



SUBMITTAL COVER SHEET

From: Tyler O'Neill Attn: Tim Brown
 Company: Piazza, Inc. C&S Companies
 Phone/Fax #: (914)741-4435 499 Col. Eileen Collins Blvd.
 Project: Dutchess Stadium Syracuse, NY 13212
 Project #: RFB-DCB-18-22 (315) 455-2000; Fax: 455-9577

Reference: CSI Code: 237413-1.2 Dwg No: _____
 Paragraph: _____ Other: _____

Description: Central Station Air Handling Units Product data

Supplier: CBStrain

Manufacturer: _____

Item Type: Product Data _____ Manf. Cert/Warranty
 Shop Drawings _____ Samples
 Other: _____

Contractor's Approval:

_____ Reviewed for general compliance of specifications.
 _____ This submittal is a **substitute** to the specified product.
 _____ For Architects / Engineers Approval

This is our _____ submittal for this item.

We are submitting _____ copies.

Contractor Submittal Review Stamp
 THE ATTACHED MATERIAL HAS BEEN REVIEWED BY THE UNDERSIGNED AND IS BELIEVED TO COMPLY WITH ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE UNDERSIGNED UNDERSTANDS VERIFICATION OF FIELD DIMENSIONS, AND COORDINATION WITH OTHER TRADES, REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.

Submitted by: Piazza, Inc.
 Date: 07/28/2023

Digitally signed by Piazza, Inc.
 DN: C=US, E=tyler@piazzabrothers.com,
 OU=Piazza, Inc., O=Piazza, Inc.,
 CN=Piazza, Inc.
 Date: 2023.03.15 15:04:38-04'00'

C&S Companies Approval:

(A) Approved
 (A/N) Approved As Noted
 (R) Reviewed for General Conformance
 (RR) Revise and Resubmit
 (REJ) Rejected
 (SUB) Submit Specified Item

Checking is only for general compliance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for dimensions which shall be confirmed and correlated at the jobsite; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and the satisfactory performance of his work.

Reviewed by: _____
 Date: _____

*Note: Provide one cover sheet for each copy of the submittal.



SUBMITTAL COVER SHEET

SUBMITTAL NUMBER: 11C

PROJECT: *Dutchess Stadium Leftfield Clubhouse*

ARCHITECT: *DLR Group*

ENGINEER: *DLR Group*

CONSTRUCTION MANAGER: *Piazza*

DATE: 7/27/2023

CONTRACTOR: CB Strain a Division of Dynamic Systems, Inc.

SUBCONTRACTOR:

ITEM: *Packaged Outdoor, Central-Station Air Handling Units*

SPECIFICATION SECTION: 237413

DRAWING NUMBER: *M1.1A*

SUPPLIER or MANUFACTURER: *Trane*

COMMENTS: Current Lead time is **16-17 weeks for DOAS.**
32-34 weeks for AHUs

REVIEWED BY *Charles DeMarco*



Submittal

Prepared For:
All Bidders

Date: July 26, 2023

Job Name:
Dutchess County Stadium Imp Ph II and PH III

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

Product Summary

Qty Product

- 2 DOAS Rooftop Units
- 2 Packaged Rooftop Units

Trane U.S. Inc.
301 Old Niskayuna Road, Suite 1
Latham, NY 12110
E-mail: Jacob.Hall@Trane.com
Cell: (585) 441-2799

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.



- REVIEWED
- REVIEWED – ADDITIONAL INFORMATION REQUIRED
- FURNISH AS CORRECTED
- REVISE AND RESUBMIT
- REJECTED
- NOT REVIEWED

This review is for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review of submittals is not for the purpose of determining the accuracy and completeness of other information such as dimensions, quantities, and installation or performance of equipment or systems, which are the Contractor's responsibility. The Architect's review shall not constitute approval of safety precautions or construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component. The Architect's comments, notes or corrections are not an authorization to proceed with Work involving a change in the Contract Sum, the Contract Time or both. If any portion of this review requires a change to the Work, an appropriate change instrument must be executed in accordance with the Contract Documents.

DLR Group

Date: 07-28-23
By: Cody Campbell

Product Data - Horizon™ - Outdoor Air Unit (Revision 6)

Size	Qty	Description	Model Number
D020	1	Horizon™ - Outdoor Air Unit (Revision 6)	OADG020C3-DAB10BJ00-E1AE00000-21B000030-A00C01A01-AA0A00000-01AK00000

Tag(s): DOAS-K

Unit Voltage: 460-3-60

Warranty: 1-Year Labor DX Gas Heat or Cooling Only

Warranty: 1-Year Parts Only (manufacturer warranty)

Warranty: 5-Year Digital/Variable Speed/Standard Scroll Compressor / 25-Year Heat Exchanger

Airflow Configuration: Vertical Discharge/Vertical Return

Indoor Coil Type: DX 6-Row

Reheat: Fin & Tube Modulating HGRH

Compressor: Digital Scroll-1st Circuit Only

Outdoor Coil Type: Air Cooled Fin & Tube

Heat Type - Primary: Indirect Fired NG (IF) - High Efficiency (81%)

Heat Capacity - Primary: 350 MBH, (10:1 Turndown NG, 8:1 Turndown LP)

Supply Fan Motor Type: Direct Drive w/VFD

Unit Controls: Discharge Air Control - UC600

Building Interface: BACnet

Filter Options: MERV-13, 80%

Damper Options: Modulating OA & RA Dampers w/Economizer

Electrical Options: Non-Fused Disconnect "Circuit Breaker"

Condenser Fan Options: Active (VFD) Head Pressure Low Ambient Control

Smoke Detector: Supply Smoke Detector

Hailguards: Hailguards

UV Lights: UV Lights

Installation: Outdoor

Convenience Outlet: Convenience Outlet

Cooling Controls: Reliatel

Damper Leakage Classification: Class 1A

Supply Discharge Air Sensor (FLD)

2 inch Double Wall Construction

Stainless Steel Drip Pan

Blower HP - 2

Blower RPM - 1853

Supply Fan - ANPA 16

Unit Amps - FLA: 40.7 Amps

Min Circuit Ampacity - MCA: 44.4 Amps

Maximum Fuse Size - MFS: 50 Amps

Product Data - Horizon™ - Outdoor Air Unit (Revision 6)

Size	Qty	Description	Model Number
D010	1	Horizon™ - Outdoor Air Unit (Revision 6)	OADG010C3-DAB10AF00-E3AEE3AE1-21B10C13A-A01C00A01-AA1A00000-00AK00000

Tag(s): DOAS-L

Unit Voltage: 460-3-60

Warranty: 1-Year Parts Only (manufacturer warranty)

Warranty: 2-Year Parts Only DX Gas Heat or Cooling Only

Warranty: 5-Year Digital/Variable Speed/Standard Scroll Compressor / 25-Year Heat Exchanger

Airflow Configuration: Vertical Discharge/Vertical Return

Indoor Coil Type: DX 6-Row

Reheat: Fin & Tube Modulating HGRH

Compressor: Digital Scroll-1st Circuit Only

Outdoor Coil Type: Air Cooled Fin & Tube

Heat Type - Primary: Indirect Fired NG (IF) - Standard Efficiency (80%)

Heat Capacity - Primary: 200 MBH, (10:1 Turndown NG, 8:1 Turndown LP)

Supply Fan Motor Type: Direct Drive w/Shaft Grounding Ring w/VFD

Exhaust Fan Motor Type: Direct Drive w/Shaft Grounding Ring w/VFD

Fan Piezo Rings: Supply Fan Piezo Ring/Tap

Unit Controls: Discharge Air Control - UC600

Building Interface: BACnet

Filter Options: MERV-13, 80%

Energy Recovery: ERV-Composite Construction with Frost Control and Bypass

Energy Recovery Wheel Size: ERC-4136C

ERV Rotation sensor: Rotation sensor

Damper Options: Modulating OA & RA Dampers w/Economizer

Exhaust Dampers: Gravity Dampers

Electrical Options: Non-Fused Disconnect "Circuit Breaker"

Outdoor Air Monitoring: Airflow Probes

Condenser Fan Options: Active (VFD) Head Pressure Low Ambient Control

Hailguards: Hailguards

UV Lights: UV Lights

Installation: Outdoor

Convenience Outlet: Convenience Outlet

Controls Display: TD7 Factory Installed

Cooling Controls: Reliatel

Supply Discharge Air Sensor (FLD)

2 inch Double Wall Construction

Stainless Steel Drip Pan

Blower HP - 2

Blower RPM - 1956

Supply Fan - ANPA 16

Exhaust RPM - 1902

Exhaust HP - 2

Exhaust Fan - ANPA 16

Unit Amps - FLA: 30.8 Amps

Min Circuit Ampacity - MCA: 32.8 Amps

Maximum Fuse Size - MFS: 40 Amps

Tag: DOAS-K

Comments:

Unit Information

Model: Horizon™ (OAD/N Rev6 - OADG/OANG)	Unit Length: 110 in	Weight Operating: 3263 lb*
Size: D020	Unit Width: 95 in	<i>Note: Weight does not include CURB weight. See CURB submittal for actual</i>
Quantity: 1	Unit Height: 68 in	Refrigerant Charge
Supply Airflow: 3,600 CFM	Elevation: 0 ft	Circuit 1: 49.73 lbs
Outside Airflow: 3,600 CFM	Ambient Air DB: 95 F	
Minimum Airflow: 2,613 CFM		

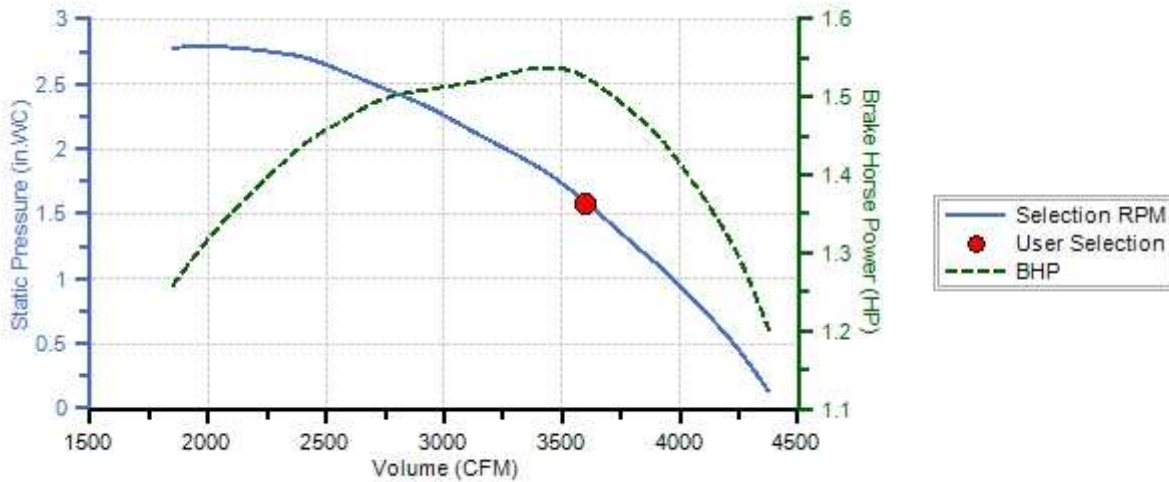
Cooling Performance

Gross Total Capacity: 268.7 MBh	Evaporator Face Area: 17.36 sq ft
Gross Sensible Capacity: 146.7 MBh	Evaporator Rows / FPI: 6 / 14
Net Total Capacity: 264.8 MBh	Condenser Face Area: 30 sq ft
Net Sensible Capacity: 142.8 MBh	Condenser Rows / FPI: 2 / 14
Entering Air DB / WB (Coil): 95 / 78 F	Air Velocity: 207 fpm
Leaving Air DB / WB (Coil): 58.5 / 57.5 F	Coil Air PD: 0.21 in H2O
Leaving Air DB / WB (Reheat): 88.3 / 67.85 F	EER: 14.3
Leaving Air DB / WB (Unit): 89.5 / 68.2 F	Watts: 18537
Leaving DP: 56.7 F	MRE: 5.97 lb/kWh
MRC: 110.68 lb/h	

