



Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
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Phone 501-834-3320
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Date: 4/9/2024

Return Request: 4/19/2024

Project: LRAFB – Dorm 854 Renovation

Supplier: Trane

Manufacturer: Trane

Submittal: Energy Recovery AHU

Submittal Number: 23 00 00-05

Drawing # and Installation: Mechanical Drawings

ARCHITECT

ENGINEER

EECI
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Little Rock, AR 72205
501-244-0511

GENERAL CONTRACTOR

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501-983-1160

MECHANICAL SUBCONTRACTOR

Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

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CSUSA PROJECT NO.

24-7031

joseph@comfortar.com

9924 Landers Rd.
No. Little Rock, AR 72117



Energy Recovery AHU Submittal

Prepared For:
Energy Engineering Consultants, Inc.

Date: April 02, 2024

Sold To:
Comfort Systems USA (AR), Inc

Job Name:
LRAFB B854 Dorm Renovation

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

Product Summary

Qty	Product
1	2500 CFM Chilled/Hot Water Indoor Energy Recovery Trane Horizon Unit (Tag: ERAHU-1)

Equipment Submitted Based on Plans Dated 29 FEB, 2024

Submittal Notes:

- Heating Reheat Coil
- Setup for 30% Glycol Chilled Water System
- Setup for Water Only on the Hot Water
- 2" Pleated Merv 8 Filters
- Disconnect Switch
- Factory Startup

Not Included: Labor warranty, Installation, Wiring, Rigging, Any Kind of Vibration Isolation, Seismic Isolation, **Curbs**, Pads, or Stands, Extra Filters, **Smoke Detectors**, **Control Valves (Provided by Others)**, And Any Other Item Not Specified Above.

Austin Johnson

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

*Submittal acceptance and return is a critical step, so please ensure submittals are returned with approval to release to production within **14 days** of submittal date.*

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.

Product Data - Horizon™ - Outdoor Air Unit (B/G)

Size	Qty	Description	Model Number
B036	1	Horizon™ - Outdoor Air Unit (B/G)	OABD036D3-F00001KM-J5D00001KG4D10B0A400

Tag(s): DOAS**Unit Voltage: 208-3-60****Airflow Configuration: Horizontal Discharge/Horizontal Return**

Installation: Outdoor

Hot Water Coil: 2-Row

Evaporator Coil: Chilled Water

Indoor Blower Motor: Direct Drive w/VFD

Heat Type: Hot Water

Fuel Type: Hot Water

Unit Controls: Non DDC - Terminal Strip

Powered Exhaust: Direct Drive w/VFD & Gravity Damper

ERV/HRV: ERV - Aluminum Construction w/ Frost Protection w/ VFD

Energy Recovery & Conservation: ERC-3018C-4M

Damper Options: 2-Position Outdoor Air Damper

Filters: MERV-8

Electrical Options: Non-Fused Disconnect Switch "Circuit Breaker" (B/G)

Air Flow Monitoring: IFM Piezo Ring and PE Piezo Ring/Tap

Curb Selection: No Curb

Warranty: 1-Year Parts Only (manufacturer warranty)

Supply Discharge Air Sensor (Field Installed)

2 inch Double Wall Construction

Stainless Steel Drip Pan

Blower HP - 3

Blower RPM - 2782

Supply Fan - CF140.6

Exhaust RPM - 2370

Exhaust HP - 1.5

Exhaust Fan - CF140.6

Unit Amps - FLA: 15.1 Amps

Min Circuit Ampacity - MCA: 16.9 Amps

Maximum Fuse Size - MFS: 20 Amps

Tag: DOAS

Comments:

Unit Information

Model:	Horizon™ (OAB/G Rev5)	Unit Length:	161 in	Weight Operating:	1753 lb*
Size:	B036	Unit Width:	52 in	Note: Weight does not include CURB weight. See CURB submittal for actual	
Quantity:	1	Unit Height:	55 in		
Supply Airflow:	2,500 CFM	Elevation:	0 ft		
Outside Airflow:	2,500 CFM	Ambient Air DB:	0 F		
Minimum Airflow:	565 CFM				

Cooling Performance

Gross Total Capacity:	61.1 MBh	Evaporator Face Area:	5.14 sq ft
Gross Sensible Capacity:	50.6 MBh	Evaporator Rows / FPI:	6 / 12
Net Total Capacity:	56 MBh	Entering Fluid Temp:	42 F
Net Sensible Capacity:	45.5 MBh	Leaving Fluid Temp:	55 F
Entering Air DB / WB (Coil):	83.4 / 70.9 F	Fluid Flow:	9.94 GPM
Leaving Air DB / WB (Coil):	65.1 / 64 F	Fluid Pressure Drop:	1.5 ft. H2O
Leaving Air DB / WB (Unit):	67.3 / 64.8 F	Fluid Type:	Propylene
Leaving DP:	63.2 F	Percent Glycol:	30 %
Air Velocity:	486 fpm		
Coil Air PD:	0.51 in H2O		

