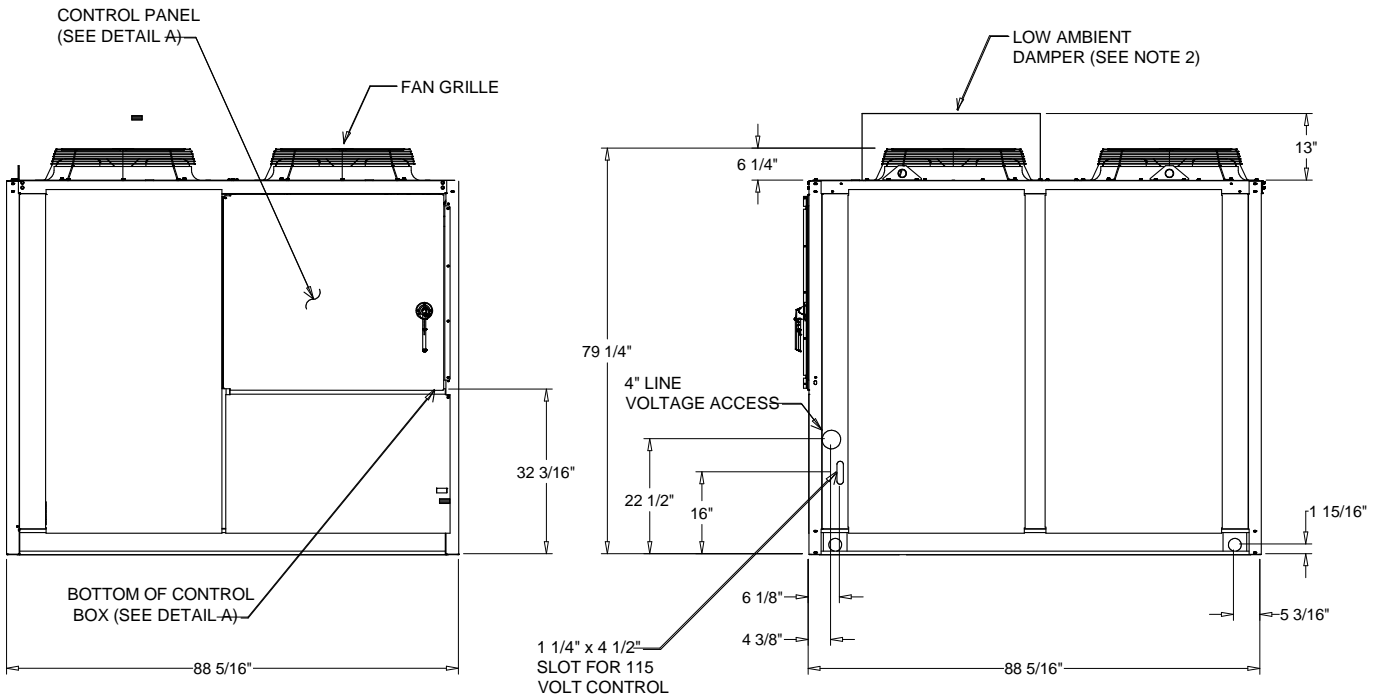
Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2

NOTES:

1. SEE CONNECTION DRAWING FOR CONNECTION LOCATION AND SIZES.
2. LOW AMBIENT DAMPER ONLY COMES WITH SELECTED UNIT .
3. FRONT & BACK OF UNIT CLEARANCE 72". LEFT & RIGHT SIDE OF UNIT CLEARANCE 42"



DETAIL A
BOTTOM OF CONTROL BOX



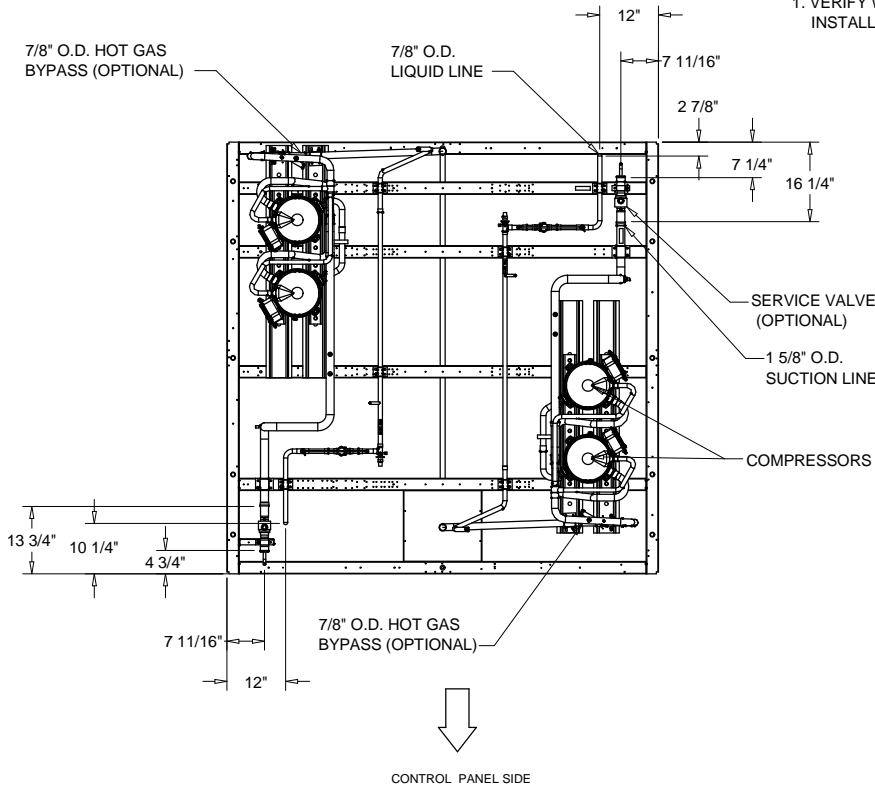
40 TON UNIT

DIMENSIONAL DRAWING

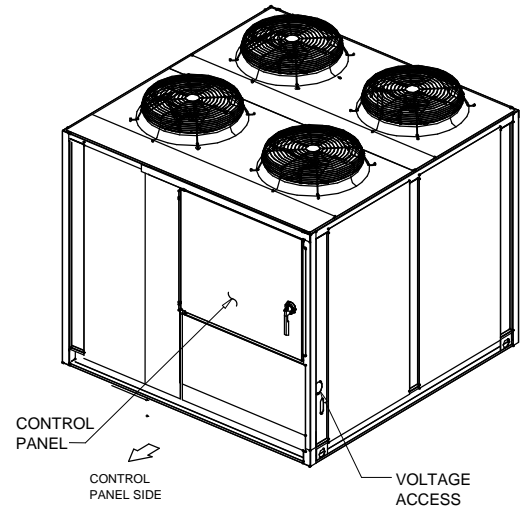
Unit Dimensions - Air-Cooled Condensing Units (Commercial)

Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2

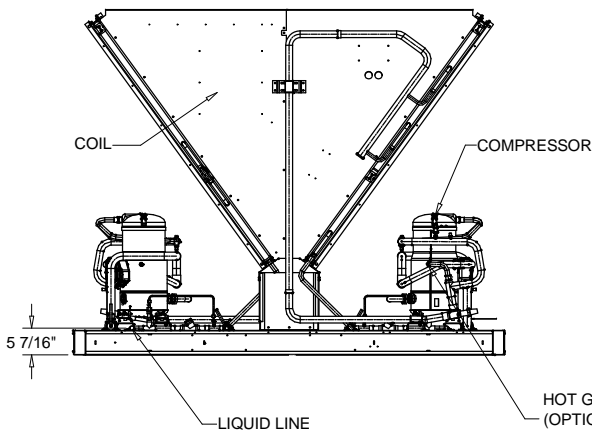
NOTES:
1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION



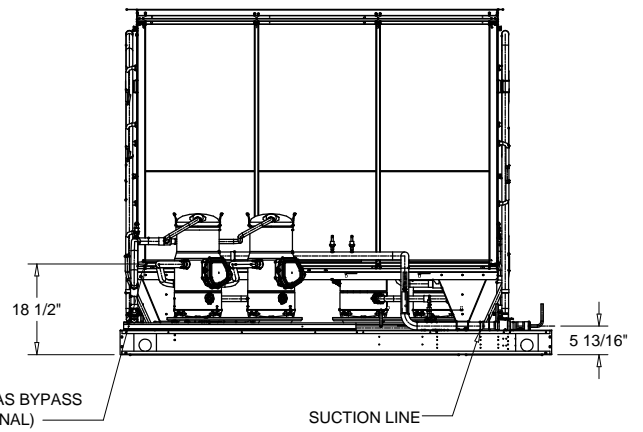
PLAN VIEW OF UNIT
CONNECTION DRAWING



ORIENTATION VIEW OF UNIT
ISOMETRIC DRAWING



CONTROL PANEL (LEFT) SIDE VIEW OF UNIT
CONNECTION DRAWING



BACK VIEW OF UNIT
CONNECTION DRAWING

40 TON UNIT

DIMENSIONAL CONNECTION DRAWING

Unit Dimensions - Air-Cooled Condensing Units (Commercial)

Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2

GENERAL ELECTRICAL DATA

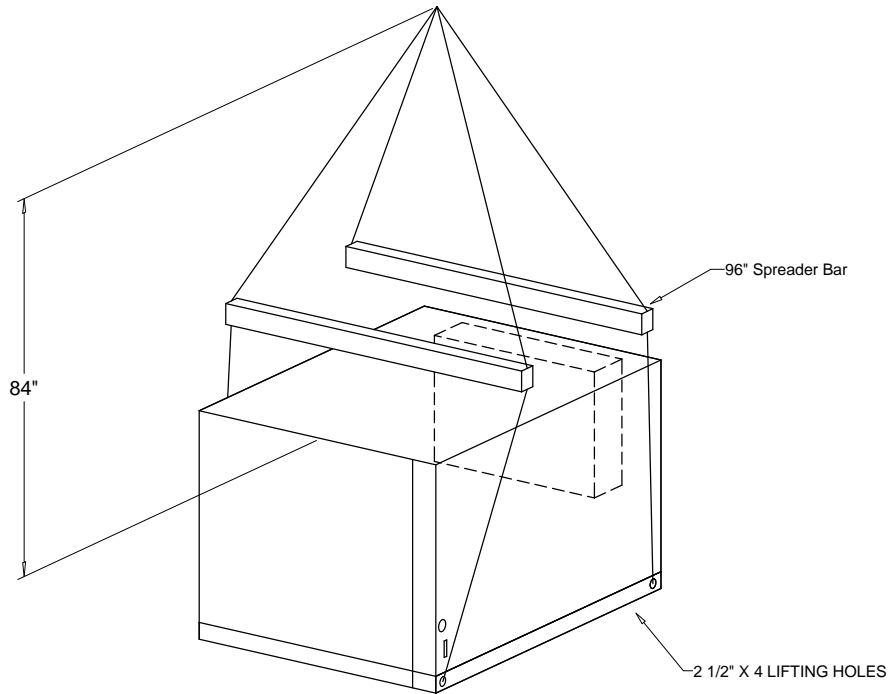
<p>GENERAL</p> <p>Tonnage / kW: 40 [140.0 kW] Unit Operating Voltage Range: 414-506 Unit Primary Voltage: 460 Unit Hertz: 60 Unit Phase: 3 Minimum Circuit Ampacity: (3) 87.0 Maximum Overcurrent Protection Device: (2) 100.0 Recommended Dual Element Fuse: (4) 100.0</p>	<p>OUTDOOR MOTOR</p> <p>Number: 4 Horsepower: 1.0 Motor Speed (rpm): 1,140 Outdoor Motor Full Load amps: 1.8 Outdoor Motor Locked Rotor amps: 9.0</p>
<p>COMPRESSOR</p> <p style="text-align: center;">Circuit A1/A2 - Circuit B1/B2</p> <p>Tons (ea): 10.0 / 10.0 - 10.0 / 10.0 Compressor Rated Load Amps (ea): 18.6 / 18.6 - 18.6 / 18.6 Locked Rotor Amps (ea): 142.0 / 142.0 - 142.0 / 142.0</p>	<p>REFRIGERANT</p> <p>Type: R410A Number of Circuits: 2 Condenser Storage Capacity: 23.5 lb Refrigerant Operating Charge (Condenser Only) : 22.7 lb</p>

Notes:

1. Electrical data is for each individual motor.
2. Maximum overcurrent protection permitted by nec 440-22 is 225 percent of largest compressor motor RLA plus the remaining motor RLA and FLA values.
3. Minimum circuit ampacity is 125 percent of the largest compressor motor RLA plus the remaining motor RLA and FLA values.
4. Recommended dual element fuse size is 150 percent of the largest compressor motor RLA plus the remaining motor RLA and FLA values.
5. Local codes may take precedence.

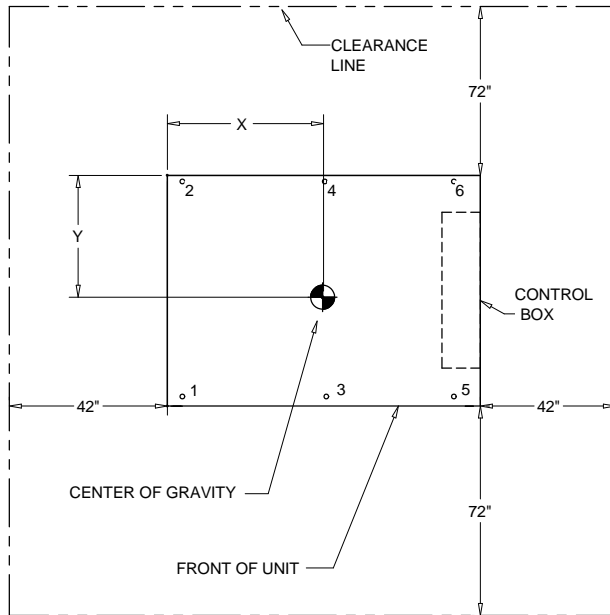
Weight, Clearance & Rigging Diagram - Air-Cooled Condensing Units (Commercial)

Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2



40 TON RIGGING

WEIGHT AND RIGGING



40 TON CENTER OF GRAVITY AND CLEARANCES

WEIGHT AND RIGGING

WEIGHTS AND LOAD POINTS

OPERATING:	2532.0 lb
SHIPPING:	2482.0 lb
LOAD POINTS 1 :	452.3 lb
LOAD POINTS 2 :	415.7 lb
LOAD POINTS 3 :	440.3 lb
LOAD POINTS 4 :	403.7 lb
LOAD POINTS 5 :	428.3 lb
LOAD POINTS 6 :	391.8 lb

*ALL WEIGHTS ARE APPROXIMATE

CENTER OF GRAVITY

X:	43 3/8"
Y:	46"

ADD WEIGHTS

SHIPPING:	(4)
OPERATING:	(4)

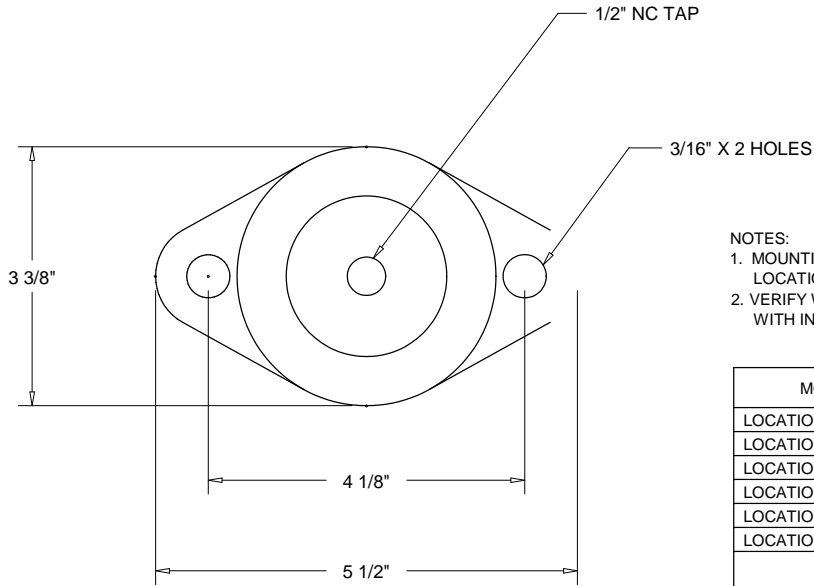
NOTES:

1. OPERATING WEIGHT INCLUDES REFRIGERANT, OIL AND WATER.
2. SHIPPING WEIGHT INCLUDES REFRIGERANT AND OIL CHARGES
3. THE ACTUAL WEIGHT IS SHOWN ON THE NAMEPLATE. WEIGHT SHOWN REPRESENT TYPICAL SHIPPING AND OPERATING WEIGHTS FOR THE UNIT SELECTED.
4. ADD WEIGHT TO TOTAL WEIGHT OF UNIT
5. IF UNITS IS INSTALLED IN A WELL, THE DEPTH OF THE WELL MUST NOT EXCEED THE TOP HEIGHT OF THE UNIT. THE TOP OF THE UNIT MUST HAVE UNRESTRICTED AIRFLOW. PLEASE REFERENCE RECOMMENDED CLEARANCES.

WARNING!

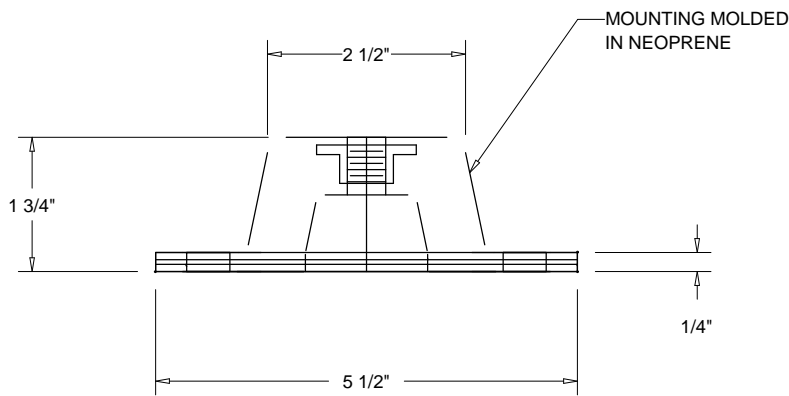
TO PREVENT INJURY OR DEATH AND POSSIBLE EQUIPMENT DAMAGE, DO NOT USE CHAIN (CABLES) OR SLINGS EXCEPT AS SHOWN AND USE CABLES STRONG ENOUGH TO SUPPORT UNIT WEIGHT. TEST LIFT UNIT TO ENSURE PROPER BALANCE AND RIGGING.

Accessory - Air-Cooled Condensing Units (Commercial)
Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2



- NOTES:
 1. MOUNTING LOCATIONS CORRELATE WITH MOUNTING LOCATIONS SHOWN IN CLEARANCE DRAWING.
 2. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION

MOUNTING LOCATIONS	
LOCATION 1	R-3-RED
LOCATION 2	R-3-RED
LOCATION 3	R-3-RED
LOCATION 4	R-3-RED
LOCATION 5	R-3-RED
LOCATION 6	R-3-RED

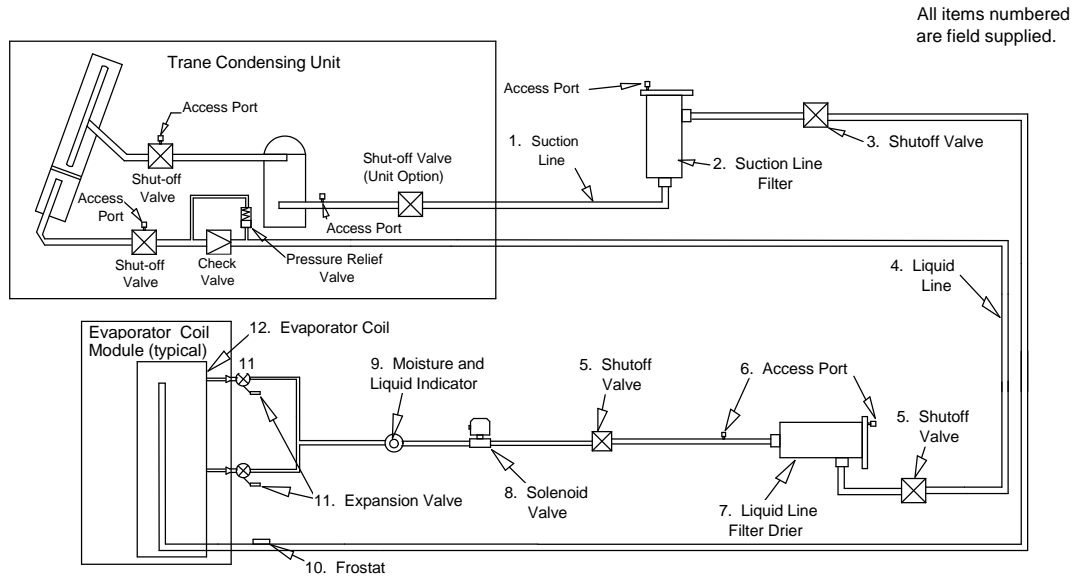


MOUNTING ISOLATOR (NEOPRENE)

DIMENSIONAL ACCESSORIES DRAWING

Field Wiring - Air-Cooled Condensing Units (Commercial)
Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2

Required Components for Refrigerant Circuits



SUCTION LINE

- 1. Interconnected Tubing (Suction line)
 Maximum of 50 feet if condenser is above evaporator (If risers are more than 50 feet, the application must be viewed by Trane) Refer to SS-APG012-EN for more details
- 2. Suction Line
 Filter Drier 1 / ckt suction filter should be the replaceable-core type, and a clean core should be installed after the system is cleaned up
- 3. Shut-Off Valve
 Manual ball valves for 2 1/8" tubing.

LIQUID LINE

- 4. Interconnected Tubing (Liquid Line)
 Refer to applications guide SS-APG012 - EN for vertical & horizontal piping limitations.
- 5. Shut-Off Valve
 2 Manual ball valves
- 6. Access Port
 Port used to determine suction pressure. This port is usually a Schraeder valve with a core.
- 7. Liquid Line
 Filter Drier 1 / ckt liquid filter should be the replaceable-core type, and a clean core should be installed after the system is cleaned up.
- 8. Solenoid Valves
 Liquid line requires a field supplied and installed isolation solenoid valve within 10 feet of the evaporator. The suggested solenoid uses a 120-volt service and requires code-compliant wiring to the RAUJ condensing unit.

 Note: Trim solenoids cannot be used. They are not compatible with Microchannel condenser coils
- 9. Moisture and Liquid Indicator
 One moisture-indicating sight glass is to be installed in the main liquid line.

Field Wiring - Air-Cooled Condensing Units (Commercial)
Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2

EVAPORATOR

10. Froststat (not required) - The control is mechanically attached to the outside of the refrigerant line, near the evaporator, and wired to the unit control panel See application guide SS-APG012-EN for selection information.

11. Expansion Valves - See application guide SS-APG012-EN for selecting valve quantity and size.

Note: Units with Microchannel condenser coils applied with DX systems will require 30 percent bleed valves.

Expansion Valves for 20-60T MCHE (30 percent Bleed) Evap Circuit Tonnage

REFRIGERANT	MIN.	MAX.	SPORLAN MODEL NUMBER	TRANE PART
R-410A	2.0	3.0	BBIZE-1-1/2-GA (BP/30)	VAL10487
R-410A	2.5	3.5	BBIZE-2-GA (BP/30)	VAL10488
R-410A	3.5	5.0	BBIZE-3-GA (BP/30)	VAL10489
R-410A	4.5	7.0	BBIZE-4-GA (BP/30)	VAL10490
R-410A	6.0	8.5	BBIZE-5-GA (BP/30)	VAL10491
R-410A	7.0	10.0	BBIZE-6-GA (BP/30)	VAL10492
R-410A	8.0	13.5	BBIZE-8-GA (BP/30)	VAL10493
R-410A	11.0	17.5	BBIZE-12-1/2-GA (BP/30)	VAL10494
R-410A	14.0	21.5	BBIZE-15-GA (BP/30)	VAL10495
R-410A	17.0	28.5	OZE-20-GA (BP/30)	VAL10496
R-410A	22.0	30.0	OZE-25-GA (BP/30)	VAL10497

(1) Ton per distributor, choose the valve that matches the evap coil circuit capacity that it serves.

(2) Provide and install one expansion valve per distributor.

Refrigerant Charge and Maximum Line Length

Total interconnecting line length (per circuit)	50 ft	100 ft	150 ft
Condenser and line set approx. refrigerant charge (per circuit) - evaporator charge not included	25.0 lb	37.0 lb	50.0 lb

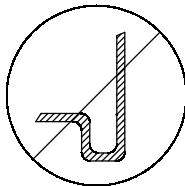
If total interconnecting line length is more than 150 feet, the application must be reviewed by Trane.

**Contact product support for information on refrigeration components and piping applications assistance

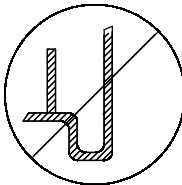
Installation Guidelines

Suction Line Piping

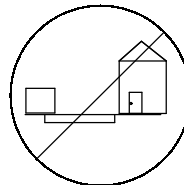
1. Do not use suction line traps.



2. Do not use double risers.



3. Avoid putting suction lines underground.



4. Route suction lines as short and direct as possible.

5. Slope suction line away from the condensing unit 1 inch for every 10 feet.

6. Insulate suction line.

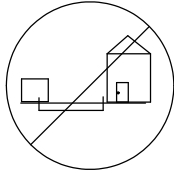
7. The suction filter should be located as close to the compressors as possible.

Field Wiring - Air-Cooled Condensing Units (Commercial)
Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2

Required Components for Refrigerant Circuits Continued

Liquid Line Piping

1. Avoid putting liquid lines underground.



2. Route liquid lines as short and direct as possible.
3. Slope liquid line away from the condensing unit 1 inch for every 10 feet.
4. Only insulate liquid lines that pass through heated areas.
5. Wire solenoid valve per field connection diagram.
6. The liquid line filter drier should be as close to the solenoid valve as possible.

Evaporator Piping

1. Install TXV directly to unit liquid connection.
2. Locate TXV bulb midway between 90F bends on top of suction tube as shown.
3. Secure bulb to tube with the two clamps provided by the manufacturer and insulate bulb.
4. Install the TXV equalizer line close to & downstream of the bulb, on top of the horizontal suction line.
5. Install froststat per kit instructions on the common suction line as close to the evaporator as possible.

See SS-APG012-EN for DX evaporator piping details.

Field Wiring - Air-Cooled Condensing Units (Commercial)
Item: B1, B2 Qty: 2 Tag(s): SHE- CU-1, SHE- CU-2

CUSTOMER WIRE SELECTION TABLE	
POWER WIRE SELECTION TO DISCONNECT SWITCH (1S1)	CONNECTOR WIRE RANGE (1) #14 -- 1/0
FACTORY INSTALLED DISCONNECT SWITCH SIZE 100 AMP	
POWER WIRE SELECTION TO MAIN TERMINAL BLOCK (1TB1)	CONNECTOR WIRE RANGE (1) #6 -- 350 MCM
TERMINAL BLOCK SIZE 335 AMP	
CONTROL WIRE SELECTION	
WIRE GAUGE	OHMS PER: 12000"
18 AWG	8
16 AWG	5
14 AWG	3
	MAX WIRE LENGTH 6000" 12000" 24000"
SHIELDED WIRE TABLE	
WIRE GAUGE	MAX WIRE LENGTH
16 AWG	6000"
14 AWG	12000"

WARNING
HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING. FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

AVERTISSEMENT
VOLTAGE HASARDEUX!

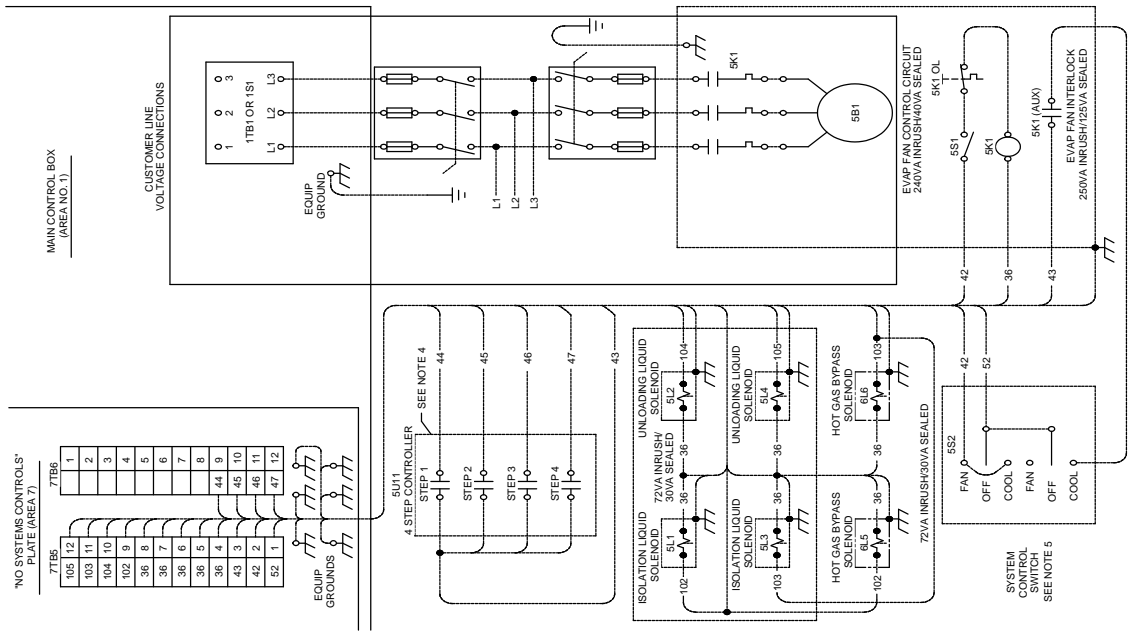
DECONNECTEZ TOUTES LES SOURCES ELECTRIQUES INCLUANT LES DISJONCTEURS SITUES A DISTANCE AVANT D'EFFECTUER L'ENTRETIEN. FAUTE DE DECONNECTER LA SOURCE ELECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN PEUT ENTRAINER DES BLESSURES CORPORELLES SEVERES OU LA MORT.

CAUTION

USE COPPER CONDUCTORS ONLY!
UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.
FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

IMPORTANT!

DO NOT ENERGIZE UNIT UNTIL CHECK-OUT AND START-UP PROCEDURE HAS BEEN COMPLETED



- NOTES:**
1. All wiring and components shown dashed to be supplied and installed by customer in accordance with local and national electrical codes.
 2. All wiring to be NEC Class 1 based on 60 degree C wire unless specified.
 3. CAUTION - Do not run low voltage wire (30 volts maximum) in conduit or raceway with higher voltage wire.
 4. Step controller min rating - NO contacts = 150 VA Inrush/75 VA sealed; NC contacts = 80 VA Inrush/40 VA sealed.
 5. Suggested system control switch is Cutler Hammer 7562K5 2-pole toggle switch.

Field Installed Options - Part/Order Number Summary

This is a report to help you locate field installed options that arrive at the jobsite. This report provides part or order numbers for each field installed option, and references it to a specific product tag. It is NOT intended as a bill of material for the job.

Product Family - Air-Cooled Condensing Units (Commercial)

Item	Tag(s)	Qty	Description	Model Number
B1	SHE- CU-1	1	20-60 Ton Air-Cooled Condensing Unit	RAUJC404B
B2	SHE- CU-2	1	20-60 Ton Air-Cooled Condensing Unit	RAUJC404B

Field Installed Option Description	Part/Ordering Number
Hot gas bypass valve	
Unit neoprene isolators	



White Paper

Disassembling the Performance Climate Changer™ Air Handler - Model UCCA

Executive Summary

While our Performance Climate Changer air handler model UCCA is smaller than our model CSAA, there are still space-restricted areas that require the unit be disassembled to get into the space. It is critical to follow step-by-step instructions to minimize risk of incorrect assembly and reduce the amount of labor involved.

Problem

There are often instances that will require the equipment to fit through tight spaces in the building before it gets to the intended installation location. This becomes a greater challenge as the number of retrofits increase.

Solutions

On the Performance air handler UCCA, if a mixing box or mixing box with filter is ordered, it will ship separately from the unit. If a flat filter is ordered, it will ship attached to the unit. The main section of the unit is a fan and coil. There cannot be a shipping split for this section. If this section is still too big to get through the access area, the air handler will have to be broken down to some extent to accommodate the space requirements.

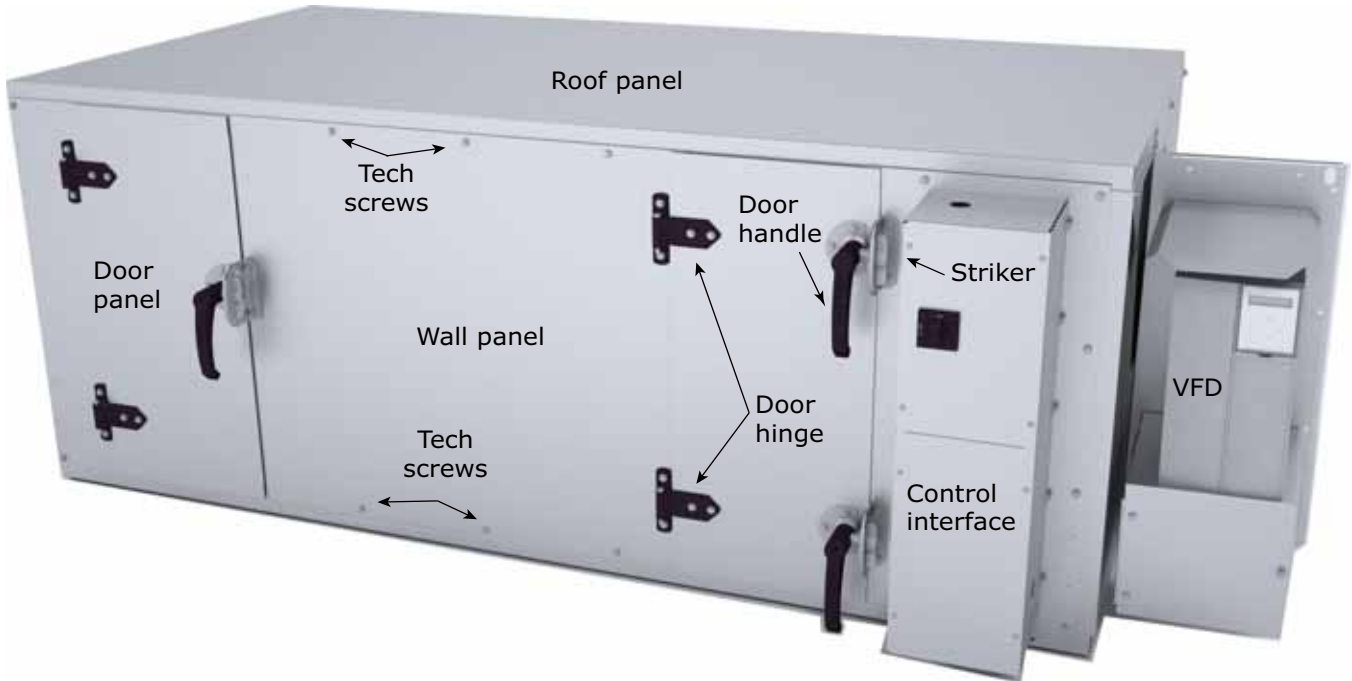
Performance UCCA Air Handler Disassembly

There are some key points to remember before attempting to disassemble a Performance UCCA air handler.

- Plan your work prior to beginning.
- Mark the panels before disassembly begins. A sticker could be applied and a unique number written.
- Make a quick sketch of the layout of the unit with the numbers of the panels listed in relation to airflow.
- Be careful not to strip the sheet metal on the panels when removing and attaching tech screws. In the event the metal strips out, change affected fastener to a larger tech screw. The standard tech screw is 10-16 x 0.75 self driller (5/16-inch hex head).

If you follow these steps prior to performing the unit breakdown, you will minimize the man hours it will take, plus eliminate confusion of assembling unit.

Common Terminology Used for Performance UCCA Air Handler



Roof Panel

Remove 5/16-inch hex head tech screws that are used to attach the roof panel to the side walls and/or center of unit (COU) wall along the perimeter of the panel.

Figure 1. Remove roof panel



Tech Screw Details

Figure 2. Top corner of unit



Figure 3. Bottom of unit



Low Voltage Harness

If low voltage harness is installed loosen the metal clad tape that is holding on the panel to free harness for removal. This is important to eliminate possible damage to the harness while removing roof.

Figure 4. Remove low voltage harness



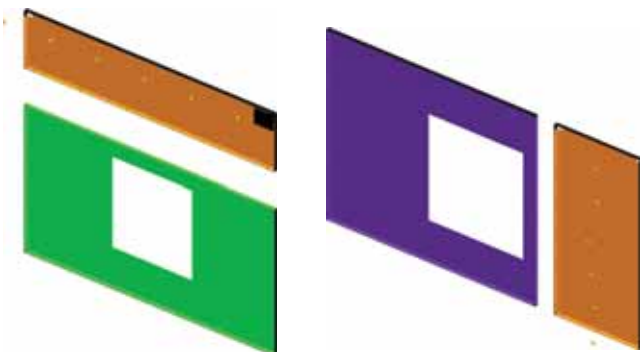
Internal Walls and Blockoffs

Remove screws on internal components that are attached to the walls and roof panels from the inside of unit.

Figure 5. Filter blockoff Figure 6. Coil blockoff



Figure 7. DDP fan COU panel



Roof Panel

Once tech screws are removed from perimeter of the roof the panel can be lifted off.

Figure 8. Lift the roof panel off

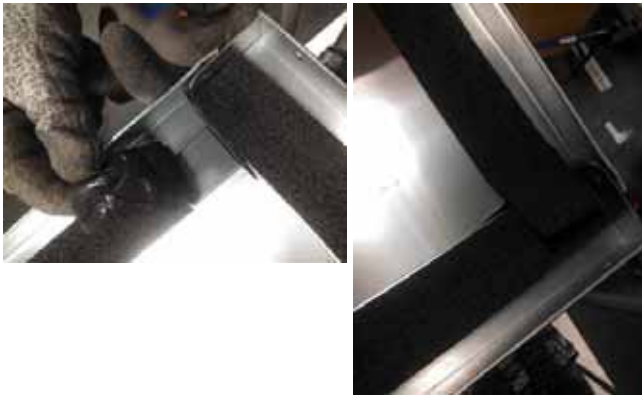


There is gasket along top of the unit at the COU panel and wall panels. The gasket should be in good condition to be reused, but if not, the gasket will need to be replaced. The door flange will have gasket along top and bottom as shown above and not on the top like wall and COU panels.

Figure 9. Replace gasket if needed



Figure 10. Gasket details at top corner



Wall Panels

Remove tech screws from the wall panels along the perimeter of the panel. 5/16-inch hex head along bottom and sides of panels.

Figure 11. Remove the wall panels



Base Panel

Figure 12. Base panel with wall and roof panels removed.



Fan Removal

⚠ WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

The second level fan section of a vertical unit can be removed to maneuver the unit into the space. Removal will require field-supplied lifting lugs (part # LUG00180).