Heating Performance

Heat Type: Gas Furnace	Entering Air DB: 2 F
Input Capacity: 350 MBh	Leaving Air DB: 74.6 F
Output Capacity: 283.5 MBh	Coil Air PD: 0.13 in H2O

Supply Fan ANPA 16



Supply Pressure Drop Summary

External Static Pressure:	1.05 in H2O
Cooling Coil:	0.21 in H2O
Filter:	0.12 in H2O
Primary Heat:	0.13 in H2O
HGRH:	0.02 in H2O
Outdoor:	0.05 in H2O
Total Static Pressure:	1.58 in H2O

Supply Fan Conditions

Fan Motor BHP:	1.52 BHP
Operating RPM:	1853 RPM
Minimum RPM:	1381 RPM

Standard Radiated Sound Power Level (dBA)

63	125	250	500	1000	2000	4000	8000	Total dBA
59.7	69.7	76.7	81.7	81.7	81.7	82.7	78.7	88.7

Sound power levels are listed for informational purposes only and are not guaranteed.

Unit Electrical Data

Unit Voltage-Ph-Hz:	460-3-60	Min Circuit Ampacity - MCA:	44.4 Amps
Unit Amps - FLA:	40.7 Amps	Maximum Fuse Size - MFS:	50.0 Amps

Electrical Summary

Component	Fan Service	Qty	HP (ea.)	FLA (ea.)	RLA (ea.)	LRA (ea.)
Scroll		1			14.7	130
	Supply	1	2	3		
UV		1		3.13		
Gas Heater		1		3.13		
Digital Scroll		1			14.7	130
Controls		1		1		
	Condenser	2	1	2.1		

Notes

- Unit Electrical amps include the greater of compressor or electrical heat amps.
- Unit's electrical as shown above are for single point power.

Tag: DOAS-L

Comments:

Unit Information

Model: Horizon™ (OAD/N Rev6 - OADG/OANG)	Unit Length: 183 in	Weight Operating: 4013 lb*
Size: D010	Unit Width: 95 in	<i>Note: Weight does not include CURB weight. See CURB submittal for actual</i>
Quantity: 1	Unit Height: 68 in	Refrigerant Charge
Supply Airflow: 3,270 CFM	Elevation: 0 ft	Circuit 1: 33.72 lbs
Outside Airflow: 3,270 CFM	Ambient Air DB: 105 F	
Minimum Airflow: 1,475 CFM		

Cooling Performance

Gross Total Capacity: 125.3 MBh	Evaporator Face Area: 10.42 sq ft
Gross Sensible Capacity: 83 MBh	Evaporator Rows / FPI: 6 / 14
Net Total Capacity: 120.7 MBh	Condenser Face Area: 30 sq ft
Net Sensible Capacity: 78.4 MBh	Condenser Rows / FPI: 2 / 14
Entering Air DB / WB (Coil): 76.9 / 66.3 F	Air Velocity: 313 fpm
Leaving Air DB / WB (Coil): 53.9 / 53.8 F	Coil Air PD: 0.36 in H2O
Leaving Air DB / WB (Reheat): 90.1 / 66.97 F	EER: 19.1
Leaving Air DB / WB (Unit): 91.6 / 67.4 F	Watts: 12566
Leaving DP: 53.5 F	MRE: 9.31 lb/kWh
MRC: 117.03 lb/h	

Heating Performance

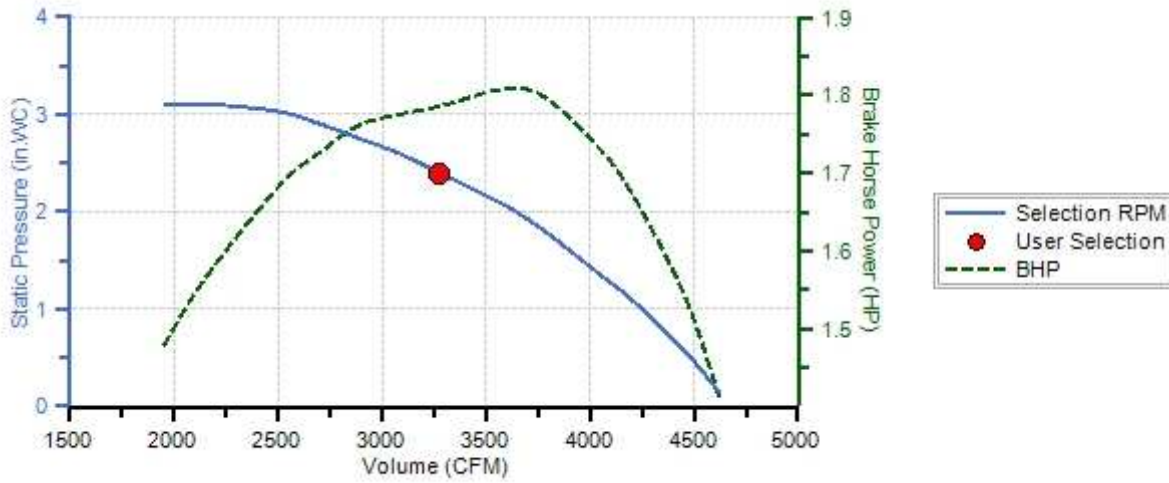
Heat Type: Gas Furnace	Entering Air DB: 47.7 F
Input Capacity: 200 MBh	Leaving Air DB: 92.8 F
Output Capacity: 160 MBh	Coil Air PD: 0.27 in H2O

Energy Recovery Wheel ERC-4136C

** TAB Outside airflow through OA Intake to this value

Summer Conditions				Winter Conditions			
Ventilation Supply		Outside		Ventilation Supply		Outside	
Airflow: 3,270 CFM		Airflow: 3,457 CFM**		Airflow: 3,270 CFM		Airflow: 3,457 CFM**	
DB: 76.9 F		DB: 87.0 F		DB: 47.7 F		DB: 2.0 F	
WB: 66.3 F		WB: 76.0 F		WB: 41.1 F		WB: 2.0 F	
PD: 0.84 in H2O				PD: 0.84 in H2O			
Return		Exhaust		Return		Exhaust	
Airflow: 3,400 CFM		Airflow: 3,587 CFM		Airflow: 3,400 CFM		Airflow: 3,587 CFM	
DB: 72.0 F		DB: 81.5 F		DB: 72.0 F		DB: 27.1 F	
WB: 60.0 F		WB: 70.4 F		WB: 56.0 F		WB: 26.5 F	
ESP: 0.75 in H2O		ERV PD: 0.87 in H2O		ESP: 0.75 in H2O		ERV PD: 0.87 in H2O	
Total Capacity: 119.56 MBH				Total Capacity: 213.70 MBH			
Sensible Capacity: 34.48 MBH	Eff: 0.66			Sensible Capacity: 163.57 MBH	Eff: 0.64		
Latent Capacity: 85.09 MBH	Eff: 0.62			Latent Capacity: 50.13 MBH	Eff: 0.61		

Supply Fan ANPA 16



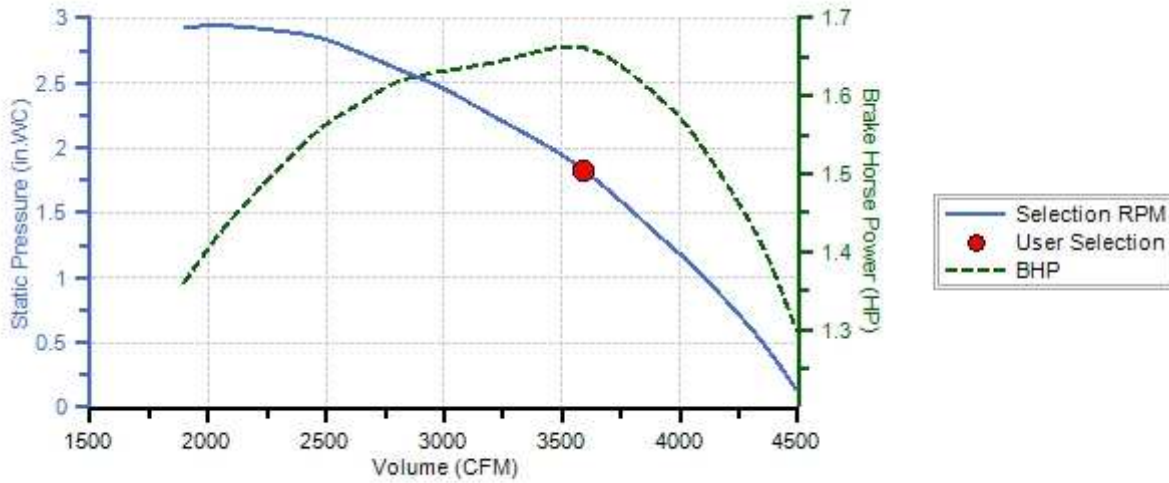
Supply Pressure Drop Summary

Supply Fan Conditions

External Static Pressure:	0.75 in H2O
Cabinet:	0.01 in H2O
Cooling Coil:	0.36 in H2O
Base Filter:	0.01 in H2O
Filter:	0.1 in H2O
Primary Heat:	0.27 in H2O
HGRH:	0.02 in H2O
ERV OA:	0.84 in H2O
Outdoor:	0.04 in H2O
Total Static Pressure:	2.40 in H2O

Fan Motor BHP:	1.79 BHP
Operating RPM:	1956 RPM
Minimum RPM:	1082 RPM

Exhaust Fan ANPA 16



Exhaust Pressure Drop Summary

Exhaust Fan Conditions

Return External Static Pressure:	0.75 in H2O	Fan Motor BHP:	1.66 BHP
ERV Return Filter PD:	0.2 in H2O	Operating RPM:	1902 RPM
ERV Wheel PD:	0.87 in H2O		
Total Exhaust Static Pressure			
	1.82 in H2O		

Standard Radiated Sound Power Level (dBA)

<u>63</u>	<u>125</u>	<u>250</u>	<u>500</u>	<u>1000</u>	<u>2000</u>	<u>4000</u>	<u>8000</u>	<u>Total dBA</u>
59.7	69.7	76.7	81.7	81.7	81.7	82.7	78.7	88.7

Sound power levels are listed for informational purposes only and are not guaranteed.