Heating Performance

Heat Type:	Hot Water	Rows:	2	Entering Fluid Temp:	160 F
Capacity:	94.6 MBh	FPI:	10	Leaving Fluid Temp:	140 F
Entering Air DB:	49.3 F	Fluid Flow:	9.64 GPM	Fluid Type:	Water
Leaving Air DB:	84.1 F	Fluid PD:	0.9 ft. H2O	Percent Glycol:	0 %
Air Velocity:	817 fpm	Fluid Velocity:	10.1 ft/s		
Coil Air PD:	0.35 in H2O				

Energy Recovery Wheel ERC-3018C-4M

** TAB Outside airflow through OA Intake to this value

Summer Conditions**Winter Conditions**Ventilation SupplyOutside

Airflow: **2,500** CFM
DB: **83.4** F
WB: **70.9** F
PD: **1.07** in H2O

Airflow: **2,772** CFM**
DB: **98.0** F
WB: **78.0** F

ReturnExhaust

Airflow: **2,000** CFM
DB: **75.0** F
WB: **63.0** F
ESP: **0.75** in H2O

Airflow: **2,272** CFM
DB: **92.6** F
WB: **72.9** F
ERV PD: **0.87** in H2O

Ventilation SupplyOutside

Airflow: **2,500** CFM
DB: **49.3** F
WB: **41.3** F
PD: **1.07** in H2O

Airflow: **2,772** CFM**
DB: **17.0** F
WB: **15.0** F

ReturnExhaust

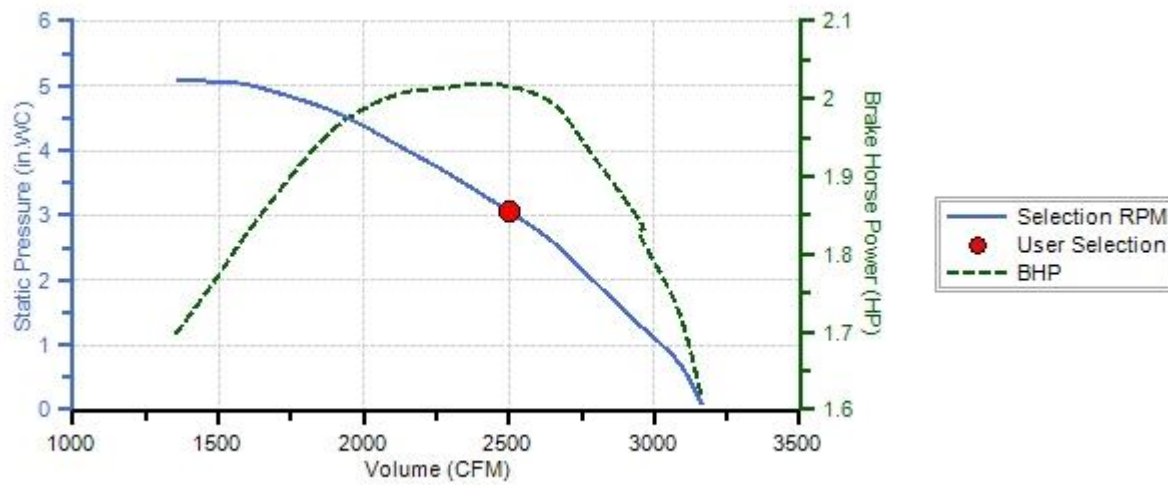
Airflow: **2,000** CFM
DB: **70.0** F
WB: **58.0** F
ESP: **0.75** in H2O

Airflow: **2,272** CFM
DB: **32.1** F
WB: **31.9** F
ERV PD: **0.87** in H2O

Total Capacity: **69.15** MBH Eff. **63.0%**
Sensible Capacity: **37.38** MBH Eff. **76.0%**
Latent Capacity: **31.78** MBH Eff. **48.0%**

Total Capacity: **118.00** MBH Eff. **70.0%**
Sensible Capacity: **88.65** MBH Eff. **77.0%**
Latent Capacity: **29.35** MBH Eff. **47.0%**