1. Remove screws located in front and rear panels of second level fan portion.

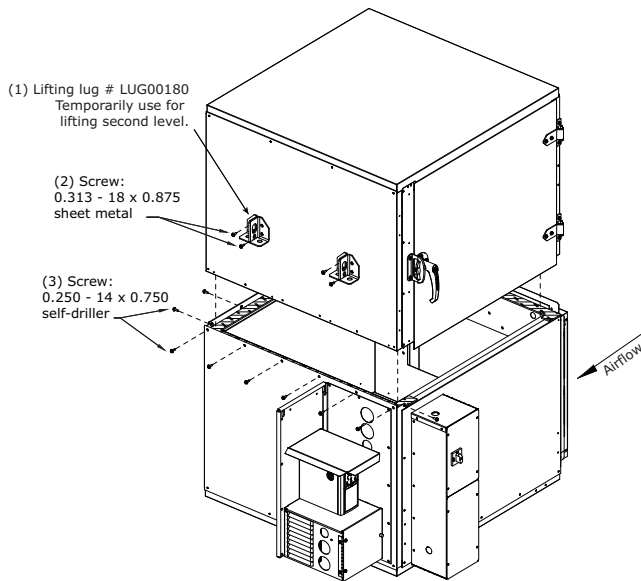
⚠ WARNING

Risk of Unit Dropping!

Do not use skid tie down brackets to lift the unit. Tie down brackets are designed only to secure the unit to the floor, housekeeping pad, or platform. Improper use of the tie down brackets could result in unit dropping and crushing technicians which could result in death or serious injury, and equipment damage.

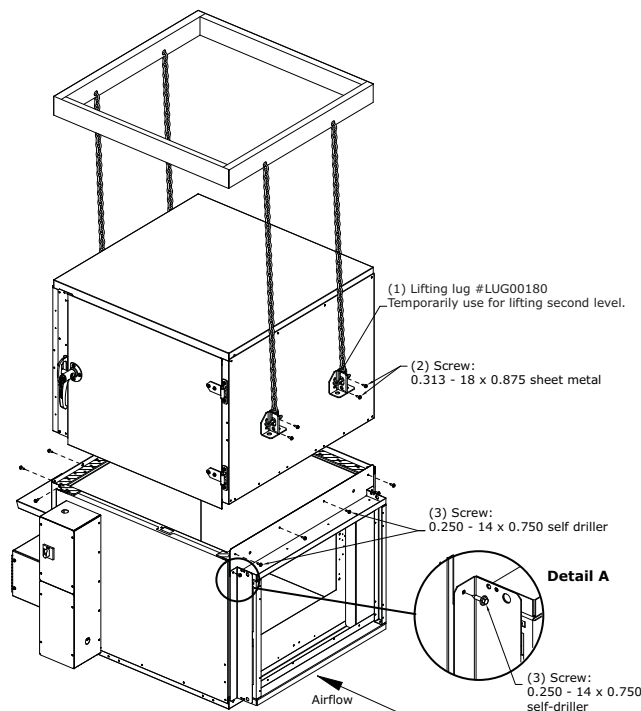
2. Install four lifting lugs. Install two on front panel and two on rear panel of second level fan using screws. See [Figure 13](#).

Figure 13. Install temporary lifting lugs



3. Use field-provided spreader bars and slings to rig as shown [Figure 14](#). Straps can be used but careful consideration must be taken not to damage equipment panels.

Figure 14. Use spreader bars to lift top unit



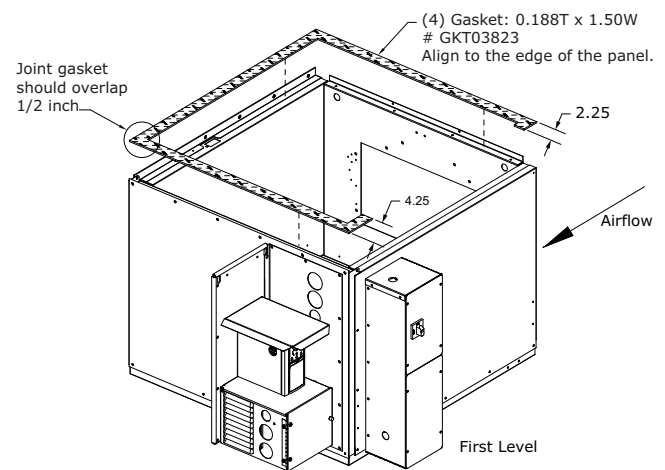
4. Remove screws around parameter lip where second level is attached to first level.

5. If unit is equipped with optional filter rack, insert screws in vertical flanges on each side of the filter rack (See detail A in [Figure 14](#)). Screws installed to support filter rack are temporary and must be removed after reassembly.
6. Lift second level fan portion vertically to clear perimeter lip on first level top panels.

Repeat steps 1-6 in reverse order to reinstall second level fan portion on the first level portion of unit.

Lifting lugs should be removed once reassembly is complete. Check gasket between the two sections. In the event the gasket between the two sections is damaged, replace with new gasket (Part # GKT03823). See [Figure 15](#).

Figure 15. Replace gasket between sections if necessary



Note: If unit is equipped with a control interface, VFD or electric heat, disconnect electrical wiring. Wiring between fan motor and contactor or VFD can be disconnected via quick connects in the control interface or VFD box respectively. Electric heat wiring should be disconnected from switch in control interface box. Any controls low voltage end devices located in second level fan portion should be disconnected via quick connects at each device.

Vertical Fan Removal from Walls

1. Remove screws attaching shipping protection brackets from center of isolation base to casing mounting bracket.
2. Remove shipping protection brackets through door.

Figure 16. Remove screws attaching shipping tie-downs

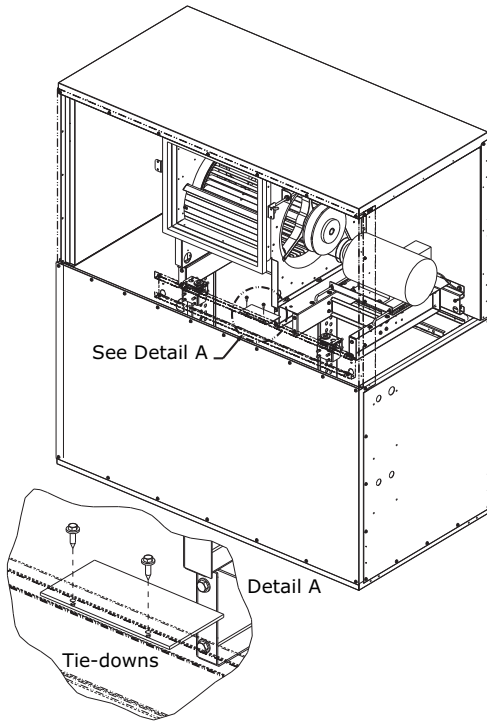


Figure 17. Isolation channels

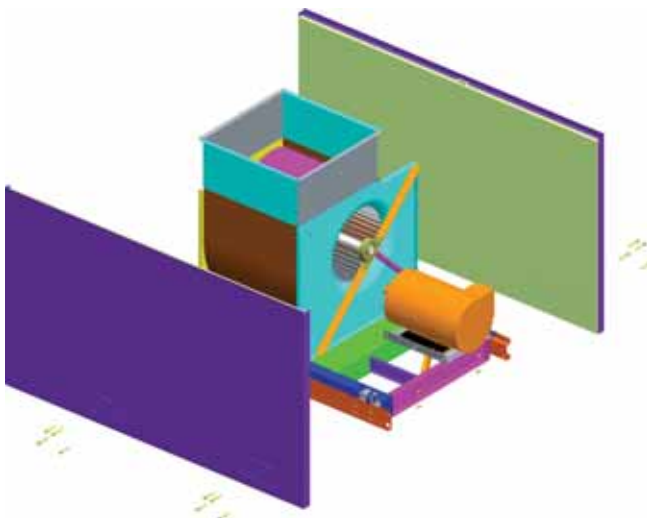
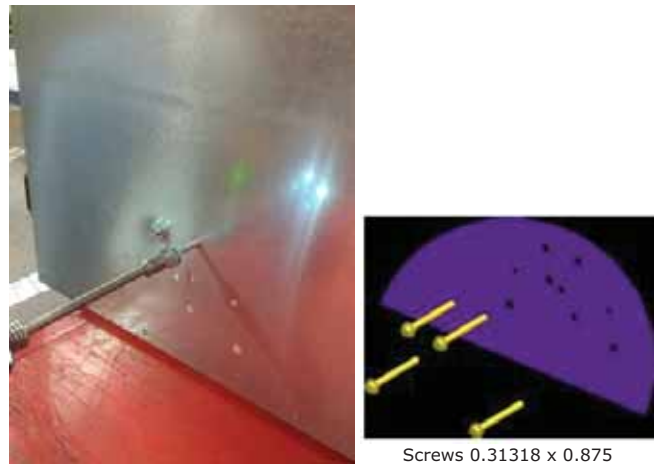


Figure 18. Remove screw to remove isolation bracket



Remove any screw ties from the walls that might be supporting high voltage wiring harness prior to removal of interior ½-inch screws on isolation channel.

Figure 19. Remove screw ties holding high voltage wiring harness



The walls and fan need to be supported when the ½-inch screws are removed.

Note: Caution the walls will fall if not supported during the removal of screws.

Figure 20. Support walls to prevent falling



Electrical Component Consideration

There are many different electrical components that may have to be removed during disassembly. Only qualified electrical personnel should work with electrical components.

Low voltage harnesses are labeled, but distinguishable markings should be added where multiple harnesses exist such as electrical tape. This will eliminate the chance for cross wiring.

Final Steps

- Remove all the remaining wall panels.
- Replace any damaged gasketing
 - Foam gasketing 0.188T x 1.50W (GKT03823)
- Reassemble in the reverse order as the instructions above. Remember to start with panels on one side to use as a guide and structural support for the internal components that are added next.

Action

If space constraints are an issue, it's important to be proactive early in the ordering process to determine how best to get the air handler to fit into the space.

Determine the size of the space that the air handler will have to fit through in the building, including hallways, elevators, stairs, doorways, etc.

If the unit must be broken down at the job site, it is important to follow the method described in this White Paper to minimize risk and reduce the amount of labor involved.

WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.



Trane optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments, Trane offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services, and parts. For more information, visit www.Trane.com.

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.

Independence School District
Independence, MO

Date: 3/31/17

Project: Truman AHU101 Replacement

Problem Definition:

- A. AHU101 was originally installed in 1979 and beyond the end of their expected service life.

Owner Provided Equipment:

- 1. (1) Trane chilled water, hot water air handling unit.

General:

- 1. The Contractor is responsible to provide Construction Documents sealed by an Engineer registered in the State of Missouri. The construction documents shall meet the intent of this scope of work and shall be reviewed and approved by ISD.
 - a. Include a complete MEP design, sizing equipment, ductwork, piping, electrical, etc.
 - b. Review the owner provided equipment selections and advise if there are any concerns with equipment sizing. Review shall be completed by mid-May.
 - c. Size the contractor provided equipment immediately for so equipment can be ordered and received in time to meet the construction schedule.
 - d. Provide structural review and design for any changes in roof mounted equipment loads.
 - e. The contractor shall provide the following deliverables:
 - i. 75% construction documents for review.
 - ii. 100% construction documents for review and permitting.
 - iii. Project specifications.
 - iv. Provide three full size printed copies and the electronic PDFs of the construction documents to ISD for record.
 - v. Provide three full size printed copies and the electronic PDFs of the redlined as-built drawings to ISD for record.
- 2. The Contractor shall provide equipment submittals for review by ISD and the owner's representative.
- 3. The Contractor is responsible permitting for their respective scope of work.
- 4. The equipment warranty of all owner provided equipment will be provided by the equipment manufacturer.
- 5. The Contractor shall provide a one year parts and labor warranty on all equipment, material, labor they provide and install.
- 6. The contractors shall provide all materials and labor required to complete this work unless otherwise specified.
- 7. Any damage caused by contractor during performance of work shall be repaired by the contractor to match existing finishes and be to the satisfaction of ISD.

8. The installation of new equipment shall include, unless specifically stated in this document or associated sketch:
 - a. Mechanical and electrical installations shall comply with local Code and authority having jurisdiction.
 - b. Installation shall be inspected by ISD, their owner's representative, the owner provided equipment manufacturer, and by the authority having jurisdiction.
 - c. Providing new system components including, but not limited to, piping, valves, ductwork, dampers, fittings, transitions, roof curbs, electrical disconnects, circuit breakers, switches, fuses etc. for a complete and functioning system.
 - d. All new work shall be performed by qualified tradesmen.
9. Upon receipt, verify equipment is in accordance with approved equipment submittals. Protect and store equipment on site from damage, vandalism, and theft, weather. Contractor is responsible for equipment after accepting delivery.
10. The contractor shall receive, unload, hoist, assemble and set the new equipment in accordance with manufacturer's recommendations and installation, operation and maintenance manuals. Retain any loose shipped components for installation.
11. Protect the existing building structure, utilities, floors coverings and finishes from damage, dust partitions, separations. Any damage will be repaired by the contractor.
12. Complete pre-startup checklist as required by the manufacturer.
13. Coordinate the installation with other contractors.
14. Verify voltages, amperages are in accordance with approved equipment submittals upon receipt of equipment/materials.
15. Seal all penetrations as they are created.
16. Retain any loose shipped electrical or control components (noted (field) on equipment submittals or as noted on alternate supplier installation manuals).
17. Utilize the operation and installation manuals shipped with the equipment for the installation and immediately submit copy to the Project Manager.

Mechanical Scope:

1. The information in the scope of work is schematic in nature and does not show all details or components necessary to complete the system. The contractor's proposal shall include all items necessary to create a complete and operational system.
2. Refer to the schematic drawings attached for more information.
3. Lockout/tagout all equipment prior to service or replacement.
4. Include the crane service and all rigging, hoisting and hauling.
5. The owner will provide the equipment listed above shipped to a location designated by the contractor. The contractor shall inspect the equipment upon receipt and document and notify the shipping company and ISD of any damage.
6. The intent of this scope of work is to direct replace an air handling unit serving lower level classrooms.
7. Remove and replace the AHU.
 - a. Shutdown the existing AHU.
 - b. Isolate and shutdown the chilled water and heating hot water system.

- c. Partially drain the heating hot and chilled water system.
 - d. Disconnect the ductwork and prepare for connection to new.
 - e. Disconnect the chilled water and heating hot water piping and prepare for connection to new.
 - f. Remove the 96x48 outside air louver.
 - g. Disassemble and remove the existing AHU.
 - h. Move the AHU into the mechanical room through the outside air louver opening.
 - i. Assemble the AHU section per the IOM and seal airtight.
 - i. Rotate the mixing box such that the return air damper is in the bottom to set over the existing RA floor opening.
 - j. Blank off and seal the RA floor opening that extends beyond the new AHU.
 - k. Provide and install a new 96x42 outside air louver in the existing wall and seal water tight. Color of the louver shall match existing.
 - l. Provide a duct transition from the existing outside air louver to the new AHU and connect.
 - m. Provide a duct transition from the existing supply duct to the AHU discharge and connect.
 - n. Provide chilled water supply and return to the chilled water coil from the existing piping. Provide new isolation valves, temperature gauges, unions, a strainer, and a balance valve. Install the 2-way control valve provided by the temperature controls contractor.
 - o. Provide heating hot water supply and return to heating coil from the existing piping. Provide new isolation valves, temperature gauges, unions, a strainer, and a balance valve. Install the 3-way control valve provided by the temperature controls contractor.
 - p. Provide a full size, trapped condensate drain off the AHU and terminate over the floor drain.
 - q. Insulate and label the new ductwork and piping.
8. Flush and fill the chilled water and heating hot water system.
 9. Prepare the AHU for start-up.
 10. Trane will provide start-up of the owner provided equipment.
 11. Provide test and balance of the AHU and submit the report to ISD for review.

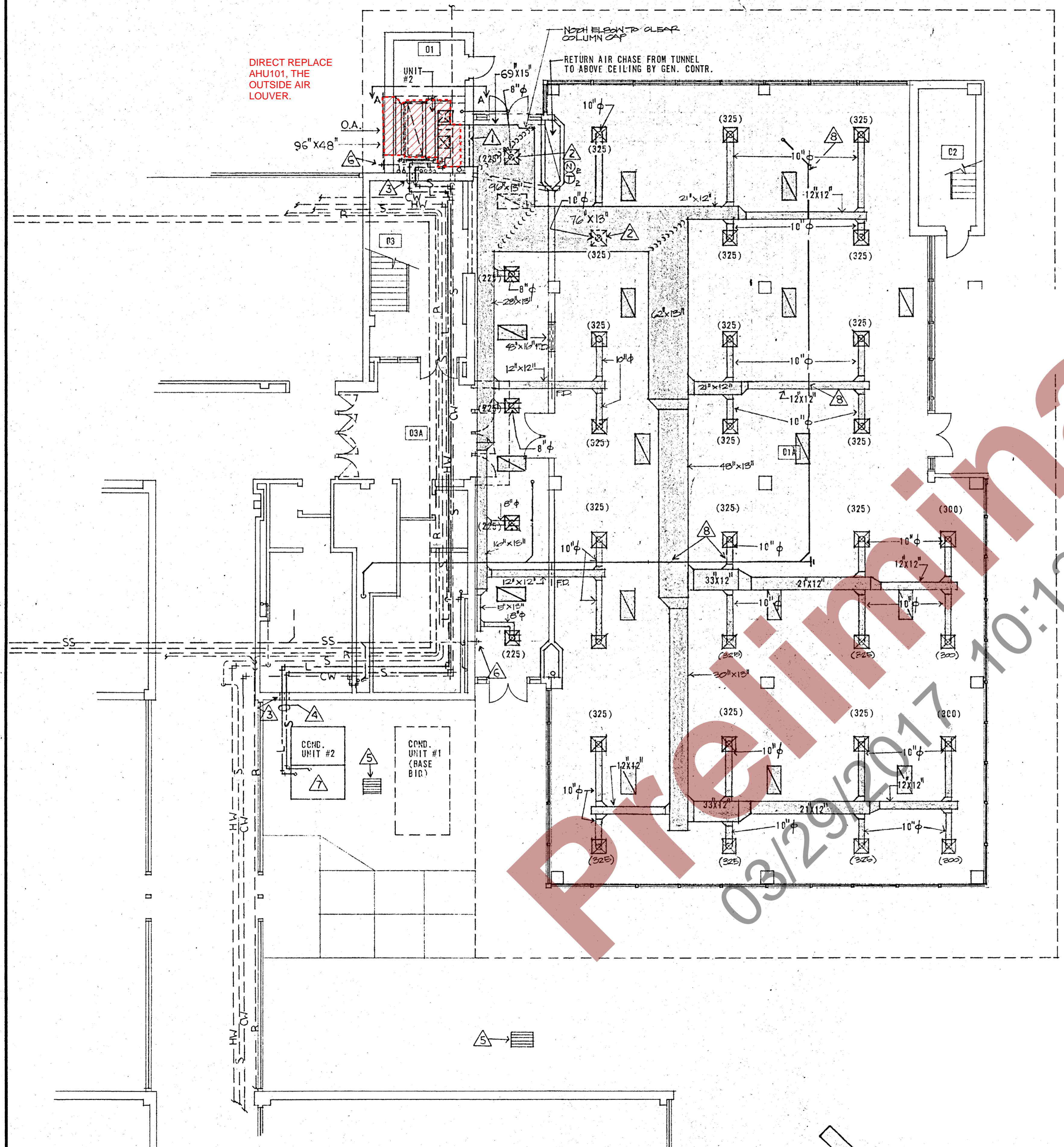
Electrical Scope:

1. The information in the scope of work is schematic in nature and does not show all details or components necessary to complete the system. The contractor's proposal shall include all items necessary to create a complete and operational system.
2. Refer to the schematic drawings attached for more information.
3. Lockout/tagout all equipment prior to service or replacement.
4. Disconnect the electrical feeder AHU-101 and remove back to source.
5. Provide and install VFD with an integral disconnect and without a bypass to control AHU-101's supply fan.
6. Provide new feeders from the panel "LG" (located adjacent to the AHU) to the new equipment.

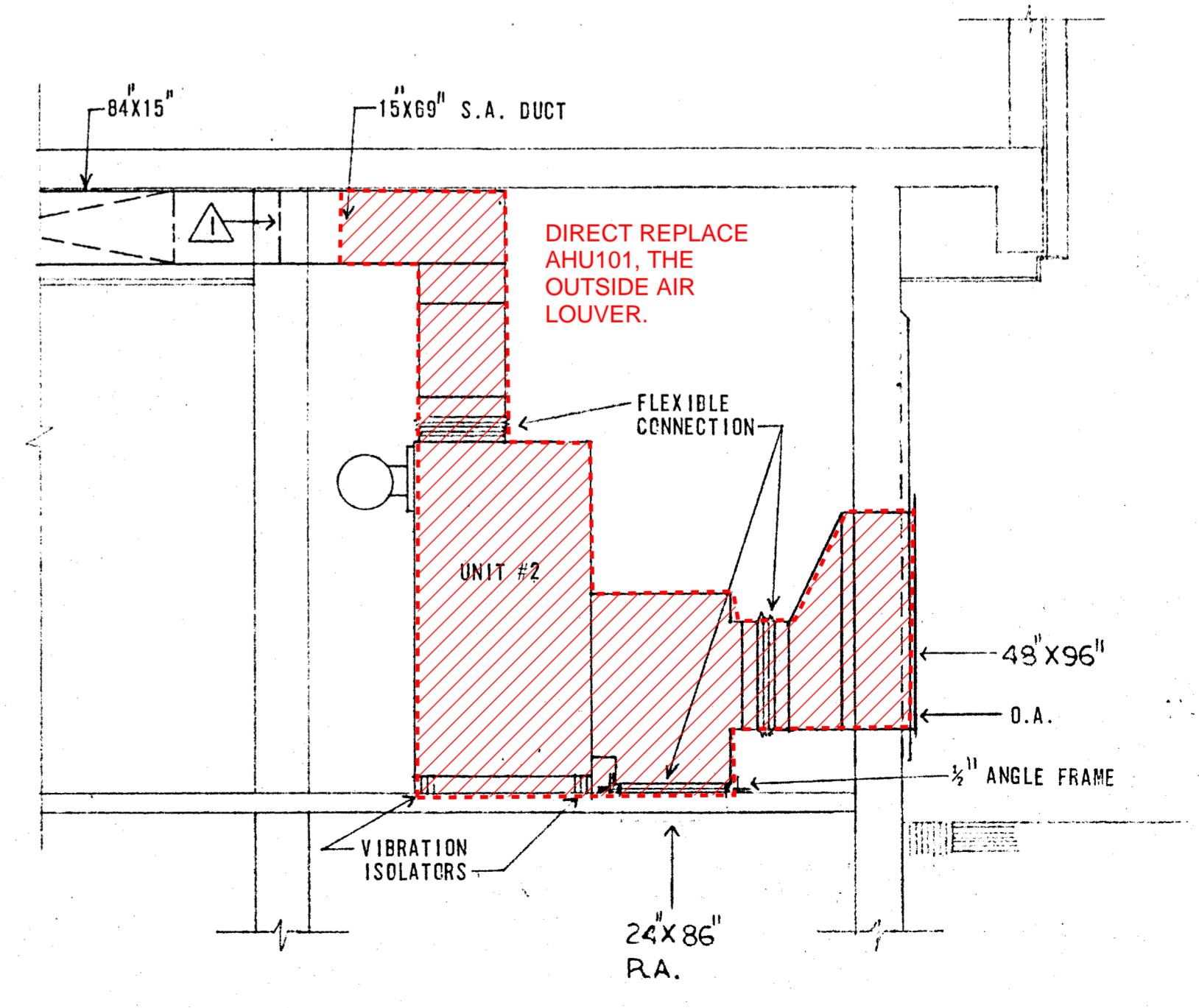
7. Replace the existing 20 amp circuit breaker in panel “LG” and provide a new circuit breaker sized appropriately to protect the larger supply fan.
8. Provide duct mounted supply and return smoke detectors in AHU-101. Interface the duct detectors in to the existing fire alarm system. Connect the AHU to the existing fan shutdown circuit for fan shutdown upon alarm. Test and verify proper operation.
9. Start-up and program the VFDs for the application.

NOTES

1. FIRE DAMPER WITH ACCESS PANEL IN BOTTOM OF DUCT.
2. PROVIDE AG-65 DAMPER ON DIFFUSER.
3. DRILL AND SLEEVE EXISTING WALL AS REQUIRED.
4. LIQUID AND SUCTION LINES OF SIZE RECOMMENDED BY MANUFACTURER FROM CONDENSING UNIT UNDERGROUND INTO EXISTING TUNNEL AS SHOWN.
5. CATCH BASIN BY GENERAL CONTRACTOR.
6. REMOVE EXISTING WALL HYDRANT AND REINSTALL.
7. PROVIDE CONDENSING UNIT FOR SINGLE POWER CONNECTION 460 V., 3 PH.
8. COORDINATE DUCTWORK WITH WASTE LINE.



A-1 ALTERNATE GROUND FLOOR MECHANICAL PLAN
 SCALE: 1/8" = 1'-0"
 North



SECTION A-A
 SCALE 3/8" = 1'-0"
 NOT FOR CONSTRUCTION

Independence School District
Independence, MO

Date: 3/31/17

Project: Truman AHU-L Replacement

Problem Definition:

- A. AHU-L was originally installed in 1979 and beyond the end of their expected service life.

Owner Provided Equipment:

- 1. (1) Trane chilled water, hot water air handling unit.
- 2. (1) Trane HW reheat coil.
- 3. (3) Trane chilled water, hot water blower coils.

General:

- 1. The Contractor is responsible to provide Construction Documents sealed by an Engineer registered in the State of Missouri. The construction documents shall meet the intent of this scope of work and shall be reviewed and approved by ISD.
 - a. Include a complete MEP design, sizing equipment, ductwork, piping, electrical, etc.
 - b. Review the owner provided equipment selections and advise if there are any concerns with equipment sizing. Review shall be completed by mid-May.
 - c. Size the contractor provided equipment immediately for so equipment can be ordered and received in time to meet the construction schedule.
 - d. Provide structural review and design for any changes in roof mounted equipment loads.
 - e. The contractor shall provide the following deliverables:
 - i. 75% construction documents for review.
 - ii. 100% construction documents for review and permitting.
 - iii. Project specifications.
 - iv. Provide three full size printed copies and the electronic PDFs of the construction documents to ISD for record.
 - v. Provide three full size printed copies and the electronic PDFs of the redlined as-built drawings to ISD for record.
- 2. The Contractor shall provide equipment submittals for review by ISD and the owner's representative.
- 3. The Contractor is responsible permitting for their respective scope of work.
- 4. The equipment warranty of all owner provided equipment will be provided by the equipment manufacturer.
- 5. The Contractor shall provide a one year parts and labor warranty on all equipment, material, labor they provide and install.
- 6. The contractors shall provide all materials and labor required to complete this work unless otherwise specified.

7. Any damage caused by contractor during performance of work shall be repaired by the contractor to match existing finishes and be to the satisfaction of ISD.
8. The installation of new equipment shall include, unless specifically stated in this document or associated sketch:
 - a. Mechanical and electrical installations shall comply with local Code and authority having jurisdiction.
 - b. Installation shall be inspected by ISD, their owner's representative, the owner provided equipment manufacturer, and by the authority having jurisdiction.
 - c. Providing new system components including, but not limited to, piping, valves, ductwork, dampers, fittings, transitions, roof curbs, electrical disconnects, circuit breakers, switches, fuses etc. for a complete and functioning system.
 - d. All new work shall be performed by qualified tradesmen.
9. Upon receipt, verify equipment is in accordance with approved equipment submittals. Protect and store equipment on site from damage, vandalism, and theft, weather. Contractor is responsible for equipment after accepting delivery.
10. The contractor shall receive, unload, hoist, assemble and set the new equipment in accordance with manufacturer's recommendations and installation, operation and maintenance manuals. Retain any loose shipped components for installation.
11. Protect the existing building structure, utilities, floors coverings and finishes from damage, dust partitions, separations. Any damage will be repaired by the contractor.
12. Complete pre-startup checklist as required by the manufacturer.
13. Coordinate the installation with other contractors.
14. Verify voltages, amperages are in accordance with approved equipment submittals upon receipt of equipment/materials.
15. Seal all penetrations as they are created.
16. Retain any loose shipped electrical or control components (noted (field) on equipment submittals or as noted on alternate supplier installation manuals).
17. Utilize the operation and installation manuals shipped with the equipment for the installation and immediately submit copy to the Project Manager.

Mechanical Scope:

1. The information in the scope of work is schematic in nature and does not show all details or components necessary to complete the system. The contractor's proposal shall include all items necessary to create a complete and operational system.
2. Refer to the schematic drawings attached for more information.
3. Lockout/tagout all equipment prior to service or replacement.
4. Include the crane service and all rigging, hoisting and hauling.
5. The Owner will provide the equipment listed above shipped to a location designated by the contractor. The contractor shall inspect the equipment upon receipt and document and notify the shipping company and ISD of any damage.
6. The intent of this scope of work is to replace a multizone air handling unit serving the library with one AHU and three blower coils.
7. Remove and replace the AHU.

- a. The doorway to the mechanical room is a standard 3-foot door.
 - b. Shutdown the existing AHU.
 - c. Isolate and shutdown the chilled water and heating hot water system.
 - d. Partially drain the heating hot and chilled water system.
 - e. Disconnect the ductwork and prepare for connection to new.
 - f. Remove the existing electric duct heaters.
 - g. Disconnect the chilled water and heating hot water piping and prepare for connection to new.
 - h. Remove the existing 120x56 outside air louver.
 - i. Disassemble and remove the existing AHU through the louver opening.
 - j. Disassemble the AHU and hoist the AHU sections/components into the mechanical room via the outside air louver opening.
 - k. Reassemble the AHU per the IOM and seal airtight.
 - l. Provide and install a new 120x56 outside air louver in the existing wall and seal water tight. Color of the louver shall match existing.
 - m. Provide an insulated outside air plenum. Provide a vertical divider to create a separate OA plenum section for the blower coils and a OA plenum section to serve new AHU-L.
 - n. Provide outside air duct from the 90x56 outside air section to new AHU-L and connect.
 - o. Install the owner provided 120x24 hot water reheat coil at the 120x16 supply duct serving the library. Provide duct transition.
 - p. Provide a supply duct from the AHU up to the reheat coil and connect with a duct transition.
 - q. Provide chilled water supply and return to the chilled water coil from the existing piping. Provide new isolation valves, temperature gauges, unions, a strainer, and a balance valve. Install the 2-way control valve provided by the temperature controls contractor.
 - r. Provide heating hot water supply and return to the AHU preheat coil from the existing piping. Provide new isolation valves, temperature gauges, unions, a strainer, and a balance valve. Install the 3-way control valve provided by the temperature controls contractor.
 - s. Provide heating hot water supply and return to the reheat coil from the existing piping. Provide new isolation valves, temperature gauges, unions, a strainer, and a balance valve. Install the 3-way control valve provided by the temperature controls contractor.
 - t. Provide a full size, trapped condensate drain off the AHU and terminate over the floor drain.
8. Blower Coils
- a. Haul the blower coils to the jobsite.
 - b. Hang the three AHUs from the structure above.
 - c. Provide supply duct off AHU-L1 and connect to the three west zone ducts (original zones 1, 2, and 3). The three zone shall be served by AHU-L1.
 - d. Provide a supply duct off AHU-L2 and connect to the 16x12, zone 5, ductwork.

- e. Provide a supply duct off AHU-L3 and connect to the 18x9, zone 4, ductwork.
 - f. Install the mixing box shipped loose with each AHU per the IOM. Seal airtight.
 - g. Provide an outside air duct from the outside air plenum and provide an OA duct to each of the three AHUs. The OA ducts shall be sized for full economizer operation.
 - h. Provide chilled water from the mains in the mechanical room to serve the three AHUs. Provide the following branch CWS/CWR to each AHU and connect. Provide new isolation valves, temperature gauges, unions, a strainer, and a balance valve. Install the 2-way control valve provided by the temperature controls contractor.
 - i. Provide heating hot water from the mains in the mechanical room to serve the three AHUs. Provide the following branch HWS/HWR to each AHU and connect. Provide new isolation valves, temperature gauges, unions, a strainer, and a balance valve. Install the 3-way control valve provided by the temperature controls contractor.
 - j. Provide a full size, trapped condensate drain off each AHU and terminate over the floor drain.
9. Insulate and label the new ductwork and piping.
 10. Flush and fill the chilled water and heating hot water system.
 11. Prepare the equipment for start-up.
 12. Trane will provide start-up of the owner provided equipment.
 13. Provide test and balance of the AHU and submit the report to ISD for review.

Electrical Scope:

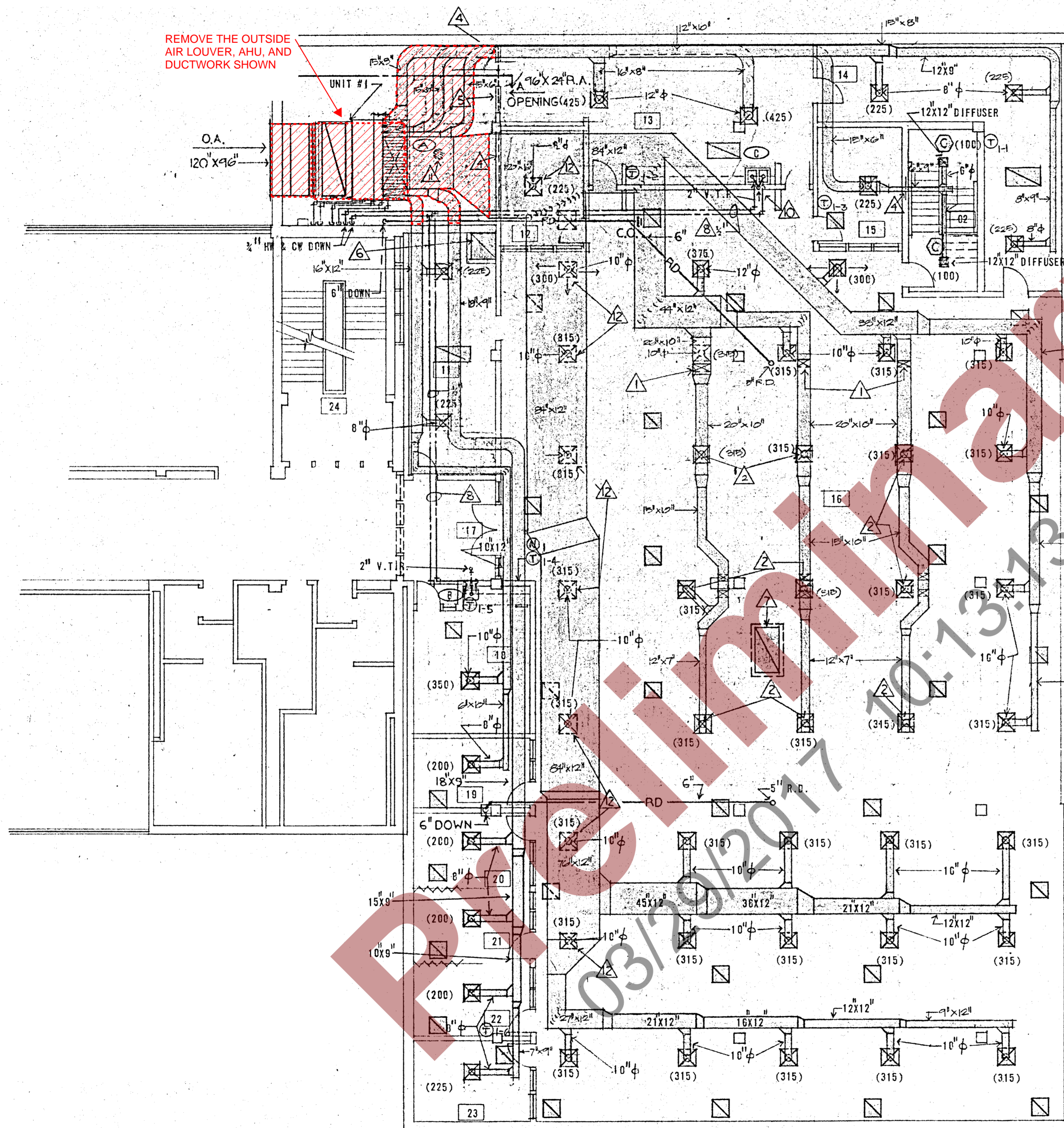
1. The information in the scope of work is schematic in nature and does not show all details or components necessary to complete the system. The contractor's proposal shall include all items necessary to create a complete and operational system.
2. Refer to the schematic drawings attached for more information.
3. Lockout/tagout all equipment prior to service or replacement.
4. Disconnect the electrical feeder AHU-L and save for reinstallation.
5. Disconnect the electrical feeders serving the electric heat coils and remove back to the source.
6. Provide and install VFD with an integral disconnect and without a bypass to control AHU-L's supply fan.
7. Extend the existing supply fan feeder to AHU-L and connect.
8. Replace the overcurrent protection to protect the new AHU-L fan, if required.
9. Provide and install a combination motor starter for AHU-L1, L2, and L3.
10. Provide new feeders from the panel "LG" (located adjacent to AHU101, lower level) to the new equipment.
11. Remove the breakers that served the removed duct heaters and install three new circuit breakers in panel "LG" to feed the new AHUs.

12. Provide duct mounted supply and return smoke detectors in AHU-L. Interface the duct detectors in to the existing fire alarm system. Provide a fan shutdown circuit to each AHU-L for fan shutdown upon alarm. Test and verify proper operation.
13. Start-up and program the VFDs for the application.