Unit Electrical Data

Unit Voltage-Ph-Hz:	460-3-60	Min Circuit Ampacity - MCA:	32.8 Amps
Unit Amps - FLA:	30.8 Amps	Maximum Fuse Size - MFS:	40.0 Amps

Electrical Summary

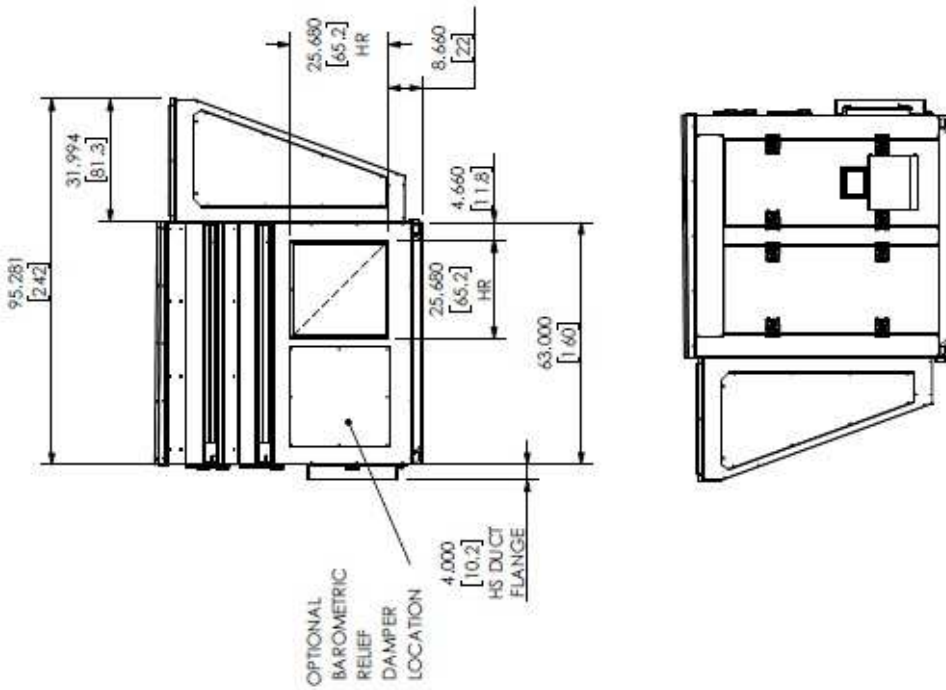
Component	Fan Service	Qty	HP (ea.)	FLA (ea.)	RLA (ea.)	LRA (ea.)
Gas Heater		1		3.13		
ERV/HRV		1	0.17	0.44		
	Exhaust	1	2	3		
Scroll		1			8.2	66.1
Digital Scroll		1			7.8	52
	Supply	1	2	3		
	Condenser	2	1	2.1		
Controls		1		1		
UV		1		3.13		

Notes

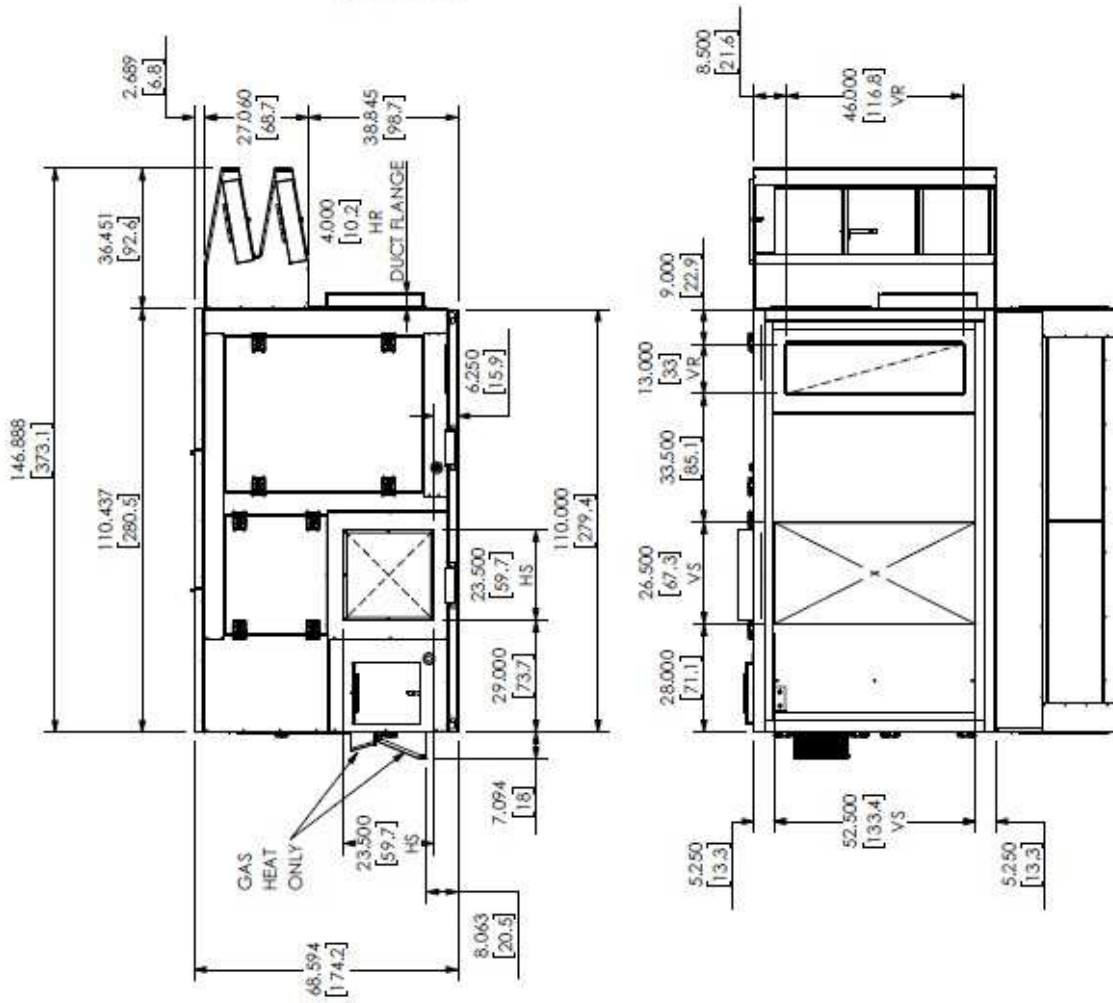
- Unit Electrical amps include the greater of compressor or electrical heat amps.
- Unit's electrical as shown above are for single point power.