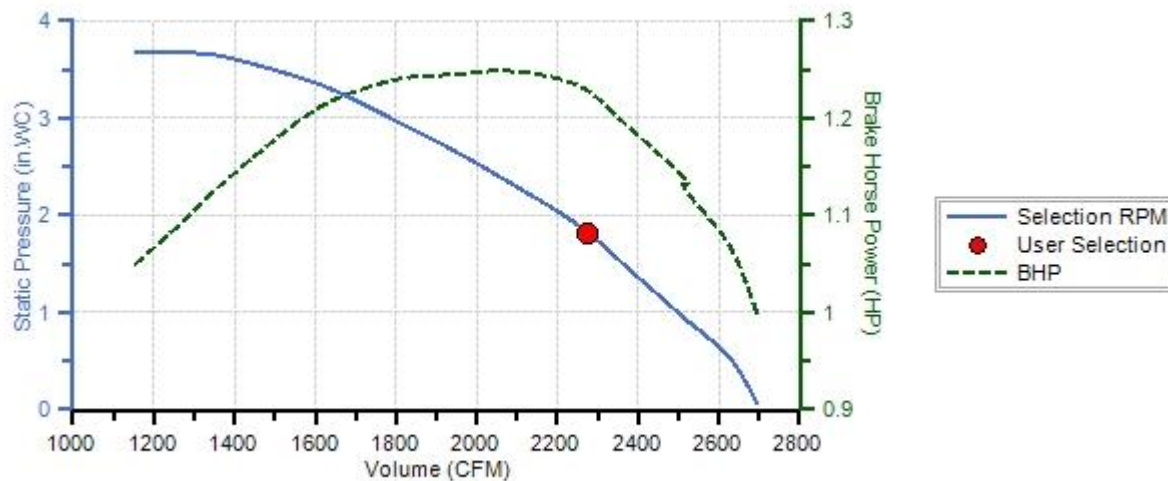
Supply Fan CF140.6

**Supply Pressure Drop Summary**

External Static Pressure:	0.75 in H ₂ O
Cabinet:	0.02 in H ₂ O
Cooling Coil:	0.51 in H ₂ O
Base Filter:	0.02 in H ₂ O
Filter:	0.34 in H ₂ O
Primary Heat:	0.35 in H ₂ O
ERV OA:	1.07 in H ₂ O
Total Static Pressure:	3.06 in H₂O

Supply Fan Conditions

Fan Motor BHP:	2.01 BHP
Operating RPM:	2782 RPM
Minimum RPM:	1244 RPM

Exhaust Fan CF140.6**Exhaust Pressure Drop Summary**

Return External Static Pressure:	0.75 in H ₂ O
ERV Return Filter PD:	0.2 in H ₂ O
ERV Wheel PD:	0.87 in H ₂ O
Total Exhaust Static Pressure	1.82 in H₂O