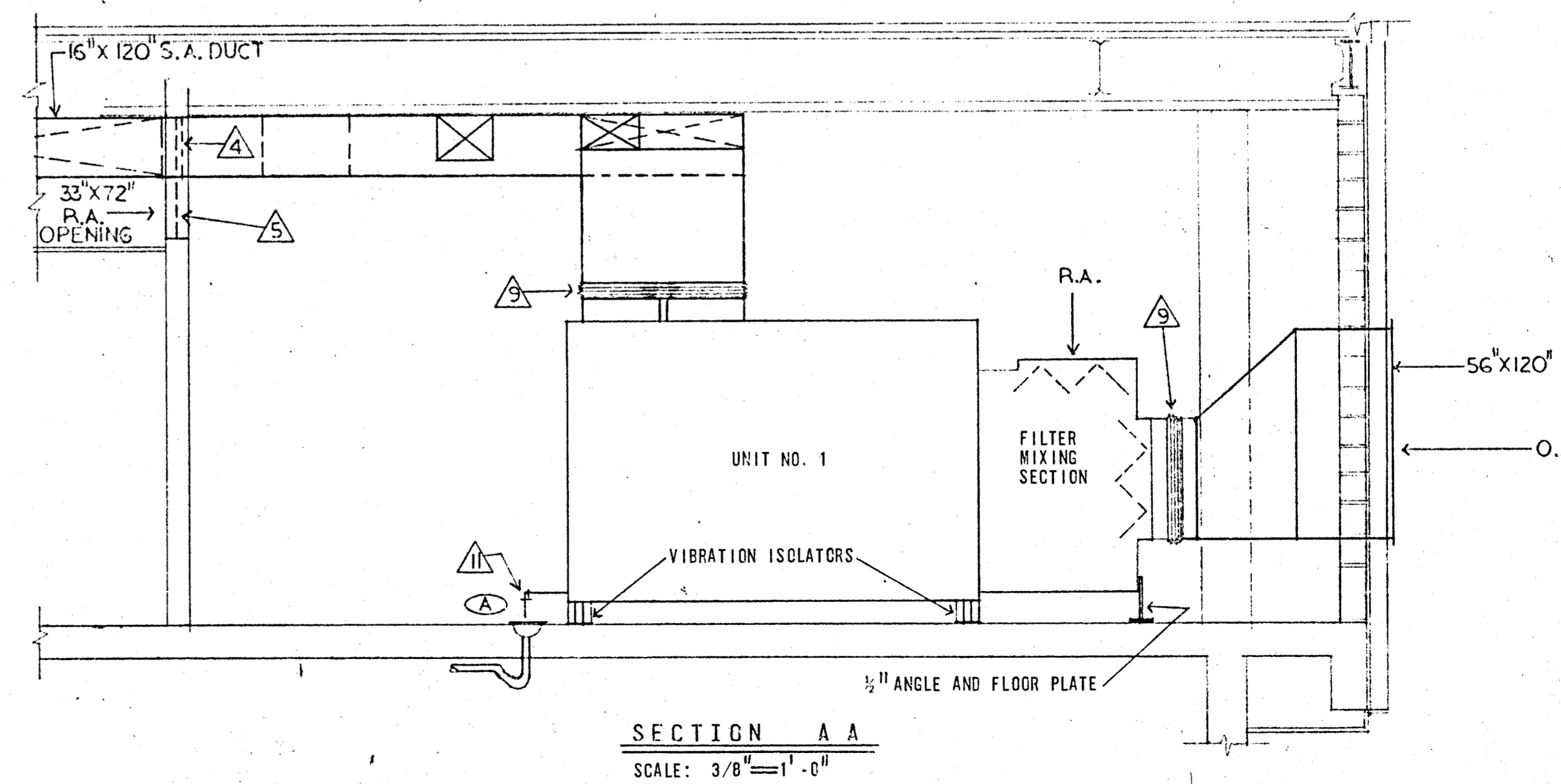
NOTES \triangle

1. 16"x12" DUCT UP TO AREA BETWEEN JOISTS. PROVIDE FIRE DAMPER WITH ACCESS PANEL IN DUCT WHERE DUCT PENETRATES FIRE RATED GYPSUM BOARD FIREPROOFING.
2. 10" ϕ DUCT DOWN TO DIFFUSER AS SHOWN. PROVIDE FIRE DAMPER WITH ACCESS PANEL IN DUCT WHERE DUCT PENETRATES FIRE RATED GYPSUM BOARD FIREPROOFING.
3. 18" x 9" DUCT SHALL RISE UP AND OVER 10"x12" DUCT AND THEN BACK DOWN AS SHOWN.
4. FIRE DAMPER WITH ACCESS PANEL IN BOTTOM OF DUCT.
5. PROVIDE FIRE DAMPER FOR R.A. OPENING IN WALL.
6. 36" x 36" PRESSURE RELIEF VENT MOUNTED ON PATE CURB.
7. 36" x 66" PRESSURE RELIEF VENT MOUNTED ON PATE CURB.
8. ABOVE CEILING.
9. FLEXIBLE CONNECTION.
10. H & CW DOWN IN WALL.
11. 1 1/2" INCH CONDENSATE DRAIN INSULATED AS SPECIFIED FOR COLD WATER.
12. PROVIDE AG-95 DAMPER ON DIFFUSER.

REMOVE THE OUTSIDE AIR LOUVER, AHU, AND DUCTWORK SHOWN

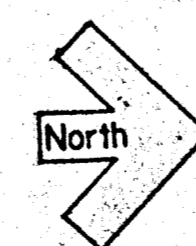


UNIT NO.	TOTAL CFM	MULTIZONE UNIT SCHEDULE																								
		1	2	3	4												5	6	ZONES							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SEGMENTS
1	16000	675	850	425													12225			1000	825					



FIRST FLOOR MECHANICAL PLAN

SCALE: 1/8" = 1'-0"



SECTION A A

SCALE: 3/8" = 1'-0"

DEMOLITION PLAN
NOT FOR CONSTRUCTION

TRUMAN HIGH SCHOOL
INDEPENDENCE SCHOOL DIST.
MISSOURI

JOB NO

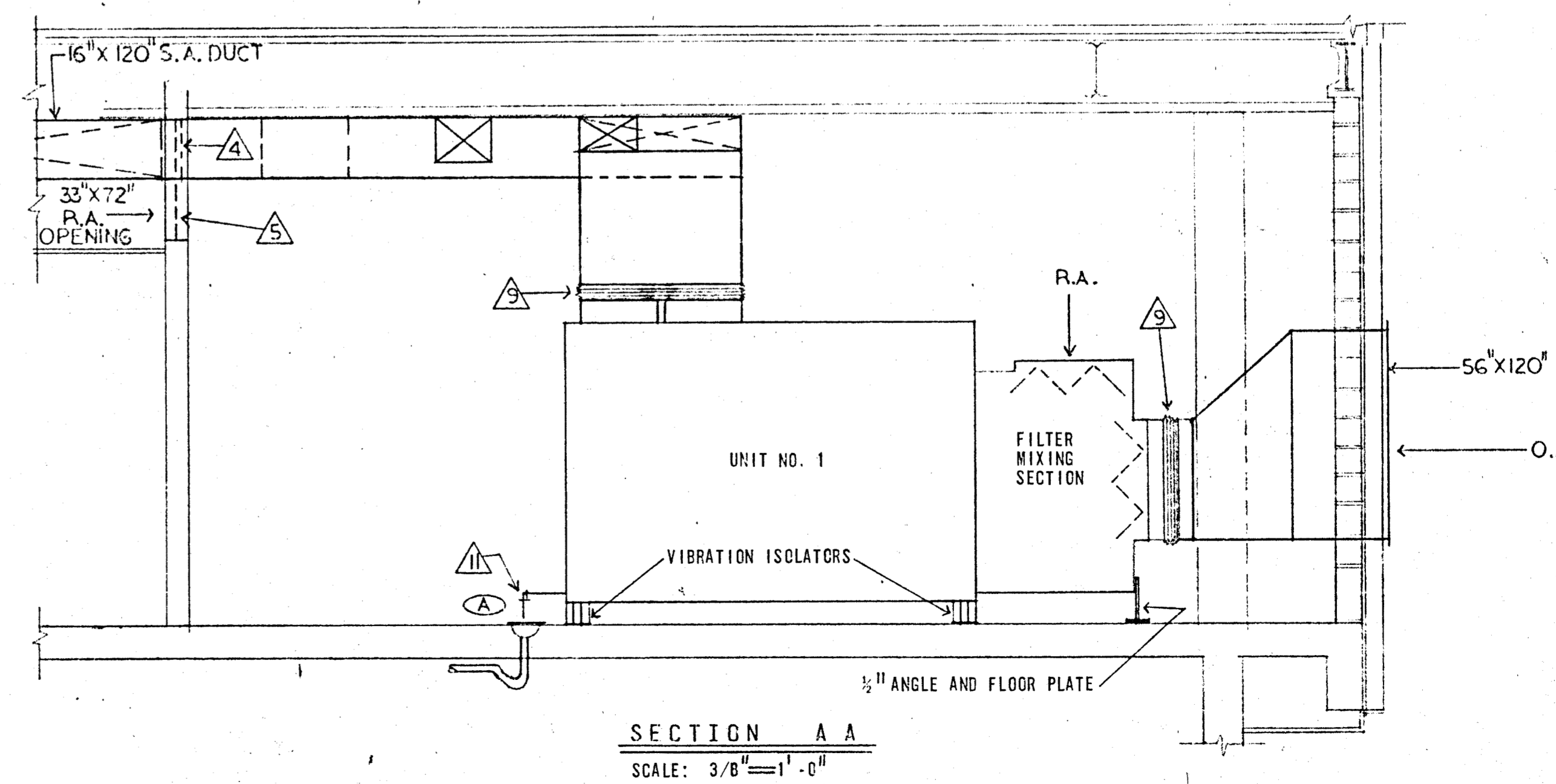
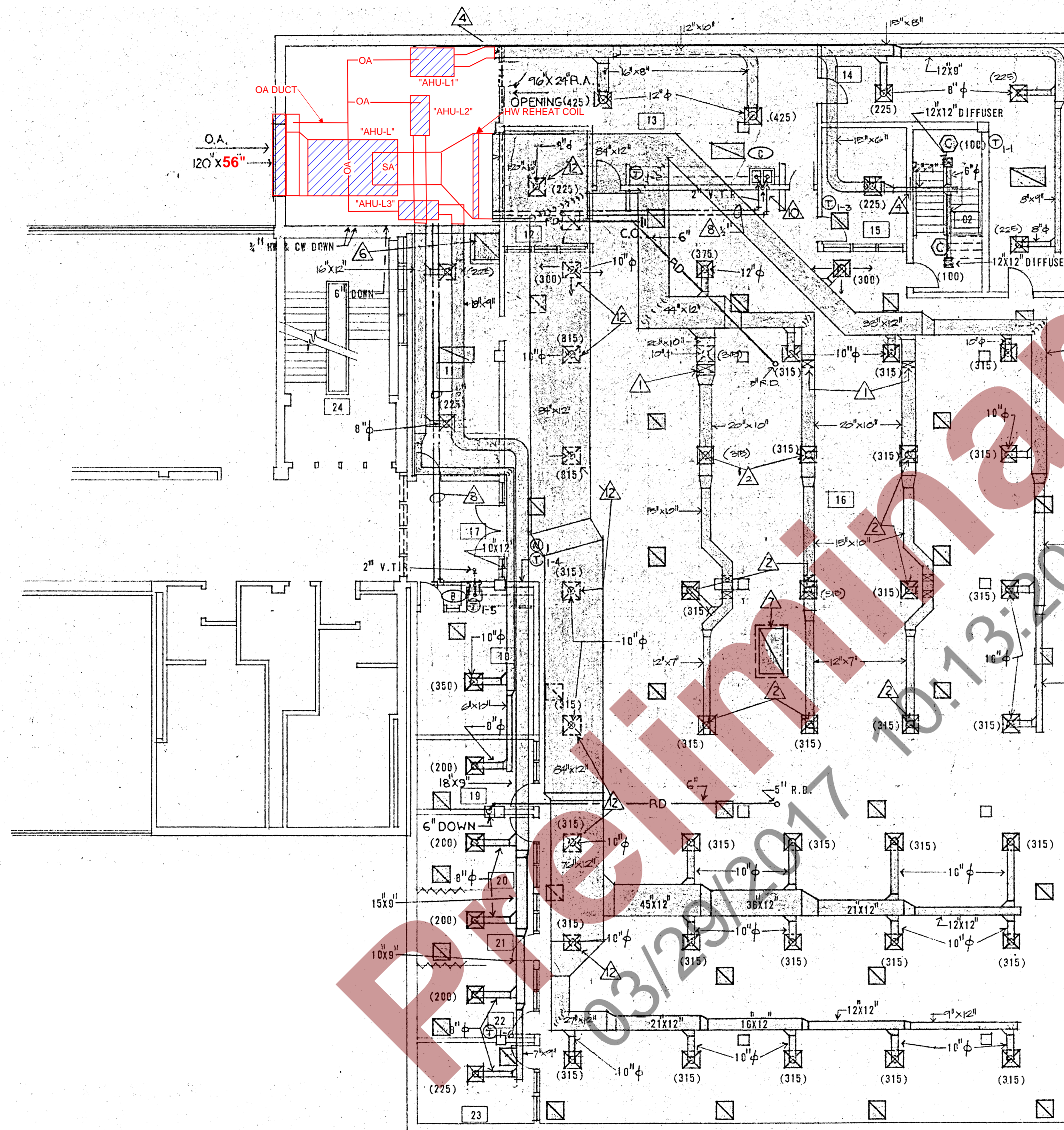


DATE

REVISED

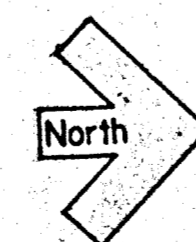
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11. 1 1/2" INCH CONDENSATE DRAIN INSULATED AS SPECIFIED FOR COLD WATER.
12. PROVIDE AG-95 DAMPER ON DIFFUSER.



FIRST FLOOR MECHANICAL PLAN

SCALE: 1/8" = 1'-0"



SECTION A A

SCALE: 3/8" = 1'-0"

IMPROVEMENT PLAN
NOT FOR CONSTRUCTION

TRUMAN HIGH SCHOOL
INDEPENDENCE SCHOOL DIST.
MISSOURI

JOB NO

DATE

REVISED



Independence School District
Independence, MO

Date: 3/31/17

Project: Truman Rooftop Unit Replacements

Problem Definition:

- A. Three rooftop units serving the office area were installed in 1998 and at the end of their expected service life.

Owner Provided Equipment:

- 1. (1) Trane 3-ton cooling only RTU.
- 2. (1) Trane 4-ton cooling only RTU.
- 3. (1) Trane 7.5-ton cooling only RTU.
- 4. (3) Adapter curbs.

General:

- 1. The Contractor is responsible to provide Construction Documents sealed by an Engineer registered in the State of Missouri. The construction documents shall meet the intent of this scope of work and shall be reviewed and approved by ISD.
 - a. Include a complete MEP design, sizing equipment, ductwork, piping, electrical, etc.
 - b. Review the owner provided equipment selections and advise if there are any concerns with equipment sizing. Review shall be completed by mid-May.
 - c. Size the contractor provided equipment immediately for so equipment can be ordered and received in time to meet the construction schedule.
 - d. Provide structural review and design for any changes in roof mounted equipment loads.
 - e. The contractor shall provide the following deliverables:
 - i. 75% construction documents for review.
 - ii. 100% construction documents for review and permitting.
 - iii. Project specifications.
 - iv. Provide three full size printed copies and the electronic PDFs of the construction documents to ISD for record.
 - v. Provide three full size printed copies and the electronic PDFs of the redlined as-built drawings to ISD for record.
- 2. The Contractor shall provide equipment submittals for review by ISD and the owner's representative.
- 3. The Contractor is responsible permitting for their respective scope of work.
- 4. The equipment warranty of all owner provided equipment will be provided by the equipment manufacturer.
- 5. The Contractor shall provide a one year parts and labor warranty on all equipment, material, labor they provide and install.
- 6. The contractors shall provide all materials and labor required to complete this work unless otherwise specified.

7. Any damage caused by contractor during performance of work shall be repaired by the contractor to match existing finishes and be to the satisfaction of ISD.
8. The installation of new equipment shall include, unless specifically stated in this document or associated sketch:
 - a. Mechanical and electrical installations shall comply with local Code and authority having jurisdiction.
 - b. Installation shall be inspected by ISD, their owner's representative, the owner provided equipment manufacturer, and by the authority having jurisdiction.
 - c. Providing new system components including, but not limited to, piping, valves, ductwork, dampers, fittings, transitions, roof curbs, electrical disconnects, circuit breakers, switches, fuses etc. for a complete and functioning system.
 - d. All new work shall be performed by qualified tradesmen.
9. Upon receipt, verify equipment is in accordance with approved equipment submittals. Protect and store equipment on site from damage, vandalism, and theft, weather. Contractor is responsible for equipment after accepting delivery.
10. The contractor shall receive, unload, hoist, assemble and set the new equipment in accordance with manufacturer's recommendations and installation, operation and maintenance manuals. Retain any loose shipped components for installation.
11. Protect the existing building structure, utilities, floors coverings and finishes from damage, dust partitions, separations. Any damage will be repaired by the contractor.
12. Complete pre-startup checklist as required by the manufacturer.
13. Coordinate the installation with other contractors.
14. Verify voltages, amperages are in accordance with approved equipment submittals upon receipt of equipment/materials.
15. Seal all penetrations as they are created.
16. Retain any loose shipped electrical or control components (noted (field) on equipment submittals or as noted on alternate supplier installation manuals).
17. Utilize the operation and installation manuals shipped with the equipment for the installation and immediately submit copy to the Project Manager.

Mechanical Scope:

1. The information in the scope of work is schematic in nature and does not show all details or components necessary to complete the system. The contractor's proposal shall include all items necessary to create a complete and operational system.
2. Refer to the schematic drawings attached for more information.
3. Lockout/tagout all equipment prior to service or replacement.
4. Include the crane service and all rigging, hoisting and hauling.
5. The Owner will provide the equipment listed above shipped to a location designated by the contractor. The contractor shall inspect the equipment upon receipt and document and notify the shipping company and ISD of any damage.
6. The intent of this scope of work is to direct replace three rooftop units.
7. Shutdown the equipment.
8. Recover the refrigerant and provide a certificate of disposal to ISD.

9. Disconnect the RTU and prepare for removal.
10. Haul the new RTUs to the jobsite.
11. Setup the crane in the south parking lot or west drive.
 - a. Contractor has the option to use a helicopter for the lift.
12. Lift the old RTUs off the roof and legally dispose of the equipment.
13. Hoist the adapter curbs to the roof and secure them to the existing curbs.
14. Hoist the RTUs to the roof and secure to the adapter curb.
15. Prepare the RTUs for start-up.
16. Trane will provide start-up of the owner provided equipment.
17. Provide documentation of all start-up activities to ISD.

Electrical Scope:

1. The information in the scope of work is schematic in nature and does not show all details or components necessary to complete the system. The contractor's proposal shall include all items necessary to create a complete and operational system.
2. Refer to the schematic drawings attached for more information.
3. Lockout/tagout all equipment prior to service or replacement.
4. Disconnect the electrical feeders, fire alarm circuit, and control wiring at each RTU and save for reinstallation.
5. Protect the existing duct mounted smoke detectors.
6. Once the new RTUs are set, extend the electrical feeder to each RTU and connect.
7. Extend the existing fire alarm fan shutdown circuit to each RTU and connect. Test and verify proper operation.



Site Plan



Submittal

Prepared For:
All Bidders

Date: March 21, 2017

Customer P.O. Number:
Customer Project Number:

Sold To:

Job Number:
Job Name:
ISD Phase III ACQ
201 North Forest
INDEPENDENCE, MO 64050

Trane U.S. Inc. dba Trane is pleased to provide the enclosed submittal for your review and approval.

Product Summary

Qty	Product
2	Performance Climate Changer (UCCA)
3	3-10 Ton R-410A PKGD Unitary Cooling Rooftop
1	Heating Coils
3	BCXD Blower Coil - Direct Drive

Trane

Phone:

Cell:

Fax:

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.

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Tag Data - Performance Climate Changer (UCCA) (Qty: 2)

Item	Tag(s)	Qty	Description	Model Number
A1	Trum- AHU-L	1	Performance Climate Changer (UCCA)	UCCAH25C0A0EAL12000000FE867BA0000020
A2	TE-AHU-101	1	Performance Climate Changer (UCCA)	UCCAD21C0A0EBJ12000000GEG00BA0000000

Product Data - Performance Climate Changer (UCCA)**All Units**

Performance Climate Changer (UCCA)
 460/60/3
 Indoor unit
 Stainless Steel Drain Pan, RH Coil / RH Motor & Drive Location
 Aluminum fins, galvanized coil casing, 1/2" coils
 Terminal block plus starter or disconnect
 FC fan w/fixed sheave or DDP fan w/ field installed VFD and SGR
 2" flat filter mixing section
 2" MERV 8
 None
 Standard - door on motor side

Item: A1 Qty: 1 Tag(s): Trum- AHU-L

Horizontal DDP fan with top front discharge
 Unit Size 25 Square Feet of Coil
 1 row preheat hydronic coil with 9 fins per inch
 6 row hydronic coil with 9 fins per inch
 7- 1/2 horsepower (5.595 kW) motor per fan (supply)
 Direct drive plenum fan / motorized impeller fan
 67 Hz / 1990 RPM
 Access section with coil

Item: A2 Qty: 1 Tag(s): TE-AHU-101

Vertical housed fan with top front discharge
 Unit Size 21 Square Feet of Coil
 1 row preheat hydronic coil with 12 fins per inch
 4 row hydronic coil with 12 fins per inch
 10 horsepower (7.460 kW) motor per fan (supply)
 950 RPM fixed / 900 - 1000 variable
 Housed fan / motorized impeller fan
 1st year Labor warr whole unit

Performance Data - Performance Climate Changer (UCCA)

Tags	Trum- AHU-L	TE-AHU-101
Design airflow (cfm)	12225	10150
Total cooling capacity (MBh)	513.72	353.13
Sensible capacity (MBh)	354.92	302.47
Main coil system type	Hydronic	Hydronic
Fluid type	Water	Water
Fluid volume (gal)	15.73	9.52
Preheat fluid volume (gal)	3.87	3.30
Cooling EDB (F)	80.00	82.50
Cooling EWB (F)	67.00	66.00
Cooling LDB (F)	53.66	55.40
Cooling LWB (F)	53.25	54.58
Cooling ent fluid temp (F)	44.00	44.00
Cooling lvg fluid temp (F)	54.00	54.00
Cooling fluid temp rise (F)	10.00	10.00
Cooling flow rate (gpm)	102.38	70.37
Cooling fluid PD (ft H2O)	12.92	5.80
Cooling face velocity (ft/min)	510	499
Fluid freeze pt (F)	32.00	32.00
Preheat coil system type	Hydronic	Hydronic
Preheat fluid type	Water	Water
Total preheat capacity (MBh)	483.98	706.81
Preheat coil performance airflow (cfm)	12225	10150
Preheat EAT (F)	45.00	0.00
Preheat LAT (F)	81.50	64.21

Tags	Trum- AHU-L	TE-AHU-101
Preheat ent fluid temp (F)	180.00	180.00
Preheat lvg fluid temp (F)	160.00	160.00
Preheat fluid temp drop (F)	20.00	20.00
Preheat flow rate (gpm)	48.33	70.59
Preheat fluid PD (ft H2O)	4.84	12.06
Preheat coil face velocity (ft/min)	510	499
Preheat fluid freeze pt (F)	32.00	32.00
Reheat coil type	None	None
Basis of selection	Cooling	Cooling
Two pipe changeover	No	No
Elevation (ft)	0.00	0.00
Supply fan ESP (in H2O)	2.000	1.000
Supply fan TSP (in H2O)	3.607	2.460
Supply fan quantity (Each)	2.00	1.00
Supply total brake hp per fan (hp)	5.762	8.237
Supply fan speed (rpm)	2016	950
Cooling APD (in H2O)	0.751	0.532
Preheat APD (in H2O)	0.104	0.129
Filter/Mixing section APD (in H2O)	0.752	0.799
Discharge velocity (ft/min)	1482	2336
Unit full load amps (A)	-	14.22
Unit max fuse size (A)	-	30.00
Unit min circuit ampacity (A)	-	17.72
Supply fan full load amps (A)	11.00	-
Supply fan max fuse size (A)	20.00	-
Supply fan min circuit ampacity (A)	13.75	-
Supply fan motor FLA (A)	11.00	14.00
Control full load amps (A)	0.22	-
Control max fuse size (A)	15.00	-
Control min circuit ampacity (A)	0.28	-
Run acoustics?	No	No
Unit length (in)	129.935	76.068
Unit width (in)	81.000	79.000
Unit height (in)	60.568	99.185
Installed weight (lb)	2601.4	1721.0
Rigging weight (lb)	2438.3	1614.5
Cooling fluid velocity (ft/s)	4.50	3.55
Preheat fluid velocity (ft/s)	4.15	7.12

Mechanical Specifications - Performance Climate Changer (UCCA)**Item: A1, A2 Qty: 2 Tag(s): Trum- AHU-L, TE-AHU-101****GENERAL****Lifting Instructions**

Performance Climate Changer air handlers must be rigged, lifted, and installed in strict accordance with the Installation, Operation, and Maintenance manual (CLCH-SVX009A-EN) for UCCA air handlers. The units are also to be installed in strict accordance with the specifications.

Per ASHRAE 62.1 recommendation, indoor air handling units will be shipped stretch-wrapped to protect unit from in-transit rain and debris.

Installing contractor is responsible for long term storage in accordance with the Installation, Operation, and Maintenance manual (CLCH-SVX009A-EN).

Unit shall be UL and C-UL Listed.

Where applicable air-handling performance data shall be certified in accordance with AHRI Standard 430. For units with housed fans or single direct drive plenum fans, fans shall be certified as complying with AHRI Standard 430. Air handling units with multiple direct drive plenum fans, or direct drive plenum fans incorporated with ECM style motors are outside the scope of AHRI 430. These fans however are rated in accordance with AHRI 430.

Coil performance shall be certified in accordance with AHRI Standard 410.

Unit Construction**Casing Construction**

All unit panels shall be 2-inch solid, double-wall construction to facilitate cleaning of unit interior. All exterior and interior AHU panels will be made of galvanized steel. Motor and drive locations can be on the same side as the unit coil connections or on the opposite side. The casing shall be able to withstand up to 6" w.g. positive or negative static pressure. The unit panels shall not exceed .005 inch deflection per inch of panel span at 6" w.g. positive or negative static pressure.

Floor Construction

The unit floor shall be of sufficient strength to support a 300.0 lb load during maintenance activities and shall deflect no more than .005 inch per inch of panel span when sitting on a support structure.

Insulation

Panel insulation shall provide a minimum thermal resistance (R) value of 13 ft²*h*°F/Btu throughout the entire unit. Insulation shall completely fill the panel cavities in all directions so that no voids exist and settling of insulation is prevented. Panel insulation shall comply with NFPA 90A.

Drain Pan

All units shall be provided with an insulated assembly of polymer material or stainless steel. To address indoor air quality (IAQ), the drain pan shall be designed in accordance with ASHRAE 62.1 being of sufficient size to collect all condensation produced from the coil and sloped in two planes promoting positive drainage to eliminate stagnant water conditions. The outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition. All drain pan connections shall be visible external to the unit.

Access Door Construction

Access doors shall be 2-inch double-wall construction. Interior and exterior door panels shall be of the same construction as the interior and exterior wall panels, respectively. Surface-mounted handles shall be provided to allow quick access to the interior of the unit. Handle hardware shall be designed to prevent unintended closure. Access doors shall be hinged and removable for quick, easy access. Door handle hardware shall be adjustable and visually indicate locking position of door latch external to the section.

MIXING SECTION

A mixing section shall be provided to support the damper assembly for outdoor and return air.

Dampers

Dampers shall modulate the volume of outdoor, and return air. The dampers shall be of double-skin airfoil design with

metal, compressible jamb seals and flexible blade-edge seals on all blades. The blades shall rotate on stainless-steel sleeve bearings. The dampers shall be rated for a maximum leakage rate of 3 cfm/ft² at 1 in. w.g. complying with ASHRAE 90.1 maximum damper leakage. All leakage testing and pressure ratings shall be based on AMCA Standard 500-D. Dampers may be arranged in a parallel blade configuration.

The following specifications apply only to units with outside air and return air dampers, with actuators. The 5 year warranty applies only to these items.

This unit contains Economizer that meets or exceeds all mandatory requirements prescribed by Title 24, including but not limited to:

- 5 yr parts only warranty
- Successfully tested to 60,000 Actuations
- Less than 10 cfm/sq.ft. of damper leakage at 1" WG per AMCA 500L

Filters

Mixing sections shall be provided with a filter rack as indicated in the Product Data and As-Built sections of the submittal.

2-inch pleated media filters made with 100% synthetic fibers that are continuously laminated to a supported steel-wire grid with water repellent adhesive shall be provided. Filters shall be capable of operating up to 625 fpm face velocity without loss of filter efficiency and holding capacity. The filters shall have a MERV 8 rating when tested in accordance with the ANSI/ASHRAE Standard 52.2.

COIL SECTION

The coil section shall be provided complete with coil and coil holding frame. The coils shall be installed such that headers and return bends are enclosed by unit casings. The drainpan outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition.

No casing penetrations supplied for hydronic drain and vents. If required, piping contractor will need to drill drain and vent penetrations using factory located features provided in coil panel.

Water Coils

Hydronic coils have W round seamless copper tubes mechanically bonded to coil fins. Coil fins are aluminum with full fin collars that provide maximum fin-tube contact and accurate spacing. Coils are available with 9, 12, and 14 fins per inch. Manufacturer shall not allow selections where moisture carryover could occur at design conditions. For hydronic coils used in a two-pipe system, the unit manufacturer shall provide performance data in both the cooling and heating mode.

Hydronic coils used as heating only will be available in one or two-row configurations. Hydronic coils used as cooling only will be available in four, six, or eight-row configurations. Multi-row hydronic coils have continuous tube circuits arranged for counterflow (water flow counter to the direction of unit airflow). The coil casing may be galvanized or stainless steel. Coils have round seamless copper pipe headers with NPT external thread steel pipe connections. Coils have one vent and one drain connection consisting of 3/8" NPT internal thread copper adapter with steel square head pipe plug. Supply and return connections are located outside the unit casing (on the same side of the unit) and are clearly labeled to facilitate field piping. Coils are proof-tested to 450 psig and leak-tested under water to 300 psig. Maximum standard operating conditions are 300 psig and 200F. Coil performance data and coils containing water or ethylene glycol shall be certified in accordance with AHRI Standard 410. Propylene glycol and calcium chloride, or mixtures thereof, are outside the scope of AHRI Standard 410 and, therefore, do not require AHRI 410 rating or certification.

Tubes are 1/2" [13 mm] OD 0.016" [0.406 mm] thick copper.

Water Coils

Hydronic coils have W round seamless copper tubes mechanically bonded to coil fins. Coil fins are aluminum with full fin collars that provide maximum fin-tube contact and accurate spacing. Coils are available with 9, 12, and 14 fins per inch. Manufacturer shall not allow selections where moisture carryover could occur at design conditions. For hydronic coils used in a two-pipe system, the unit manufacturer shall provide performance data in both the cooling and heating mode.

Hydronic coils used as heating only will be available in one or two-row configurations. Hydronic coils used as cooling only will be available in four, six, or eight-row configurations. Multi-row hydronic coils have continuous tube circuits arranged for counterflow (water flow counter to the direction of unit airflow). The coil casing may be galvanized or stainless steel. Coils have round seamless copper pipe headers with NPT external thread steel pipe connections. Coils have one vent and one drain connection consisting of 3/8" NPT internal thread copper adapter with steel square head

pipe plug. Supply and return connections are located outside the unit casing (on the same side of the unit) and are clearly labeled to facilitate field piping. Coils are proof-tested to 450 psig and leak-tested under water to 300 psig. Maximum standard operating conditions are 300 psig and 200F. Coil performance data and coils containing water or ethylene glycol shall be certified in accordance with AHRI Standard 410. Propylene glycol and calcium chloride, or mixtures thereof, are outside the scope of AHRI Standard 410 and, therefore, do not require AHRI 410 rating or certification.

Tubes are 1/2" [13 mm] OD 0.016" [0.406 mm] thick copper.

Access Section with Coil

Unit(s) shall include a separate section housing a coil section and access section as one assembly. Refer to drawings to determine which unit(s) include the additional section. Section shall include a stainless steel drainpan and an access door of sufficient size to allow for visual inspection of the leaving face of the first coil in the airstream (if ordered) and entering face of the second coil in the airstream (if ordered). Access door shall be of the same construction as all other doors on the unit.

FC FAN SECTION

The fan shall be a double-width, double-inlet, multi-blade-type, forward-curved (FC) fan. The fan shall be equipped with permanently lubricated, anti-friction bearings with an L-50 life of 200,000 hours as calculated per ANSI/AFBMA Standard 9. All fan wheels are dynamically balanced by the fan vendor or unit manufacturer.

Fans selected with a shaft grounding ring shall have a maintenance free, circumferential conductive micro fiber ring installed on the fan motor to discharge shaft currents to ground.

DIRECT-DRIVE PLENUM FAN SECTION

The fan shall be a single-width, single-inlet, 10-bladed direct-drive plenum fan. The fan shall consist of a backward-curved, welded steel wheel. Motor bearing life of the direct-drive plenum fan shall be not less than L-10 250,000 hrs.

Units containing multiple fans shall be controlled using a common control signal, such as the duct static control signal, to modulate the fan speed.

The drives shall be constant speed with fixed-pitch sheaves. The drives shall be selected at a minimum 50 percent larger than the motor brake horsepower (1.5 service factor).

Motor Frame

The motor shall be mounted integral to the isolated fan assembly and furnished by the unit manufacturer. The motor is mounted inside the unit casing on an adjustable base to permit adjustment of drive belt tension (not applicable for direct drive plenum fans). The motor shall meet or exceed all NEMA Standards Publication MG 1 requirements and comply with NEMA Premium efficiency levels when applicable except for fractional horsepower motors which are not covered by the NEMA classification. The motor shall be T-frame, squirrel cage with size, type, and electrical characteristics as shown on the equipment schedule. *Refer to the Product Data section for selected fan motors within each unit.*

Fan Isolation

All fans, including direct drive plenum fans, shall be internally isolated to inhibit noise and vibration through the ductwork and building structure. A flexible connection shall be installed between fan and unit casing to ensure complete isolation. If fans and motors are not internally isolated, then the entire unit shall be externally isolated from the building, including supply and return duct work, piping, and electrical connections. External isolation shall be furnished by the installing contractor in order to avoid transmission of noise and vibration through the ductwork and building structure.

Motor Starter

An IEC combination starter shall be provided for each fan motor. Each starter shall be properly sized, factory mounted in a metal enclosure, and wired to the fan motor to facilitate temporary heating, cooling, ventilation, and/or timely completion of the project. Starter shall include one N.C. and one N.O. auxiliary contact, and manual reset overload.

Control Interface

A control interface is available that includes:

- Fan motor disconnect switch
- Fused transformer(s)
- Customer terminal strip for field-provided controls
- For a control interface without a VFD, it will also include a starter with a motor overload and a motor contactor.
- For a control interface with a VFD, it will not include a starter..

Also, various end device options are available with the control interface wired to a terminal strip. Binary end device

options include:

- Low limit protection
- Condensate overflow switch
- Fan status switch
- Filter status switch

Analog end device options are:

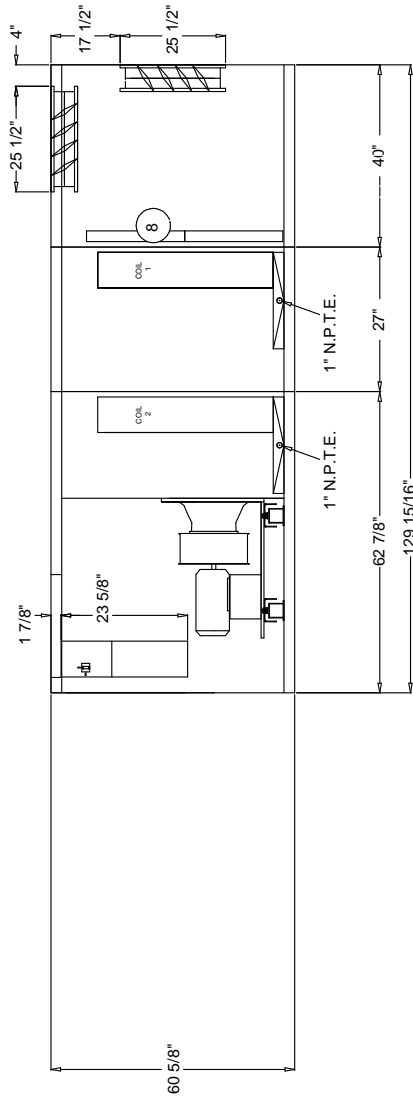
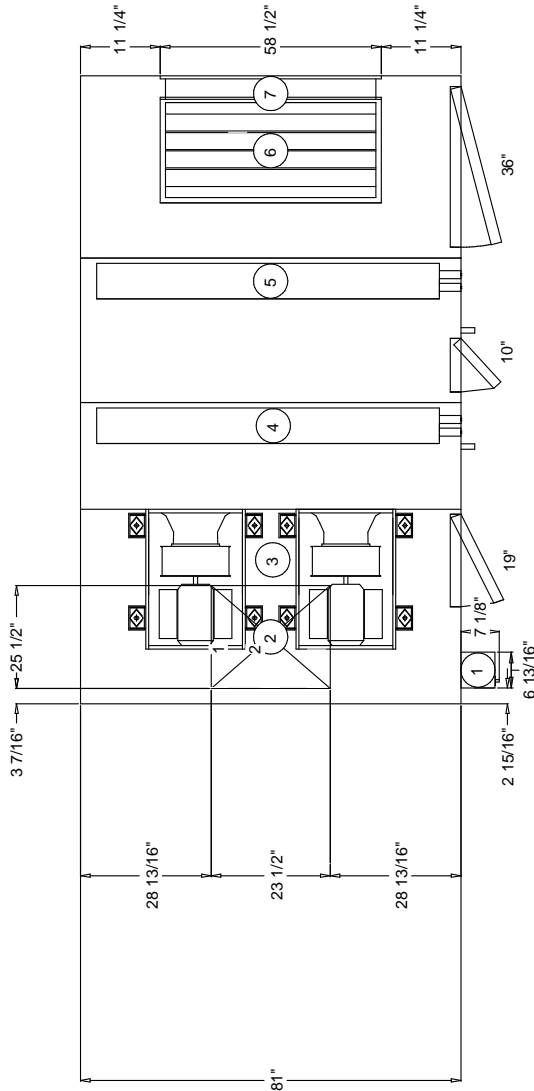
- Discharge air sensor
- Mixed air sensor
- Return air sensor
- Damper actuator

Unit Dimensions - Performance Climate Changer (UCCA)

Item: A1 Qty: 1 Tag(s): Trum- AHU-L

EQUIPMENT LIST

- 1 External unit controller
 - 2 TPFT discharge opening
25 1/2" x 23 1/2"
 - 3 Direct-drive plenum fan - 20" dia.
Supply fan 7.500 hp 460.0 V
 - 4 Cooling coil - 6 row
 - 5 Heating coil - 1 row
 - 6 Damper top-parallel blade
25.470 in x 58.500 in
 - 7 Damper back-parallel blade
25.470 in x 58.500 in
 - 8 Flat filter - 2" MERV 8
16 in. x 20 in. (0)
16 in. x 25 in. (2)
20 in. x 20 in. (0)
20 in. x 25 in. (6)
- Doors**
 19" Width x 57" Height
 10" Width x 57" Height
 36" Width x 57" Height



OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE



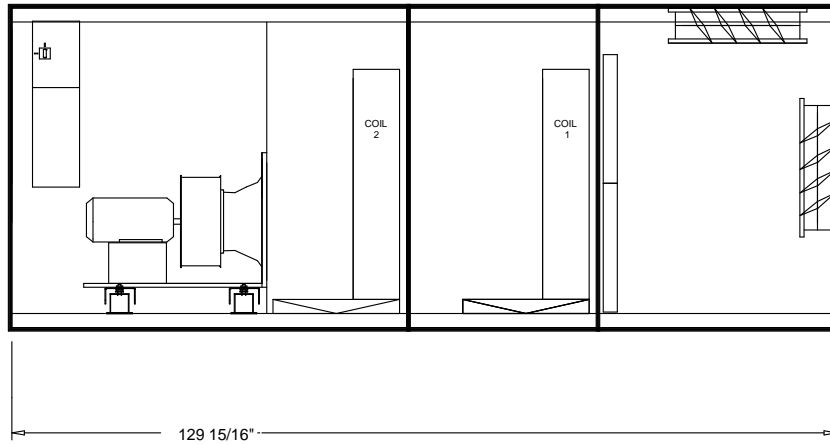
Unit Casing: 2in Double Wall	
Rigging Weight:	2438.3 lb
Installed Weight:	2601.4 lb

Actual airflow:	12225 cfm
------------------------	-----------

Unit size:	25
Product group:	Indoor Unit

Unit Dimensions - Performance Climate Changer (UCCA)


Item: A1 Qty: 1 Tag(s): Trum- AHU-L



Overall Elevation View: Right - Shipping splits indicated by bold outline.