OAD-6-DIM-DX-PRI

Qty: 1 Tag(s): DOAS-K

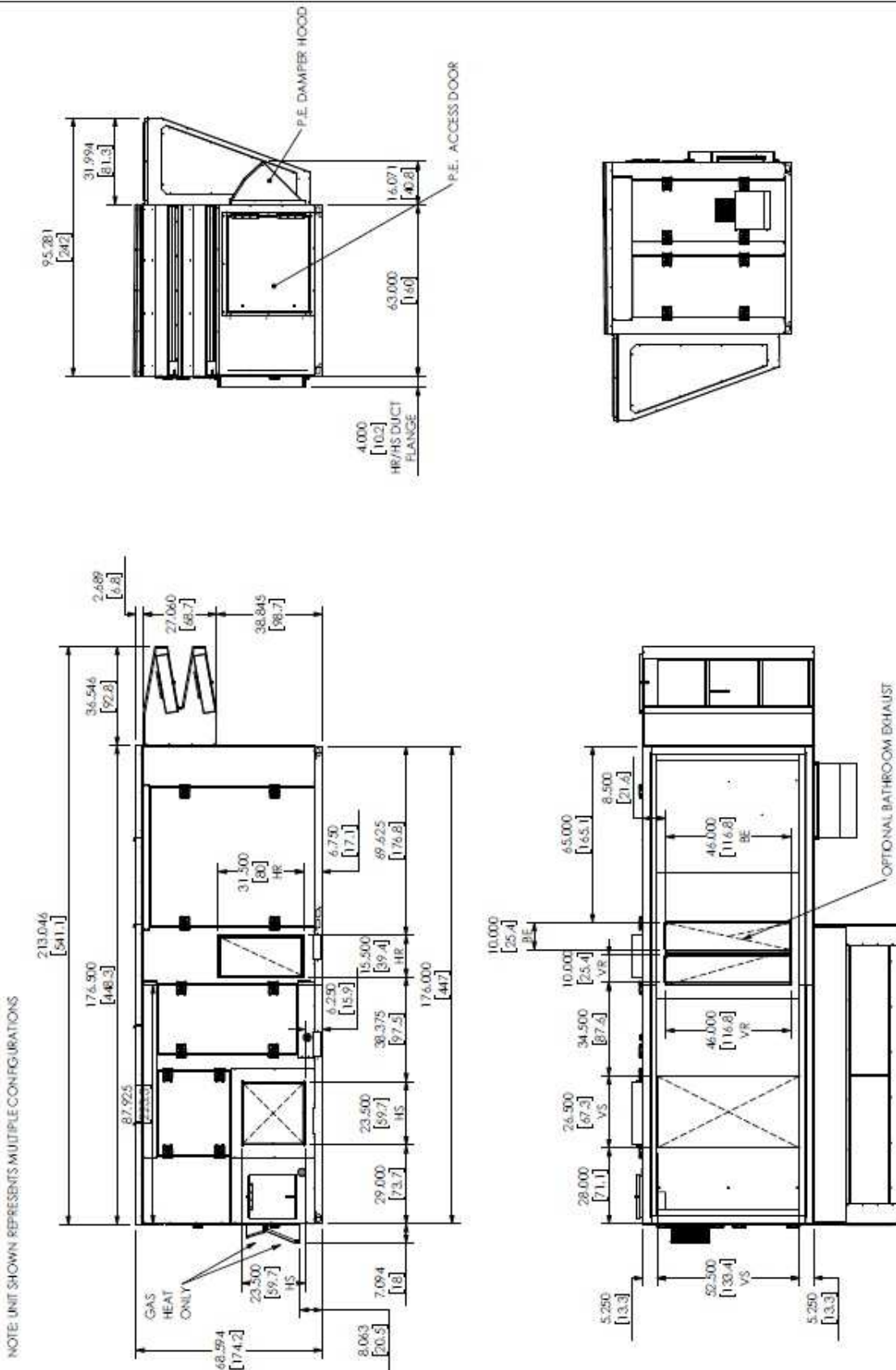


NOTE: UNIT SHOWN REPRESENTS MULTIPLE CONFIGURATIONS



OAD-6-DIM-DX-ERV

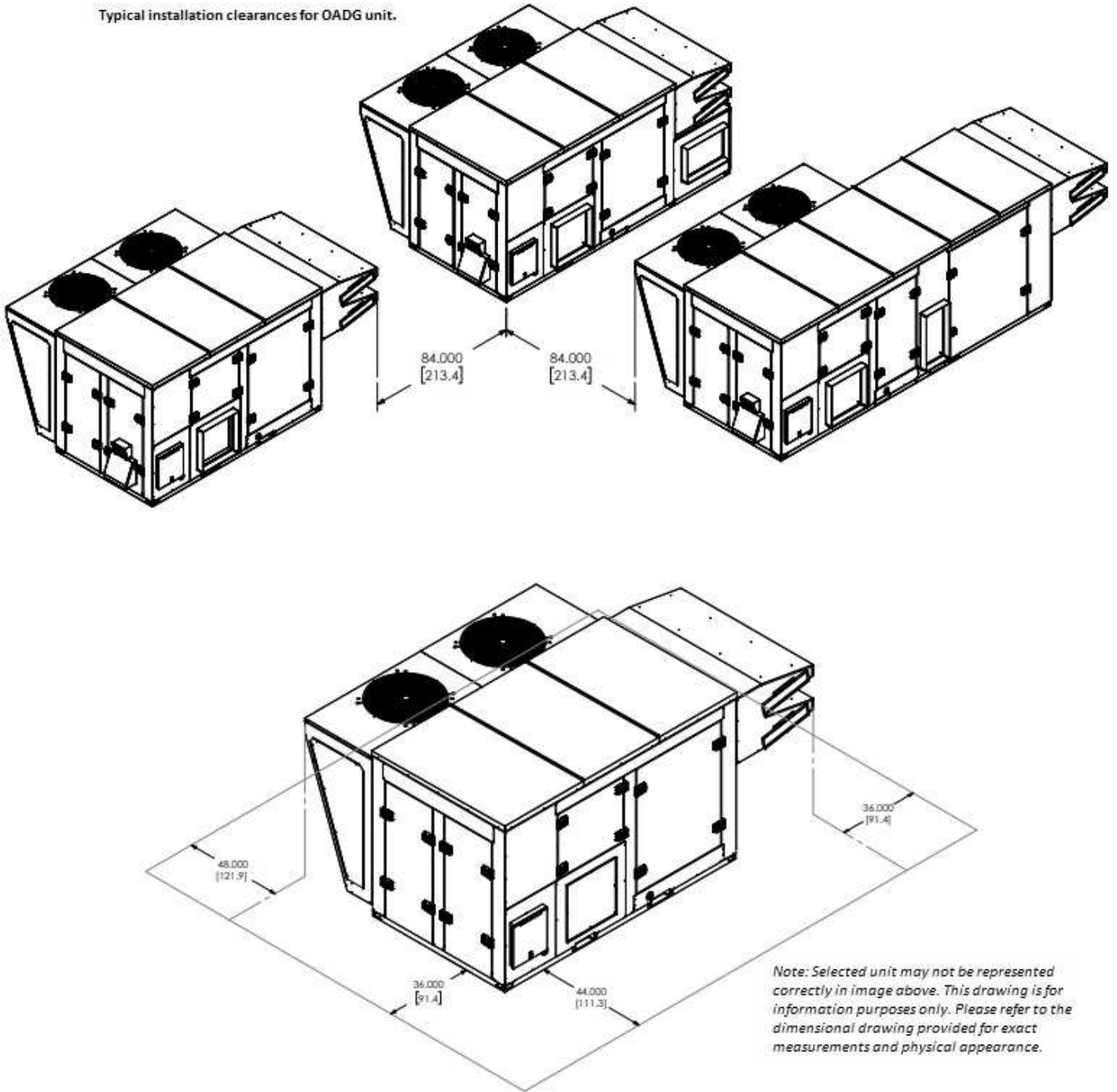
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OAD-6-CLE-DX-PRI

Qty: 1 Tag(s): DOAS-K

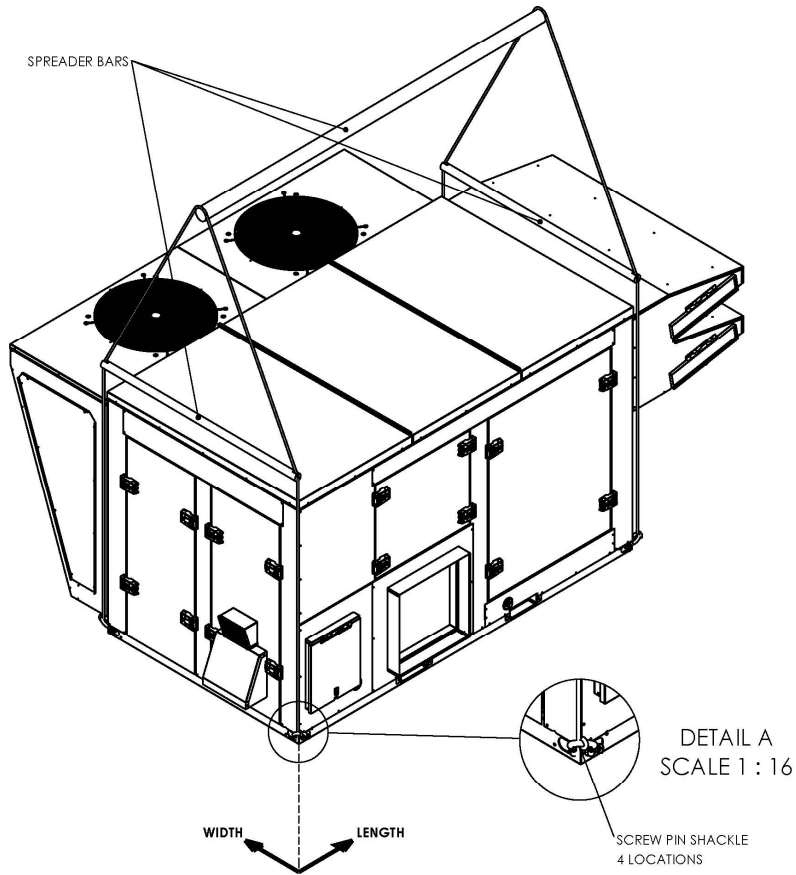
Typical installation clearances for OADG unit.



OAD-6-RIG-PRI

Qty: 1 Tag(s): DOAS-K

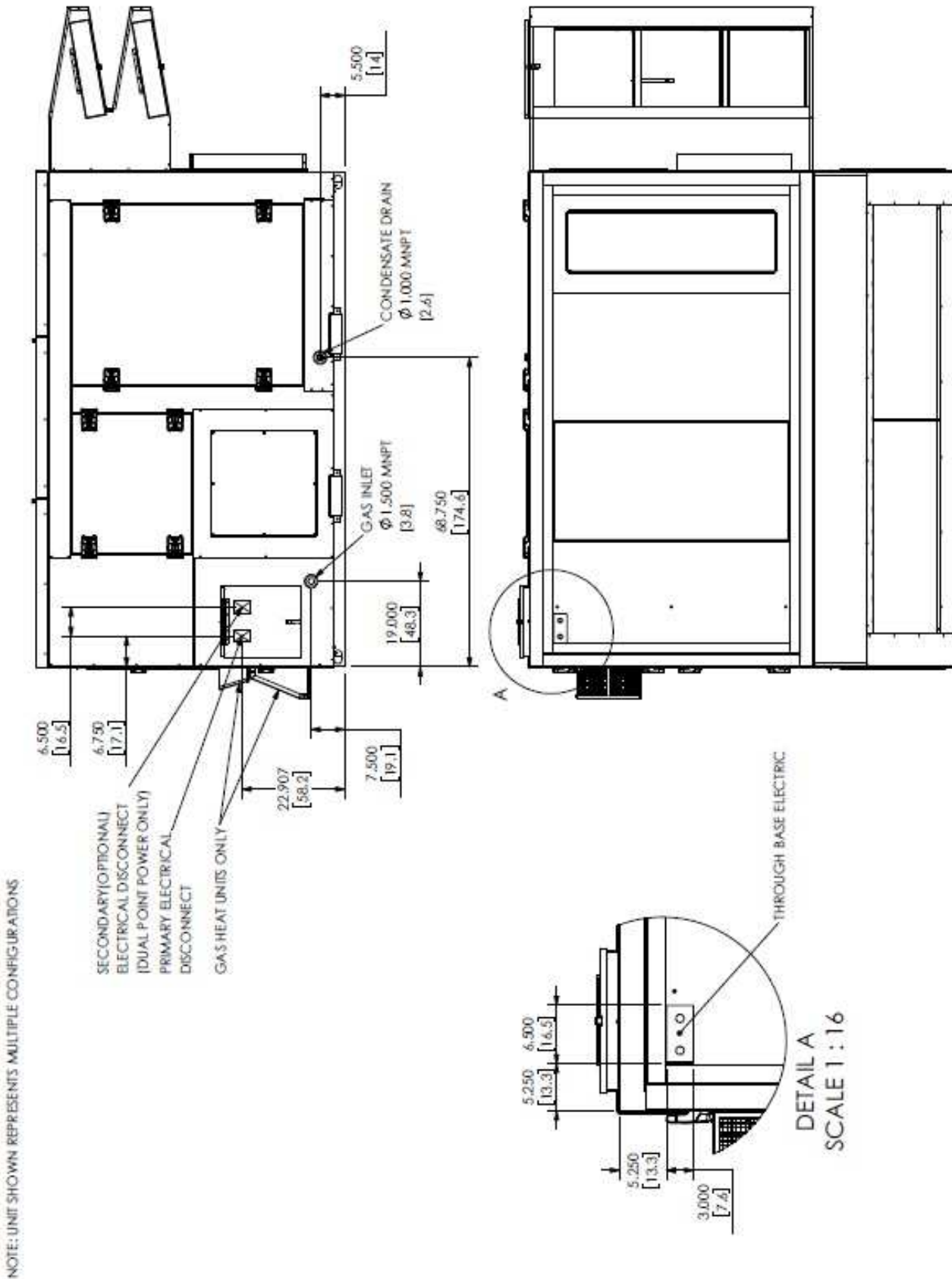
NOTE: UNIT SHOWN REPRESENTS MULTIPLE CONFIGURATIONS



IN.
[CM.]