Exhaust Fan Conditions

Fan Motor BHP:	1.23 BHP
Operating RPM:	2370 RPM

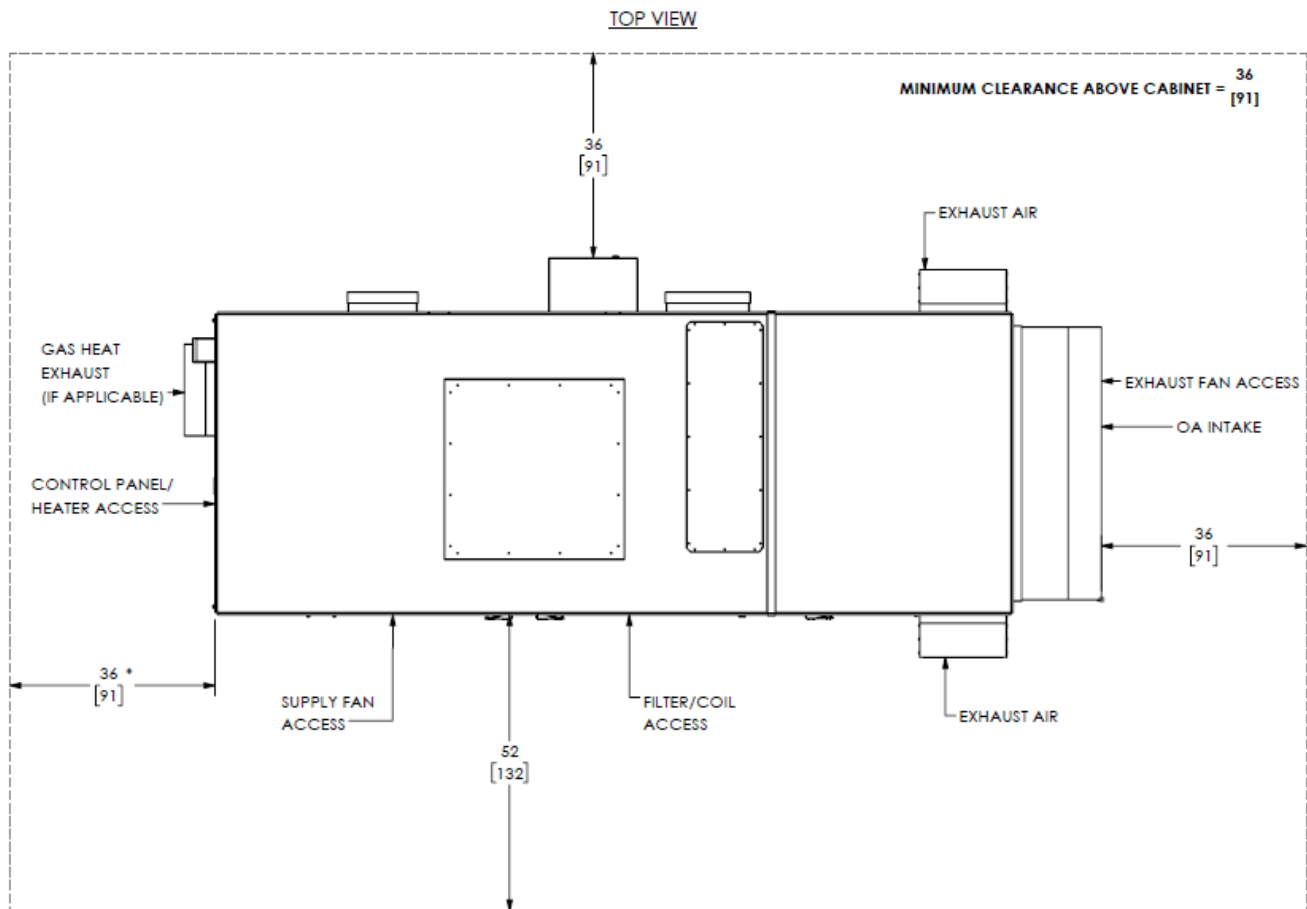
Unit Electrical Data

Unit Voltage-Ph-Hz:	208-3-60	Min Circuit Ampacity - MCA:	16.9 Amps
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Unit Amps - FLA:		15.1 Amps		Maximum Fuse Size - MFS:		20.0 Amps	
<u>Electrical Summary</u>							
<u>Component</u>	<u>Fan Service</u>	<u>Qty</u>	<u>HP (ea.)</u>	<u>FLA (ea.)</u>	<u>RLA (ea.)</u>	<u>LRA (ea.)</u>	
ERV/HRV		1	0.125	0.7			
	Exhaust	1	1.5	4.8			
	Supply	1	3	7.2			
Controls		1		2.4			
<u>Notes</u>							
• Unit Electrical amps include the greater of compressor or electrical heat amps. • Unit's electrical as shown above are for single point power.							

Drawing Accurate for OAB CW

Qty: 1 Tag(s): DOAS



NOTES:

1. DUAL DIMENSIONS: IN. [CM.]

DIMENSIONS DISPLAYED ARE REQUIRED FOR BASIC UNIT SERVICEABILITY UNLESS OTHERWISE NOTED

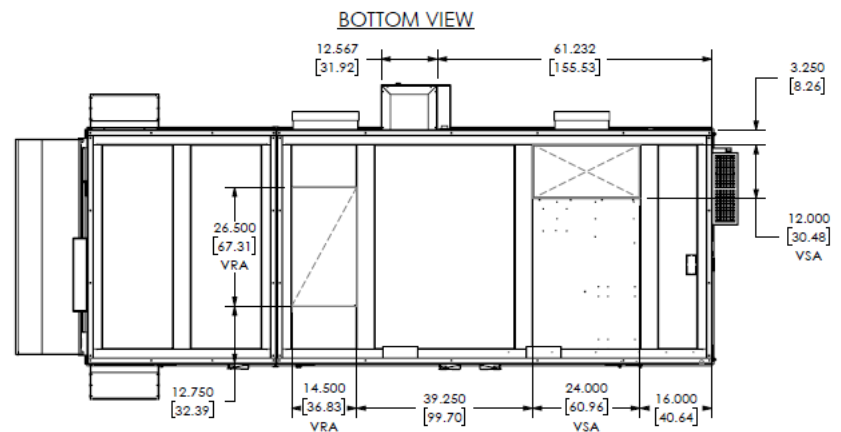
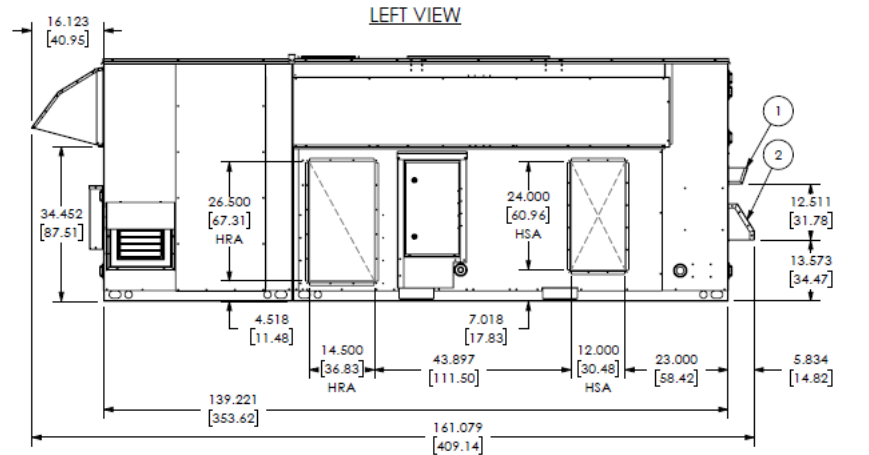
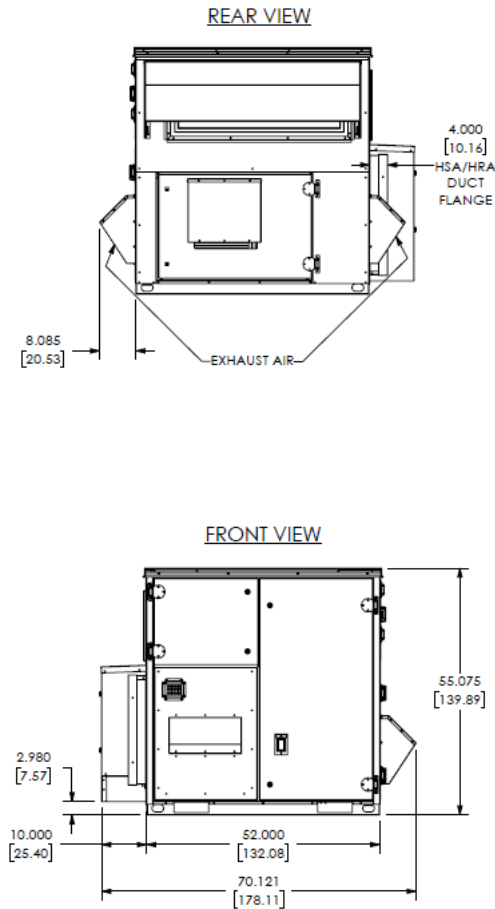
*MINIMUM REQUIRED CLEARANCE TO ENSURE UNIT PERFORMANCE FOR GAS HEAT OPTION