Component	
Main Unit	950.0 lb
Motor	240.0 lb
Coil 1 installed weight	135.2 lb
Coil 2 installed weight	461.2 lb
Access section with coil	339.0 lb
VFD	
Electric Heater	
Filter / Mixbox weight	476.0 lb

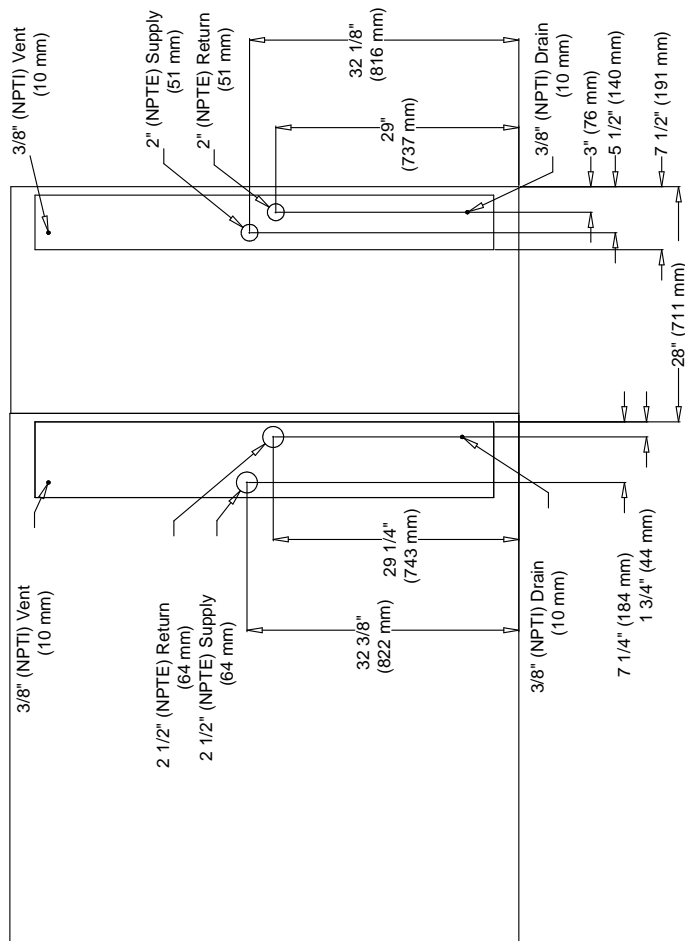
OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 25		Unit Casing: 2in Double Wall	 Performance Climate Changer Air Handlers
Product group: Indoor Unit	Actual airflow: 12225 cfm	Rigging Weight: 2438.3 lb	
		Installed Weight: 2601.4 lb	

Unit Dimensions - Performance Climate Changer (UCCA)

Item: A1 Qty: 1 Tag(s): Trum- AHU-L


Note: Not all components or accessories shown. Main unit shown for reference.



Coil connection view: Right

NPTI: National Pipe Thread Internal Connection
 NPTE: National Pipe Thread External Connection

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size:	25	Unit Casing: 2in Double Wall Foam
Product group:	Indoor Unit	Rigging Weight: 2438.3 lb
	Actual airflow: 12225 cfm	Installed Weight: 2601.4 lb
		 Performance Climate Changer Air Handlers

Unit Dimensions - Performance Climate Changer (UCCA)

Item: A1, A2 Qty: 2 Tag(s): Trum- AHU-L, TE-AHU-101

UCCA Service Clearances

Component		UNIT SIZE									
		3	6	8	10	12	14	17	21	25	30
Filter	A	40.0	44.0	42.0	42.0	40.0	45.0	45.0	45.0	51.0	51.0
Coil Pull	B	49.0	62.0	66.0	78.0	86.0	86.0	94.0	94.0	96.0	109.0
Fan Access, horizontal unit (motor side)	C	48.0	48.0	48.0	51.0	54.0	58.0	61.0	61.0	66.0	66.0
Fan access, horizontal unit (opposite motor side)	C	15.0	18.0	15.0	15.0	17.0	18.0	22.0	23.0	24.0	24.0
Fan Access, vertical unit (motor side)	C	48.0	48.0	48.0	51.0	54.0	58.0	61.0	61.0		
Fan access, vertical unit (opposite motor side)	C	25.0	28.0	21.0	23.0	27.0	27.0	31.0	31.0		
Control Box	D	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
VFD	E	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
EH	F	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
Access Door - Access Section	G	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0

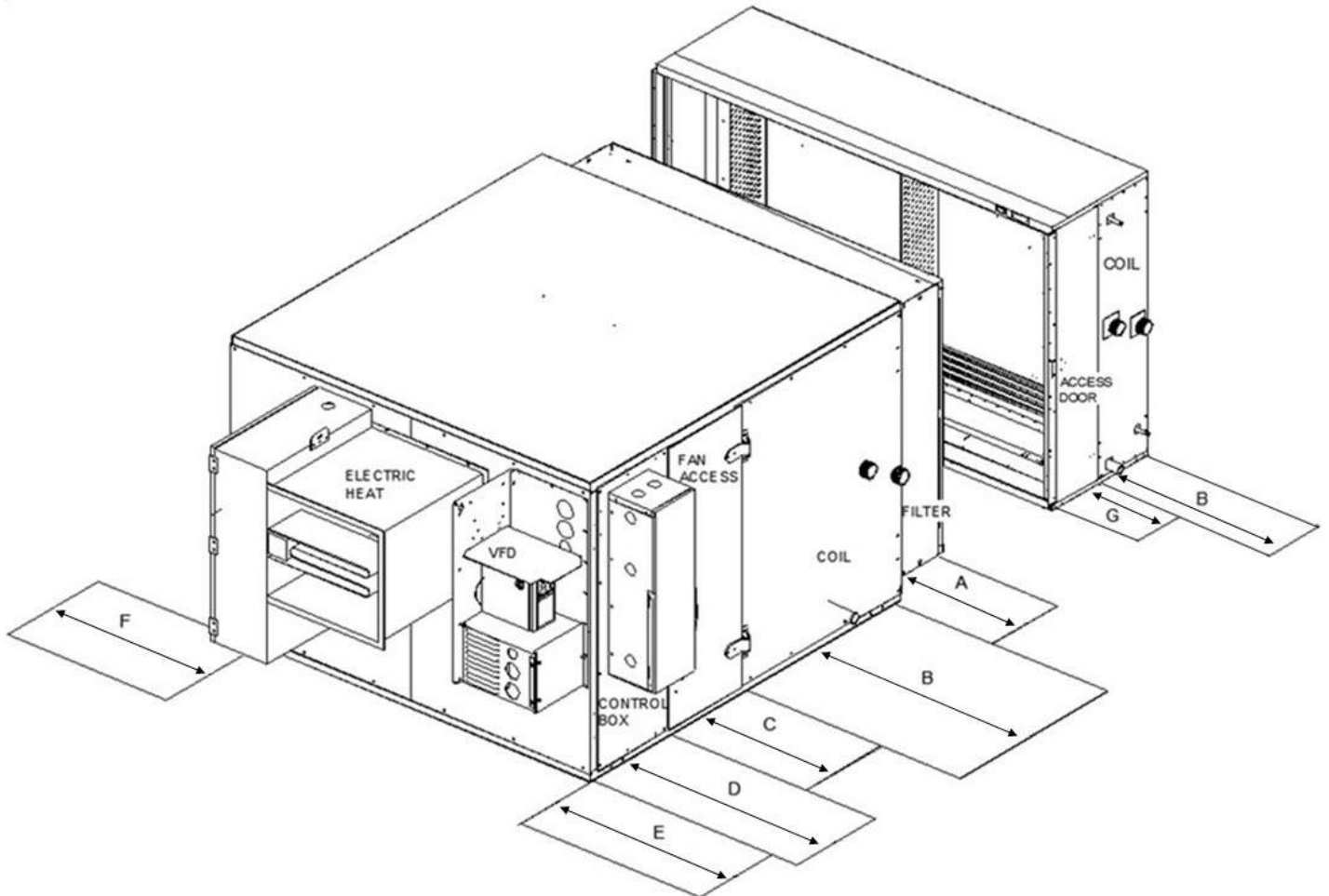
Note(s):

At a minimum, the above clearance dimensions are recommended on one side of the unit for regular service and maintenance.

Refer to as-built submittal for locations of items such as filter access doors, coil, piping connections, motor locations, etc.

Sufficient clearance must be provided on all sides of unit for removal of access panels, plug panels, or section-to-section attachment brackets

Clearance for starters, VFD's, or other high-voltage devices must be provided per NEC requirements.



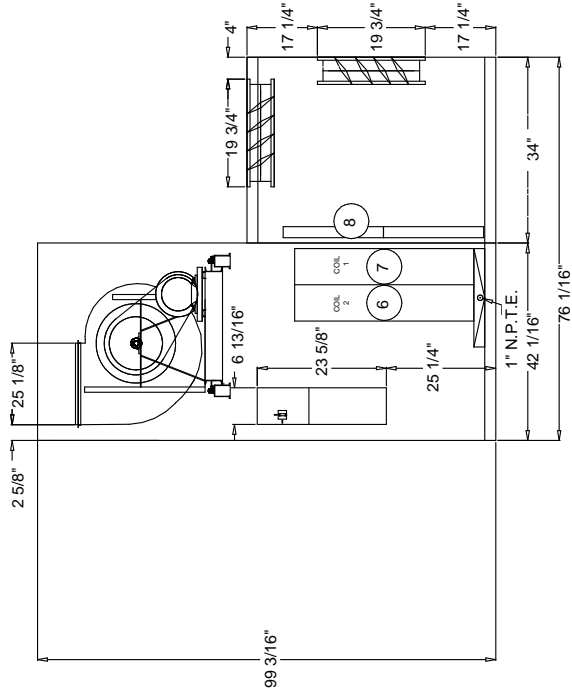
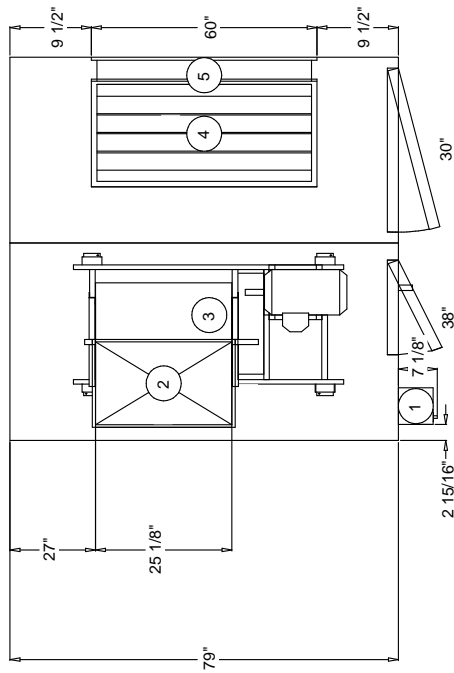
Unit Dimensions - Performance Climate Changer (UCCA)

Item: A2 Qty: 1 Tag(s): TE-AHU-101

EQUIPMENT LIST

- 1 External unit controller
- 2 TPFT discharge opening
- 3 Housed fan - 20" diameter
- 4 Supply fan 10,000 hp 460.0 V
- 5 Damper top-parallel blade
- 6 Damper back-parallel blade
- 7 Cooling coil - 4 row
- 8 Heating coil - 1 row
- Flat filter - 2" MERV 8
- 16 in. x 20 in. (2)
- 20 in. x 25 in. (2)
- 20 in. x 20 in. (2)
- 20 in. x 25 in. (2)

Doors
 38" Width x 45" Height
 30" Width x 50" Height



OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE



Unit Casing: 2in Double Wall

Rigging Weight: 1614.5 lb

Installed Weight: 1721.0 lb

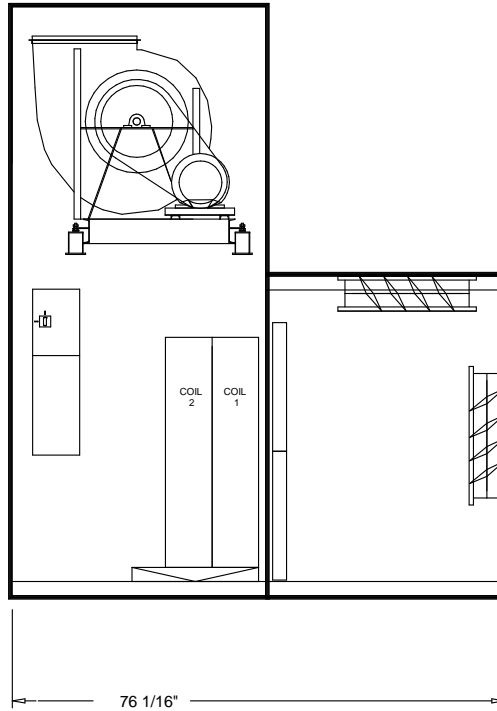
Actual airflow: 10150 cfm

Unit size: 21

Product group: Indoor Unit

Unit Dimensions - Performance Climate Changer (UCCA)


Item: A2 Qty: 1 Tag(s): TE-AHU-101



Overall Elevation View: Right - Shipping splits indicated by bold outline.

Component	
Main Unit	742.0 lb
Motor	136.0 lb
Coil 1 installed weight	118.9 lb
Coil 2 installed weight	318.1 lb
Access section with coil	
VFD	
Electric Heater	
Filter / Mixbox weight	405.0 lb

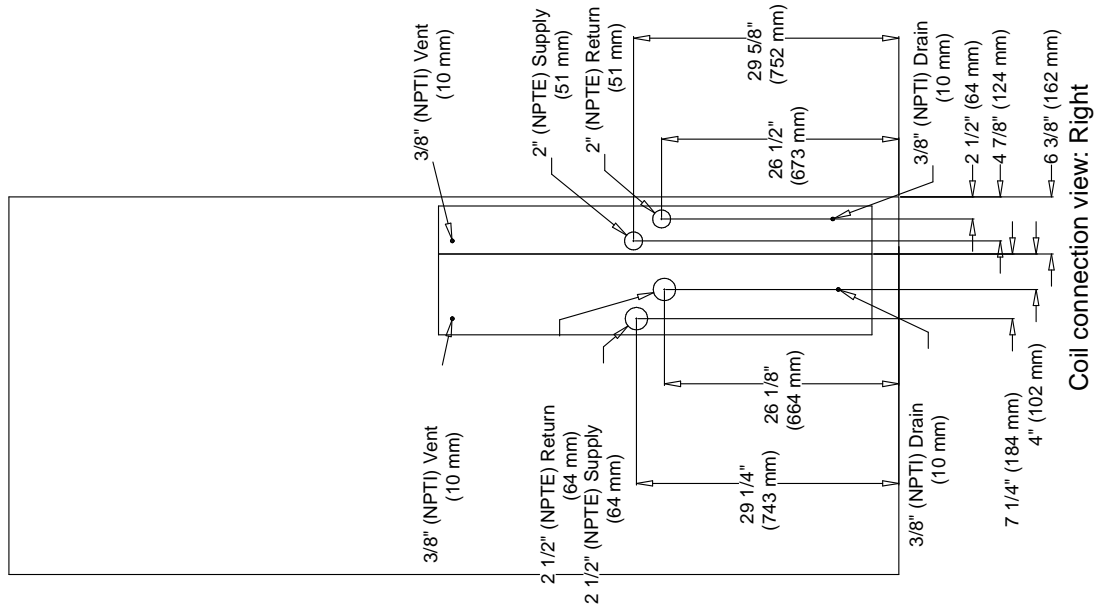
OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

Unit size: 21		Unit Casing: 2in Double Wall	 Performance Climate Changer Air Handlers
Product group: Indoor Unit	Actual airflow: 10150 cfm	Rigging Weight: 1614.5 lb	
		Installed Weight: 1721.0 lb	

Unit Dimensions - Performance Climate Changer (UCCA)

Item: A2 Qty: 1 Tag(s): TE-AHU-101


Note: Not all components or accessories shown. Main unit shown for reference.



Coil connection view: Right

NPTI: National Pipe Thread Internal Connection
 NPTE: National Pipe Thread External Connection

OPENING AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS / RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES / NOT TO SCALE

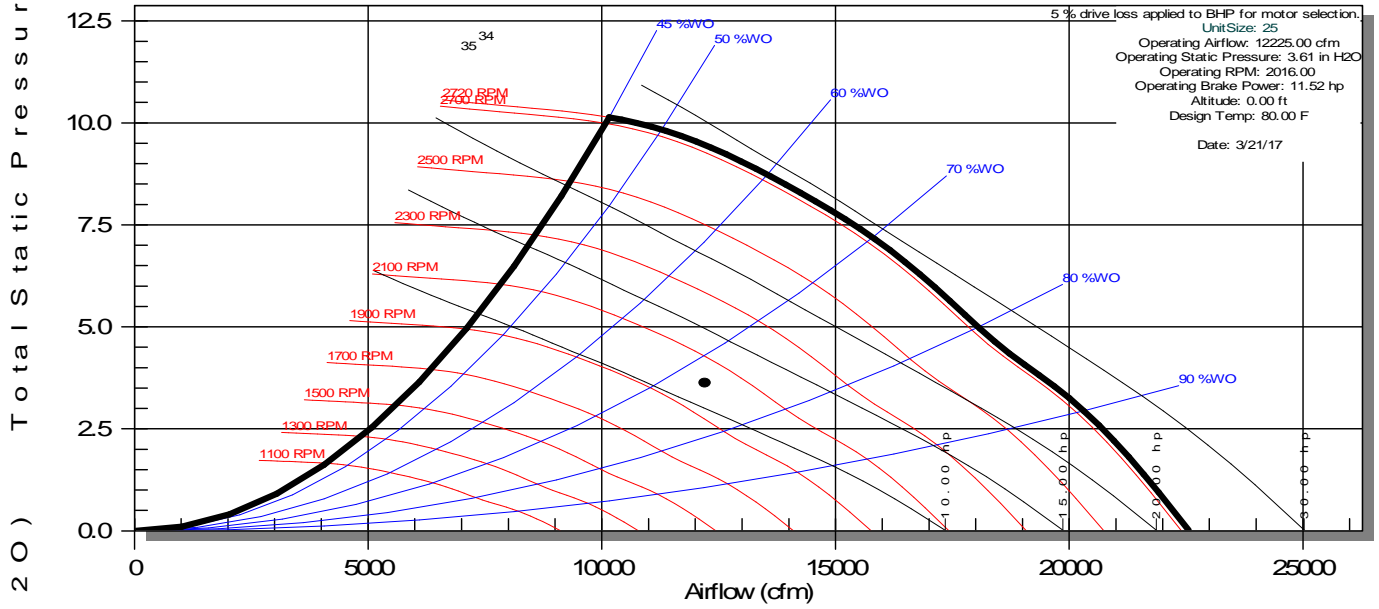
Unit size:	21	Unit Casing: 2in Double Wall Foam
Product group:	Indoor Unit	
Actual airflow: 10150 cfm		Rigging Weight: 1614.5 lb
		Installed Weight: 1721.0 lb
		 Performance Climate Changer Air Handlers

Fan Curve - Performance Climate Changer (UCCA)

Item: A1 Qty: 1 Tag(s): Trum- AHU-L

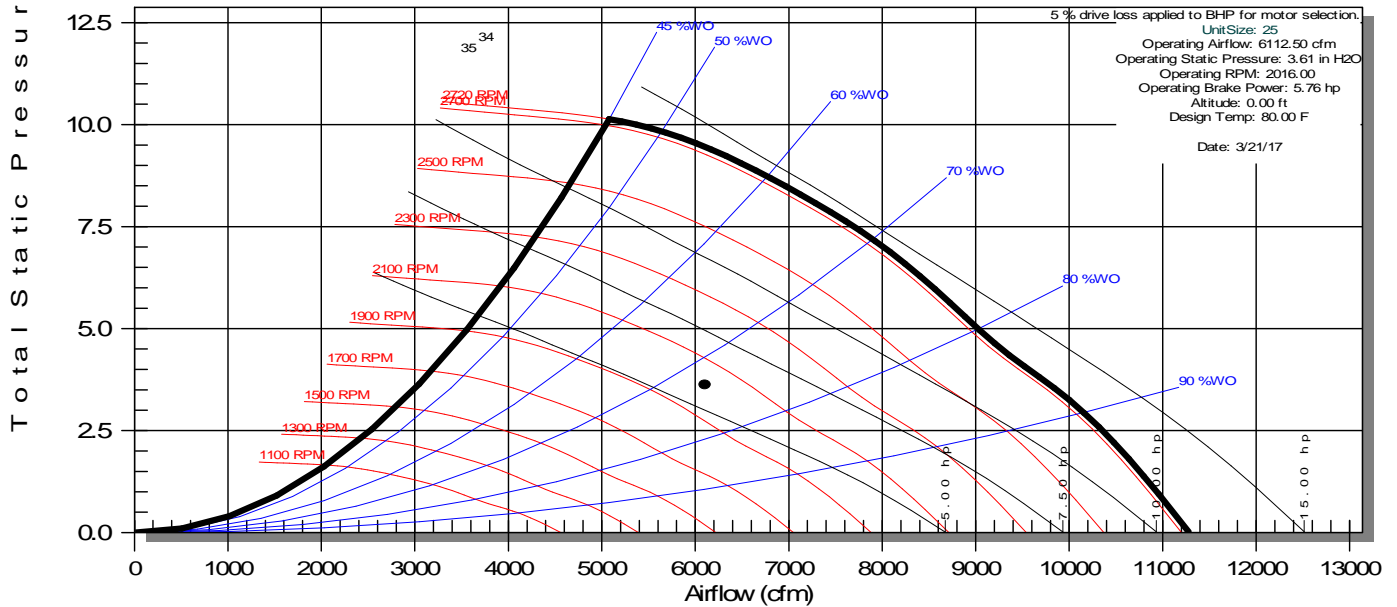
- Supply Fan

Size 25 DDP Front Top Discharge - Dual Fan



- Supply Fan

Size 25 DDP Front Top Discharge - Single Fan

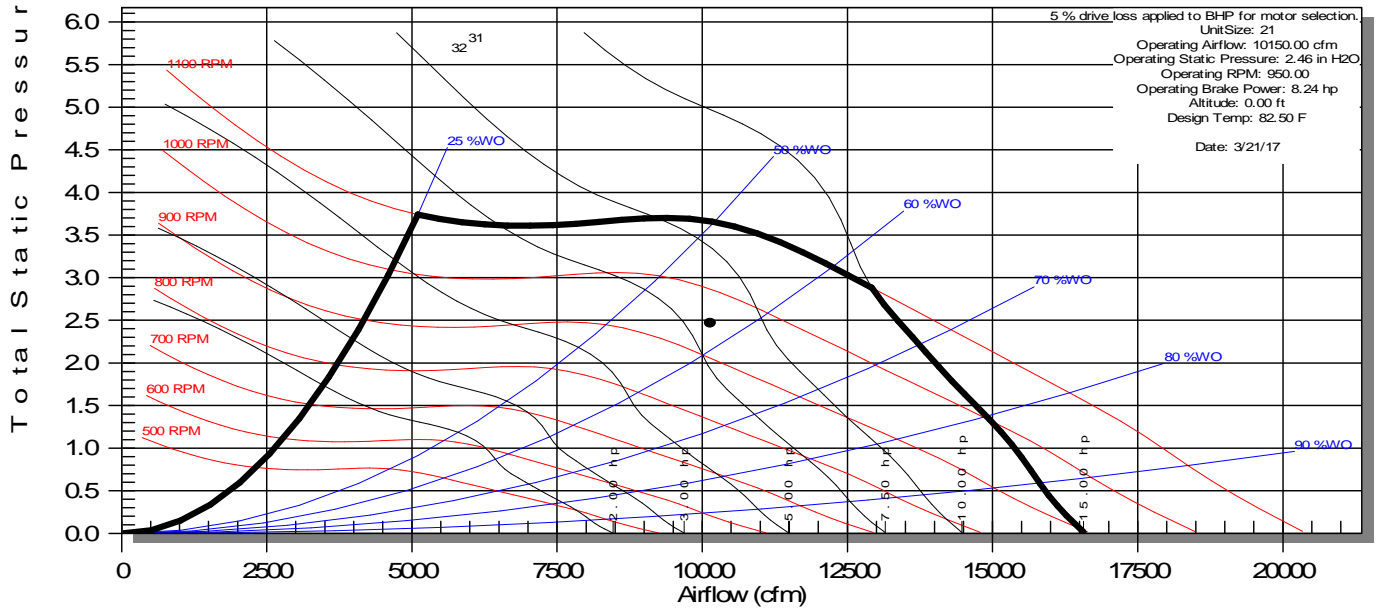


Fan Curve - Performance Climate Changer (UCCA)

Item: A2 Qty: 1 Tag(s): TE-AHU-101

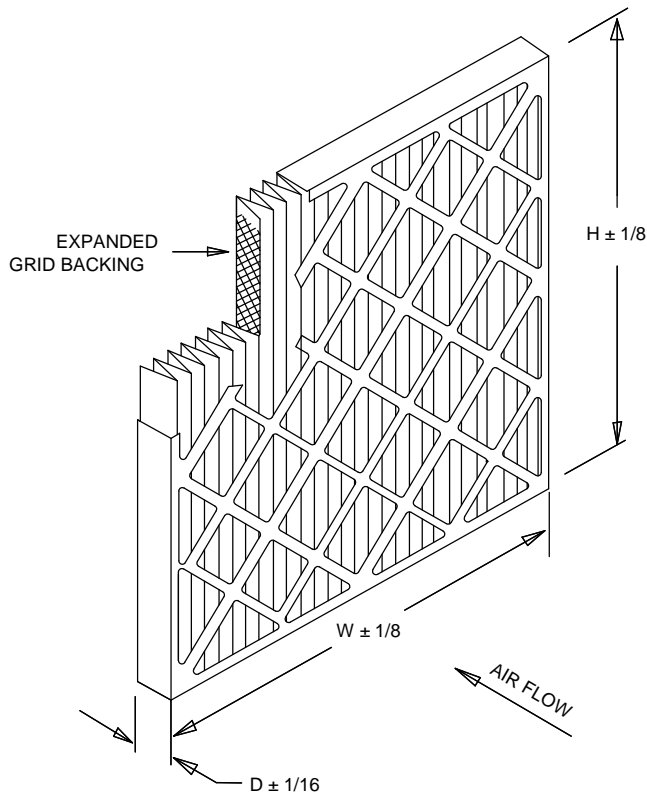
- Supply Fan

Size 21 FC Vertical Top Front Discharge - Single Fan



Accessory - Performance Climate Changer (UCCA)

Item: A1, A2 Qty: 2 Tag(s): Trum- AHU-L, TE-AHU-101



STANDARD CONSTRUCTION

1. 100 % Synthetic White Un-Dyed Media
2. 10.0 Pleats Per Foot
3. Expanded Metal Pleat Supports
4. Moisture Resistant Beverage Board Frame
5. Double Wall Frame

NOTES

1. MERV 8-A Per ASHRAE 52.2-2007 Appendix J.
2. Final Resistance: 1/0" W.G.
3. Rated Velocity: 500 FPM
4. Class 2 Filter Per U.L. Standard 900
5. Maximum Operating Temperature: 225 DEG. F

MODEL NUMBER	NOMINAL SIZE IN. W X H X D	ACTUAL SIZE IN. W X H X D	RATED AIR FLOW CFM	INITIAL RESISTANCE IN. W.G.	MEDIA AREA SQ. FT.
MX40-STD2-217	10 X 20 X 2	9-1/2 X 19-1/2 X 1-3/4	700	0.29	4.7
MX40-STD2-220	12 X 20 X 2	11-1/2 X 19-1/2 X 1-3/4	840	0.29	5.5
MX40-STD2-210	12 X 24 X 2	11-3/8 X 23-3/8 X 1-3/4	1000	0.29	6.2
MX40-STD2-239	14 X 20 X 2	13-1/2 X 19-1/2 X 1-3/4	980	0.29	5.7
MX40-2TD2-241	14 X 25 X 2	13-1/2 X 24-1/2 X 1-3/4	1220	0.29	7.1
MX40-STD2-245	15 X 20 X 2	14-1/2 X 19-1/2 X 1-3/4	1050	0.29	6.2
MX40-STD2-201	16 X 20 X 2	15-1/2 X 19-1/2 X 1-3/4	1120	0.29	6.7
MX40-STD2-216	16 X 24 X 2	15-3/8 X 23-3/8 X 1-3/4	1340	0.29	8.0
MX40-STD2-202	16 X 24 X 2	15-1/2 X 24-1/2 X 1-3/4	1400	0.29	8.0
MX40-STD2-280	15 X 20 X 2	17-1/2 X 19-1/2 X 1-3/4	1250	0.29	7.8
MX40-STD2-212	18 X 24 X 2	17-3/8 X 23-3/8 X 1-3/4	1500	0.29	9.3
MX40-STD2-285	18 X 25 X 2	17-1/2 X 24-1/2 X 1-3/4	1570	0.29	9.7
MX40-STD2-203	20 X 20 X 2	19-1/2 X 19-1/2 X 1-3/4	1400	0.29	8.3
MX40-STD2-211	20 X 24 X 2	19-3/8 X 23-3/8 X 1-3/4	1670	0.29	9.9
MX40-STD2-204	20 X 25 X 2	19-1/2 X 24-1/2 X 1-3/4	1750	0.29	10.3
MX40-STD2-205	24 X 24 X 2	23-3/8 X 23-3/8 X 1-3/4	2000	0.29	11.7
MX40-STD2-225	25 X 25 X 2	24-1/2 X 24-1/2 X 1-3/4	2170	0.29	13.6

Accessory - Performance Climate Changer (UCCA)

Filter Schedule

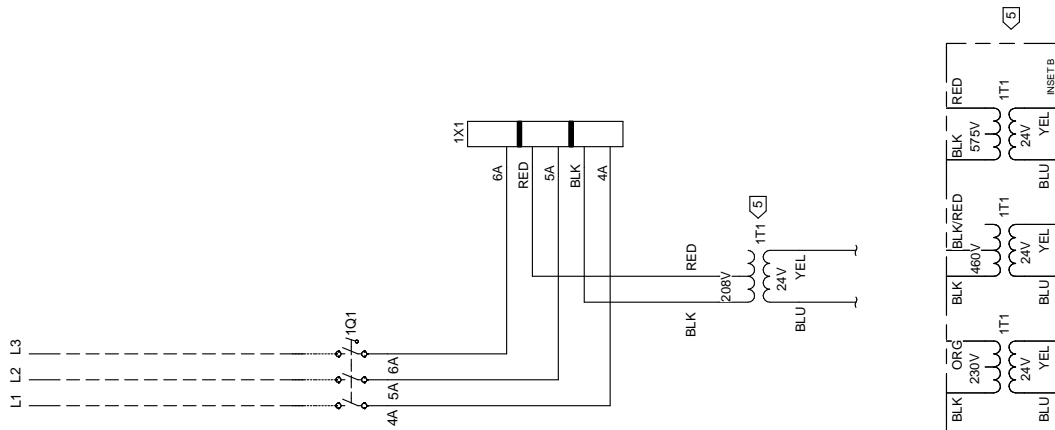
Item: A1, A2 Qty: 2 Tag(s): Trum- AHU-L, TE-AHU-101

Unit Tag(s)	Unit Size	Filter Arrangement	Filter Type \ MERV Rating	Filter Quantity	Filter Size
			2" MERV 8	0 2 0 6	16 in. x 20 in. 16 in. x 25 in. 20 in. x 20 in. 20 in. x 25 in.
			2" MERV 8	2 2 2 2	16 in. x 20 in. 16 in. x 25 in. 20 in. x 20 in. 20 in. x 25 in.

Field Wiring - Performance Climate Changer (UCCA)
Item: A1 Qty: 1 Tag(s): Trum- AHU-L

POWER SCHEMATIC PAGE 1 OF 2

DEVICE	DESCRIPTION	ZONE
1Q1	UNIT DISCONNECT SWITCH	15
1T1	CONTROL TRANSFORMER	31
1X1	POWER DISTRIBUTION BLOCK	20



<p>CAUTION</p> <p>USE COPPER CONDUCTORS ONLY. OTHER TYPES MAY BE DAMAGED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.</p> <p>ATTENTION</p> <p>N'UTILISER QUE DES CONDUCTEURS EN CUIVRE! LES BORNES DE L'UNITÉ NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS. L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT ENDOMMAGER L'ÉQUIPEMENT.</p> <p>PRECAUCION</p> <p>UTILICE ÚNICAMENTE CONDUCTORES DE COBRE! LAS TERMINALES DE LA UNIDAD NO ESTÁN DISEÑADAS PARA RECIBIR OTROS TIPOS DE CONDUCTORES. SI NO LO HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.</p>	<p>WARNING</p> <p>HAZARDOUS VOLTAGE. SERIOUS INJURY OR DEATH MAY RESULT FROM CONTACT WITH ENERGIZED PARTS. FOLLOW LOCK-OUT AND TAG PROCEDURES INCLUDING REMOTE DISCONNECTS AND VERIFY ZERO VOLTAGE. MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVES HAVE STORED VOLTAGE. FOLLOW THE MANUFACTURER'S INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE BEFORE WORKING ON THE UNIT MAY RESULT IN DEATH OR SERIOUS INJURY.</p> <p>AVERTISSEMENT</p> <p>TENSION DANGEREUSE! NE PAS RESPECTER CES MESURES DE SÉCURITÉ PEUT ENTRAÎNER DES BLESSURES GRAVES, MORTELLES, OU LA MORT.</p> <p>ADVERTENCIA</p> <p>¡VOLTAJE PELIGROSO! NO RESPETAR ESTAS MEDIDAS DE SEGURIDAD PUEDE CAUSAR LESIONES PERSONALES, SERIOAS O LA MUERTE. SIGA LOS PROCEDIMIENTOS DE CIERRE Y VERIFIQUE CERO VOLTAJE. LOS CONDENSADORES DE LOS MOTORES SON CAPACITORES QUE TIENEN CARGA ALMACENADA. SIGA LAS INSTRUCCIONES DEL FABRICANTE PARA LA DESCARGA DEL CONDENSADOR. EL NO REALIZAR LO ANTERIORMENTE PUEDE RESULTAR EN LA MUERTE O SERIAS LESIONES PERSONALES.</p>
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Field Wiring - Performance Climate Changer (UCCA)
Item: A1 Qty: 1 Tag(s): Trum- AHU-L

POWER SCHEMAIC PAGE 2 OF 2

NOTES:

1. UNLESS OTHERWISE NOTED ALL SWITCHES ARE SHOWN AT 25 C (77 F), AT ATMOSPHERIC PRESSURE, AT 50 PERCENT RELATIVE HUMIDITY, WITH ALL UTILITIES TURNED OFF, AND AFTER A NORMAL SHUTDOWN HAS OCCURRED.
2. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. PHANTOM LINE ENCLOSURES INDICATE ALTERNATE CIRCUITRY OR AVAILABLE SALES OPTIONS. SOLID LINES INDICATE WIRING BY TRANE.
3. NUMBERS ALONG THE RIGHT SIDE OF THE SCHEMATIC DESIGNATE THE LOCATION OF CONTACTS BY LINE NUMBER. AN UNDERLINED NUMBER INDICATES A NORMALLY CLOSED CONTACT. AN OPEN ARROWHEAD BELOW THE LINE NUMBER POINTING UPWARD INDICATES A TIMED CONTACT WHICH BEGINS TIMING WHEN ENERGIZED.
4. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, STATE, AND LOCAL REQUIREMENTS. OTHER COUNTRIES APPLICABLE NATIONAL AND/OR LOCAL REQUIREMENTS SHALL APPLY. FIELD CONDUCTORS SHALL HAVE INSULATION RATING NOT LESS THAN 600V COPPER CONDUCTORS ONLY.
5. CONTROL TRANSFORMER SHOWN FOR 208V PRIMARY. FOR 230V, 460V, OR 575V PRIMARY REFER TO INSET "B".

AREA	DEVICE PREFIX	LOCATION CODE
1		LOCATION
2		MAIN CONTROL PANEL
3		SUPPLY FAN & COIL SECTION
4		ELECTRIC HEAT CONTROL BOX
5		FILTER SECTION
6		MIXING BOX SECTION
7		COIL ACCESS SECTION
8		EXTERNAL PIPING
9		FIELD INSTALLED DEVICE
		VFD CONTROL PANEL

WARNING

HAZARDOUS VOLTAGE!
 DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS AND FOLLOW LOCK OUT AND TAG PROCEDURES BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED DRIVE, REFER TO DRIVE INSTRUCTIONS FOR CAPACITOR DISCHARGE. FAILURE TO DO THE ABOVE BEFORE SERVICING COULD RESULT IN DEATH OR SERIOUS INJURY.

AVERTISSEMENT

TENSION DANGEREUSE!
 COUPER TOUTES LES TENSIONS ET OUVRIR LES SECTIONNEURS A DISTANCE PUIS SUIVRE LES PROCEDURES DE VERIFICATION DE LA VERIFICATION DE LA TOUTE INTERVENTION. VERIFIER QUE TOUT LES CONDENSATEURS DES MOTEURS SONT DECHARGES. DANS LE CAS D'UNITES COMPORTANT DES ENTRAINEMENTS A VITESSE VARIABLE, SE REPORTER AUX INSTRUCTIONS DE L'ENTRAINEMENT POUR DECHARGER LES CONDENSATEURS.

ADVERTENCIA

VOLTAJE PELIGROSO!
 DESCONECTE TODA LA ENERGIA ELECTRICA, INCLUIDO LAS DESCONEXIONES REMOTAS Y OUVRIRE LAS SECCIONES A DISTANCIA Y SIGUIENDO LAS PROCEDURAS DE VERIFICACION DEL SERVICIO. ASEGURESE DE QUE TODOS LOS CAPACITORES DEL MOTOR HAYAN DESCARGADO EL VOLTAJE ALMACENADO. PARA LAS UNIDADES CON EJE DE DIRECCION DE VELOCIDAD VARIABLE, CONSULTAR LAS INSTRUCCIONES PARA LA DESCARGA DEL CONDENSADOR. EL NO REALIZAR LO ANTERIORMENTE INDIQUADO PUEDE RESULTAR EN LA MUERTE O SERIAS LESIONES PERSONALES.