OAD-6-UTIL-DX-PRI

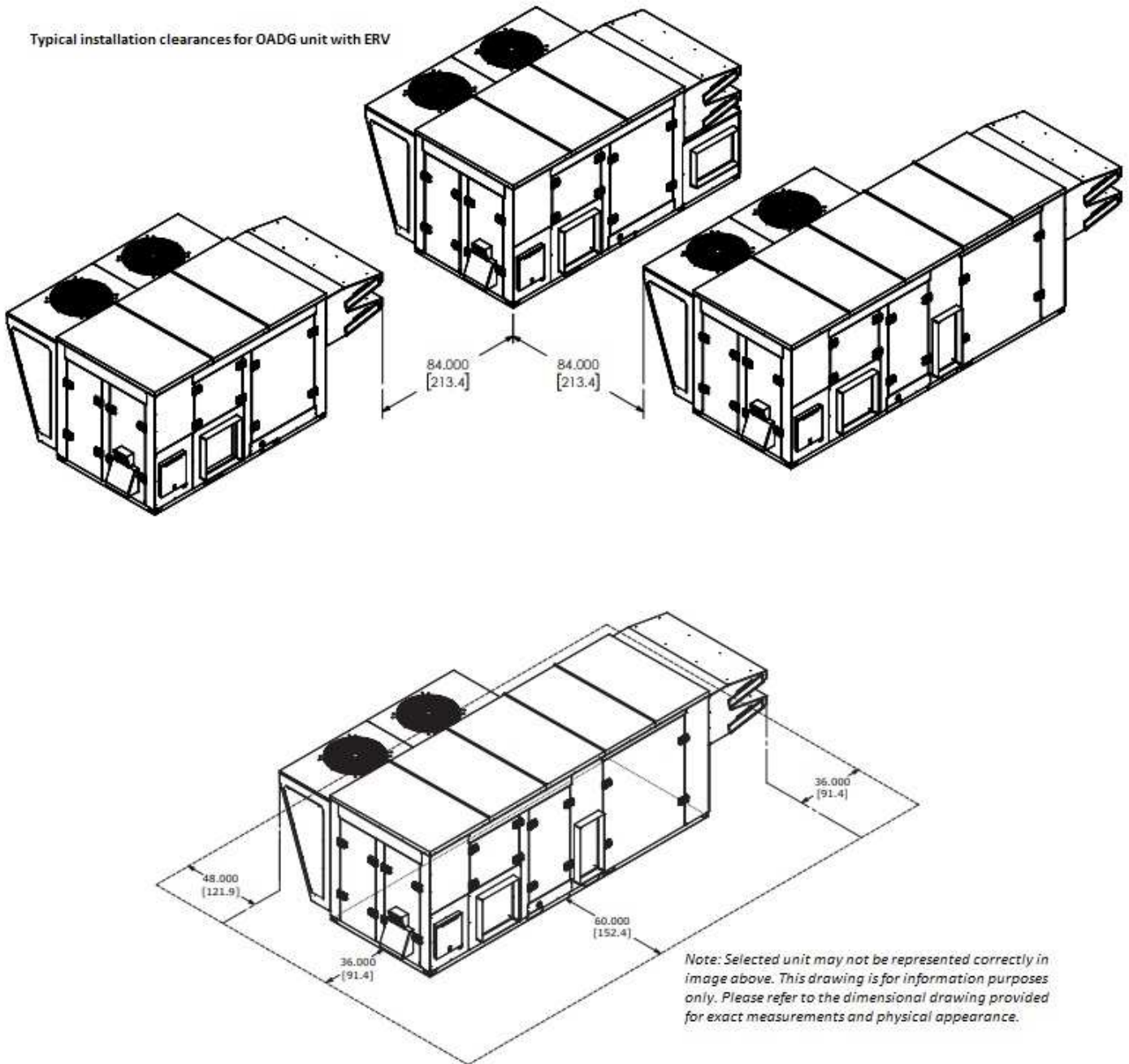
Qty: 1 Tag(s): DOAS-K



OAD-6-CLE-DX-ERV

Qty: 1 Tag(s): DOAS-L

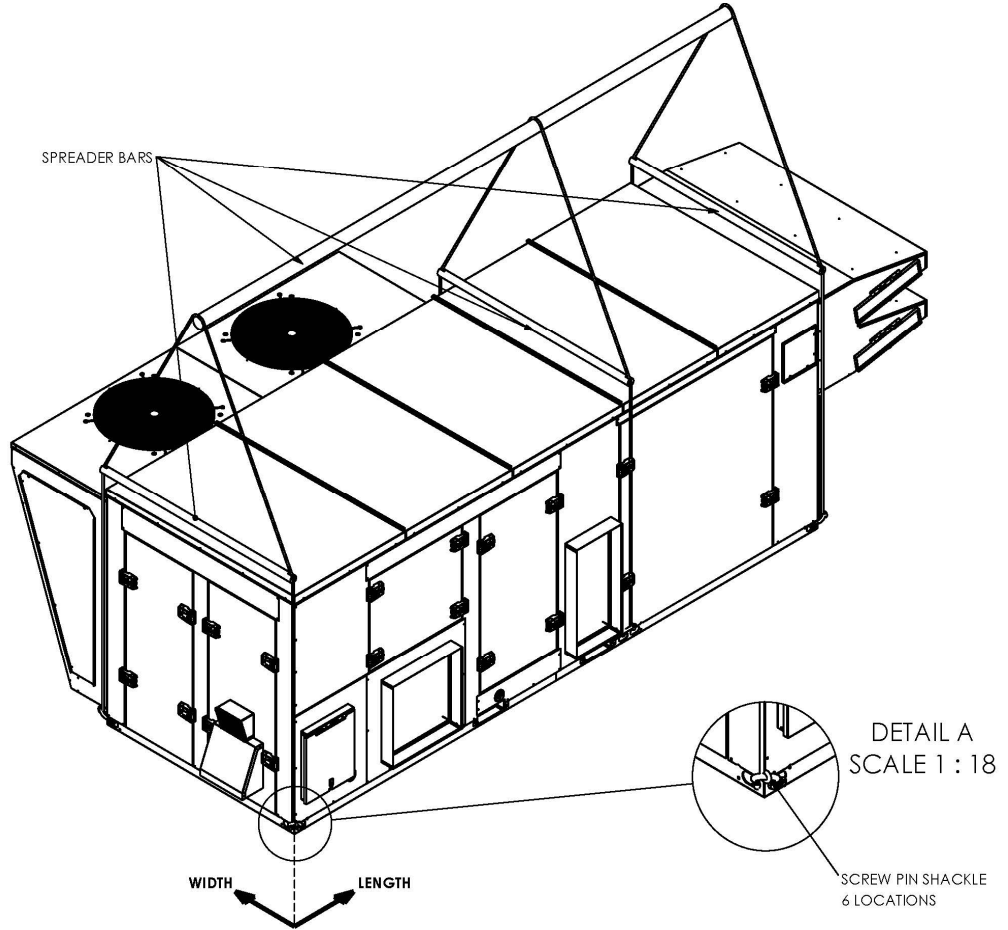
Typical installation clearances for OADG unit with ERV



OAD-6-RIG-ERV

Qty: 1 Tag(s): DOAS-L

NOTE: UNIT SHOWN REPRESENTS MULTIPLE CONFIGURATIONS

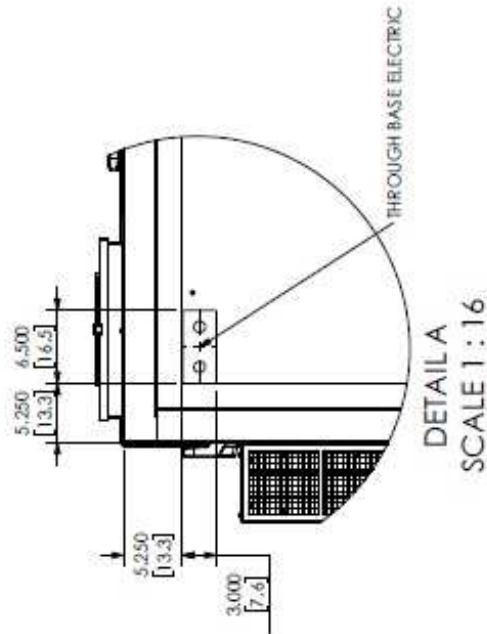
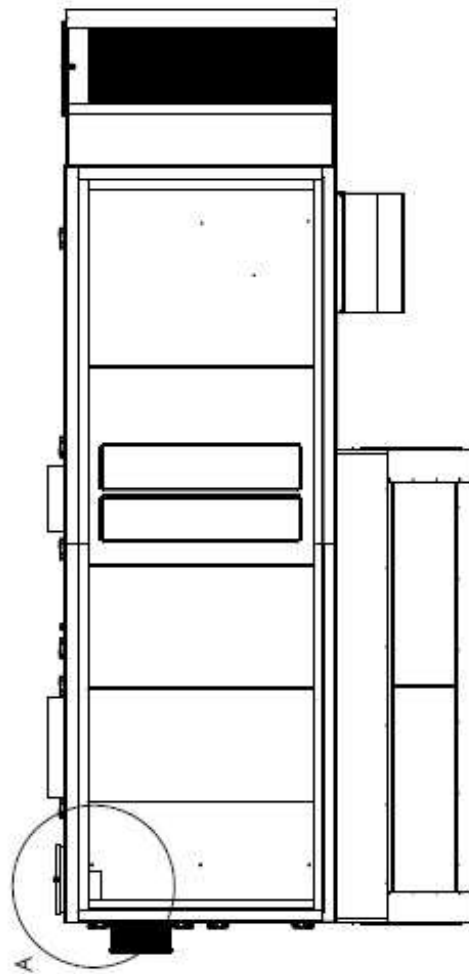
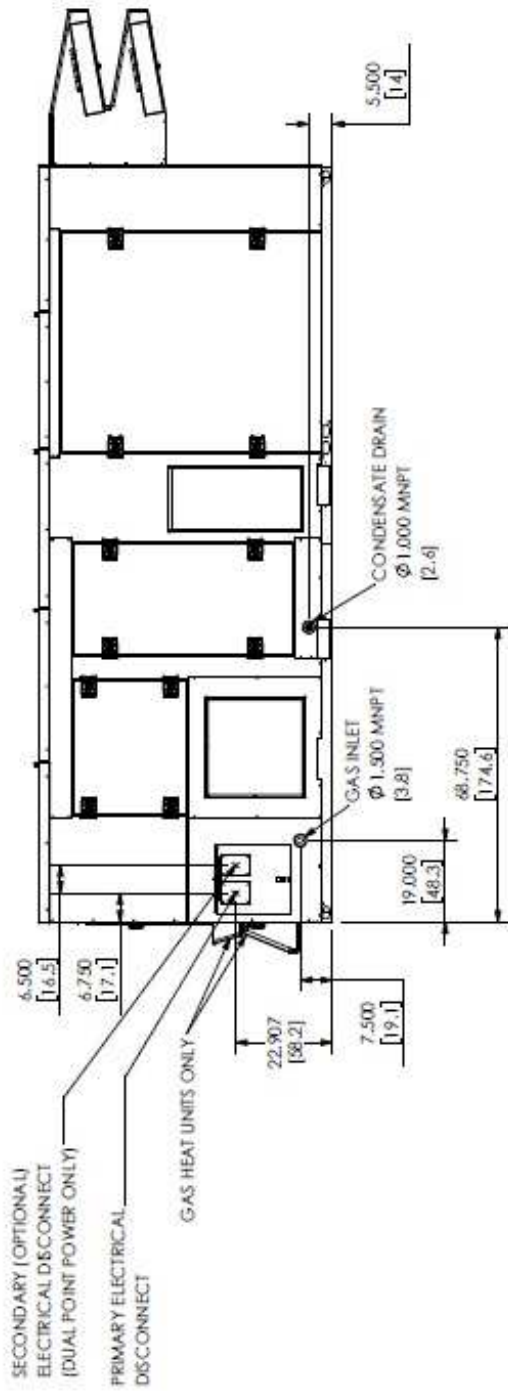


IN.
[CM.]