**MINIMUM REQUIRED CLEARANCE TO ENSURE UNIT PERFORMANCE

REFER TO LOCAL BUILDING CODES TO ENSURE INSTALLATION MEETS ALL NECESSARY REQUIREMENTS

Drawing Accurate for OAB CW

Qty: 1 Tag(s): DOAS



GENERAL NOTES:

IN.

A. DUAL DIMENSIONS: [CM.]

B. UNIT SHOWN REPRESENTS MULTIPLE AIRFLOW CONFIGURATIONS

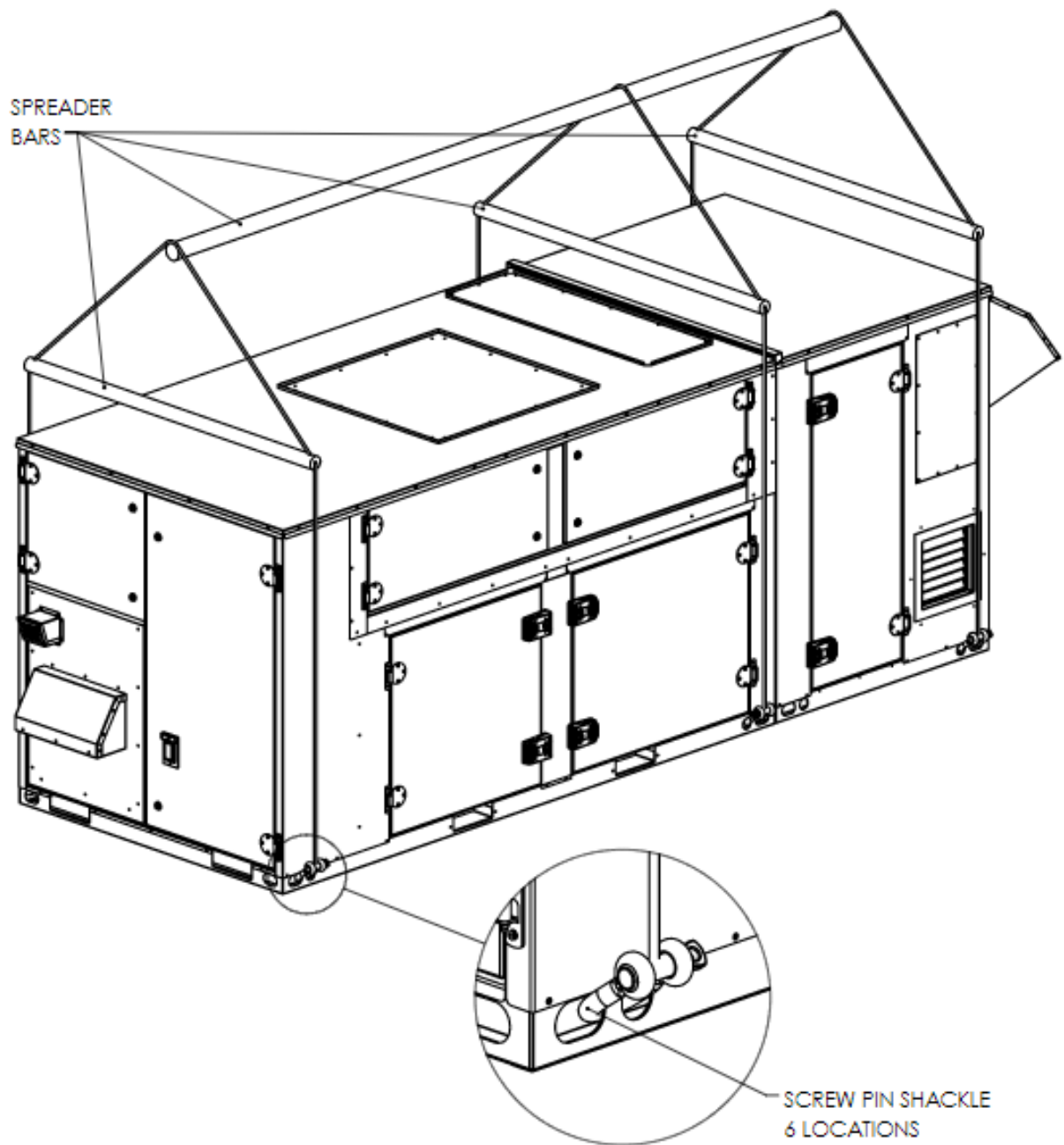
CONFIGURATION SPECIFIC NOTES:

1. FLUE HOOD: INCLUDED WITH GAS HEAT

2. COMBUSTION AIR INTAKE: INCLUDED WITH GAS HEAT

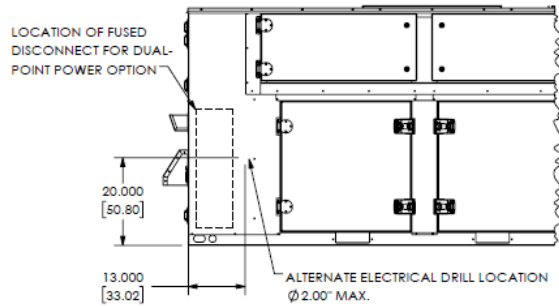
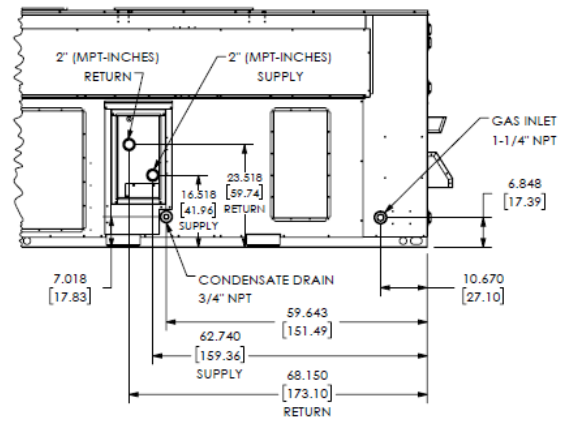
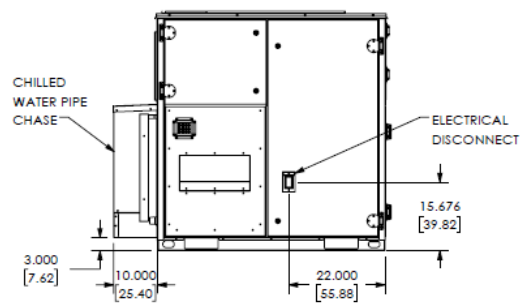
Drawing Accurate for OAB CW and OAB NC

Qty: 1 Tag(s): DOAS

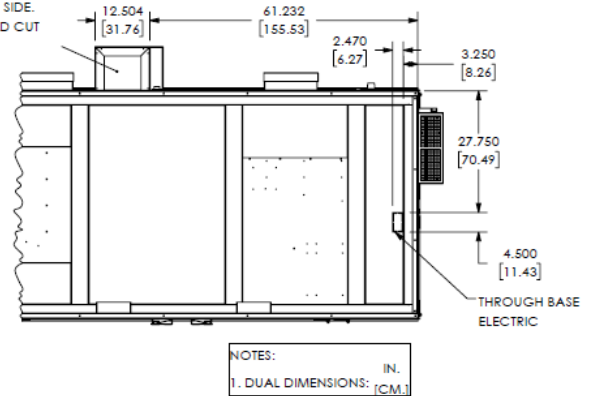


Drawing Accurate for OAB CW

Qty: 1 Tag(s): DOAS

RIGHT VIEWLEFT VIEWFRONT VIEWBOTTOM VIEW

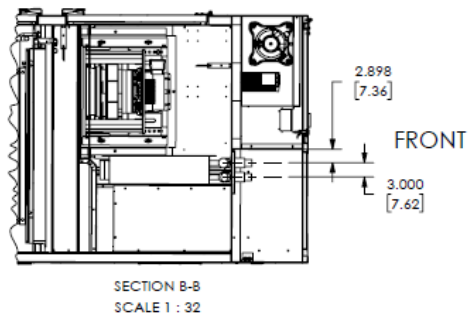
WATER CONNECTIONS
INSIDE PIPE CHASE. ROUTE
THROUGH BASE OR SIDE.
(SIDE REQUIRES FIELD CUT
HOLES)