CAUTION

USE COPPER CONDUCTORS ONLY!
 UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.
 FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

ATTENTION

N'UTILISER QUE DES CONDUCTEURS EN COUVRÉ!
 LES BORNES DE L'UNITÉ NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS.
 L'UTILISATION DE TOUT AUTRE CONDUCTEUR PEUT ENDOMMAGER L'ÉQUIPEMENT.

PRECAUCION

UTILICE UNICAMENTE CONDUCTORES DE COBRE!
 LAS TERMINALES DE LA UNIDAD NO ESTAN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES.
 SI NO LO HACE, PUEDE OCASIONAR DAÑO AL EQUIPO.

Field Wiring - Performance Climate Changer (UCCA)
Item: A1 Qty: 1 Tag(s): Trum- AHU-L

WARNING
 HAZARDOUS VOLTAGE!
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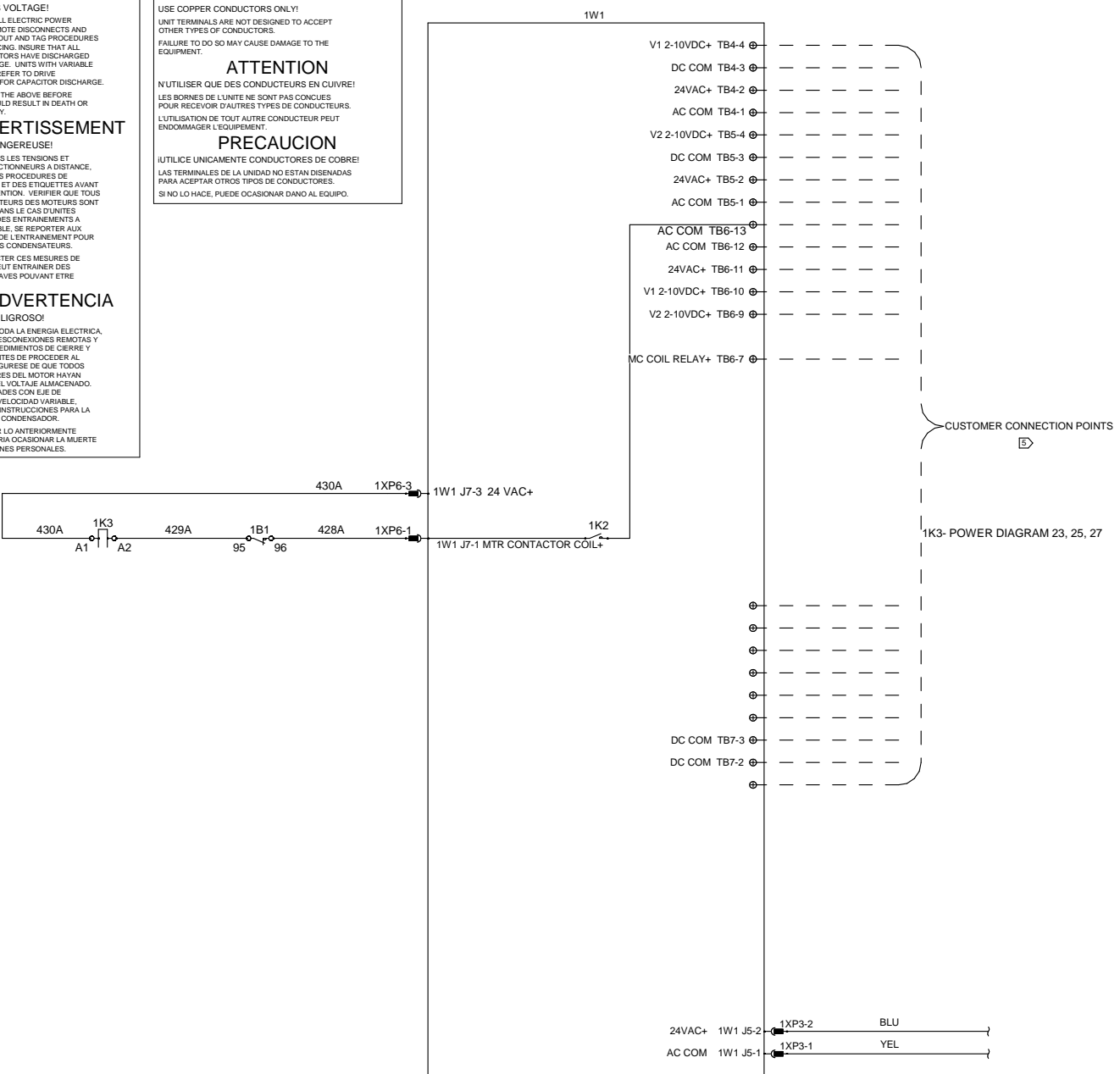
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CONTROL SCHEMATIC



NOTES:

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- DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS PROVIDED BY THE FIELD. PHANTOM LINE ENCLOSURES INDICATE ALTERNATE CIRCUITRY OR AVAILABLE SALES OPTIONS. SOLID LINES INDICATE WIRING BY TRANE.
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- USE CLASS 2 WIRING.
- ALL AVAILABLE END DEVICES SHOWN. SEE UNIT CONFIGURATION FOR END DEVICES ON UNIT.

DEVICE PREFIX LOCATION CODE	
AREA	LOCATION
1	MAIN CONTROL PANEL
2	SUPPLY FAN & COIL SECTION
3	ELECTRIC HEAT CONTROL BOX
4	FILTER SECTION
5	MIXING BOX SECTION
6	COIL ACCESS SECTION
7	EXTERNAL PIPING
8	FIELD INSTALLED DEVICE
9	VFD CONTROL PANEL

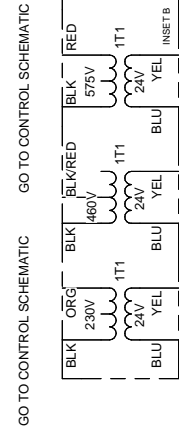
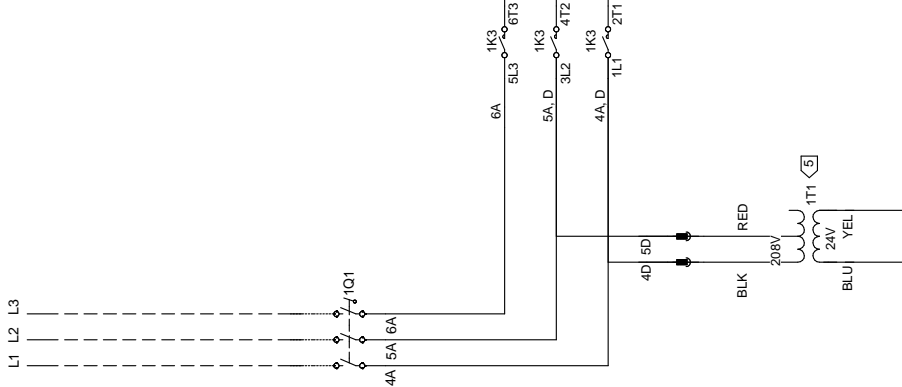
DEVICE	DESCRIPTION	ZONE
1B1	RELAY; OVERLOAD	38
1K2	RELAY; MTR CONTACTOR COIL	38
1K3	MOTOR CONTACTOR	38
1W1	ADAPTER BOARD	34
2R1	MIXED AIR SENSOR	51
2R2	DISCHARGE AIR SENSOR	53
2S1	LOW LIMIT SWITCH	55
2S2	CONDENSATE OVERFLOW SWITCH	57
2S3	FAN STATUS SWITCH	59
2S4	FILTER STATUS SWITCH	61
5M1	DAMPER ACTUATOR	47

Field Wiring - Performance Climate Changer (UCCA)

Item: A2 Qty: 1 Tag(s): TE-AHU-101

POWER SCHEMATIC PAGE 1 OF 2

DEVICE	DESCRIPTION	ZONE
1B1	MOTOR OVERLOAD RELAY	24
1K3	FAN MOTOR CONTACTOR	25
1Q1	UNIT DISCONNECT SWITCH	17
1T1	CONTROL TRANSFORMER	36
2M1	MOTOR 1	24



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WARNING
HAZARDOUS VOLTAGE
ELECTRIC SHOCK, FATAL FATALITIES OR OTHER SERIOUS INJURIES MAY OCCUR IF YOU DO NOT FOLLOW THE INSTRUCTIONS.
FOLLOW LOCK-OUT AND TAG PROCEDURES INCLUDING REMOTE DISCONNECTS AND VERIFY THE SYSTEM IS DEENERGIZED.
MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE. UNITS WITH VARIABLE SPEED VOLTAGE.
FOLLOW THE INSTRUCTIONS FOR CAPACITOR DISCHARGE.
FAILURE TO DO THE ABOVE BEFORE SERVICING MAY RESULT IN DEATH OR SERIOUS INJURY.

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SIGA LAS INSTRUCCIONES DE LA UNIDAD PARA LAS UNIDADES CON VELOCIDAD VARIABLE. LA FALTA DE DESCARGA DE LOS CAPACITORES PUEDE RESULTAR EN LA MUERTE O SERIAS LESIONES PERSONALES.

TENSION DANGEREUSE!
COUPER TOUS LES TENSIONS ET VÉRIFIER QUE LE SYSTÈME EST DÉENERGIZÉ.
PLUS SUIVRE LES PROCÉDURES DE CIERRE Y VERIFICATION DE L'ENERGIE.
SI VOUS REALISER UN SERVICE, S'ASSUREZ QUE TOUTES LES CONDENSATEURS DES MOTEURS SONT DÉCHARGÉS.
SUIVEZ LES INSTRUCTIONS DE LA UNITE POUR LES UNITES A VITESSE VARIABLE.
LA NON-RECHARGE DES CONDENSATEURS PEUT ENTRAÎNER LA MORT OU DE SERIES LÉSIONS PERSONNELLES.

Field Wiring - Performance Climate Changer (UCCA)
Item: A2 Qty: 1 Tag(s): TE-AHU-101

POWER SCHEMAIC PAGE 2 OF 2

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5. CONTROL TRANSFORMER SHOWN FOR 208V PRIMARY. FOR 230V, 460V, OR 575V PRIMARY REFER TO INSET "B".

AREA	DEVICE PREFIX	LOCATION CODE
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Field Wiring - Performance Climate Changer (UCCA)
Item: A2 Qty: 1 Tag(s): TE-AHU-101

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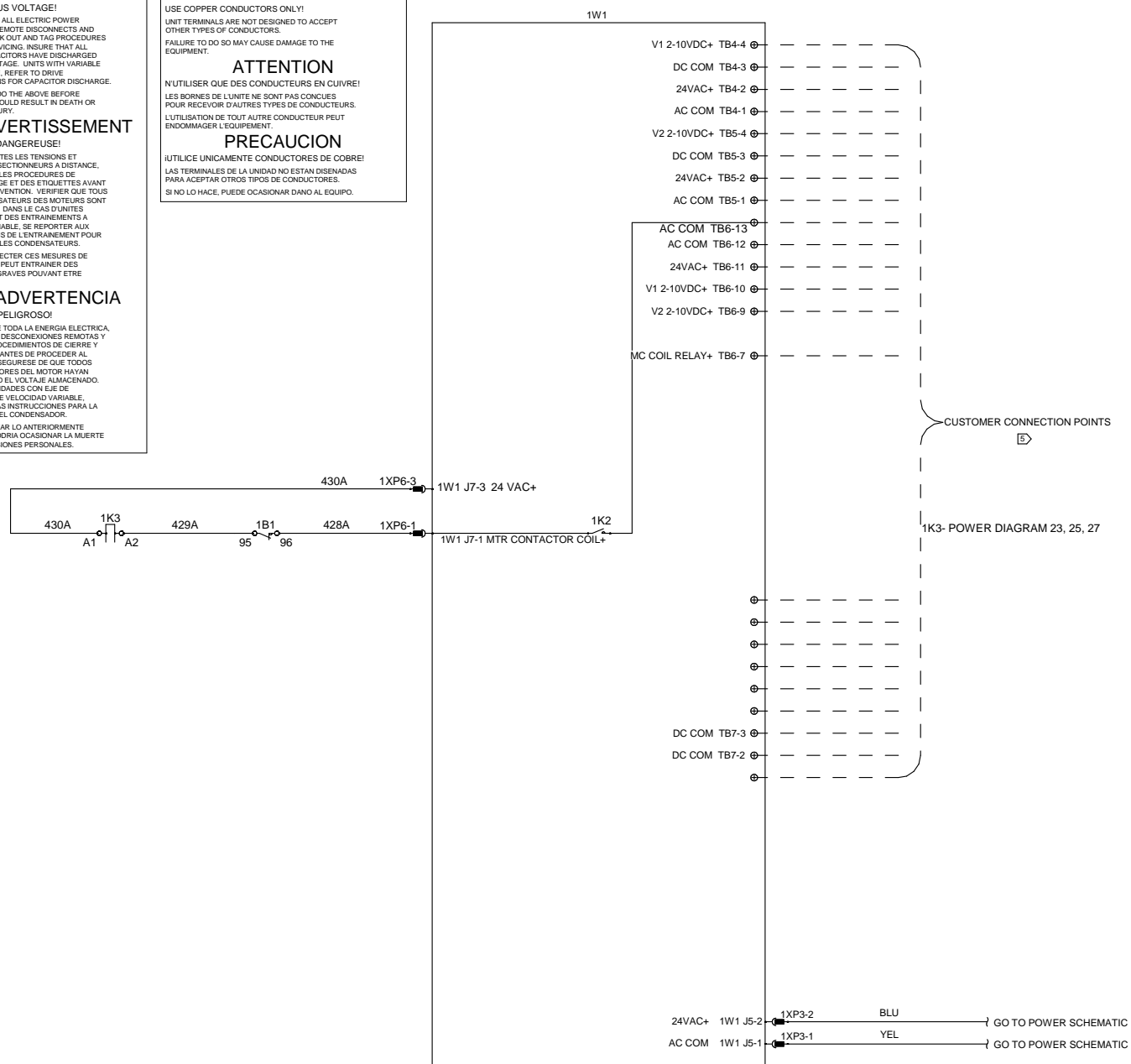
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5M1	DAMPER ACTUATOR	47

Field Wiring - Performance Climate Changer (UCCA)**MCA - MOP Schedule****Item: A1, A2 Qty: 2 Tag(s): Trum- AHU-L, TE-AHU-101**

Unit Tag(s)	Circuit	Circuit Description	Voltage/Phase/Hz	MCA (A)	MOP (A)
	1	Single point power	460/60/3	-	-
	1	Single point power	460/60/3	17.72	30.00

Tag Data - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop (Qty: 3)

Item	Tag(s)	Qty	Description	Model Number
B1	TE-RTU-1	1	3-10 Ton R-410A PKGD Unitary Cooling Roo	THC048F3E0A--D2B1A1000000000000000000000000
B2	TE-RTU-2	1	3-10 Ton R-410A PKGD Unitary Cooling Roo	THC092F3E0A--D0B1A1000000000000000000000000
B3	TE-RTU-3	1	3-10 Ton R-410A PKGD Unitary Cooling Roo	THC036-3E0A--D2B1A1000000000000000000000000

Product Data - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop**All Units**

DX cooling
 High efficiency
 Convertible configuration
 208-230/60/3
 Electro-Mechanical controls 3ph
 Economizer Dry Bulb 0-100% with barometric relief
 Standard panels/Pleated Filters Merv 8
 Standard condenser coil with hail guard
 Through the base 3 ph
 Non-fused disconnect 3 ph
 1st Year Labor warranty

Item: B1 Qty: 1 Tag(s): TE-RTU-1

4 Ton
 Belt drive motor 3 ph

Item: B2 Qty: 1 Tag(s): TE-RTU-2

7.5 Ton Dual compressor

Item: B3 Qty: 1 Tag(s): TE-RTU-3

3 Ton
 Belt drive motor 3 ph

Performance Data - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop

Tags	TE-RTU-1	TE-RTU-2	TE-RTU-3
Airflow Application	Downflow	Downflow	Downflow
Design Airflow (cfm)	1600	3000	1200
Cooling Entering Dry Bulb (F)	80.00	80.00	80.00
Cooling Entering Wet Bulb (F)	67.00	67.00	67.00
Ent Air Rel Humidity (%)	51.08	51.08	51.08
Ambient Temp (F)	100.00	100.00	100.00
Cooling Leaving Unit DB (F)	62.20	61.02	60.97
Cooling Leaving Unit WB (F)	58.03	58.07	57.78
Gross Total Capacity (MBh)	48.24	89.23	37.03
Gross Sensible Capacity (MBh)	34.08	66.97	27.17
Gross Latent Capacity (MBh)	14.16	22.26	9.86
Net Total Capacity (MBh)	45.33	84.70	34.91
Net Sensible Capacity (MBh)	31.17	62.44	25.05
Net Sensible Heat Ratio (Number)	0.69	0.74	0.72
Design ESP (in H2O)	1.250	1.250	1.000
Electric Heat Static Press Add (in H2O)	0.000	0.000	0.000
Component SP Add (in H2O)	0.150	0.230	0.100
Field Supplied Drive Kit Required	High Static Drive Kit	None	None
Indoor Mtr. Operating Power (bhp)	0.88	1.64	0.72
Indoor RPM (rpm)	1118	1318	1051
Indoor Motor Power (kW)	0.66	1.22	0.54
Outdoor Motor Power (kW)	0.34	0.70	0.22
Compressor Power (kW)	3.36	6.49	2.81
System Power (kW)	4.35	8.41	3.57
SEER @ AHRI (btuh/watt)	-	-	15.00
IPLV @ AHRI (IPLV)	0.0	14.5	-
MCA (A)	24.60	41.90	19.60
MOP (A)	35.00	50.00	30.00
Compressor 1 RLA (A)	13.70	15.90	11.50
Compressor 2 RLA (A)	0.00	10.00	0.00
Condenser Fan FLA (A)	2.50	3.50	1.50

Tags	TE-RTU-1	TE-RTU-2	TE-RTU-3
Evaporator Fan FLA (A)	5.00	8.50	5.00
Evaporator Face Area (sq ft)	9.27	12.36	7.71
Evaporator Face Velocity (ft/min)	173	243	156
Evaporator Fin Spacing (Per Foot)	192	192	192
Evaporator Rows ()	3	4	3
Min. Unit Operating Weight (lb)	642.0	928.0	544.0
Max Unit Operating Weight (lb)	905.0	1228.0	773.0
Fan Motor Heat (MBh)	2.91	4.53	2.12
Evap Coil Leav Air Temp (DB) (F)	60.28	59.33	59.04
Evap Coil Leav Air Temp (WB) (F)	57.29	57.43	57.03
Dew Point Temp (F)	55.36	56.21	55.74
Ducted Discharge Heating - 63 Hz (dB)	-	82	91
Ducted Discharge Heating - 125 Hz (dB)	-	86	76
Ducted Discharge Heating - 250 Hz (dB)	-	81	72
Ducted Discharge Heating - 500 Hz (dB)	-	78	65
Ducted Discharge Heating - 1 kHz (dB)	-	74	63
Ducted Discharge Heating - 2 kHz (dB)	-	70	59
Ducted Discharge Heating - 4 kHz (dB)	-	69	57
Ducted Discharge Heating - 8 kHz (dB)	-	61	49
Ducted Inlet Heating - 63 Hz (dB)	-	80	89
Ducted Inlet Heating - 125 Hz (dB)	-	80	75
Ducted Inlet Heating - 250 Hz (dB)	-	76	64
Ducted Inlet Heating - 500 Hz (dB)	-	66	56
Ducted Inlet Heating - 1 kHz (dB)	-	57	52
Ducted Inlet Heating - 2 kHz (dB)	-	58	50
Ducted Inlet Heating - 4 kHz (dB)	-	57	48
Ducted Inlet Heating - 8 kHz (dB)	-	48	42
Outdoor Noise Heating - 63 Hz (dB)	-	90	79
Outdoor Noise Heating - 125 Hz (dB)	-	86	85
Outdoor Noise Heating - 250 Hz (dB)	-	90	79
Outdoor Noise Heating - 500 Hz (dB)	-	85	79
Outdoor Noise Heating - 1 kHz (dB)	-	80	77
Outdoor Noise Heating - 2 kHz (dB)	-	77	71
Outdoor Noise Heating - 4 kHz (dB)	-	74	67
Outdoor Noise Heating - 8 kHz (dB)	-	66	58
Rated capacity (AHRI) (MBh)	49.00	89.00	37.00
Exhaust fan power (kW)	0.65	0.65	0.65
Refrig charge (HFC-410A) - ckt 1 (lb)	5.2	5.5	6.2
Refrig charge (HFC-410A) - ckt 2 (lb)	-	4.2	-
ASHRAE 90.1	Yes	Yes	Yes
Saturated Suction Temp Circuit 1 (F)	51.11	53.26	51.61
Saturated Discharge Temp Circuit 1 (F)	115.46	121.11	118.89
Saturated Suction Temp Circuit 2 (F)	-	55.14	-
Saturated Discharge Temp Circuit 2 (F)	-	118.18	-
IEER Rating ()	0.00	14.50	-
EER @ AHRI Conditions (EER)	15.0	12.6	-
Total Static Pressure (in H2O)	1.400	1.480	1.100

Mechanical Specifications - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B1 - B3 Qty: 3 Tag(s): TE-RTU-1, TE-RTU-2, TE-RTU-3**General**

The units shall be convertible airflow. The operating range shall be between 115°F and 0°F in cooling as standard from the factory for units with microprocessor controls. Operating range for units with electromechanical controls shall be between 115°F and 40°F. Cooling performance shall be rated in accordance with ARI testing procedures. All units shall be factory assembled, internally wired, fully charged with R-410A, and 100 percent run tested to check cooling operation, fan and blower rotation, and control sequence before leaving the factory. Wiring internal to the unit shall be colored and numbered for simplified identification. Units shall be cULus listed and labeled, classified in accordance for Central Cooling Air Conditioners.

Casing

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. Units surface shall be tested 672 hours in a salt spray test in compliance with ASTM B117. Cabinet construction shall allow for all maintenance on one side of the unit. Service panels shall have lifting handles and be removed and reinstalled by removing two fasteners while providing a water and air tight seal. All exposed vertical panels and top covers in the indoor air section shall be insulated with a cleanable foil-faced, fire-retardant permanent, odorless glass fiber material. The base of the unit shall be insulated with 1/8", foil-faced, closed-cell insulation. All insulation edges shall be either captured or sealed. The units base pan shall have no penetrations within the perimeter of the curb other than the raised 1 1/8" inch high downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up. The base of the unit shall have provisions for forklift and crane lifting, with forklift capabilities on three sides of the unit.

Unit Top

The top cover shall be one piece construction or, where seams exist, it shall be double-hemmed and gasket-sealed. The ribbed top adds extra strength and enhances water removal from unit top.

Filters

Throwaway filters shall be standard on all units. Optional 2-inch MERV 8 and MERV 13 filters shall also be available.

Two-Inch Pleated Filters

Two inch pleated media filters shall be available on all models.

Compressors

All units shall have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps. Motor shall be suction gas-cooled and shall have a voltage utilization range of plus or minus 10 percent of unit nameplate voltage. Internal overloads shall be provided with the scroll compressors.

Dual compressors are outstanding for humidity control, light load cooling conditions and system back-up applications. Dual compressors are available on 7½-10 ton models and allow for efficient cooling utilizing 3-stages of compressor operation for all high efficiency models.

Notes:

Crankcase heaters are optional on TSC (036, 048, 060, 072, 090, 102, 120); standard on THC (036, 048, 060, 072, 092, 102, 120).

Evaporator and Condenser Coils

Internally finned, 5/16" copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Evaporator coils are standard for all 3 to 10 ton standard efficiency models. Microchannel condenser coils are standard for all 3 to 10 ton standard efficiency models and 4,5,6, 7.5, 8.5 ton high efficiency models. The microchannel type condenser coil is not offered on the 4 and 5 ton dehumidification model. Due to flat streamlined tubes with small ports, and metallurgical tube-to-fin bond, microchannel coil has better heat transfer performance. Microchannel condenser coil can reduce system refrigerant charge by up to 50% because of smaller internal volume, which leads to better compressor reliability. Compact all-aluminum microchannel coils also help to reduce the unit weight. These all aluminum coils are recyclable. Galvanic corrosion is also minimized due to all aluminum construction. Strong aluminum brazed structure provides better fin protection. In addition, flat streamlined tubes also make microchannel coils more dust resistant and easier to clean. Coils shall be leak tested at the factory to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 600 psig. The assembled unit shall be leak tested to 465 psig. The condenser coil shall have a patent pending 1+1+1 hybrid coil designed with slight gaps for ease of cleaning. A plastic, dual-sloped, removable and reversible condensate drain pan with through-the-base condensate drain is standard.

Tool-less Hail Guards

Tool-less, hail protection quality coil guards are available for condenser coil protection.

Outdoor Fans

The outdoor fan shall be direct-drive, statically and dynamically balanced, draw-through in the vertical discharge position. The fan motor shall be permanently lubricated and shall have built-in thermal overload protection.

Indoor Fan

The following units shall be equipped with a direct drive plenum fan design (T/YSC120F, T/YHC074F, T/YHC092F, T/YHC102F, 120F). Plenum fan design shall include a backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor. All plenum fan designs will have a variable speed adjustment potentiometer located in the control box.

3 to 5 ton units (high efficiency 3-phase with optional motor) are belt driven, FC centrifugal fans with adjustable motor sheaves. 3 to 5 ton units have multispeed, direct drive motors. All 6 to 8½ ton units (standard efficiency) shall have belt drive motors with an adjustable idler-arm assembly for quick-adjustment to fan belts and motor sheaves. All motors shall be thermally protected. All 10 tons, 6 ton (074), 7½ to 8½ (high efficiency) units have variable speed direct drive motors. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

Controls

Unit shall be completely factory-wired with necessary controls and contactor pressure lugs or terminal block for power wiring. Unit shall provide an external location for mounting a fused disconnect device. A choice of microprocessor or electromechanical controls shall be available. Microprocessor controls provide for volt control functions. The resident control algorithms shall make all heating, cooling, and/or ventilating decisions in response to electronic signals from sensors measuring indoor and outdoor temperatures. The control algorithm maintains accurate temperature control, minimizes drift from set point, and provides better building comfort. A centralized Microprocessor shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.

Refrigerant Circuits

Each refrigerant circuit offer thermal expansion valve as standard. Service pressure ports, and refrigerant line filter driers are factory-installed as standard. An area shall be provided for replacement suction line driers.

Phase monitor

Phase monitor shall provide 100% protection for motors and compressors against problems caused by phase loss, phase imbalance, and phase reversal. Phase monitor is equipped with an LED that provides an ON or FAULT indicator. There are no field adjustments. The module will automatically reset from a fault condition.

Through the Base Electrical with Disconnect Switch

This 3-pole, molded case, disconnect switch with provisions for through the base electrical connections are available. The disconnect switch will be installed in the unit in a water tight enclosure with access through a swinging door. Wiring will be provided from the switch to the unit high voltage terminal block. The switch will be UL/CSA agency recognized.

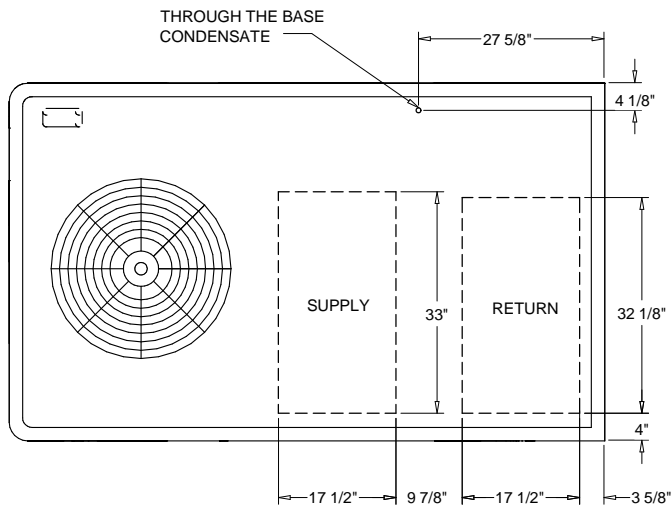
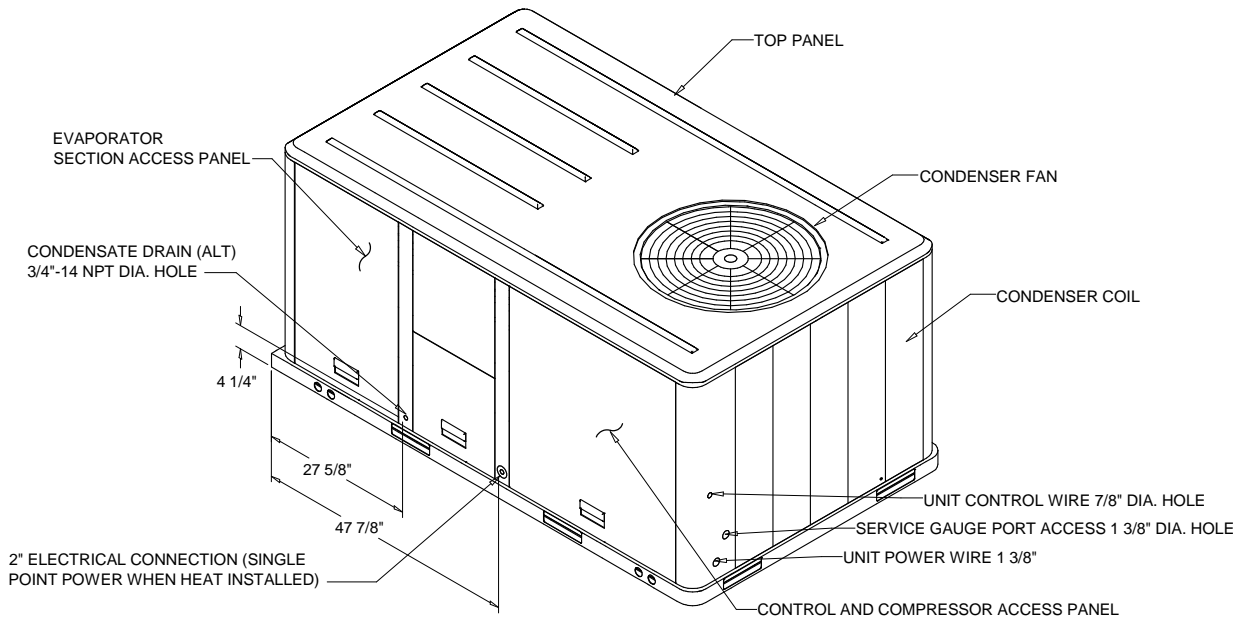
Note: The disconnect switch will be sized per NEC and UL guidelines but will not be used in place of unit overcurrent protection.

Economizer

This accessory shall be available with or without barometric relief. The assembly includes fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control. The barometric relief shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment off cycle. Optional solid state or differential enthalpy control shall be available for either factory or field installation. The economizer arrives in the shipping position and shall be moved to the operating position by the installing contractor.

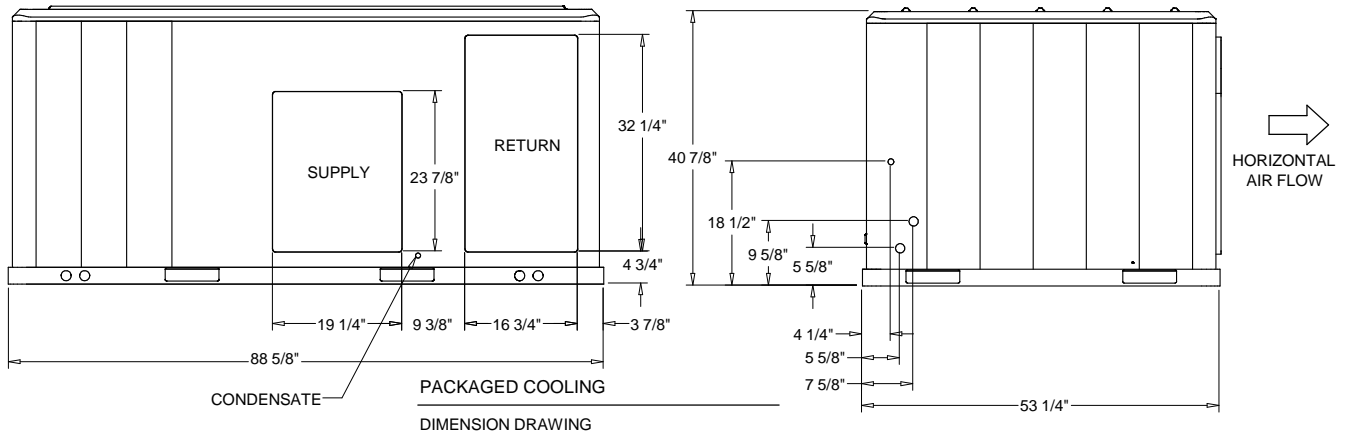
Unit Dimensions - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop

Item: B1 Qty: 1 Tag(s): TE-RTU-1

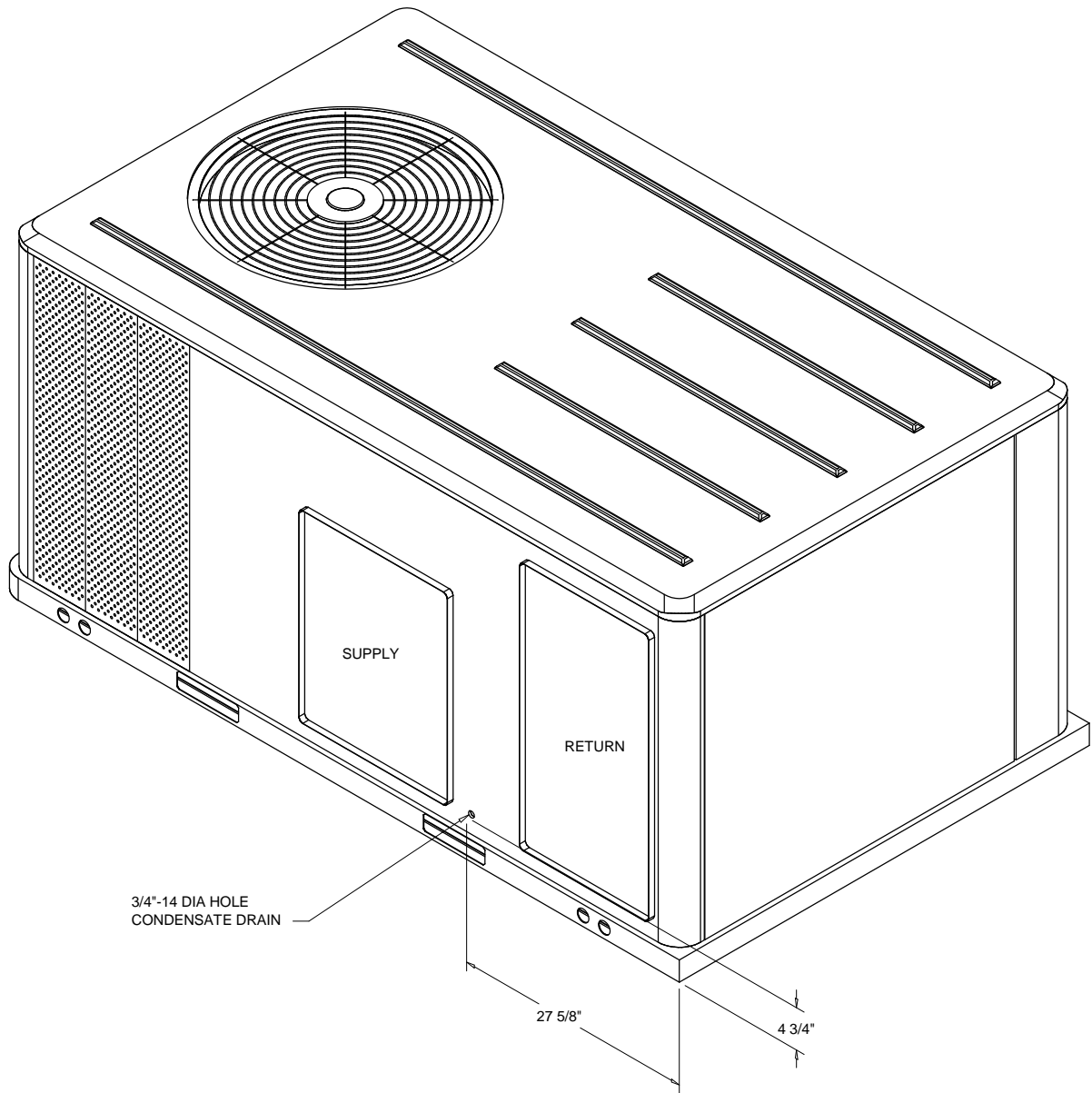


- NOTES:
 1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
 2. VERIFY ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION.