OAD-6-UTIL-DX-ERV

Qty: 1 Tag(s): DOAS-L

NOTE: UNIT SHOWN REPRESENTS MULTIPLE CONFIGURATIONS



DETAIL A
SCALE 1 : 16

Mechanical Specifications - Tag(s): DOAS-K, DOAS-L**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 two component rigid polyurethane foam insulation, metal encapsulated with no exposed edges. Initial R value of 6.7 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.

Indoor Coil Type: DX 6-Row

Internally finned, inch copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The evaporator coil shall be leak tested to 500 psig and pressure tested to 500 psig. A Stainless Steel double-sloped condensate drain pan with provision for through the unit wall condensate drain is standard. Evaporator coil will have 6 interlaced rows for superior sensible and latent cooling.

Reheat: Fin & Tube Modulating HGRH

This option shall consist of a modulating hot-gas reheat coil located on the leaving air side of the evaporator coil pre-piped and circuited with a low pressure switch. Refer to the Sequence of Operations section of the Installation, Operation and Maintenance manual for detailed unit control and operational modes.

Compressor: Digital Scroll-1st Circuit Only

All units shall have direct-drive, hermetic, digital 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. Crankcase heaters shall be included. Compressor shall be able to fully modulate from 20%-100%.

Outdoor Coil Type: Air Cooled Fin & Tube

(Fin and Tube Coil) - Internally finned, copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The condenser coil shall be leak tested to 500 psig and pressure tested to 500 psig. The condenser coil shall have a fin design with slight gaps for ease of cleaning.

Outdoor Fans: Shall be direct drive vertical discharge design with low-noise corrosion resistant glass reinforced polypropylene props, powder coated wire discharge guards and electro-plated motor mounting brackets. Fans shall be statically and dynamically balanced.

Heat Capacity - Primary: 200 MBH, (10:1 Turndown NG, 8:1 Turndown LP)

Primary heat is supplied using indirect fired gas heating. The heating section shall have a progressive tubular heat exchanger design using Stainless Steel burners and type 439 Stainless Steel tubes. An induced draft combustion blower shall be used to pull the combustion products through the firing tubes. The heater shall use a direct spark ignition (DS) system. On initial call for heat, the combustion blower shall purge the heat exchanger for 20 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat/zone sensor. Units shall be comply with the California requirement for low NOx emissions. Unit shall be suitable for use with Natural Gas. Minimum incoming gas pressure of 7" W.C. and Maximum pressure of 14" W.C. required. Factory provided 25 year heat exchanger warranty.

Heat Capacity - Primary: 350 MBH, (10:1 Turndown NG, 8:1 Turndown LP)

Primary heat is supplied using indirect fired gas heating. The heating section shall have a progressive tubular heat exchanger design using Stainless Steel burners and type 439 Stainless Steel tubes. An induced draft combustion blower shall be used to pull the combustion products through the firing tubes. The heater shall use a direct spark ignition (DS) system. On initial call for heat, the combustion blower shall purge the heat exchanger for 20 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat/zone sensor. Units shall be comply with the California requirement for low NOx emissions. Unit shall be suitable for use with Natural Gas. Minimum incoming gas pressure of 7" W.C. and Maximum pressure of 14" W.C. required. Factory provided 25 year heat exchanger warranty.

Supply Fan Motor Type: 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.

Fan Piezo Rings: Supply Fan Piezo Ring/Tap

Air flow measurement will be accomplished through the use of Piezo Ring/Tap technology installed in the supply fan wheel area.

Unit Controls: Discharge Air Control - UC600

Unit is completely factory wired with necessary controls and contactor pressure lugs for power wiring. Units will provide an external location for mounting fused disconnect device. PLC controls are provided for all 24 volt control functions. The resident control algorithms will make all heating, cooling and/or ventilating decisions in response to electronic signals from sensors measuring outdoor temperature and humidity. The control algorithm maintains accurate temperature control, minimizes drift from set point and provides better building comfort. A centralized PLC (UC600) will provide anti-short cycle timing for a higher level of machine protection. Terminals are provided for a field installed dry contact or switch closure to put the unit in the Occupied or Unoccupied modes.

Filter Options: MERV-13, 80%

Aluminum Mesh Filters (D, 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-13 rated filters (80 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.

Energy Recovery: ERV-Composite Construction with Frost Control and Bypass

Energy recovery wheel performance shall be AHRI 1060 certified and bear the AHRI certified label. The rotating wheel heat exchanger is composed of a rotating cylinder in an insulated cassette frame complete with removable energy transfer media, seals, drive motor and drive belt. Energy transfer media shall be constructed of a durable synthetic lightweight polymer. The total energy recovery wheel is coated with a desiccant that shall be either Type-A silica gel or 3A molecular sieve and permanently bonded to the energy transfer media without the use of binders or adhesives. The lightweight polymer substrate will not degrade nor require additional coatings for application in marine or coastal environments. Coated segments are cleanable outside of the cabinet with detergent or alkaline coil cleaner and water. Desiccant will not dissolve nor deliquesce in the presence of water or high humidity.

ERV Rotation sensor: Rotation sensor

Inductive Proximity Sensors detect metal objects without contact and are characterized by a long service life and extreme ruggedness. With the latest ASIC technology, the manufacture's sensors offer the ultimate in precision and reliability. Their sensors are the intelligent, reliable route to implementing wheel rotation.

Electrical Options: Non-Fused Disconnect "Circuit Breaker"

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

Outdoor Air Monitoring: Airflow Probes

The Greentrol GF-2100-A and GF-2200-A are high quality economical programmable dual-output airflow/temperature measurement and control instruments with options for analog air flow, temperature, and alarm. It is designed for installation in specified critical applications that require precise measurement of air flow (down to zero flow). The instrument includes factory calibrated probes and an advanced microprocessor controlled transmitter/controller. Each sensor probe is equipped with a high reliability bead-in-glass heated thermistor element, factory calibrated to NIST traceable standards from zero flow to 2,000 FPM. The transmitter is fully independent of the probe and does not require field matching to the probe. An advanced microprocessor processes the raw probe signals and provides versatile programmable airflow measurement and alarm options with direct LED drive or N.O./N.C. relay dry contacts, and selectable analog output signal options. A powerful variable input signal integration option can be engaged to reduce the effects of transient input signal variations, and an innovative Field Calibration Wizard allows for simple, automated field adjustment of the instrument if required. A 16 character LCD display indicates airflow, temperature, system status and is also used for configuration and diagnostics. Field configuration is accomplished using a simple four-button user interface.

Smoke Detector: Supply Smoke Detector

Smoke detector shall be factory installed photoelectric smoke detector mounted in the supply air section. The detector will be wired for continuous power whenever the unit is energized. Upon detection of smoke, the detector will shut down all unit operations. Local codes may dictate the location of detectors.

Hailguards: Hailguards

Hail guards shall be installed on the outside of the condenser coil. The guards shall consist of perforated metal, of the same gauge and color as the unit itself. Airflow through the hail guards shall not be restricted due to location or size of the perforations. Guards shall be removable to accommodate coil cleaning.

UV Lights: UV Lights

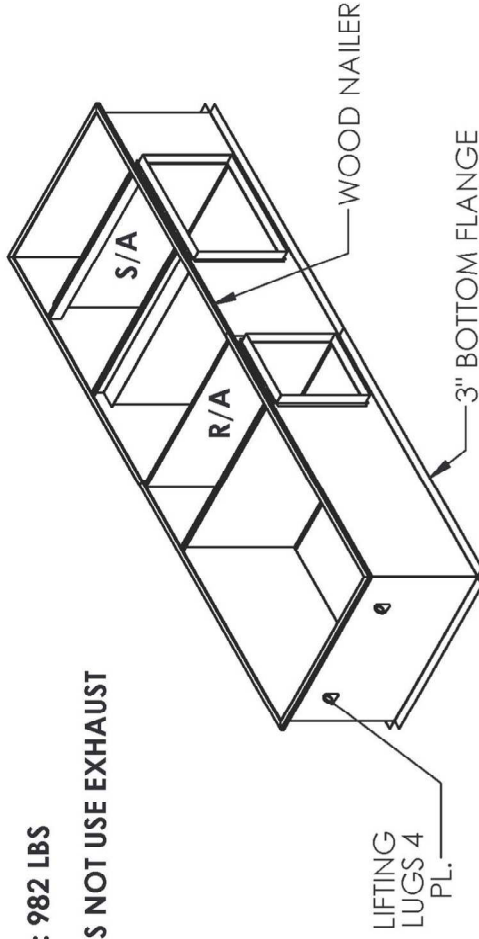
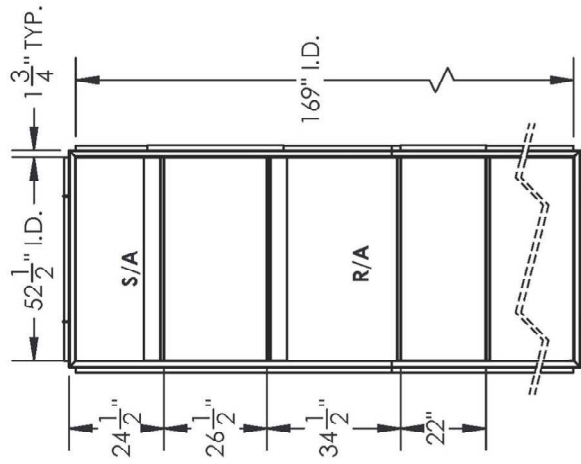
UV lights shall be installed downstream of evaporator coil.

Convenience Outlet: Convenience Outlet

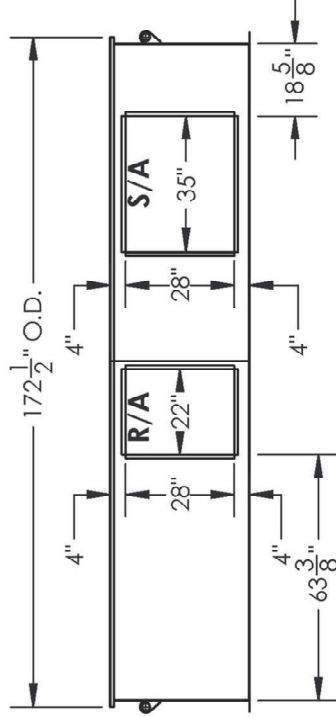
A powered 120 volt, 15 amp, 2 plug convenience outlet shall be factory installed. A service receptacle disconnect shall be installed. The convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker.