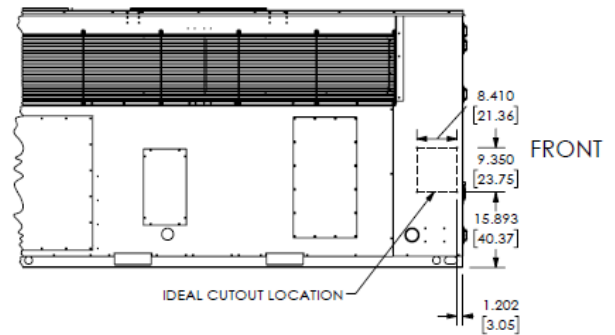
Drawing Accurate for OAB-HW Coil Connections

Qty: 1 Tag(s): DOAS

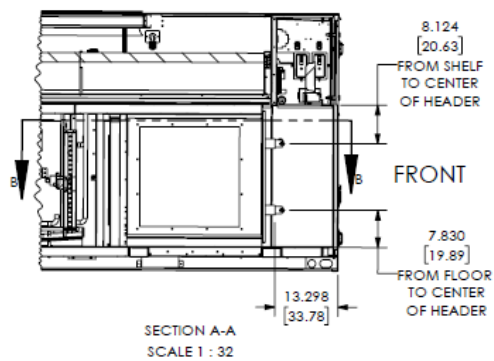
TOP SECTION VIEW



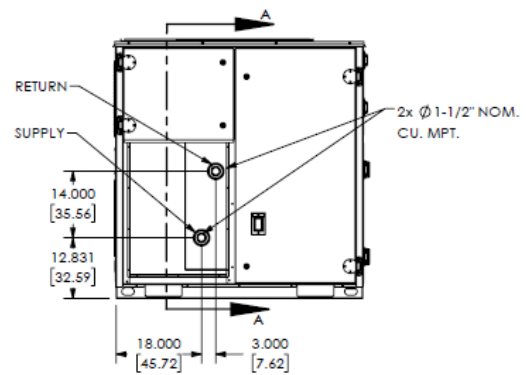
LEFT VIEW



LEFT SECTION VIEW



FRONT VIEW



*INSTALLING CONTRACTOR TO CUT HOLES IN CABINET FOR PIPING PER DESIGN REQUIREMENTS AND INSTALL FIELD-PROVIDED MODULATING HOT WATER VALVE. PLEASE REFER TO THE IOM FOR INSTALLATION INSTRUCTIONS. LOW VOLTAGE WIRING INSTRUCTIONS INCLUDED ON WIRING DIAGRAMS INSIDE CONTROL PANEL DOOR.

NOTES:
1. DUAL DIMENSIONS: [IN.]
[CM.]

Mechanical Specifications - Tag(s): DOAS**General**

The unit shall be either field convertible (OAB) or configured at the factory (OAG) between Down/Horizontal discharge for both Supply and Return Openings. 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 ETL listed and labeled, classified in accordance to UL 1995/CAN/CSA No. 236-M40 for Central Cooling Air Conditioners. Canadian units shall be CSA Certified.

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. Unit's surface shall be tested 672 hours in a salt spray test in compliance with ASTM B117. Unit shall have 2 inch thick Antimicrobial polyisocyanurate foam insulation, metal encapsulated with no exposed edges. Initial R value of 6.6 per inch of thickness. The unit's base pan shall have no penetrations within the perimeter of the curb other than the raised downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up.

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

Sensors

A factory installed combination outdoor air sensor located in the outdoor air hood is designed to sense both outdoor air temperature and relative humidity for use by the microprocessor controller to make required ventilation, cooling, dehumidification and heating decisions. Refer to the Sequence of Operations section of the Installation, Operation and Maintenance manual for detailed unit control and operational modes. A factory installed sensing tube is designed to sense the supply air temperature downstream of the indoor fan section.