PLAN VIEW UNIT
 DIMENSION DRAWING

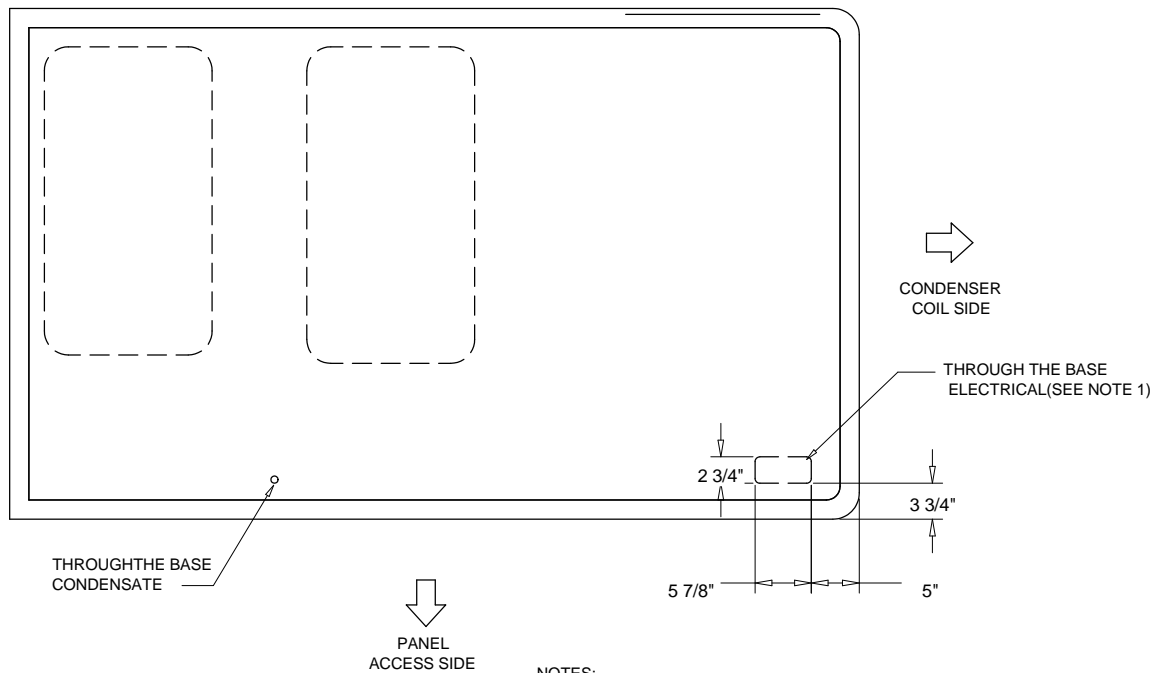
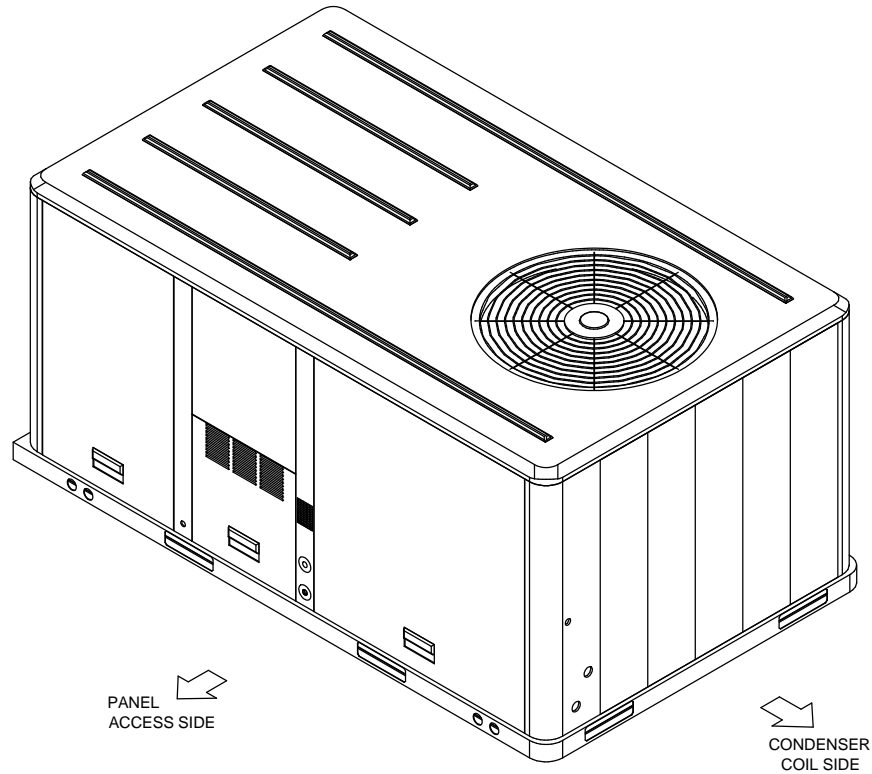


Unit Dimensions - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B1, B2 Qty: 2 Tag(s): TE-RTU-1, TE-RTU-2



ISOMETRIC-PACKAGED COOLING

Unit Dimensions - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B1, B2 Qty: 2 Tag(s): TE-RTU-1, TE-RTU-2



- NOTES:
1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
 2. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION

THRU THE BASE ELECTRICAL
PLAN / ISO VIEW DRAWING

Unit Dimensions - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B1 Qty: 1 Tag(s): TE-RTU-1

ELECTRICAL / GENERAL DATA

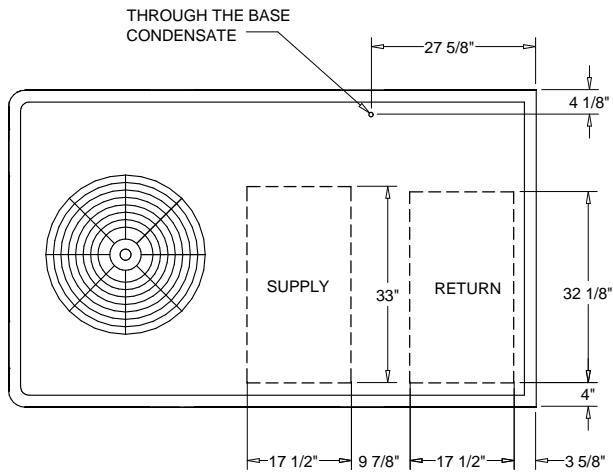
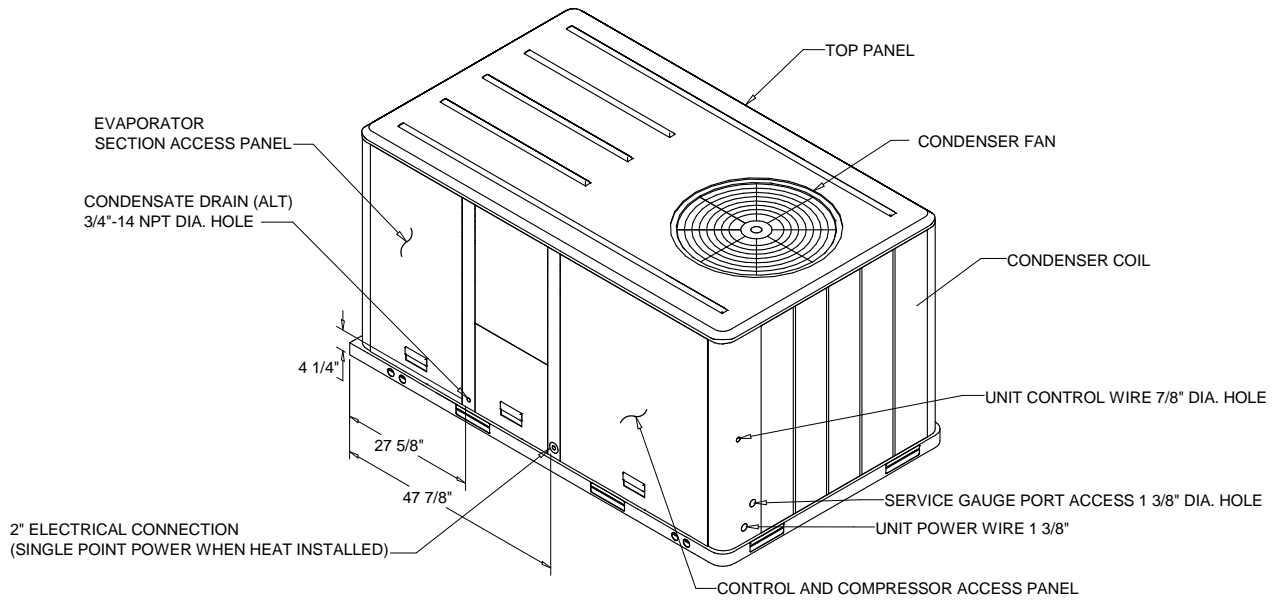
GENERAL ⁽²⁾⁽⁴⁾⁽⁶⁾ Model: THC048F Unit Operating Voltage: 187-253F Unit Primary Voltage: 208 Unit Secondary Voltage: 230 Unit Hertz: 60 Unit Phase: 3 SEER: 15.0 Standard Motor Minimum Circuit Ampacity: 24.6 Maximum Fuse Size: 35.0 Maximum (HACR) Circuit Breaker: 35.0				Oversized Motor Minimum Circuit Ampacity: N/A Maximum Fuse Size: N/A Maximum (HACR) Circuit Breaker: N/A		Field Installed Oversized Motor Minimum Circuit Ampacity: N/A Maximum Fuse Size: N/A Maximum (HACR) Circuit Breaker: N/A	
INDOOR MOTOR Standard Motor Number: 1 Horsepower: 1.0 Motor Speed (RPM): -- Phase: 3 Full Load Amps: 5.0 Locked Rotor Amps: 32.2				Outsized Motor Number: N/A Horsepower: N/A Motor Speed (RPM): N/A Phase: N/A Full Load Amps: N/A Locked Rotor Amps: N/A		Field Installed Oversized Motor Number: N/A Horsepower: N/A Motor Speed (RPM): N/A Phase: N/A Full Load Amps: N/A Locked Rotor Amps: N/A	
COMPRESSOR Circuit 1/2 Number: 1 Horsepower: 3.5 Phase: 3 Rated Load Amps: 13.7 Locked Rotor Amps: 83.1		OUTDOOR MOTOR Number: 1 Horsepower: 0.40 Motor Speed (RPM): 1075 Phase: 3 Full Load Amps: 2.5 Locked Rotor Amps: 6.6					
POWER EXHAUST ACCESSORY ⁽³⁾ (Field Installed Power Exhaust) Phase: N/A Horsepower: N/A Motor Speed (RPM): N/A Full Load Amps: N/A Locked Rotor Amps: N/A		FILTERS Type: Throwaway Furnished: Yes Number: 4 Recommended: 16"x25"x2"		REFRIGERANT ⁽²⁾ Type: R-410 Factory Charge Circuit #1: 5.2 lb Circuit #2: N/A			

NOTES:

1. Maximum (HACR) Circuit Breaker sizing is for installations in the United States only.
2. Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.
3. Value does not include Power Exhaust Accessory.
4. Value includes oversized motor.
5. Value does not include Power Exhaust Accessory.
6. EER is rated at AHRI conditions and in accordance with DOE test procedures.

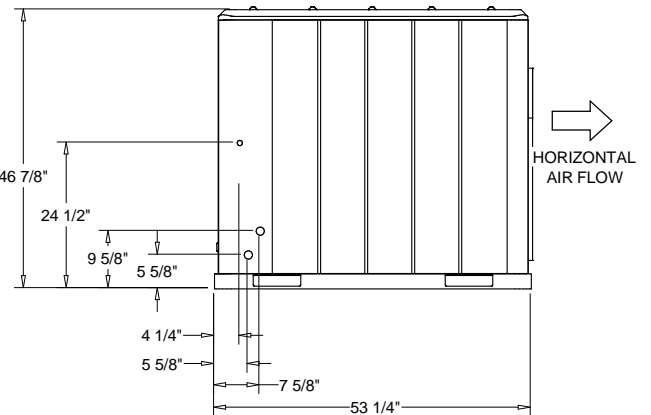
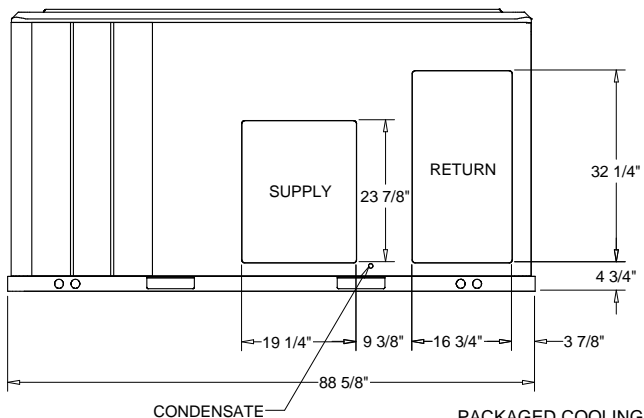
Unit Dimensions - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop

Item: B2 Qty: 1 Tag(s): TE-RTU-2



1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
2. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION

PLAN VIEW UNIT
DIMENSION DRAWING



PACKAGED COOLING
DIMENSION DRAWING

Unit Dimensions - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B2 Qty: 1 Tag(s): TE-RTU-2

ELECTRICAL / GENERAL DATA

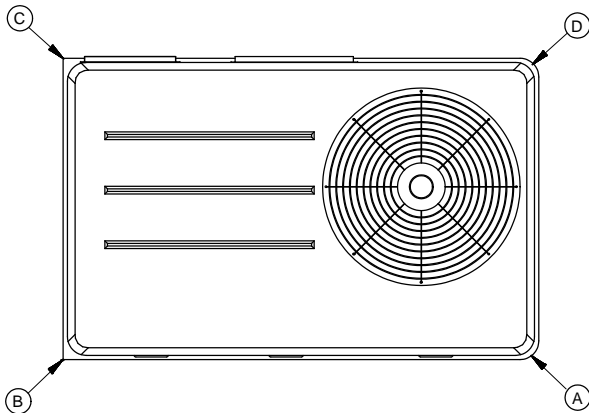
GENERAL ⁽²⁾⁽⁴⁾⁽⁶⁾ Model: THC092F Unit Operating Voltage: 187-253 Unit Primary Voltage: 208 Unit Secondary Voltage: 230 Unit Hertz: 60 Unit Phase: 3 EER: 13.0 Standard Motor: 12.6 Oversized Motor: Field Installed Oversized Motor: Minimum Circuit Ampacity: 42.4 Minimum Circuit Ampacity: N/A Minimum Circuit Ampacity: N/A Maximum Fuse Size: 50.0 Maximum Fuse Size: N/A Maximum Fuse Size: N/A Maximum (HACR) Circuit Breaker: 50.0 Maximum (HACR) Circuit Breaker: N/A Maximum (HACR) Circuit Breaker: N/A			
INDOOR MOTOR Standard Motor: Outsized Motor: Field Installed Oversized Motor: Number: 1 Number: N/A Number: N/A Horsepower: 3.8 Horsepower: N/A Horsepower: N/A Motor Speed (RPM): -- Motor Speed (RPM): N/A Motor Speed (RPM): N/A Phase: 3 Phase: N/A Phase: N/A Full Load Amps: 8.5 - 8.5 Full Load Amps: N/A Full Load Amps: N/A Locked Rotor Amps: -- Locked Rotor Amps: N/A Locked Rotor Amps: N/A			
COMPRESSOR Circuit 1/2 Number: 2 Horsepower: 4.1/2.4 Phase: 3 Rated Load Amps: 15.9/10.0 Locked Rotor Amps: 110./71.0		OUTDOOR MOTOR Number: 1 Horsepower: 0.75 Motor Speed (RPM): 1100 Phase: 1 Full Load Amps: 4.0 Locked Rotor Amps: 9.3	
POWER EXHAUST ACCESSORY ⁽³⁾ (Field Installed Power Exhaust) Phase: N/A Horsepower: N/A Motor Speed (RPM): N/A Full Load Amps: N/A Locked Rotor Amps: N/A	FILTERS Type: Throwaway Furnished: Yes Number: 4 Recommended: 20"x25"x2"	REFRIGERANT ⁽²⁾ Type: R-410 Factory Charge: Circuit #1: 5.5 lb Circuit #2: 4.2 lb	

NOTES:

1. Maximum (HACR) Circuit Breaker sizing is for installations in the United States only.
2. Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.
3. Value does not include Power Exhaust Accessory.
4. Value includes oversized motor.
5. Value does not include Power Exhaust Accessory.
6. EER is rated at AHRI conditions and in accordance with DOE test procedures.

Weight, Clearance & Rigging Diagram - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B1 Qty: 1 Tag(s): TE-RTU-1

INSTALLED ACCESSORIES NET WEIGHT DATA

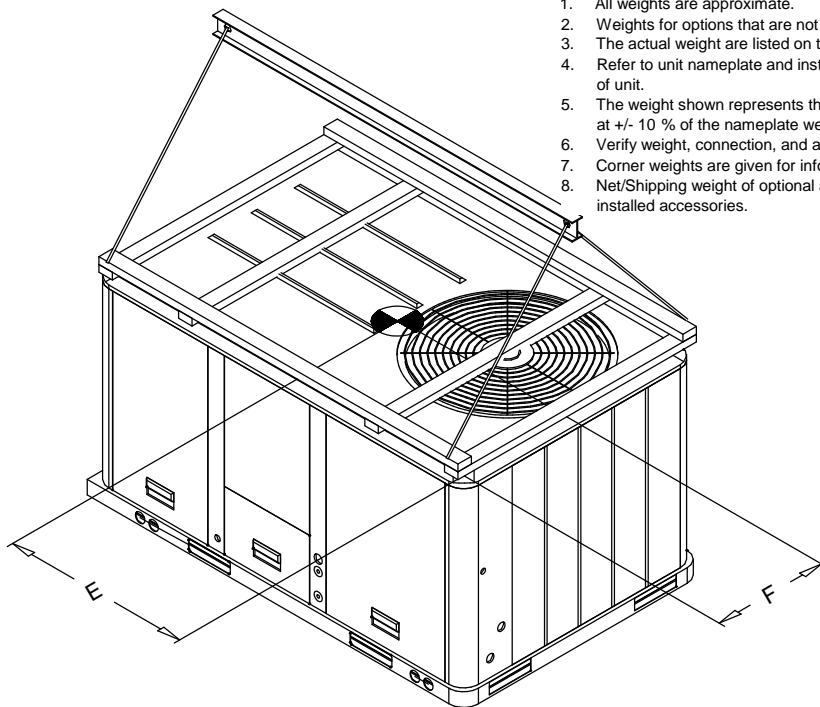


CORNER WEIGHT

ACCESSORY		WEIGHTS			
ECONOMIZER		36.0 lb			
MOTORIZED OUTSIDE AIR DAMPER					
MANUAL OUTSIDE AIR DAMPER					
BAROMETRIC RELIEF					
OVERSIZED MOTOR					
BELT DRIVE MOTOR					
POWER EXHAUST					
HEATER					
REHEAT					
THROUGH THE BASE ELECTRICAL (FIOPS)					
UNIT MOUNTED CIRCUIT BREAKER (FIOPS)					
UNIT MOUNTED DISCONNECT (FIOPS)		5.0 lb			
POWERED CONVENIENCE OUTLET (FIOPS)					
HINGED DOORS (FIOPS)					
HAIL GUARD		20.0 lb			
SMOKE DETECTOR, SUPPLY / RETURN					
NOVAR CONTROL					
BASIC UNIT WEIGHTS		CORNER WEIGHTS		CENTER OF GRAVITY	
SHIPPING	NET	(A)	(C)	(E) LENGHT	(F) WIDTH
737.0 lb	642.0 lb	(B) 117.0 lb	(D) 130.0 lb	44"	22"

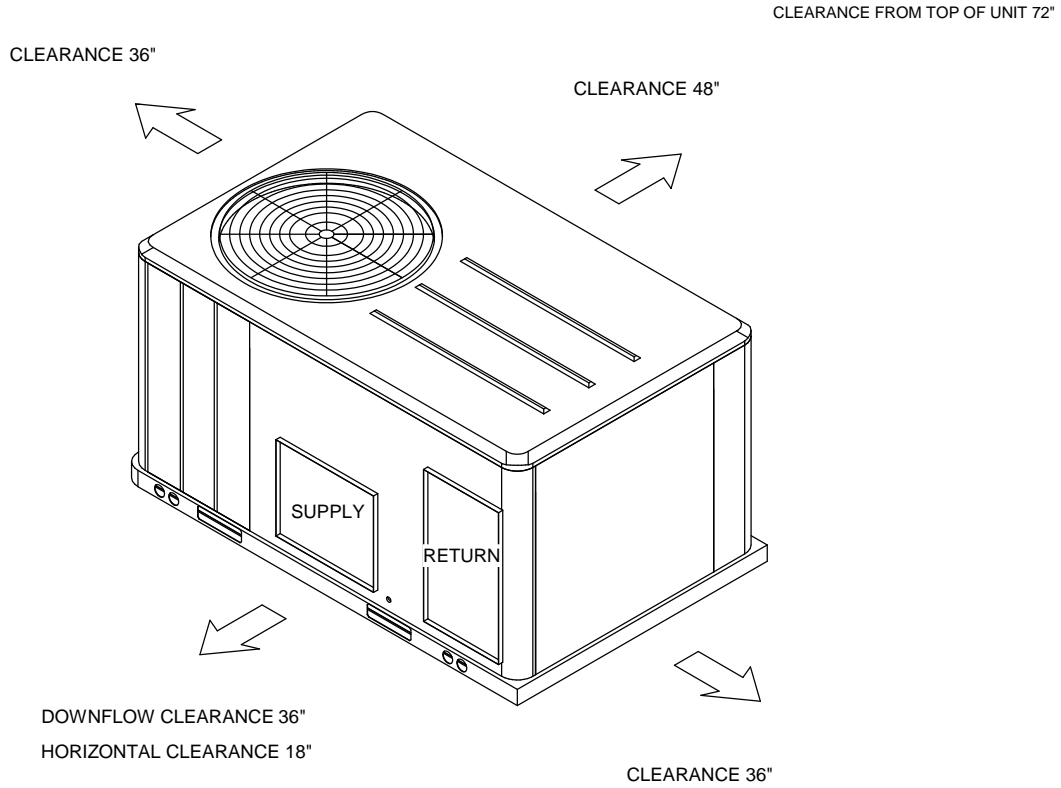
NOTE:

1. All weights are approximate.
2. Weights for options that are not list refer to Installation guide.
3. The actual weight are listed on the unit nameplate.
4. Refer to unit nameplate and installation guide for weights before scheduling transportation and installation of unit.
5. The weight shown represents the typical unit operating weight for the configuration selected. Estimated at +/- 10 % of the nameplate weight. .
6. Verify weight, connection, and all dimension with installer documents before installation.
7. Corner weights are given for information only.
8. Net/Shipping weight of optional accessories should be added to unit weight when ordering factory or field installed accessories.

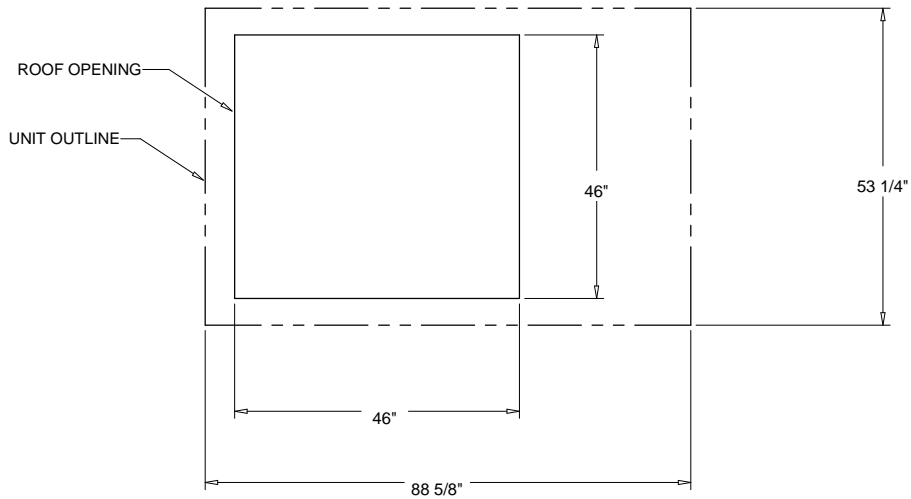


RIGGING AND CENTER OF GRAVITY

Weight, Clearance & Rigging Diagram - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B1, B2 Qty: 2 Tag(s): TE-RTU-1, TE-RTU-2



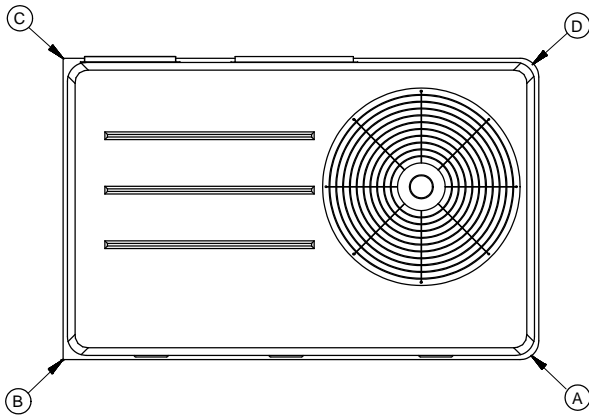
PACKAGED COOLING
CLEARANCE



PACKAGED COOLING
DOWNFLOW TYPICAL ROOF OPENING

Weight, Clearance & Rigging Diagram - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B2 Qty: 1 Tag(s): TE-RTU-2

INSTALLED ACCESSORIES NET WEIGHT DATA

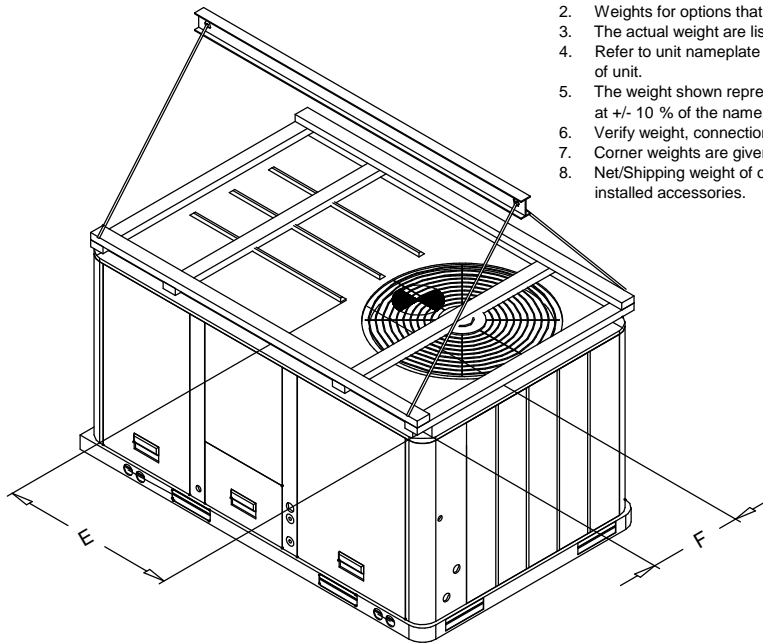


PACKAGED COOLING
CORNER WEIGHT

ACCESSORY		WEIGHTS			
ECONOMIZER					
MOTORIZED OUTSIDE AIR DAMPER					
MANUAL OUTSIDE AIR DAMPER					
BAROMETRIC RELIEF					
OVERSIZED MOTOR					
BELT DRIVE MOTOR					
POWER EXHAUST					
HEATER					
REHEAT					
THROUGH THE BASE ELECTRICAL (FIOPS)		13.0 lb			
UNIT MOUNTED CIRCUIT BREAKER (FIOPS)					
UNIT MOUNTED DISCONNECT (FIOPS)		5.0 lb			
POWERED CONVENIENCE OUTLET (FIOPS)					
HINGED DOORS (FIOPS)					
HAIL GUARD		30.0 lb			
SMOKE DETECTOR, SUPPLY / RETURN					
NOVAR CONTROL					
ROOF CURB					
BASIC UNIT WEIGHTS		CORNER WEIGHTS		CENTER OF GRAVITY	
SHIPPING	NET	(A)	(C)	(E) LENGHT	(F) WIDTH
1421.0 lb	1227.0 lb	(B) 330.0 lb	(D) 282.0 lb	49"	28"

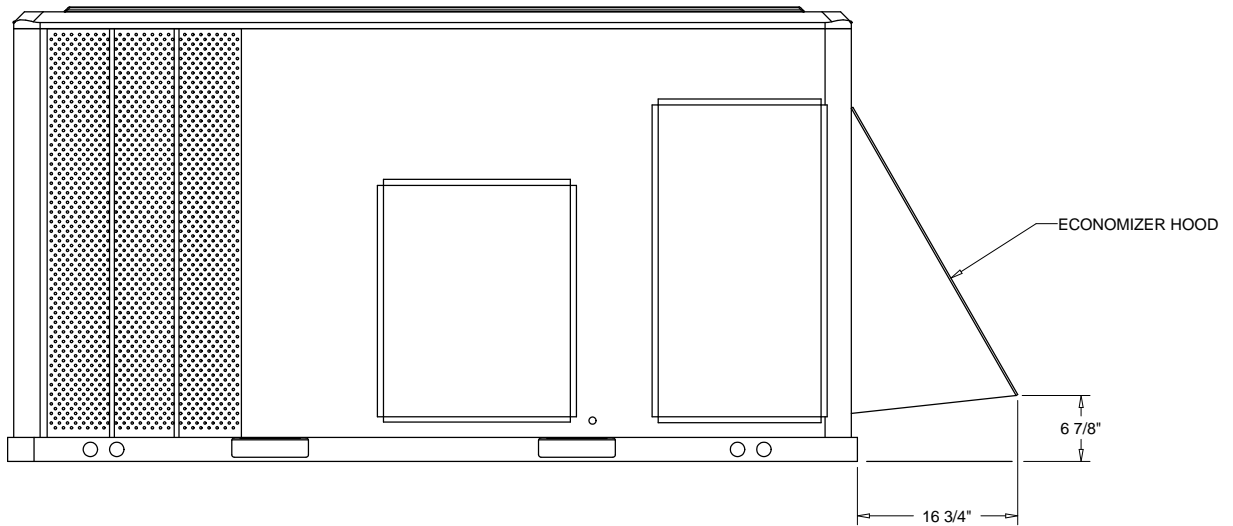
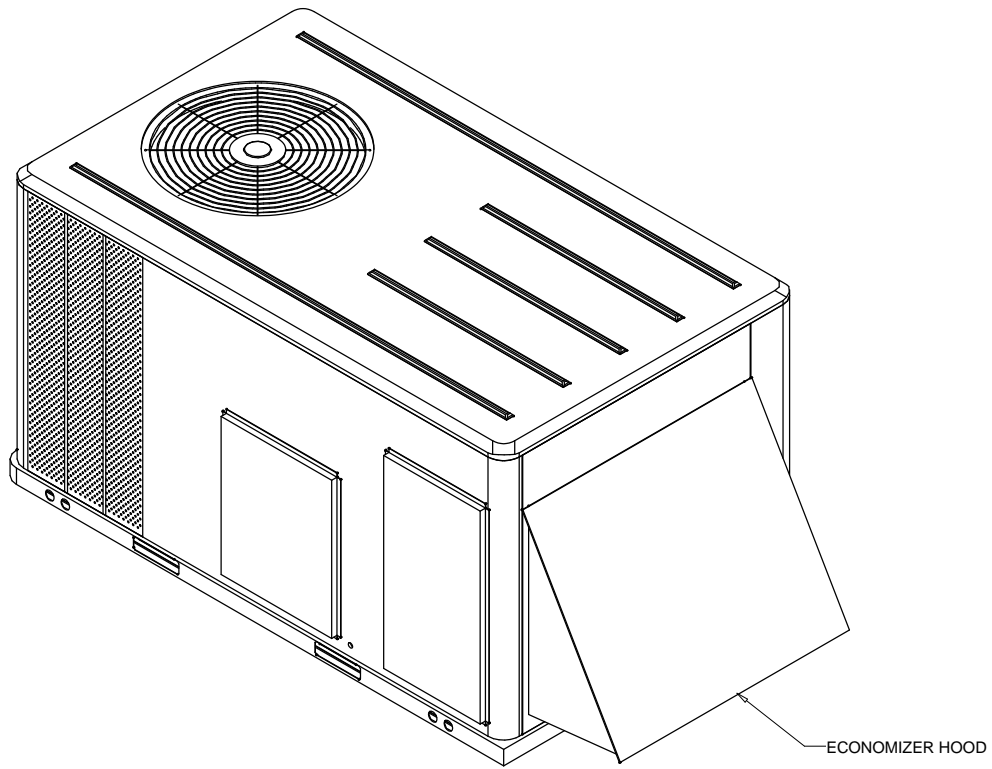
NOTE:

1. All weights are approximate.
2. Weights for options that are not list refer to Installation guide.
3. The actual weight are listed on the unit nameplate.
4. Refer to unit nameplate and installation guide for weights before scheduling transportation and installation of unit.
5. The weight shown represents the typical unit operating weight for the configuration selected. Estimated at +/- 10 % of the nameplate weight .
6. Verify weight, connection, and all dimension with installer documents before installation.
7. Corner weights are given for information only.
8. Net/Shipping weight of optional accessories should be added to unit weight when ordering factory or field installed accessories.



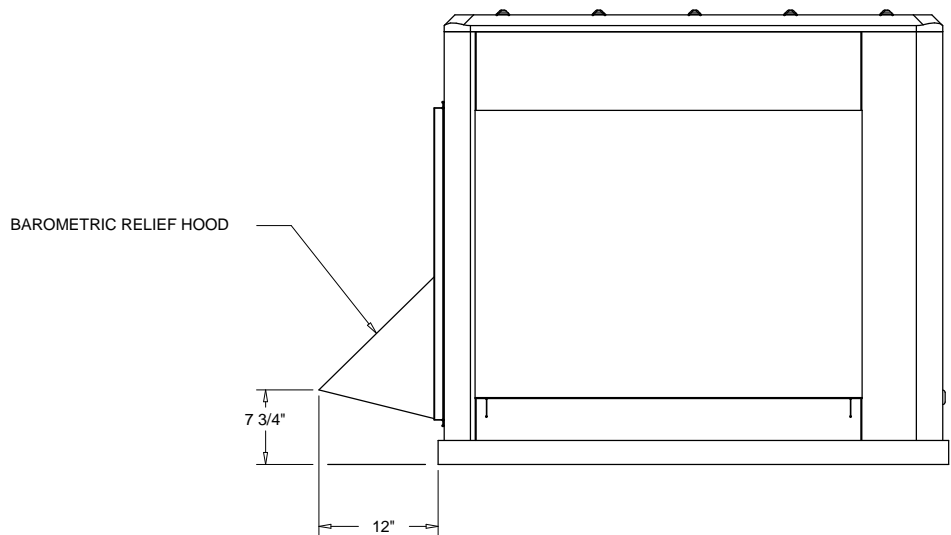
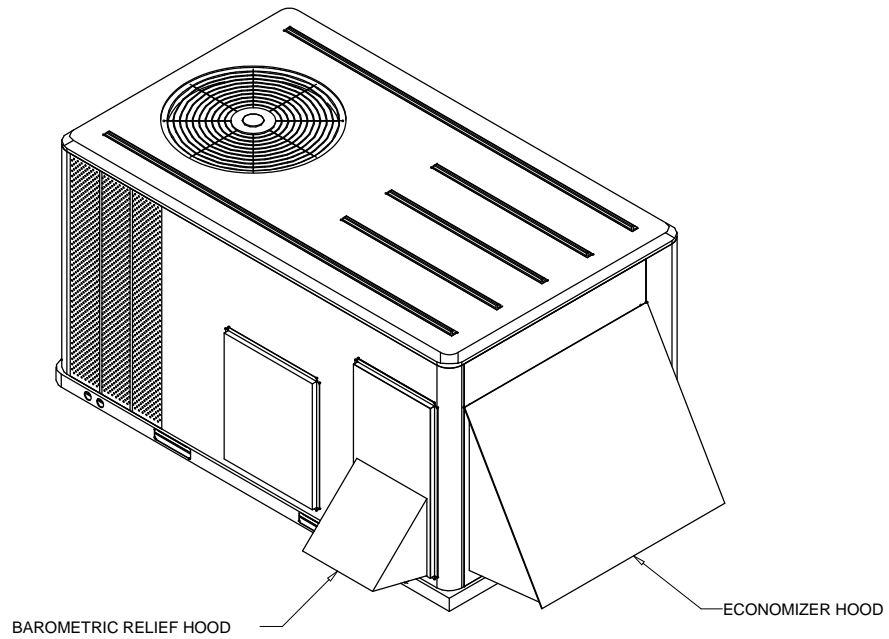
PACKAGED COOLING
RIGGING AND CENTER OF GRAVITY

Accessory - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B1, B2 Qty: 2 Tag(s): TE-RTU-1, TE-RTU-2



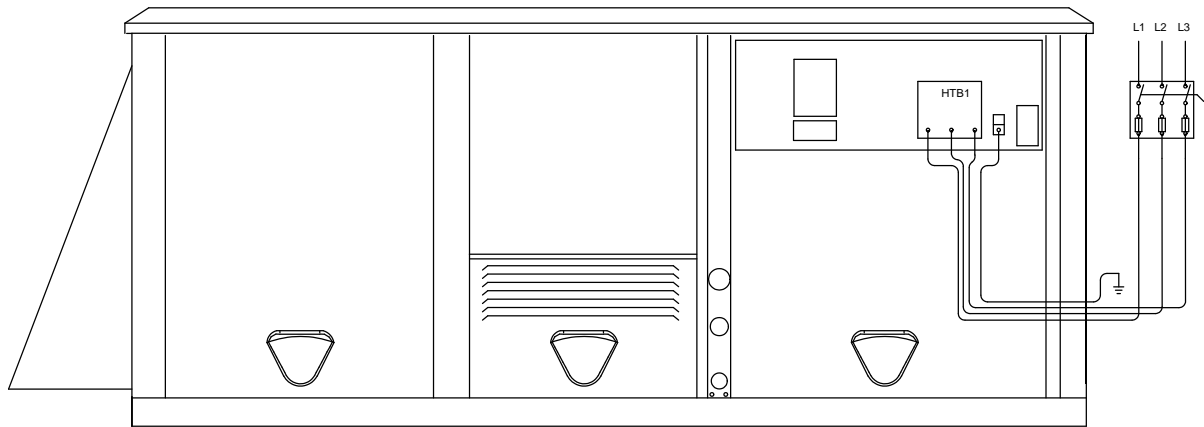
ECONOMIZER HOOD
ACCESSORY

Accessory - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B1, B2 Qty: 2 Tag(s): TE-RTU-1, TE-RTU-2



BAROMETRIC RELIEF DAMPER HOOD
ACCESSORY

Field Wiring - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: B1, B2 Qty: 2 Tag(s): TE-RTU-1, TE-RTU-2



ZONE SENSOR WIRE TABLE

WIRE SIZE	MAXIMUM WIRE LENGTH
22 GAUGE	1800"
20 GAUGE	3000"
18 GAUGE	4500"
16 GAUGE	7200"
14 GAUGE	11700"

NOTE:

1. All wiring and devices shown dashed to be supplied and installed by the customer in accordance with national and local electrical codes.
2. Low voltage control wiring must not be run in conduit with power wiring.

Tag Data - Heating Coils (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
C1	AHU-L RH	1	Heating coil (HTCL)	D5WB24120G0AA137BABA0AA

Product Data - Heating Coils**Item: C1 Qty: 1 Tag(s): AHU-L RH**

Drainable at header
 5W coil 5/8" full row serpentine
 Heating coil
 Shipping coil
 Right hand supply
 Galvanized steel casing (Std)
 1 row
 24" (610 mm) coil height
 120" (3048 mm) finned length
 Aluminum fins
 Prima-flo E (energy efficient)
 137 fins per foot nominal fin spacing
 .020 (0.508 mm) std copper tubes
 Turbulators
 AHRI ranges not applied
 AHRI ACHC certified
 1st Year Labor Warranty Whole Unit

Performance Data - Heating Coils

Tags	AHU-L RH
Elevation (ft)	0.00
Leaving dry bulb (F)	95.00
Fouling factor (hr-sq ft-deg F/Btu)	0.00025
Fluid type	Water
Actual airflow (cfm)	12225
Entering dry bulb (F)	55.00
Entering fluid temp (F)	180.00
Total capacity (MBh)	530.32
Standard fluid flow rate (gpm)	52.96
Volume (gal)	3.05
Fluid temp drop (F)	20.00
APD (in H2O)	0.143
Fluid PD (ft H2O)	29.88
Face velocity (ft/min)	611
Leaving fluid temp (F)	160.00
Fluid velocity (ft/sec)	7.32
Actual coil face area (sq ft)	20.00
Installed weight (lb)	132.6
Rigging weight (lb)	107.2
System type	Hot Water
Solution number (Each)	1.00
Reynolds number (Each)	95574.49

Mechanical Specifications - Heating Coils
Item: C1 Qty: 1 Tag(s): AHU-L RH**GENERAL**

Coil is manufactured by Trane. Coil will be designed with aluminum or copper plate fins and copper/copper alloy tubes. Fins have collars drawn, belled and firmly bonded to the tubes by means of mechanical expansion of the tubes. Coil has airflow arrow and nameplate attached to coil casing. Coil is 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.