WEIGHT: 982 LBS

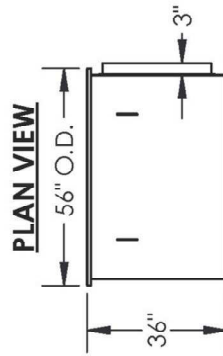
CURB DOES NOT USE EXHAUST



ISOMETRIC VIEW



SIDE VIEW



PLAN VIEW

FRONT VIEW

NOTES:

- 12 GA. GALV. STEEL CONSTRUCTION
- INTERNALLY INSULATED WITH 1"-1.5 PCF DENSITY INSULATION
- CONTINUOUS WELDED SEAMS AND CORNERS
- 1/4" X 1 1/4" GASKETING
- 1" X 4" WOOD NAILER
- SHIPPED FULLY ASSEMBLED

INSTALLATION INSTRUCTIONS:

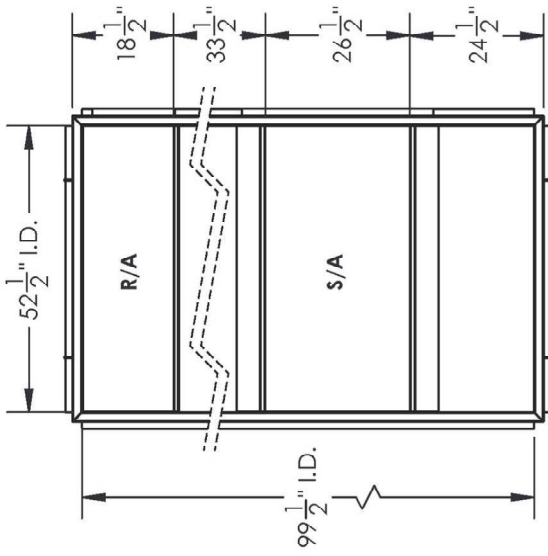
- INSTALL & SECURE CURB ON ROOF AS REQUIRED BY LOCAL BUILDING CODES.
- APPLY 1/4" X 1 1/4" GASKETING ON CURB.
- INSTALL & SECURE A/C UNIT ON CURB AS REQUIRED BY LOCAL BUILDING CODE.

APPROVED		UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS SHOWN ARE IN MILLIMETERS. SEE REFERENCE ONLY	APPROVALS	DATE
		UNLESS OTHERWISE SPECIFIED LOCATIONS ON ANGLES ARE: 20° (1/2) 25° (1/4) 30° (1/8)	DR: MDC	7/26/23
		THIRD ANGLE	CHKR:	
		MATERIAL:	SUPV:	
			ELEC ENG:	
			MECH ENG:	

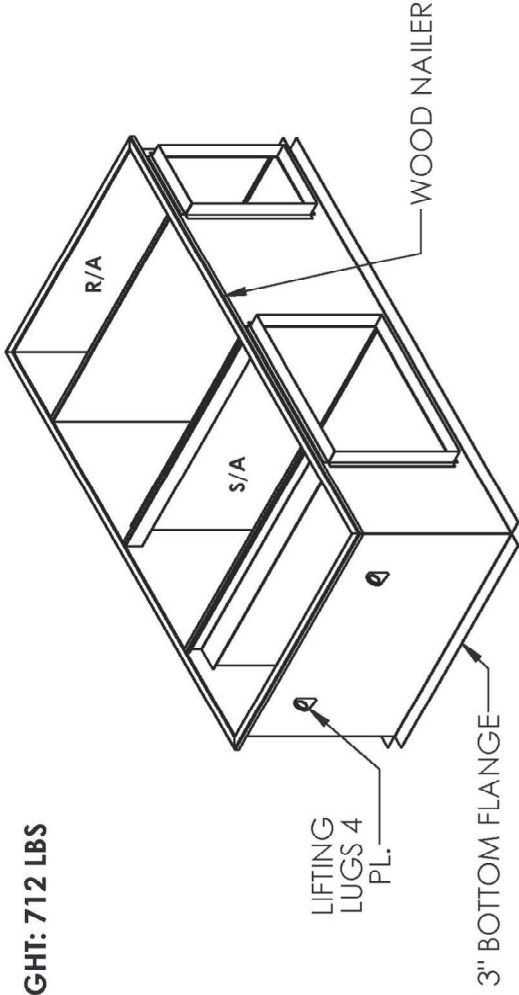


TCWOADG20PEE36HOR44NBM1	
DWG NO: A	ISS
SCALE: 1/32	SHEET 1 OF 1

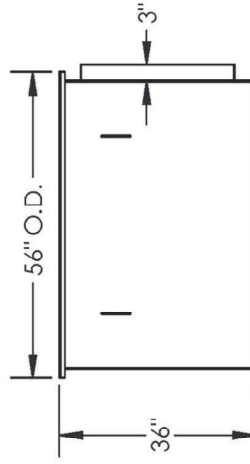
WEIGHT: 712 LBS



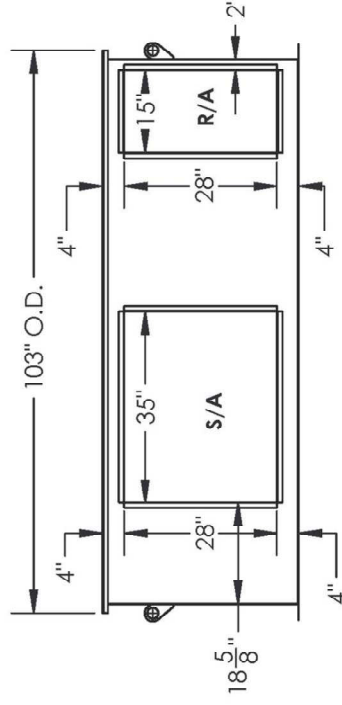
PLAN VIEW



ISOMETRIC VIEW



FRONT VIEW



SIDE VIEW

NOTES:

1. 12 GA. GALV. STEEL CONSTRUCTION
2. INTERNALLY INSULATED WITH 1"-1.5 PCF DENSITY INSULATION
3. CONTINUOUS WELDED SEAMS AND CORNERS
4. 1/4" X 1 1/4" GASKETING
5. 1" X 4" WOOD NAILER
6. SHIPPED FULLY ASSEMBLED

INSTALLATION INSTRUCTIONS:

- INSTALL & SECURE CURB ON ROOF AS REQUIRED BY LOCAL BUILDING CODES.
- APPLY 1/4" X 1 1/4" GASKETING ON CURB.
- INSTALL & SECURE A/C UNIT ON CURB AS REQUIRED BY LOCAL BUILDING CODE.

APPROVED	DATE	APPROVALS	DATE
		DR: MDC	7/26/23
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS SHOWN ARE IN MILLIMETERS AND REFERENCE ONLY			
UNLESS OTHERWISE SPECIFIED OCCUPANCY ON			
X(1) X(2) X(3) X(4) X(5) X(6) X(7) X(8) X(9) X(10) X(11) X(12) X(13) X(14) X(15) X(16) X(17) X(18) X(19) X(20) X(21) X(22) X(23) X(24) X(25) X(26) X(27) X(28) X(29) X(30) X(31) X(32) X(33) X(34) X(35) X(36) X(37) X(38) X(39) X(40) X(41) X(42) X(43) X(44) X(45) X(46) X(47) X(48) X(49) X(50) X(51) X(52) X(53) X(54) X(55) X(56) X(57) X(58) X(59) X(60) X(61) X(62) X(63) X(64) X(65) X(66) X(67) X(68) X(69) X(70) X(71) X(72) X(73) X(74) X(75) X(76) X(77) X(78) X(79) X(80) X(81) X(82) X(83) X(84) X(85) X(86) X(87) X(88) X(89) X(90) X(91) X(92) X(93) X(94) X(95) X(96) X(97) X(98) X(99) X(100)			
THIRD ANGLE			
MATERIAL			



TCWOADG2036HOR22NB

DWG NO:	132	SHEET	1	OF	1
DWG SIZE:	A				
ISS					

Tag Data – Packaged Rooftop Units (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	AHU-W	1	6- 25 Ton PKGD Precedent Unitary Rooftop	YSJ102A4S0M**P2D0A1B1A0C401000000000000

Product Data - PREC

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

- DX Cooling / Gas Heat
- Standard Efficiency
- R-410A
- 8.5 Ton
- 460/60/3
- Symbio 700
- Medium Gas Heat
- Downflow Low Leak Economizer, Comparative Enthalpy with Barometric Relief
- Single Zone Variable Air Volume with Standard Motor
- Standard Access Panels with 2-in MERV 13 Filters
- Through the Base Electric
- Non-Fused Disconnect Switch
- Powered 15A Convenience Outlet
- Advanced Controls and BACnet BAS
- Modulating Hot Gas Reheat (HGRH)
- Return and Supply Air Smoke Detector
- CFS and FFS and COS
- Stainless Steel Drain Pan
- Plenum Curb (Field Installed)
- CO2 wall mounted (Field Installed)
- 1st Yr Labor Whole Unit

Provide with interior UV lights.

Does Not Include catwalks, railings, etc. Contractor is responsible for unit height/installation meeting electric code.

Performance Data - 6- 25 Ton PKGD Precedent Unitary Rooftops

Tags	AHU-W
Cooling Entering Dry Bulb (F)	80.00
Cooling Entering Wet Bulb (F)	67.00
Summer Ambient (F)	95.00
Entering Dry Bulb (in HGRH) (F)	73.00
Entering Wet Bulb (in HGRH) (F)	64.00
Ambient (In HGRH) (F)	75.00
Heating Entering Air Temperature (F)	60.00
Design Airflow (cfm)	2720
Airflow Application	Downflow
Design ESP (in H2O)	1.200
Fan Pressurized (in H2O)	1.762
Design ESP + Component SP (in H2O)	1.719
Elevation (ft)	0.00
Net Total Capacity (MBh)	98.93
Net Sensible Capacity (MBh)	69.09
Net Sensible Heat Ratio (%)	70.00
Coil LAT DB (F)	54.95
Coil LAT WB (F)	54.41
Cooling Leaving Unit Dry Bulb (F)	57.13
Cooling Leaving Unit WB (F)	55.31
Dew Point Temperature (F)	54.06
Refrigerant charge (HFC-410A) - Ckt 1 (lb)	10.1
Max Available ESP (in H2O)	1.481
Supply Motor Horsepower (hp)	3.000
Supply Operating Horsepower (hp)	1.660
Supply RPM (rpm)	1347
Compressor Power (kW)	7.24
System Power (kW)	9.78
EER @ AHRI (Number)	11.00
IEER @ AHRI (Number)	15.10
MCA (A)	25.00
MOP (A)	30.00
Compressor 1 RLA (A)	9.90
Compressor 2 RLA (A)	5.80
Condenser Fan FLA (A)	1.50
Evaporator Fan FLA (A)	4.60
Heating Input Capacity (MBh)	150.00
Output Heating Capacity (MBh)	121.50
Heating Leaving Air Temperature (F)	100.55
Heating Temperature Rise (F)	40.55
Height (ft)	4.24
Width (ft)	4.44
Length (ft)	7.34
Approx Configured Weight (lb)	1171.0
Approx Installed Weight (lb)	1171.0
Leaving dry bulb w HGRH (F)	70.43
Temperature Rise (HGRH) (F)	16.18
HGRH Capacity (MBh)	48.24
Dew Point Temperature (HGRH) (F)	51.89
Reheat Coil LAT DB (HGRH) (F)	68.87
Reheat Coil LAT WB (HGRH) (F)	58.68
Moisture Removal Rate (HGRH) (gph)	3.64
Evap Coil LAT DB (HGRH) (F)	52.68
Evap Coil LAT WB (HGRH) (F)	52.22

Basis of design MOP = 25 A.
Coordinate with electrical contractor.