Evaporator Coil: Chilled Water**Chilled Water Coils**

Tubes are to be

mechanically expanded into fins (secondary surface) for maximum heat transfer and shall be 6 rows. Materials are to be 1/2 in. diameter x (0.020) wall thickness. Secondary surface (fins) shall be of the plate-fin design using aluminum with die-formed collars. Fin design is waffle in a staggered tube pattern to meet performance requirements. Collars will hold fin spacing at specified density, and cover the entire tube surface. Fins are to be free of oils and oxidation. The coil shall have MPT connections constructed of copper. Water valves are field supplied and installed. The included Cooney Freeze Block is designed to allow ice to form within the tubes, without restriction, by discharging a small amount of water into the drain pan. Each expansion header has a factory installed Cooney Freeze Block Valve that is both pressure and thermally activated. The valve will open when outside air below 35°F comes in contact with the header or return end of the coil, or when the internal pressure of the coil exceeds 300 psi. The valve will automatically reset and allow the coil to resume normal operation, when the pressure decreases, or when the temperature increases.

Indoor Blower Motor: Direct Drive w/VFD

Supply Fan motor shall be direct drive type with factory installed Variable Frequency Drive (unless no controls option is selected, VFD can be provided by others). All motors shall be thermally protected. All indoor fan motors meet the U.S. Energy Policy Act of 2005 (EPACT). All Fans shall be mounted on rubber vibration isolators, to reduce the transmission of noise.

Fuel Type: Hot Water

The hot water coil is ARI performance certified and shall bear the ARI symbol. Tubes are to be mechanically expanded into fins (secondary surface) for maximum heat transfer. Materials are to be 5/8" diameter x (0.020) wall thickness. Secondary surface (fins) shall be of the plate-fin design using aluminum with die-formed collars. Fin design is waffle in a staggered tube pattern to meet performance requirements. Collars will hold fin spacing at specified density, and cover the entire tube surface. Fins are to be free of oils and oxidation. The coil shall have MPT connections constructed of copper. Water valves are field supplied and installed.

Unit Controls: Non DDC - Terminal Strip

Non DDC - Electromechanical. Terminal strip wiring only. In this case all factory safeties that are programmed are removed along with the standard Trane UC600 along with all factory programs. The Horizon manufacturer warranty is still valid on all components unless the affected part is receiving a signal from the field supplied controller or BAS. Falcon claims made relative to a component failure based on the signal will be rejected. After a successful run test and shipment a manufacturer workmanship warranty is provided on all units sold with no controls. The standard twelve (12) months from start up or eighteen (18) months from shipment is still provided to guarantee the quality of workmanship that we provide to the customer. This warranty does not cover any damages or defects caused by field provided components and only manufacturer defects.

Powered Exhaust: Direct Drive w/VFD & Gravity Damper

Powered Exhaust Fan motor shall be direct drive type with factory installed Variable Frequency Drive to (unless no controls option is selected and the VFD is to be provided by others) allow variable air volume operation. All motors shall be thermally protected. All fan motors shall meet the U.S. Energy Policy Act of 2005 (EPACT). All Fan(s) shall be mounted on rubber vibration isolators, to reduce the transmission of noise.

Energy Recovery & Conservation: ERC-3018C-4M

Energy recovery wheel performance shall be AHRI 1060 certified and bear the AHRI certified label. The rotor media shall be light weight and must be made of aluminum. Paper or fibrous media are not acceptable. All surfaces must be coated with a nonmigrating adsorbent layer of desiccant prior to being formed into the media structure to insure that all surfaces are coated and that adequate latent capacity is provided. The desiccant must be a 3A molecular sieve designed for the adsorption of water vapor. The media shall be cleanable by vacuuming the media surface, without degrading the latent recovery. Dry particles up to 800 microns shall pass freely through the media.

Damper Options: 2-Position Outdoor Air Damper

The unit shall have a factory installed and integrated 100% outdoor air hood with damper controlled a by direct coupled actuator and 2 inch permanent and washable aluminum mesh filters accessible through a hinged access panel. The return air damper tray is blocked off to allow 100% outdoor airflow.

Filters: MERV-8

Aluminum Mesh Filters (K and N Cabinets) and Galvanized Mesh Bird Screen (B and G Cabinets) shall be installed on the intake of the unit. In addition, one row of 2 inch MERV-8 rated filters (30 percent) shall be installed prior to the evaporator coil. Unit shall be equipped with a 6" filter rack upstream of the evaporator. Frame shall be field-adjustable to match any filter combination specified in the attached selection.

Electrical Options: Non-Fused Disconnect Switch "Circuit Breaker" (B/G)

A 3-pole, molded case, HACR circuit breaker with provisions for through the base electrical connections shall be factory installed. Wiring will be provided from the circuit breaker to the unit high voltage terminal block. The switch will be UL/CSA agency recognized. The circuit breaker will be sized per NEC and UL guidelines.

Factory wired Voltage/Phase monitor shall be included as standard. In the event of any of the following, the units will be shut down and upon correction of the fault condition the unit will reset and restart automatically.

1. Phase Unbalance Protection: Factory set 2%
2. Over/Under/Brown Out Voltage Protection: +/-10% of nameplate voltage
3. Phase Loss/Reversal