TYPE "5W" 1 ROW HOT WATER COIL

An alternate-tube feed 1 row coil, with 5/8" [16mm] OD tubes. Coil has a supply header to ensure distribution of hot water to each tube of coil. Coil is proof tested at a minimum of 300 psig [2068kPa] and leak tested to 200 psig [1379kPa], air pressure under water. Working pressure is maximum 200 psig [1379kPa] at 250F [121C].

COIL CASING

Coil casing is manufactured with galvanized steel.

COIL PLATE FIN TYPE

Aluminum plate fin is Trane PRIMA FLO E (Energy Efficient) fin design.

COIL SUPPLY CONNECTION

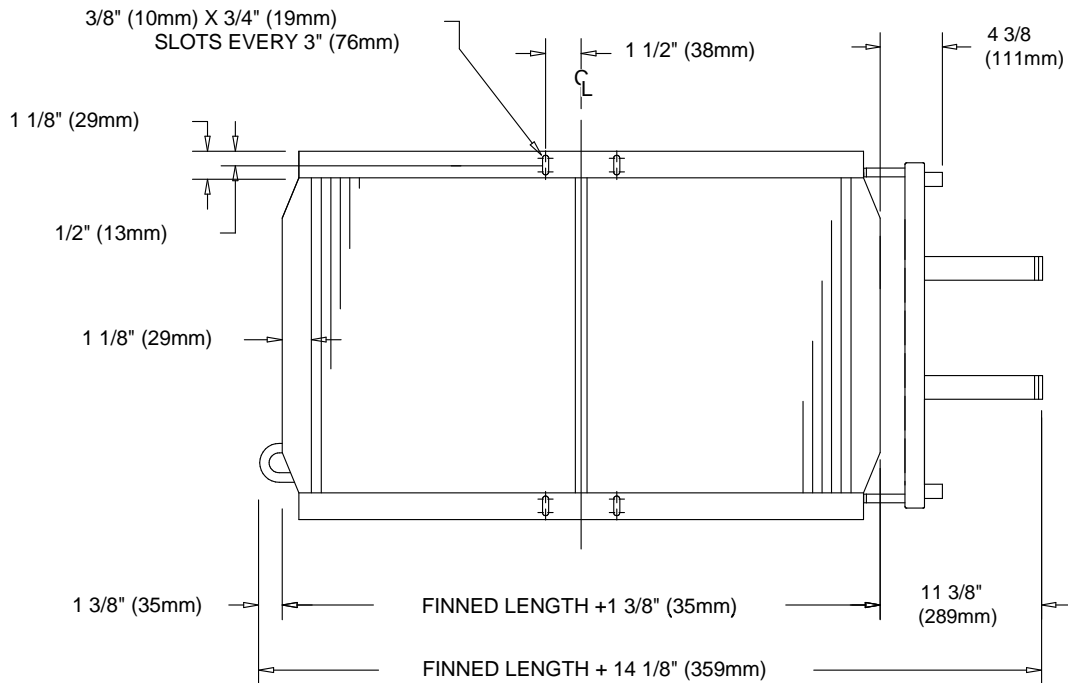
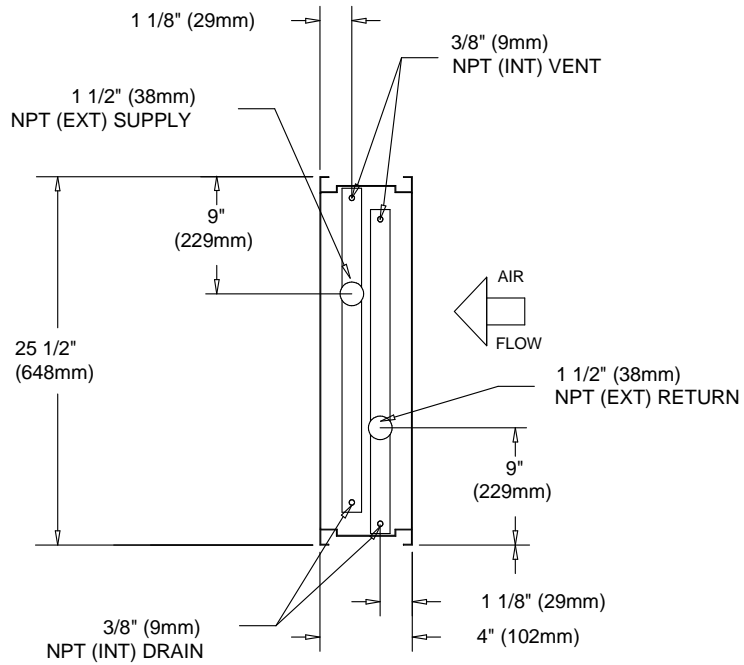
Coil supply connection is on right side of coil with horizontal airflow (facing airflow).

TURBULATORS

Silicon bronze, spring turbulators are fitted in tubes for increased heat transfer at lower water tube velocities.

Unit Dimensions - Heating Coils
Item: C1 Qty: 1 Tag(s): AHU-L RH

1 ROW 5W



Tag Data - BCXD Blower Coil - Direct Drive (Qty: 3)

Item	Tag(s)	Qty	Description	Model Number
D1	Trum-AHU-L 1	1	BCXD Blower Coil - Direct Drive (BCXD)	BCHD054G2**A2AG5Z000000BA600000000 0000-0
D2	AHU-L2	1	BCXD Blower Coil - Direct Drive (BCXD)	BCHD024G2**A1AN4Z000000BA100000000 0000-0
D3	AHU-L3	1	BCXD Blower Coil - Direct Drive (BCXD)	BCHD024G2**A1AN4Z000000BA100000000 0000-0

Product Data - BCXD Blower Coil - Direct Drive**All Units****HORIZONTAL CONFIGURATION**

Horizontal Configuration

460/60/3

Foil Faced Insulation 1"

Motor, drive & control box on Same Side as Coil & Drainpan Connection

1 Row Heating Hydronic Coil

Topss selection

2" Pleated MERV 8 Throwaway Filter

Mixing Box Only (Fld)

No paint

Without double wall insulation

Item: D1 Qty: 1 Tag(s): Trum-AHU-L1

Unit Size 54; 4-1/2 Ton

Polymer Drainpan - Left Hand Coil & Drainpan Connections

6 Row Hydronic Coil

1-1/2 Horsepower

No controls (FSS)

Item: D2, D3 Qty: 2 Tag(s): AHU-L2, AHU-L3

Unit Size 24; 2 Ton

Polymer Drainpan - Right Hand Coil & Drainpan Connections

6 Row High Capacity Hydronic Coil

1 Horsepower

Customer Supplied Terminal Interface

Performance Data - BCXD Blower Coil - Direct Drive

Tags	Trum-AHU-L1	AHU-L2	AHU-L3
Design airflow (cfm)	1950	1000	825
Fan speed (rpm)	1377	1971	1821
Total cooling capacity (MBh)	82.86	42.67	37.13
Sensible capacity (MBh)	57.50	29.47	25.20
Cooling EDB (F)	80.00	80.00	80.00
Cooling EWB (F)	67.00	67.00	67.00
Cooling LDB (F)	53.25	53.27	52.29
Cooling LWB (F)	53.07	53.00	52.11
Cooling ent fluid temp (F)	44.00	44.00	44.00
Cooling leaving fluid temp (F)	54.00	54.00	54.00
Cooling flow rate (gpm)	16.51	8.50	7.40
Cooling delta T (F)	10.00	10.00	10.00
Cooling fluid PD (ft H2O)	4.79	11.83	9.22
Fluid type	Water	Water	Water
Fluid velocity (ft/s)	2.75	4.25	3.70
APD (in H2O)	0.951	1.349	0.996
Cooling face velocity (ft/min)	488	600	495
Auxiliary heat type	Hydronic Preheat	Hydronic Preheat	Hydronic Preheat
Aux EAT (F)	60.00	65.00	65.00
Aux LAT (F)	98.36	99.62	103.32
Auxiliary total capacity (MBh)	81.13	37.54	34.29
Aux APD (in H2O)	0.153	0.182	0.130
Aux ent fluid temp (F)	180.00	180.00	180.00
Aux flow rate (gpm)	8.10	3.75	3.42
Aux fluid PD (ft H2O)	0.99	10.00	8.44
Unit length (in)	41.570	33.720	33.720
Unit width (in)	40.000	28.000	28.000
Unit height (in)	22.000	18.000	18.000

Tags	Trum-AHU-L1	AHU-L2	AHU-L3
Installed weight (lb)	260.4	115.4	115.4
Rigging weight (lb)	239.9	114.2	114.2
Aux delta T (F)	20.00	20.00	20.00
Aux fluid type	Water	Water	Water
Aux face velocity (ft/min)	501	600	495
Elevation (ft)	0.00	0.00	0.00
ESP (in H2O)	1.500	1.250	1.250
TSP (in H2O)	2.793	3.006	2.538
Motor heat calculation	Ignore	Ignore	Ignore
Aux fluid freeze pt (F)	32.00	32.00	32.00
Aux fluid velocity (ft/min)	119	337	308
Piping pkg PD (ft H2O)	0.00	0.00	0.00
Aux piping pkg PD (ft H2O)	0.00	0.00	0.00
Aux lvg fluid temp (F)	160.00	160.00	160.00
Min circuit ampacity (A)	4.13	3.13	3.13
Coil design basis	Cooling	Cooling	Cooling
Max fuse size (A)	15.00	15.00	15.00
Main coil type	Hydronic	Hydronic	Hydronic
Inlet - 63 HZ (dB)	83	77	75
Inlet - 125 HZ (dB)	83	82	80
Inlet - 250 HZ (dB)	67	80	78
Inlet - 500 HZ (dB)	51	66	64
Inlet - 1 kHz (dB)	53	64	62
Inlet - 2 kHz (dB)	47	63	61
Inlet - 4 kHz (dB)	43	59	57
Inlet - 8 kHz (dB)	35	55	52
Casing - 63 HZ (dB)	80	71	69
Casing - 125 HZ (dB)	73	74	72
Casing - 250 HZ (dB)	66	70	67
Casing - 500 HZ (dB)	59	62	60
Casing - 1 kHz (dB)	60	60	57
Casing - 2 kHz (dB)	48	52	49
Casing - 4 kHz (dB)	41	47	43
Casing - 8 kHz (dB)	35	43	40
Discharge - 63 HZ (dB)	93	87	86
Discharge - 125 HZ (dB)	90	88	87
Discharge - 250 HZ (dB)	80	84	81
Discharge - 500 HZ (dB)	77	79	77
Discharge - 1 kHz (dB)	80	81	78
Discharge - 2 kHz (dB)	73	76	73
Discharge - 4 kHz (dB)	71	74	71
Discharge - 8 kHz (dB)	66	70	67
ECM - brake horsepower (hp)	1.434	0.849	0.598
Full load amps (A)	3.30	2.50	2.50
Outlet velocity (ft/min)	1645	1174	968
Inlet plus casing - 63 HZ (dB)	85	78	76
Inlet plus casing - 125 HZ (dB)	84	84	82
Inlet plus casing - 250 HZ (dB)	69	81	79
Inlet plus casing - 500 HZ (dB)	59	69	67
Inlet plus casing - 1 kHz (dB)	61	68	66
Inlet plus casing - 2 kHz (dB)	51	64	62
Inlet plus casing - 4 kHz (dB)	45	59	57
Inlet plus casing - 8 kHz (dB)	38	55	52
ECM - service factor (Number)	1.11	1.20	1.76

Mechanical Specifications - BCXD Blower Coil - Direct Drive
Item: D1 - D3 Qty: 3 Tag(s): Trum-AHU-L1, AHU-L2, AHU-L3**BCHD General**

The product line consists of a horizontal air handling unit and optional mixing box. Air-handling airflow data is certified in accordance with AHRI standard 430. The unit is UL listed to U. S. and Canadian safety standards and complies with NFPA 90A. Air handlers consist of a hydronic and/or DX coil, drain pan, and centrifugal fan with motor in a common cabinet. Motor location and coil connections are independent for the same or opposite side location. Air handlers are provided with knockouts in all four corners for installing the unit suspended from the ceiling with threaded rods. Unit and accessories are insulated with 1" 1.5 lb/cu. ft density fiberglass insulation. 1" foil faced insulation is also available. Large motor access panels are provided on both sides of the unit and accessories.

Casing

Casings (structural components) are constructed of 18-gauge galvanized steel, insulated with 1" 1.5 lb/cu. ft density fiberglass fire resistant and odorless glass fiber material to provide thermal and acoustical insulation. Fan housing sides are directly attached to the air handler top and bottom panels strengthening the entire unit assembly. Coil access panels are located on both sides of the air handler and allow easy removal of the internal coils and drain pan. Main access panels provide generous access to the fan and motor from both sides of the air handler.

Foil Faced Insulation

The interior surface of the unit is acoustically and thermally lined with 1" 2.0 lb/cu. ft R-Value of 4.3 density glass fiber with a foil facing. The insulation is UL listed and meets NFPA-90A, UL 181 and bacteriological C665 standards.

Coil #1 Hydronic Heating Coils

Heating coils are one or two row hot water. All water coils are 12 fins per inch. All water coils use highly efficient Trane Delta Flo, Type H aluminum fins, mechanically bonded to seamless copper tubes. All coils are specifically designed and circuited for water use. All coils are factory tested with 450.00 psi air under water. Maximum standard operating conditions are 300.00 psi at 200.0 F. Sweat type connections are standard. Coil performance data is in accordance with the current edition of AHRI Standard 410.

Coil #2 Hydronic Cooling Coils

Cooling coils are four or six row chilled water. All water coils are 12 fins per inch. All water coils use highly efficient Trane Delta Flo, Type H aluminum fins, mechanically bonded to seamless copper tubes. All coils are specifically designed and circuited for water use. All coils are factory tested with 450.00 psi air under water. Maximum standard operating conditions are 300.00 psi at 200.0 F. Sweat type connections are standard. Coil performance data is in accordance with the current edition of AHRI Standard 410.

Unit Fan

The fans are DWDI (double width double inlet) forward curved centrifugal blower type. The fans are direct drive mounted directly to the motor shaft. All fans are dynamically balanced. All air handlers have a single fan.

Electronically Commutated Motors (ECM)

All motors are brushless DC (BLDC) electronically commutated motors (ECM) factory programmed and run tested in assembled units. The motor controller is mounted in a control box with a built in integrated user interface and LED tachometer. If adjustments are needed, motor parameters can be adjusted through momentary contact switches accessible without factory service personnel on the motor control board. Motors will soft ramp between speeds to lessen the acoustics due to sudden speed changes. Motors can be operated at three speeds or at variable speed with factory supplied or field supplied controllers. The motor will choose the highest speed if there are simultaneous or conflicting speed requests. All motors have integral overload protection with a maximum ambient operating temperature of 130.0 F and use permanently sealed ball bearings. Motors can operate at plus or minus 10 percent of rated voltage on all speed settings.

2" Pleated Throw-Away Merv8 Filter

The units are equipped with 2" flat pleated media filters with a rated average dust spot efficiency of no less than 35 to 40 percent when tested in accordance with ASHRAE 52.1 atmospheric dust spot method and a Merv8 rating based on ASHRAE Standard 52.2.

Mixing Box

Mixing boxes are constructed of heavy-gauge galvanized steel. They are complete with two low leak parallel blade dampers that are factory linked together. A 1/2" extendible drive rod is provided that can be used for actuator connection, either internally or externally. Damper blades are extruded aluminum having interlocked PVC extruded edge seals. Damper frame seals are PVC extruded forms interlocked to the damper frame and provided with a continuous edge seal to the blades. Damper seals are stable in the temperature range of -50.0 F to 230.0 F.

Mixing boxes also include two side access panels as standard to provide access to the unit's internal components.

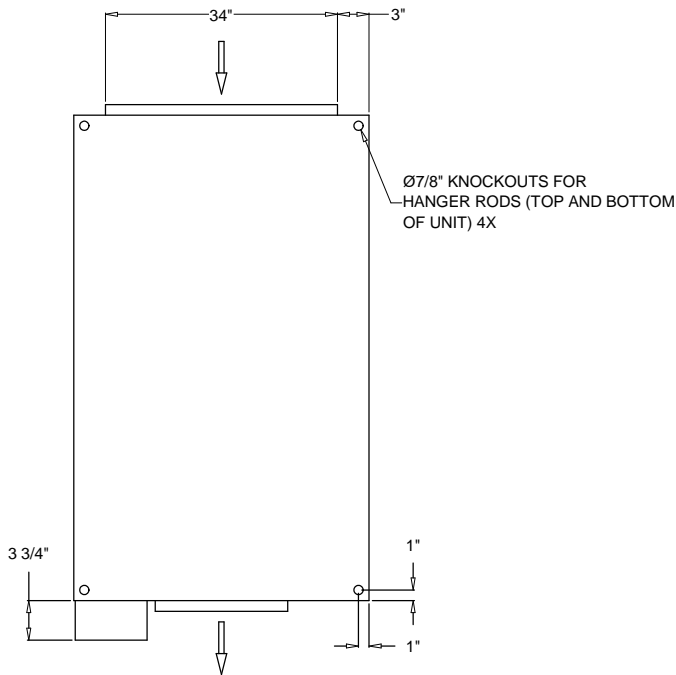
Polymer Drain Pan

The drain pan is noncorrosive and double-sloped to allow condensate drainage. The drainpan construction is polymer. Coils mount above the drain pan, not in the drain pan - thus allowing the drain pan to be fully inspected and cleaned. The drain pan can also be removed for cleaning. The drain pan connections are unthreaded 3/4" schedule 40 PVC for solvent bonding. The main drain connection is at the lowest point of the drain pan. An auxiliary drain connection is provided on the same side as the main connection.

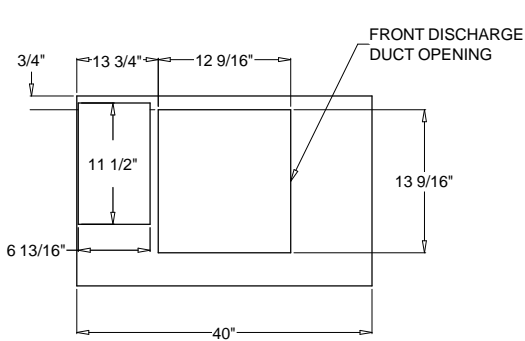
Customer Supplied Terminal Interface (CSTI)

The customer supplied terminal interface (CSTI) is a pre-wired control offering of selected control components. This option intended to be used with a field-supplied, low-voltage thermostat or controller and field supplied temperature sensors. The control box contains a relay board which includes a line voltage to 24-volt transformer. Selected components are wired to a low-voltage terminal block and are run-tested, so the only a power connection and thermostat/controller connection are needed to commission the unit.

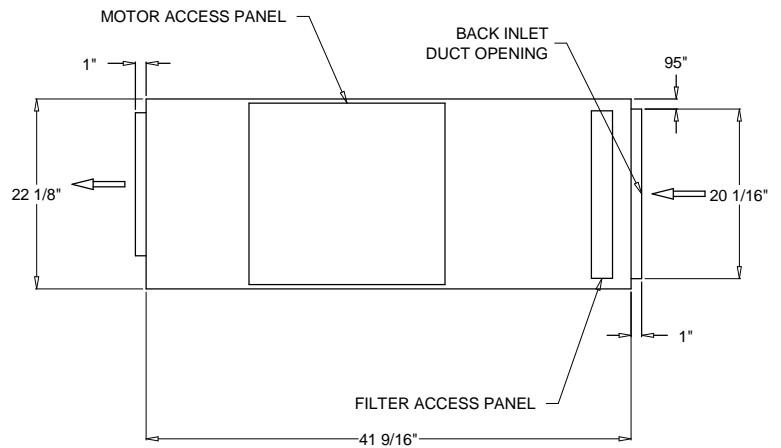
Unit Dimensions - BCXD Blower Coil - Direct Drive
Item: D1 Qty: 1 Tag(s): Trum-AHU-L1



TOP VIEW



FRONT VIEW

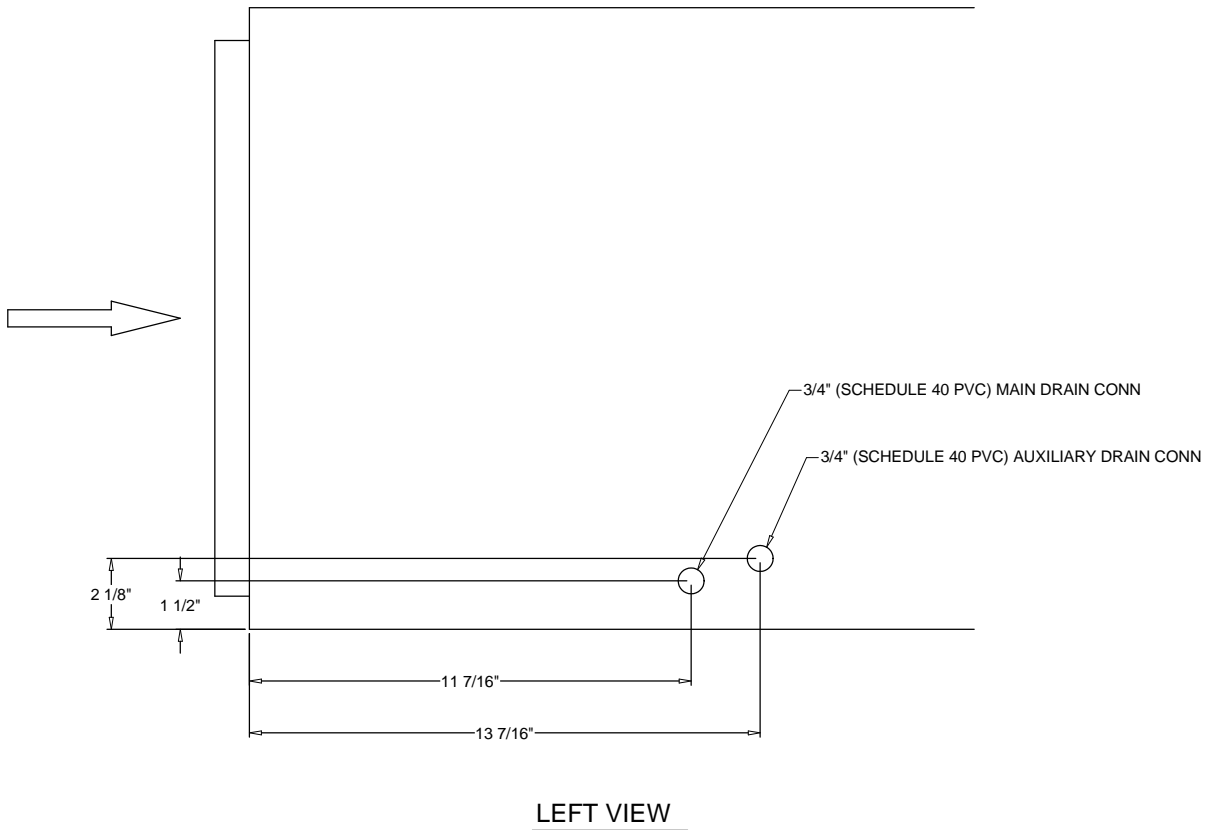


RIGHT VIEW

NOTES:

1. ACCESS PANELS ARE LOCATED ON BOTH SIDES OF THE UNIT TO PROVIDE ACCESS TO THE UNIT'S INTERNAL COMPONENTS.
2. CONTROL BOX IS FACTORY MOUNTED ON DRIVE SIDE AND PROVIDED WITH 7/8" DIAMETER KNOCKOUTS FOR FIELD WIRING.
3. ARROWS INDICATE THE DIRECTION OF AIRFLOW.

Unit Dimensions - BCXD Blower Coil - Direct Drive
Item: D1 Qty: 1 Tag(s): Trum-AHU-L1



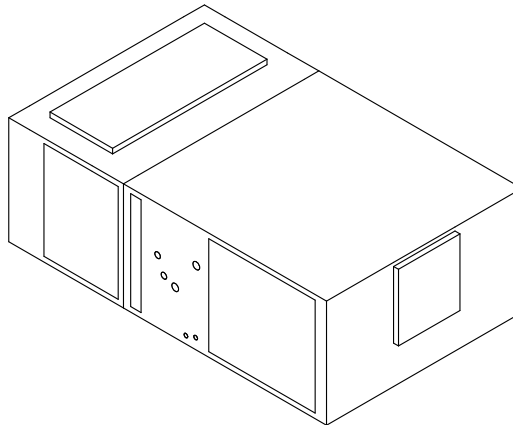
NOTES:

- 1. ALL DIMENSIONS ARE SHOWN FROM THE BOTTOM REAR CORNER OF UNIT.
- 2. STUBOUTS PROTRUDE 2 1/8" FROM EXTERIOR CASING OF UNIT.
- 3. ARROW INDICATES THE DIRECTION OF AIRFLOW.
- 4. DRAIN CONNECTIONS ARE UNTHREADED.

Unit Dimensions - BCXD Blower Coil - Direct Drive
Item: D1 Qty: 1 Tag(s): Trum-AHU-L1

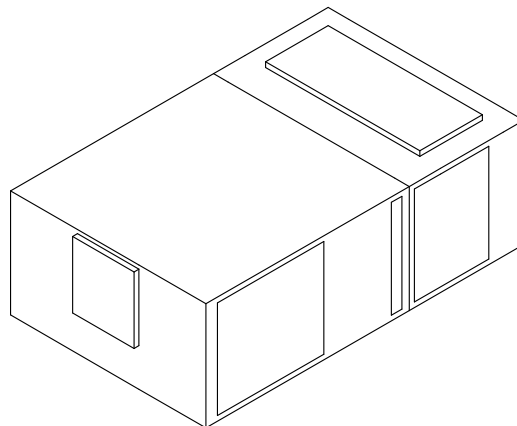
NOTES:

1. WEIGHT OF BASIC UNIT INCLUDES ONLY CABINET, FAN, AVERAGE DRIVE, WIRING AND AVERAGE FILTER.
2. WEIGHT OF STEAM COIL MODULE INCLUDES ONLY CABINET WITH AVERAGE FILTER.
3. BEFORE PREPARING ANY UNIT OR ACCESSORY MODULE FOR LIFTING, ESTIMATE THE APPROXIMATE CENTER OF GRAVITY AND TEST LIFT THE UNIT OR ACCESSORY MODULE TO DETERMINE BALANCE AND STABILITY. USE A PROPER RIGGING METHOD SUCH AS STRAPS, SLINGS OR SPREADER BARS FOR PROTECTION AND SAFETY BEFORE HOISTING THE UNIT OR ACCESSORY MODULE.
4. DO NOT LIFT UNITS OR ACCESSORY MODULES IN WINDY CONDITIONS OR ABOVE INSTALLATION PERSONNEL. FAILURE TO PROPERLY LIFT UNIT OR ACCESSORY MODULE COULD RESULT IN DEATH, SERIOUS INJURY, EQUIPMENT DAMAGE OR PROPERTY-ONLY DAMAGE.
5. DO NOT RIG OR LIFT UNITS OR ACCESSORY MODULES WITH FORK LIFT FORKS.
6. ASSEMBLY OF THE UNIT MUST BE PERFORMED AT THE INSTALLATION SITE. ALWAYS RIG UNITS AND ACCESSORY MODULES AS SHIPPED FROM THE FACTORY.



ISO1 VIEW

UNIT, COIL & ACCESSORY MODULE WEIGHTS									
BASIC UNIT	COIL 1 DRY	COIL 1 WET	COIL 2 DRY	COIL 2 WET	MOTOR	ELECTRIC HEATER	MIXING BOX	ANGLED FILTER BOX	ANGLED FILTER MIXING BOX
129.9 lb	17.6 lb	22.4 lb	52.4 lb	68.1 lb	40.0 lb		72.0 lb		
FILTER ACCESS MODULE		STEAM COIL MODULE						STEAM COIL DRY	STEAM COIL WET
								UNIT SIZE	SERVICE CLEARANCE
								54	37"

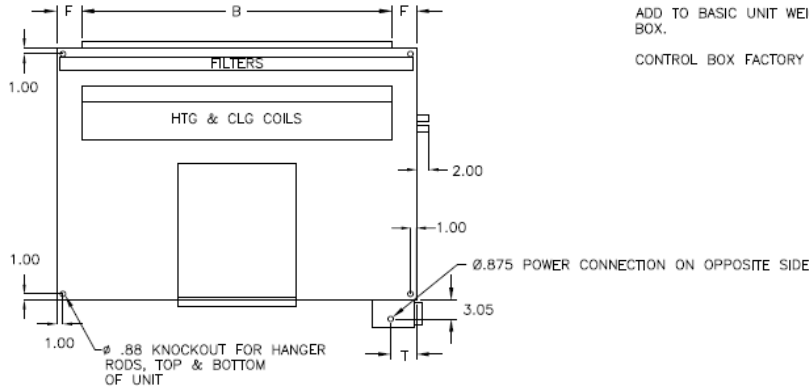


ISO2 VIEW

Unit Dimensions - BCXD Blower Coil - Direct Drive

Item: D1 - D3 Qty: 3 Tag(s): Trum-AHU-L1, AHU-L2, AHU-L3

HORIZONTAL NON-ELECTRIC HEAT BLOWER COIL



NOTES:

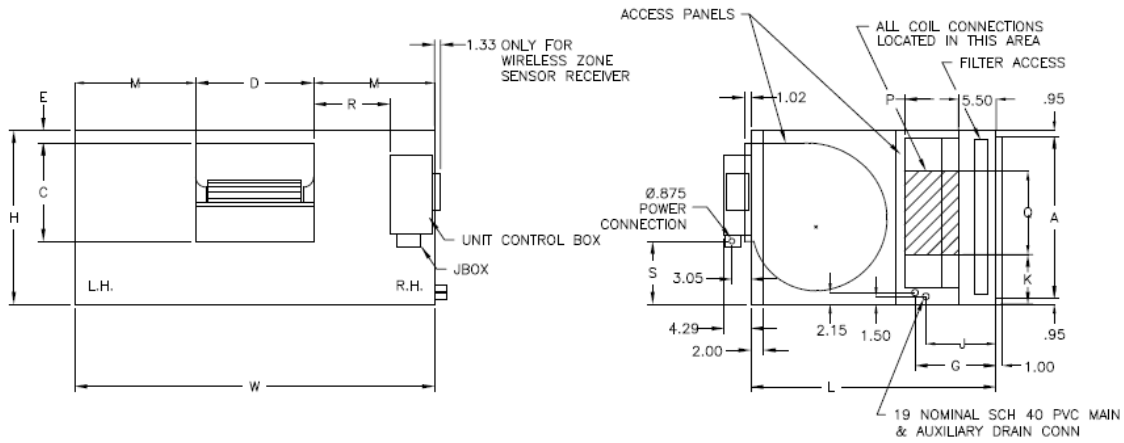
ALL DIMENSIONS ARE IN INCHES

ALL COIL CONNECTIONS ARE SWEAT STYLE.

WEIGHT OF BASIC UNIT INCLUDES CABINET, FAN, WIRING AND AVERAGE FILTER. IT DOES NOT INCLUDE COIL, MOTOR OR SHIPPING PACKAGE. PLEASE REFER TO CATALOG FOR MOTOR WEIGHTS.

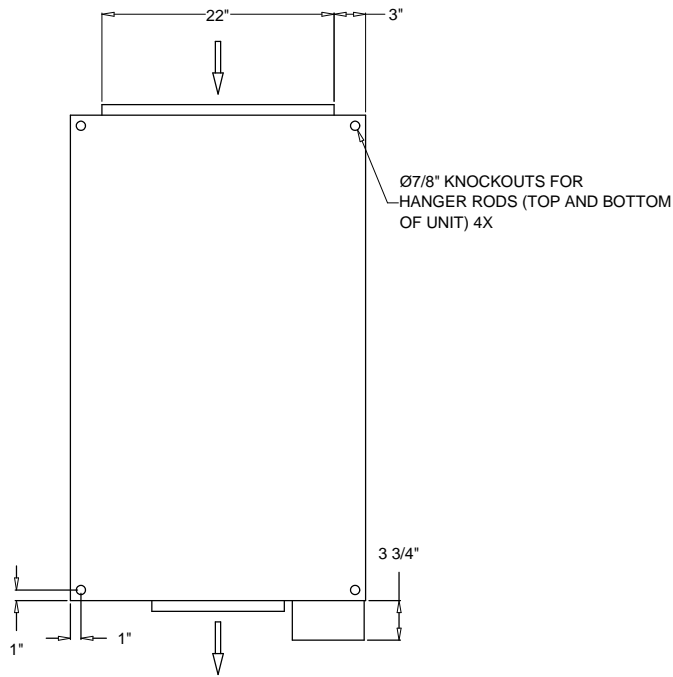
ADD TO BASIC UNIT WEIGHT, 7 LBS FOR WEIGHT OF CONTROL BOX.

CONTROL BOX FACTORY MOUNTED ON MOTOR SIDE.

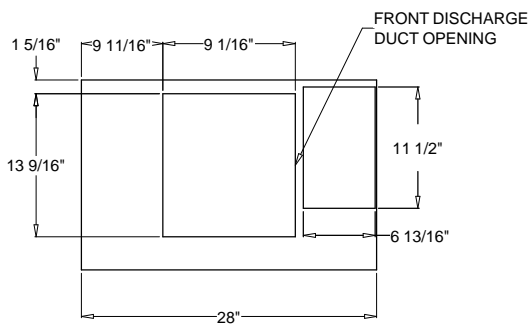


UNIT SIZE	H	W	L	A	B	C	D	E	F	G R.H.	G L.H.	J R.H.	J L.H.	K	M	P	Q	R	S	T	BASIC UNIT WEIGHT
12	14.00	24.00	31.15	12.09	18.00	10.56	7.47	0.55	3.00	11.42	13.42	9.42	11.42	4.20	8.24	9.00	5.75	1.35	.99	4.26	64.0
18	14.00	28.00	31.15	12.09	22.00	10.56	7.47	0.55	3.00	11.42	13.42	9.42	11.42	4.20	10.24	9.00	5.75	3.42	.99	4.19	69.0
24	18.00	28.00	33.72	16.09	22.00	13.57	9.04	1.30	3.00	11.42	13.42	9.42	11.42	6.20	9.68	9.00	5.75	2.73	1.17	4.09	89.6
36	18.00	40.00	33.72	16.09	34.00	13.57	9.04	1.30	3.00	11.42	13.42	9.42	11.42	6.20	15.68	9.00	5.75	8.64	1.01	4.19	104.5
54	22.00	40.00	41.57	20.09	34.00	13.58	12.57	0.72	3.00	11.42	13.42	9.42	11.42	7.43	13.72	11.00	7.27	6.87	5.01	4.19	129.9
72	22.00	48.00	41.57	20.09	40.00	13.58	12.57	0.72	4.00	11.42	13.42	9.42	11.42	7.43	17.72	11.00	7.27	10.87	5.01	4.19	142.0
90	28.00	48.00	43.94	26.09	40.00	13.58	12.57	1.66	4.00	12.79	14.79	10.79	12.79	8.24	17.72	11.25	11.64	10.92	11.14	4.14	162.8

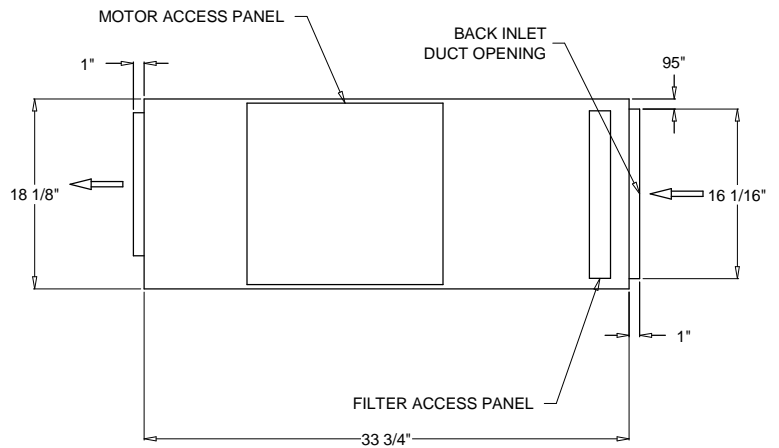
Unit Dimensions - BCXD Blower Coil - Direct Drive
Item: D2, D3 Qty: 2 Tag(s): AHU-L2, AHU-L3



TOP VIEW



FRONT VIEW

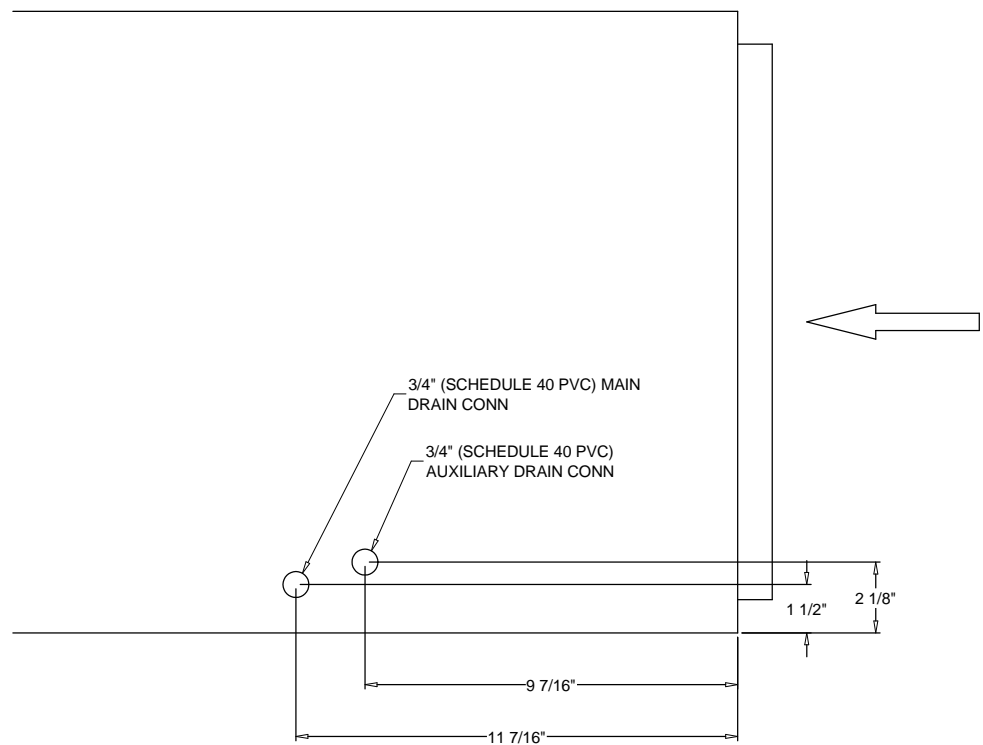


RIGHT VIEW

NOTES:

1. ACCESS PANELS ARE LOCATED ON BOTH SIDES OF THE UNIT TO PROVIDE ACCESS TO THE UNIT'S INTERNAL COMPONENTS.
2. CONTROL BOX IS FACTORY MOUNTED ON DRIVE SIDE AND PROVIDED WITH 7/8" DIAMETER KNOCKOUTS FOR FIELD WIRING.
3. ARROWS INDICATE THE DIRECTION OF AIRFLOW.

Unit Dimensions - BCXD Blower Coil - Direct Drive
Item: D2, D3 Qty: 2 Tag(s): AHU-L2, AHU-L3



RIGHT VIEW

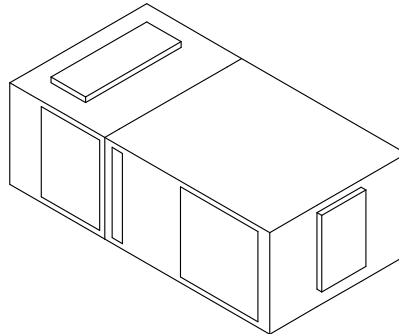
NOTES:

- 1. ALL DIMENSIONS ARE SHOWN FROM THE BOTTOM REAR CORNER OF UNIT.
- 2. STUBOUTS PROTRUDE 2 1/8" FROM EXTERIOR CASING OF UNIT.
- 3. ARROW INDICATES THE DIRECTION OF AIRFLOW.
- 4. DRAIN CONNECTIONS ARE UNTHREADED.

Unit Dimensions - BCXD Blower Coil - Direct Drive
Item: D2, D3 Qty: 2 Tag(s): AHU-L2, AHU-L3

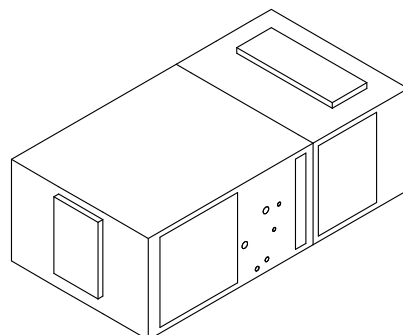
NOTES:

1. WEIGHT OF BASIC UNIT INCLUDES ONLY CABINET, FAN, AVERAGE DRIVE, WIRING AND AVERAGE FILTER.
2. WEIGHT OF STEAM COIL MODULE INCLUDES ONLY CABINET WITH AVERAGE FILTER.
3. BEFORE PREPARING ANY UNIT OR ACCESSORY MODULE FOR LIFTING, ESTIMATE THE APPROXIMATE CENTER OF GRAVITY AND TEST LIFT THE UNIT OR ACCESSORY MODULE TO DETERMINE BALANCE AND STABILITY. USE A PROPER RIGGING METHOD SUCH AS STRAPS, SLINGS OR SPREADER BARS FOR PROTECTION AND SAFETY BEFORE HOISTING THE UNIT OR ACCESSORY MODULE.
4. DO NOT LIFT UNITS OR ACCESSORY MODULES IN WINDY CONDITIONS OR ABOVE INSTALLATION PERSONNEL. FAILURE TO PROPERLY LIFT UNIT OR ACCESSORY MODULE COULD RESULT IN DEATH, SERIOUS INJURY, EQUIPMENT DAMAGE OR PROPERTY-ONLY DAMAGE.
5. DO NOT RIG OR LIFT UNITS OR ACCESSORY MODULES WITH FORK LIFT FORKS.
6. ASSEMBLY OF THE UNIT MUST BE PERFORMED AT THE INSTALLATION SITE. ALWAYS RIG UNITS AND ACCESSORY MODULES AS SHIPPED FROM THE FACTORY.



ISO1 VIEW

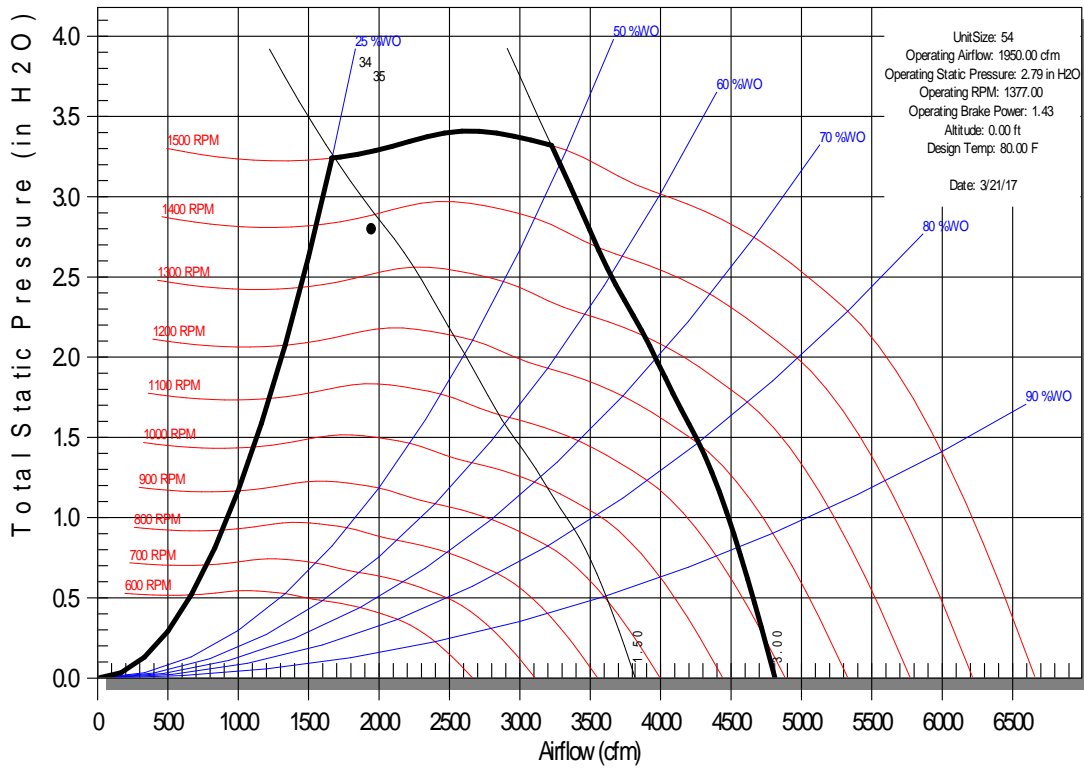
UNIT, COIL & ACCESSORY MODULE WEIGHTS									
BASIC UNIT	COIL 1 DRY	COIL 1 WET	COIL 2 DRY	COIL 2 WET	MOTOR	ELECTRIC HEATER	MIXING BOX	ANGLED FILTER BOX	ANGLED FILTER MIXING BOX
89.6 lb	6.6 lb	7.8 lb	24.7 lb	31.5 lb	18.0 lb		43.0 lb		
FILTER ACCESS MODULE		STEAM COIL MODULE						STEAM COIL DRY	STEAM COIL WET
								UNIT SIZE	SERVICE CLEARANCE
								24	25"



ISO2 VIEW

Fan Curve - BCXD Blower Coil - Direct Drive
Item: D1 Qty: 1 Tag(s): Trum-AHU-L1

SIZE 54 & 72 HORIZONTAL DRAW THRU (1.5-3 HP)

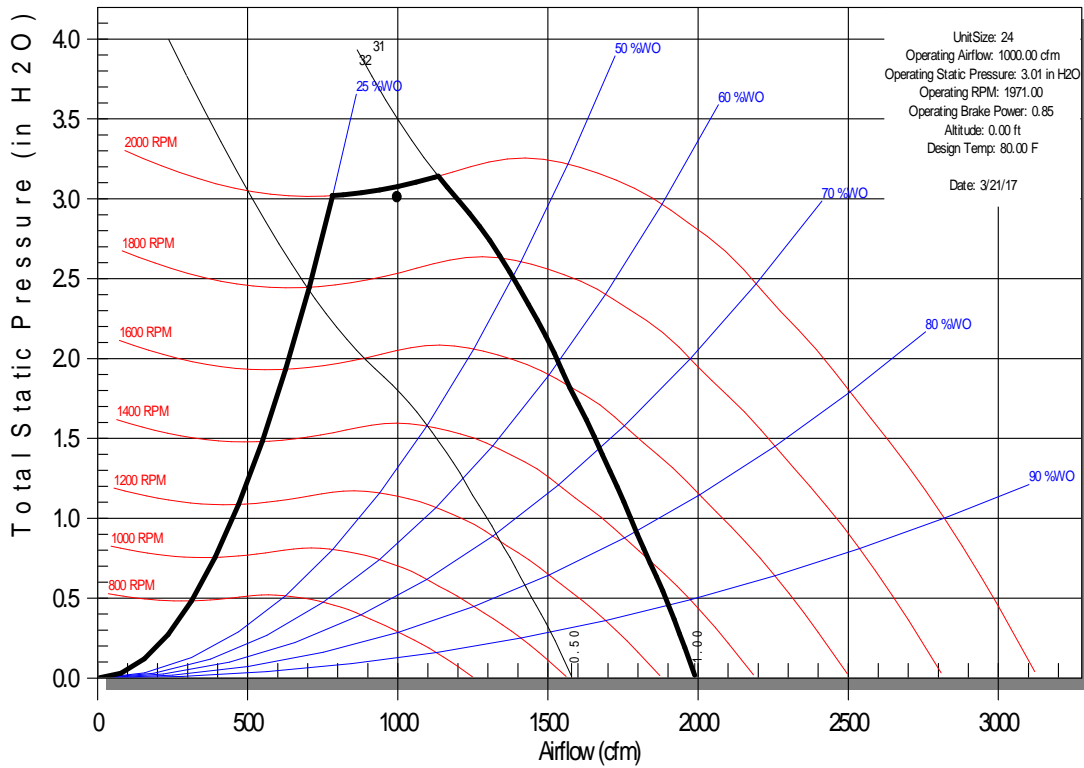


Sound Power in accordance with AHRI 260 at 1950 CFM, 2.8 in H2O.

	63-hz	125-hz	250-hz	500-hz	1 kHz	2 kHz	4 kHz	8 kHz
Discharge	93	90	80	77	80	73	71	66
Casing	80	73	66	59	60	48	41	35
Inlet	83	83	67	51	53	47	43	35

Fan Curve - BCXD Blower Coil - Direct Drive
Item: D2 Qty: 1 Tag(s): AHU-L2

SIZE 24 & 36 HORIZONTAL DRAW THRU

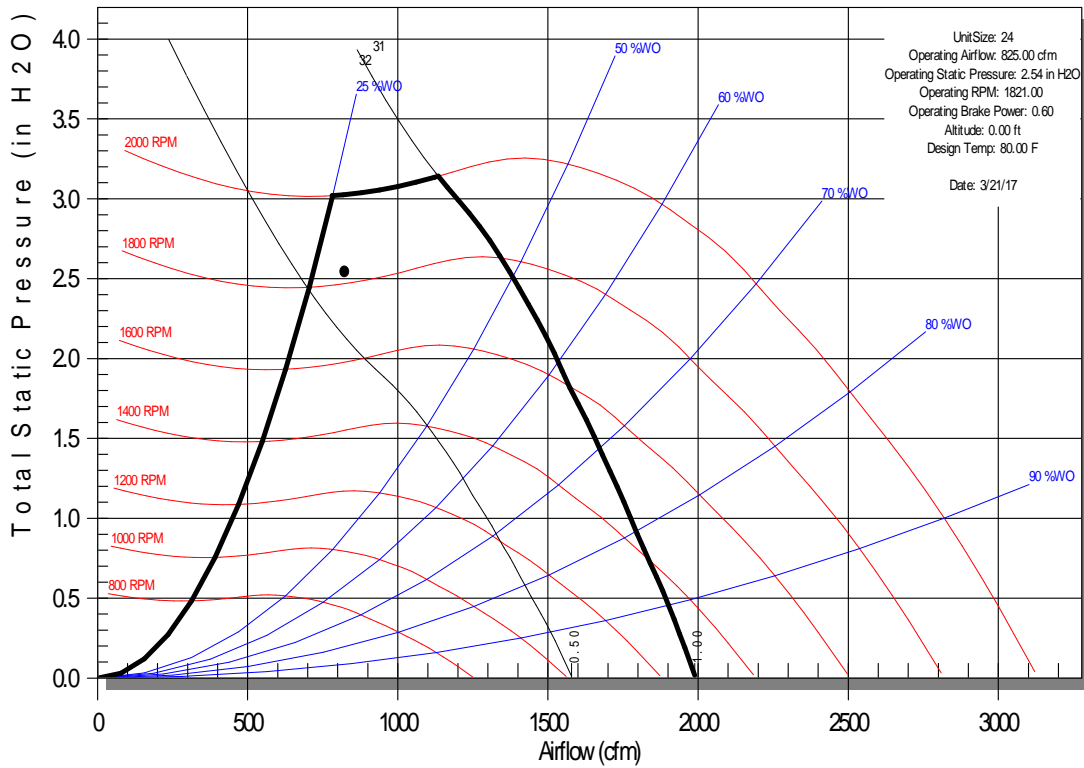


Sound Power in accordance with AHRI 260 at 1000 CFM, 3.0 in H2O.

	63-hz	125-hz	250-hz	500-hz	1 k-hz	2 k-hz	4 k-hz	8 k-hz
Discharge	87	88	84	79	81	76	74	70
Casing	71	74	70	62	60	52	47	43
Inlet	77	82	80	66	64	63	59	55

Fan Curve - BCXD Blower Coil - Direct Drive
Item: D3 Qty: 1 Tag(s): AHU-L3

SIZE 24 & 36 HORIZONTAL DRAW THRU



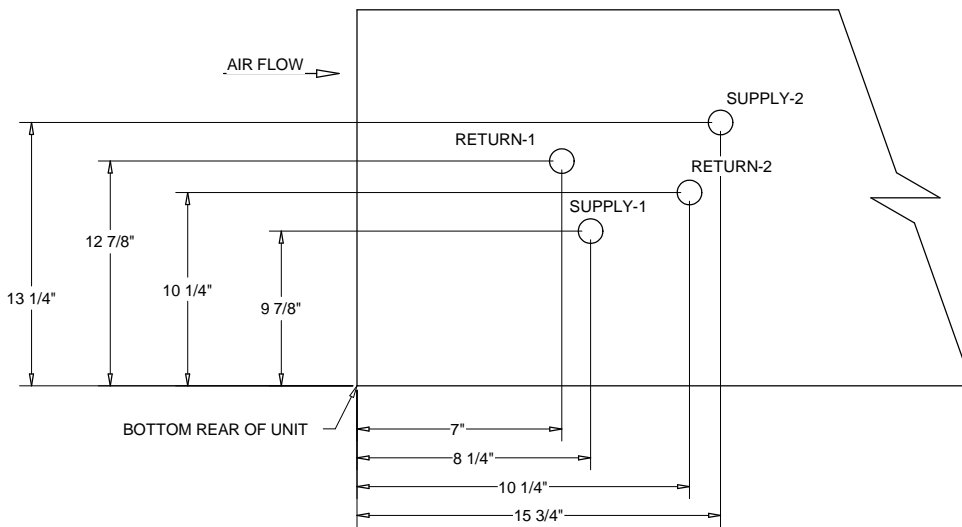
Sound Power in accordance with AHRI 260 at 825 CFM, 2.5 in H2O.

	63-hz	125-hz	250-hz	500-hz	1 k-hz	2 k-hz	4 k-hz	8 k-hz
Discharge	86	87	81	77	78	73	71	67
Casing	69	72	67	60	57	49	43	40
Inlet	75	80	78	64	62	61	57	52

Accessory - BCXD Blower Coil - Direct Drive
Item: D1 Qty: 1 Tag(s): Trum-AHU-L1

MAIN UNIT COIL CONNECTIONS

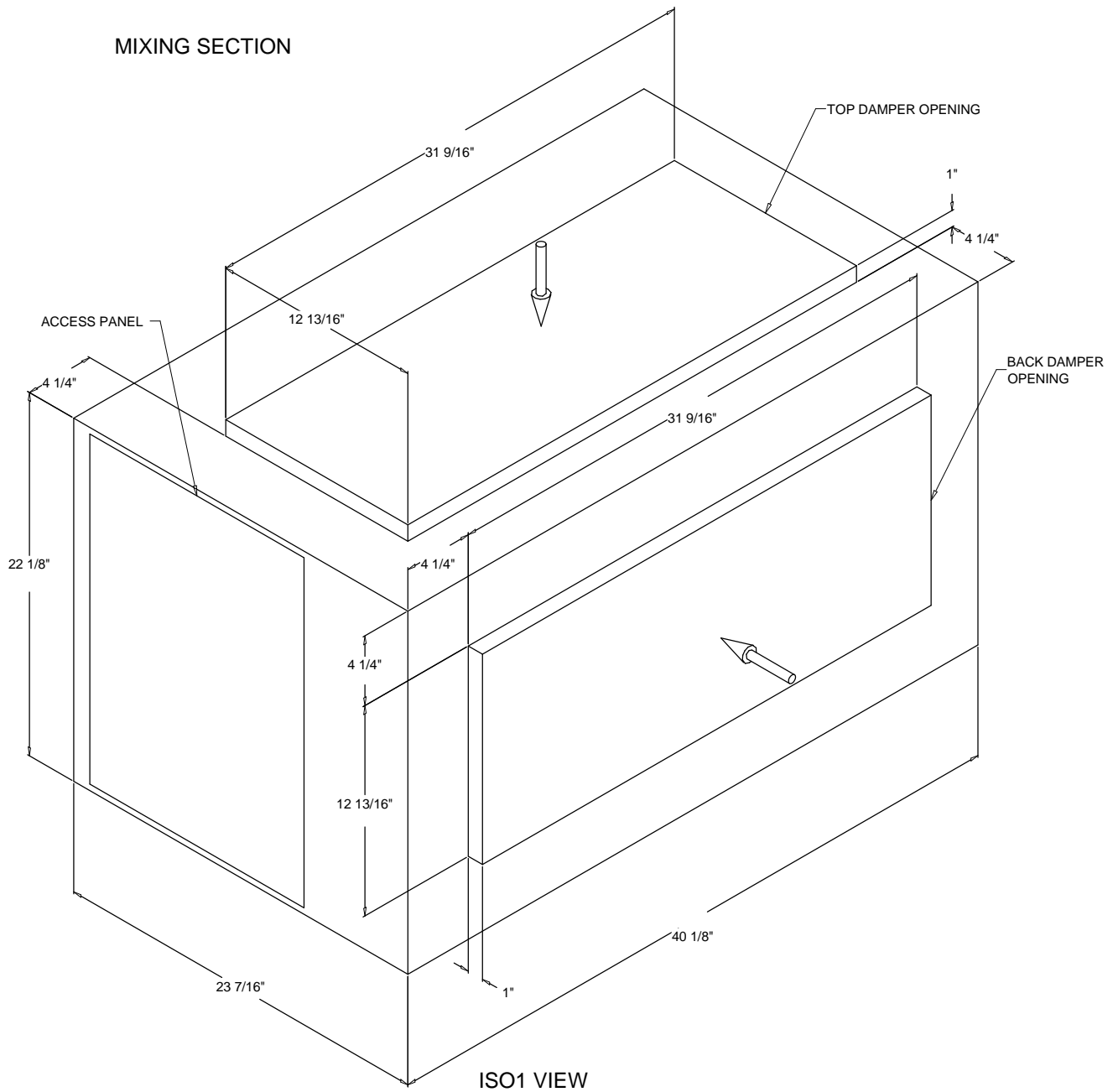
RETURN-1	1 1/8"
SUPPLY-1	1 1/8"
RETURN-2	1 3/8"
SUPPLY-2	1 3/8"



NOTES:

1. PICTORIAL HEADER STUBOUT LOCATIONS RELATIVE TO EACH OTHER MAY NOT BE ACCURATE.
2. LOCATING DIMENSIONS HAVE A PLUS / MINUS 2" TOLERANCE.
3. FOR UNITS WITH A FILTER ACCESS MODULE, ADD 7 3/16" TO HORIZONTAL DIMENSIONS SHOWN.
4. PIPING CONNECTIONS ARE SPECIFIED AS OUTSIDE DIAMETER (O.D.).

Accessory - BCXD Blower Coil - Direct Drive
Item: D1 Qty: 1 Tag(s): Trum-AHU-L1



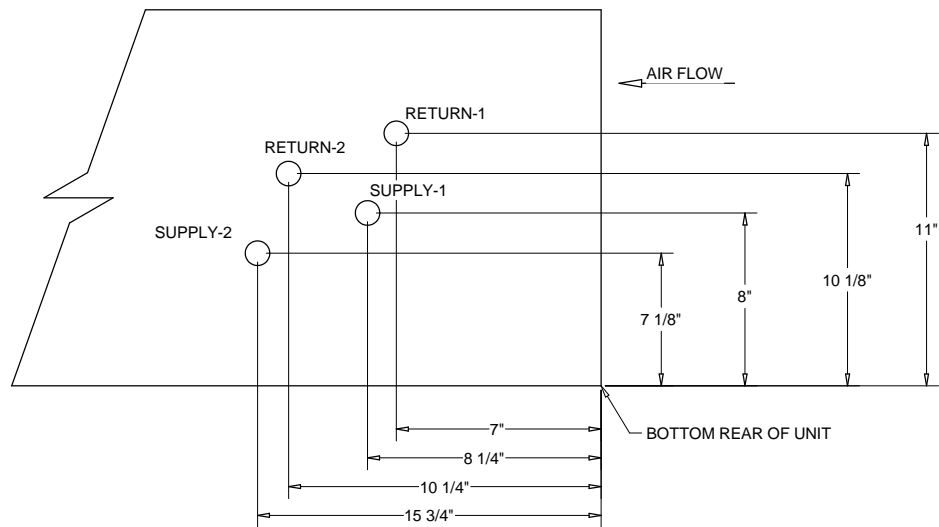
NOTES:

1. MIXING SECTION SHIPS SEPARATE FOR FIELD INSTALLATION.
2. LINKAGE BETWEEN DAMPERS IS FACTORY INSTALLED INSIDE THE MIXING SECTION OPPOSITE THE DRIVE SIDE. DRIVE ROD ON BACK DAMPER MAY BE EXTENDED THROUGH KNOCKOUT FOR EXTERNALLY MOUNTED ACTUATOR.
3. ACCESS PANELS ARE LOCATED ON BOTH SIDES OF THE MIXING SECTION TO PROVIDE ACCESS TO THE SECTION'S INTERNAL DAMPER COMPONENTS.
4. ARROWS INDICATE THE DIRECTION OF AIRFLOW.

Accessory - BCXD Blower Coil - Direct Drive
Item: D2, D3 Qty: 2 Tag(s): AHU-L2, AHU-L3

MAIN UNIT COIL CONNECTIONS

RETURN-1	5/8"
SUPPLY-1	5/8"
RETURN-2	1 1/8"
SUPPLY-2	1 1/8"

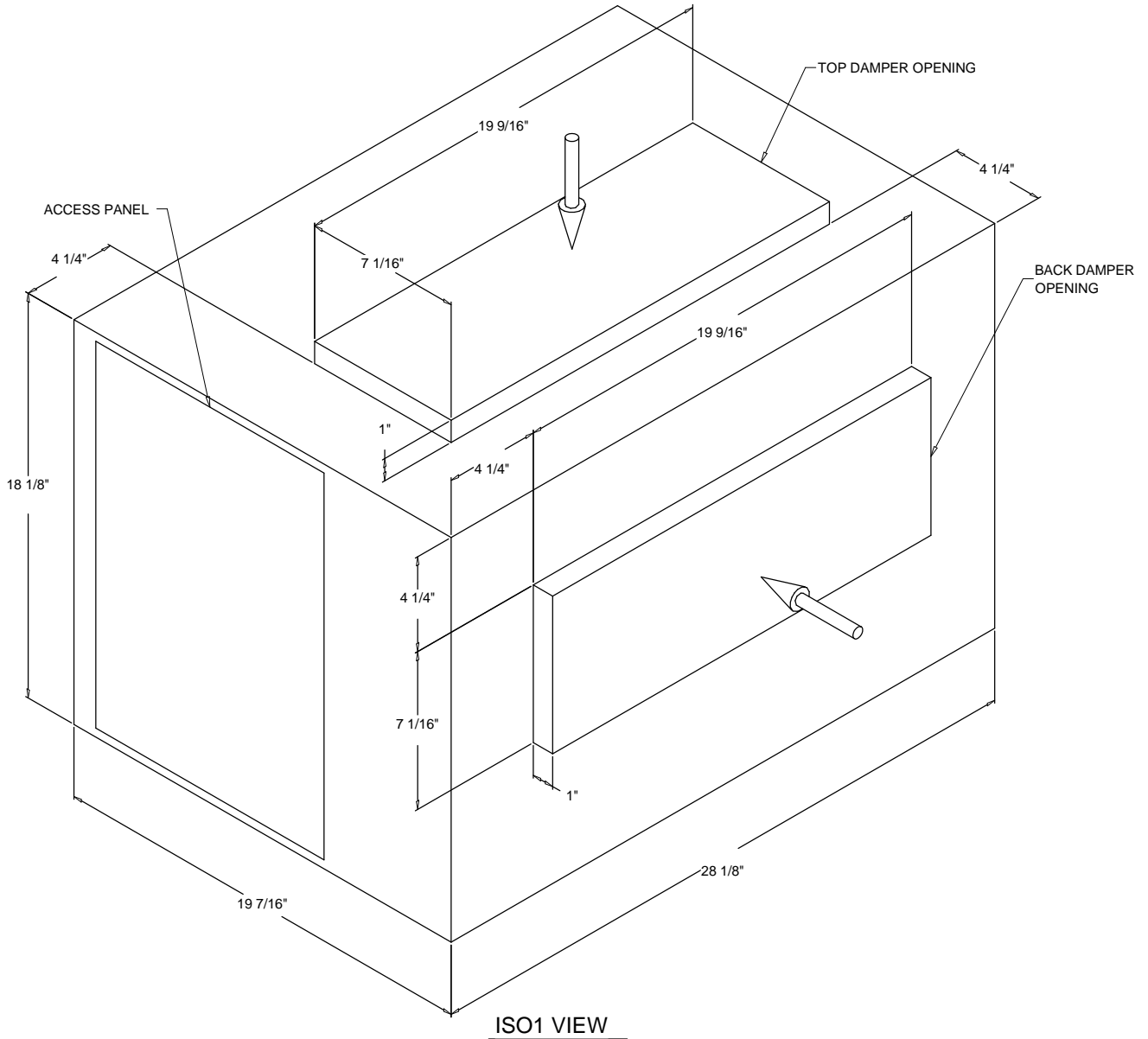


NOTES:

1. PICTORIAL HEADER STUBOUT LOCATIONS RELATIVE TO EACH OTHER MAY NOT BE ACCURATE.
2. LOCATING DIMENSIONS HAVE A PLUS / MINUS 2" TOLERANCE.
3. FOR UNITS WITH A FILTER ACCESS MODULE, ADD 7 3/16" TO HORIZONTAL DIMENSIONS SHOWN.
4. PIPING CONNECTIONS ARE SPECIFIED AS OUTSIDE DIAMETER (O.D.).

Accessory - BCXD Blower Coil - Direct Drive
Item: D2, D3 Qty: 2 Tag(s): AHU-L2, AHU-L3

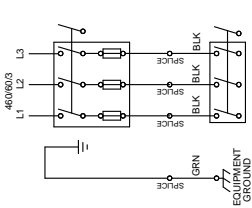
MIXING SECTION



NOTES:

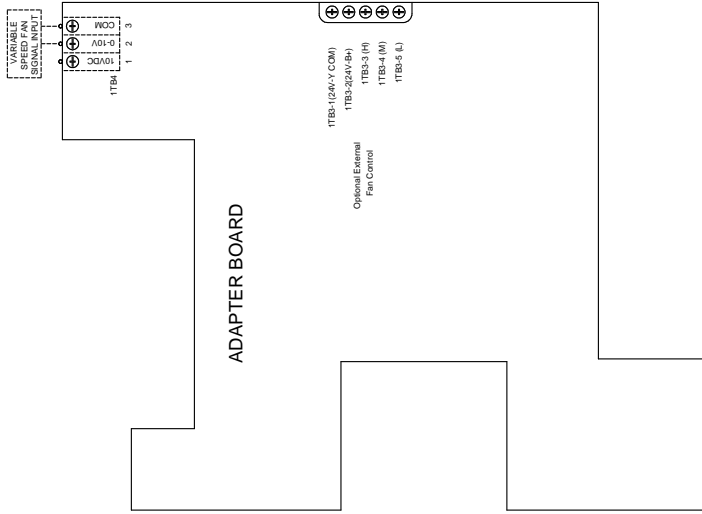
1. MIXING SECTION SHIPS SEPARATE FOR FIELD INSTALLATION.
2. LINKAGE BETWEEN DAMPERS IS FACTORY INSTALLED INSIDE THE MIXING SECTION OPPOSITE THE DRIVE SIDE. DRIVE ROD ON BACK DAMPER MAY BE EXTENDED THROUGH KNOCKOUT FOR EXTERNALLY MOUNTED ACTUATOR.
3. ACCESS PANELS ARE LOCATED ON BOTH SIDES OF THE MIXING SECTION TO PROVIDE ACCESS TO THE SECTION'S INTERNAL DAMPER COMPONENTS.
4. ARROWS INDICATE THE DIRECTION OF AIRFLOW.

Field Wiring - BCXD Blower Coil - Direct Drive
Item: D1 Qty: 1 Tag(s): Trum-AHU-L1



POWER WIRING

CONTROL WIRING



MINIMUM CIRCUIT AMPACITY: 4.13 A
 MAXIMUM FUSE SIZE: 15.00 A

- NOTES:
1. UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 70°F AT ATMOSPHERIC PRESSURE AT 65% RELATIVE HUMIDITY WITH ALL UTILITIES TURNED OFF AND AFTER A NORMAL SHUTDOWN HAS OCCURRED.
 2. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE RECOMMENDED FIELD WIRING BY TRANE CO. SOLID LINES INDICATE WIRING BY TRANE CO.
 3. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL REQUIREMENTS. ALL FIELD WIRING MUST HAVE AN INSULATION VOLTAGE RATING THAT EQUALS OR EXCEEDS UNIT RATED VOLTAGE.

7. USE CLASS 2 WIRING FOR LOW VOLTAGE APPLICATIONS.

NOTICE

USE COPPER CONDUCTORS ONLY!
 UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.
 FAILURE TO DO THE ABOVE COULD RESULT IN EQUIPMENT DAMAGE.

AVIS

UTILISER QUE DES CONDUCTEURS EN CUIVRE!
 LES BORNES DE L'UNITÉ NE SONT PAS CONÇUES POUR RECEVOIR D'AUTRES TYPES DE CONDUCTEURS.
 FAIRE DÉFAUT À LA PROCÉDURE CI-DESSUS PEUT ENTRAÎNER DES DOMMAGES À L'ÉQUIPEMENT.

AVISO

UTILICE ÚNICAMENTE CONDUCTORES DE COBRE!
 LAS TERMINALES DE LA UNIDAD NO ESTÁN DISEÑADAS PARA ACEPTAR OTROS TIPOS DE CONDUCTORES.
 NO SEGUIR LAS INSTRUCCIONES ANTERIORES PUEDE PRODUCIR DAÑOS EN EL EQUIPO.

WARNING

HAZAROUS VOLTAGE!
 ALL ELECTRICAL CONNECTIONS MUST BE MADE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC), STATE AND LOCAL REQUIREMENTS. ALL FIELD WIRING MUST HAVE AN INSULATION VOLTAGE RATING THAT EQUALS OR EXCEEDS UNIT RATED VOLTAGE.
 FAILURE TO DO THE ABOVE COULD RESULT IN EQUIPMENT DAMAGE.

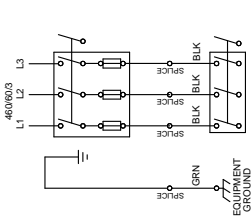
AVERTISSEMENT

TENSION DANGEREUSE!
 TOUS LES BRAS DE BRANCHEMENT DOIVENT ÊTRE RÉALISÉS EN ACCORDANCE AVEC LE CODE ÉLECTRIQUE NATIONAL (NEC), LES EXIGENCES ÉTATÉES ET LOCALES. TOUS LES BRAS DE BRANCHEMENT DOIVENT AVOIR UN NIVEAU DE TENSION D'ISOLATION ÉGAL À AU MOINS ÉGAL À LA TENSION NOMINALE DE L'ÉQUIPEMENT.
 LE NON-RESPECT DE CES RÈGLES PEUT PROVOQUER DES DOMMAGES À L'ÉQUIPEMENT.

ADVERTENCIA

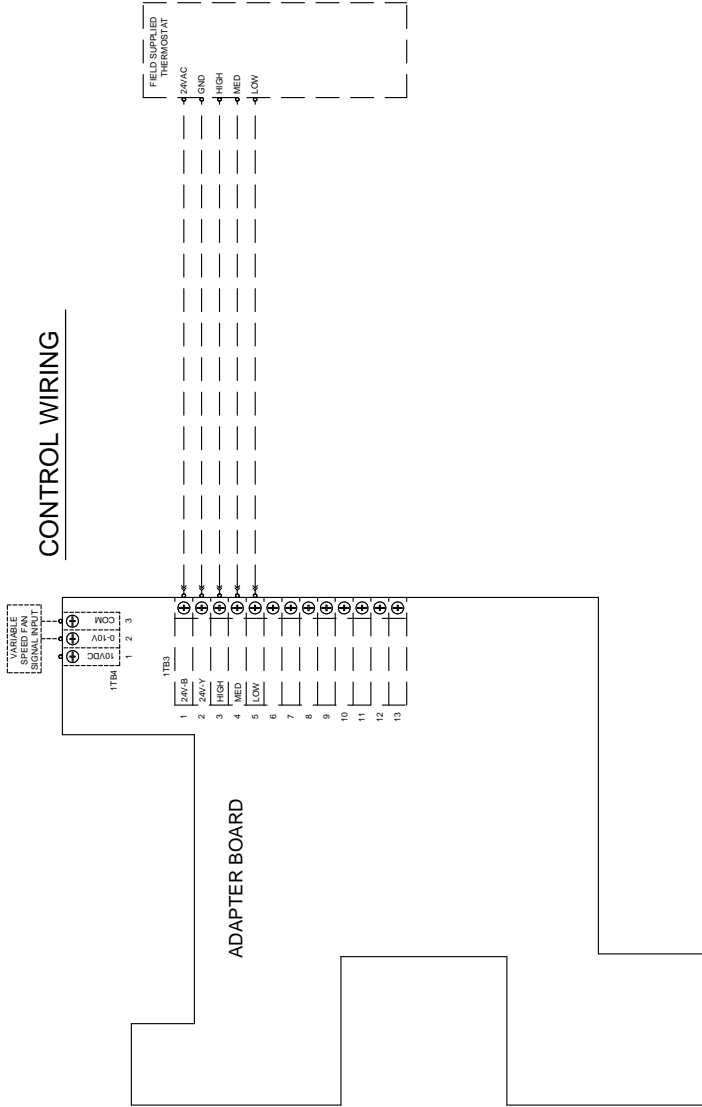
¡TENSION PELIGROSA!
 TODAS LAS CONEXIONES DEBEN HECHAS DE ACUERDO CON EL CÓDIGO ELÉCTRICO NACIONAL (NEC), LAS EXIGENCIAS ESTATALES Y LOCALES. TODAS LAS CONEXIONES DEBEN TENER UN NIVEL DE TENSION DE AISLAMIENTO QUE IGUAL O EXCEDE LA TENSION NOMINAL DEL EQUIPO.
 EL NO SEGUIR LAS INSTRUCCIONES ANTERIORES PUEDE PRODUCIR DAÑOS EN EL EQUIPO.

Field Wiring - BCXD Blower Coil - Direct Drive
Item: D2, D3 Qty: 2 Tag(s): AHU-L2, AHU-L3



POWER WIRING

CONTROL WIRING



ADAPTER BOARD

MINIMUM CIRCUIT AMPACITY: 3.13 A
MAXIMUM FUSE SIZE: 15.00 A

- NOTES:
1. UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 70°F AT ATMOSPHERIC PRESSURE AT 65% RELATIVE HUMIDITY WITH ALL UTILITIES TURNED OFF AND AFTER A NORMAL SHUTDOWN HAS OCCURRED.
 2. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE RECOMMENDED FIELD WIRING BY TRANE CO. SOLID LINES INDICATE WIRING BY TRANE CO.
 3. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL REQUIREMENTS. ALL FIELD WIRING MUST HAVE AN INSULATION VOLTAGE RATING THAT EQUALS OR EXCEEDS UNIT RATED VOLTAGE.

7. USE CLASS 2 WIRING FOR LOW VOLTAGE APPLICATIONS.

⚠ WARNING
 HAZARDOUS VOLTAGE!
 ALL ELECTRICAL CONNECTIONS MUST BE MADE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC), STATE AND LOCAL REQUIREMENTS. ALL FIELD WIRING MUST HAVE AN INSULATION VOLTAGE RATING THAT EQUALS OR EXCEEDS UNIT RATED VOLTAGE.
 FAILURE TO DO THE ABOVE BEFORE SERVICING MAY RESULT IN ELECTRIC SHOCK OR DEATH.
AVERTISSEMENT
 TENSION DANGEREUSE!
 COUPREZ TOUJOURS LES TENSIONS ET TANCE AVANT DE FAIRE DES TRAVAUX ÉLECTRIQUES.
 TOUJOURS PORTER DES GANTS ISOLANTS ET DES VÊTEMENTS SÛRS. NE PAS TOUCHER LES PARTIES DÉCHARGÉES. DANS LE CAS D'UN DÉCHARGEMENT ÉLECTRIQUE, NE PAS TOUCHER LES PARTIES DÉCHARGÉES. NE PAS TOUCHER LES PARTIES DÉCHARGÉES.
⚠ ADVERTENCIA
 PELIGRO DE VOLTAJE ALTA.
 INCLUIDO EN LAS ESPECIFICACIONES DE REMEDIACIÓN Y EN LA LITERATURA DE SEGURIDAD DE TRANE.
 LOS CAPACITORES RELACIONADOS CON LA UNIDAD DE TRANE DEBEN SER DESCARGADOS ANTES DE SER SERVICIADOS. PARA LAS UNIDADES CON EL SE, CONSULTA LAS INSTRUCCIONES PARA LA DESMONTAJE DEL CONDENSADOR.
 INDICADO: TODA CUALQUIERA LA MUERTE O SERIA LESIONES PERSONALES.

NOTICE
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 UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.
 FAILURE TO DO THE ABOVE COULD RESULT IN EQUIPMENT DAMAGE.
AVIS
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 FAIRE DÉFAUT À LA PROCÉDURE CI-DESSUS PEUT ENTRAÎNER DES DOMMAGES À L'ÉQUIPEMENT.
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Field Installed Options - Part/Order Number Summary

This is a report to help you locate field installed options that arrive at the jobsite. This report provides part or order numbers for each field installed option, and references it to a specific product tag. It is NOT intended as a bill of material for the job.

Product Family - BCXD Blower Coil - Direct Drive

Item	Tag(s)	Qty	Description	Model Number
D1	Trum-AHU-L1	1	BCXD Blower Coil - Direct Drive (BCXD)	BCHD054G2**A2A G5Z000000BA600 0000000000-0
D2	AHU-L2	1	BCXD Blower Coil - Direct Drive (BCXD)	BCHD024G2**A1A N4Z000000BA100 0000000000-0
D3	AHU-L3	1	BCXD Blower Coil - Direct Drive (BCXD)	BCHD024G2**A1A N4Z000000BA100 0000000000-0

Field Installed Option Description	Part/Ordering Number
Mixing Box Only	