Mechanical Specifications – Packaged Rooftop Unit**Item: A1 Qty: 1 Tag(s): AHU-W****General**

- Packaged rooftop units cooling, heating capacities, and efficiencies are AHRI Certified within scope of AHRI Standard 210-240 for 6 to 25 Tons and ANSIZ21.47 and 10 CFR Part 431 pertaining to Commercial Warm Air Furnaces (all gas heating units).
- Convertible airflow.
- Symbio controls operating range is from 0-125.0 F from factory; if designing for cooling mode operation below 40.0 F ambient temp, add low ambient kit to assure continuous and reliable operation.
- 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.
- Colored and numbered wiring internal to the unit for simplified identification.
- Units cULus listed and labeled, classified in accordance for Central Cooling Air Conditioners.

Casing

- Zinc coated, heavy gauge, galvanized steel.
- Weather resistant pre-painted metal with galvanized substrate.
- Meets ASTM B117, 672 hour salt spray test.
- Removable single side maintenance access panels.
- Lifting handles in maintenance access panels (can be removed and reinstalled by removing fasteners while providing a water and air tight seal).
- Exposed vertical panels and top covers in the indoor air section insulated with a cleanable foil-faced, fire-retardant permanent, odorless glass fiber material.
- Base pan shall have no penetrations within the perimeter of the curb other than the raised 1 inch high downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up.
- Base of the unit insulated with 1/8 inch, foil-faced, closed-cell insulation.
- Unit base provisions for forklift and/or crane lifting on three sides of unit.

Hail Guards

- Provides condenser coil protection.

Powered or Unpowered Convenience Outlet

- Powered GFCI, 120V/15A, 2 plug, convenience outlet or unpowered GFCI, 120V/20A, 2 plug, convenience outlet.
- When convenience outlet is powered, a service receptacle disconnect will be available.
- Convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker.
- Available to order when through-the-base electrical with disconnect switch or circuit breaker option is ordered.

Stainless Steel Drain Pan

- Corrosion and oxidation resistance.
- Constructed of 304 stainless steel.

Microchannel Coils

- Optimal heat transfer performance due to flat, streamlined tubes with small ports, and metallurgical tube-to-fin bond.
- Reduce system refrigerant charge by up to 50% leading to better compressor reliability.
- Compact all-aluminum microchannel coils reduce the unit weight.
- Recyclable all aluminum coils All aluminium construction minimizes galvanic corrosion.
- Strong aluminum brazed structure provides better fin protection.
- Flat streamlined tubes more dust resistant and easy to clean.
- Coils leak tested at the factory to ensure the pressure integrity.

Compressors

- All units have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps.
- Suction gas-cooled motor with voltage utilization range of plus or minus 10 percent of unit nameplate voltage.
- Internal overloads standard with scroll compressors.
- Crankcase heaters are standard on all compressors.
- All units have dual compressors.
- Three stages of cooling available on 6 to 17.5 tons units and four stages of cooling available on 20 and 25 tons units.

Filters

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

Frostat

- Utilized as a safety device.
- Opens to prevent freezing temperatures on evaporator coil.
- Temperature will need to rise to 50°F before closing.
- Utilized in low airflow or high outside air applications (cooling only).

Gas Heating Section

- The heating section shall have a progressive tubular heat exchanger with corrosion-resistant aluminized steel tubes and burners as standard on all models.
- Stainless steel heat exchanger with 409 stainless steel tubes and 439 stainless steel burners shall be optional.
- Induced draft combustion blower shall be used to pull the combustion products through the firing tubes.
- Heater shall use a direct spark ignition (DSI) system.
- On initial call for heat, the combustion blower shall purge the heat exchanger for 20 seconds before ignition.
- After three unsuccessful ignition attempts, entire heating system shall be locked out until manually reset at the thermostat/zone sensor.
- Units shall be suitable for use with natural gas or propane (field-installed kit).

Heat Exchanger

- Compact cabinet features a tubular heat exchanger in low, medium and high heat capacities.
- Corrosion-resistant aluminized steel tubes and burners are standard on all models.
- Induced draft blower to pull the gas mixture through the burner tubes.
- Direct spark ignition and a flame sensor as a safety device to validate the flame.

Indoor Fan

- Direct drive plenum fan design - 6 to 25 tons units.
- Plenum fan design - backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor.
- Supply fan speed adjustments can be made using the Symbio 700 or Mobile App.
- Motors are thermally protected.
- Variable speed direct drive motors are high efficiency - 6 to 25 tons.

Through-the-Base Electrical with Disconnect Switch

- 3-pole, molded case, disconnect switch with provisions for through-the-base electrical connections.
- Disconnect switch installed within unit in a water tight enclosure.
- Wiring provided from the switch to the unit high voltage terminal block.
- Switch cULus agency recognized.

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

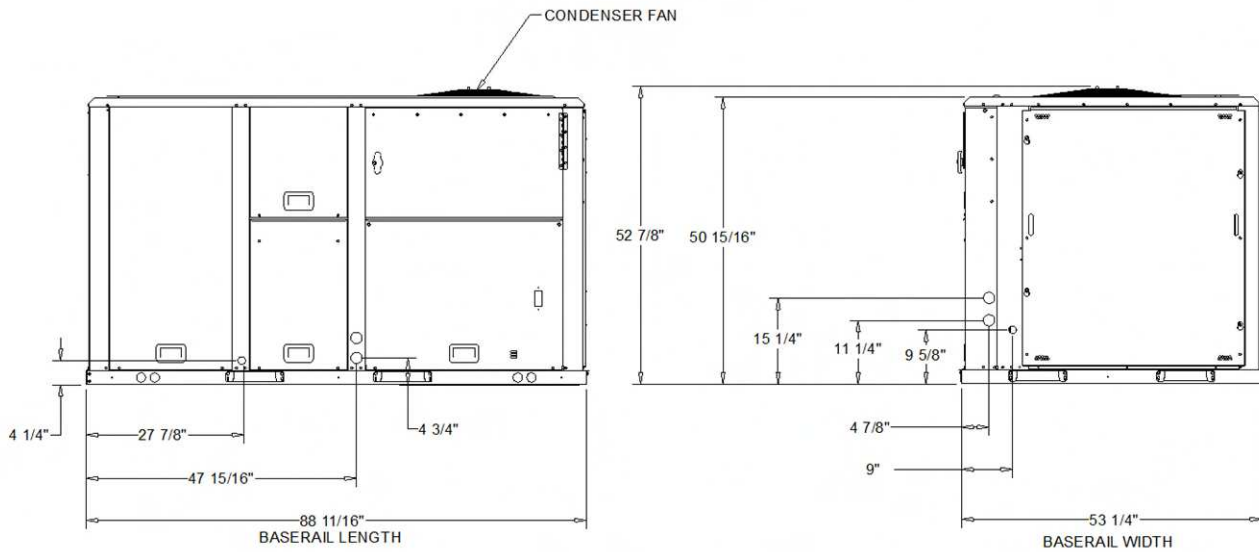
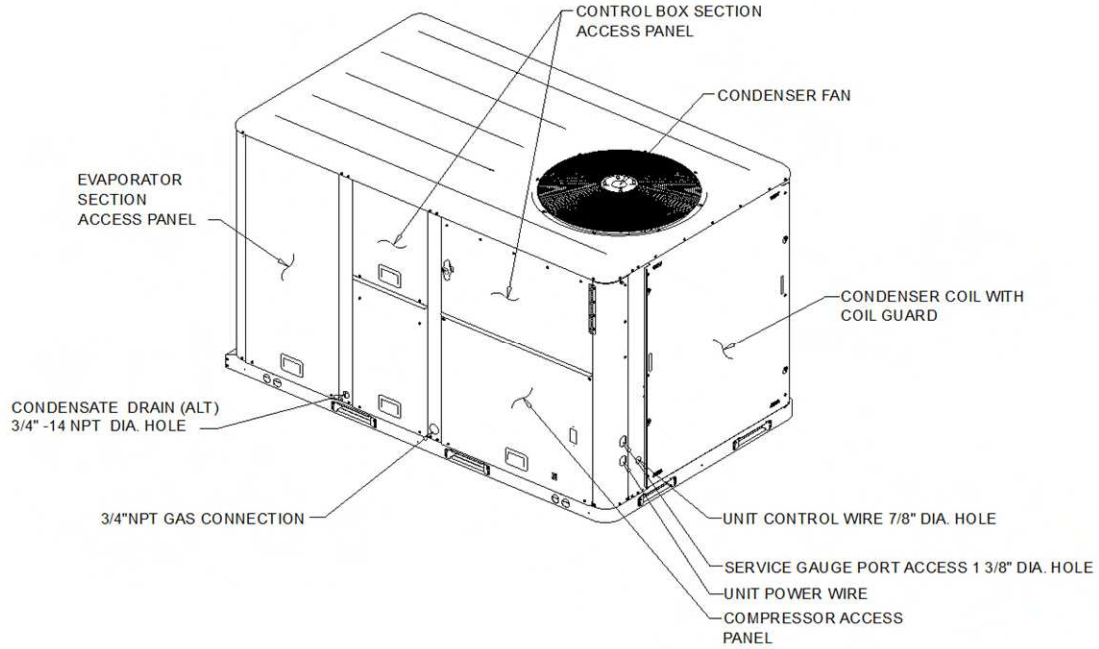
Reference or Comparative Enthalpy

- Reference enthalpy used to measure and communicate outdoor humidity.
- Unit receives and uses information to provide improved comfort cooling while using the economizer.
- Comparative enthalpy measures and communicates humidity for both outdoor and return air conditions, and return air temperature.
- Unit receives and uses information to maximize use of economizer cooling, and to provide maximum occupant comfort control.
- Reference or comparative enthalpy available when a factory or field installed downflow economizer ordered.

Dimensional Drawings - Packaged Rooftop Unit

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

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

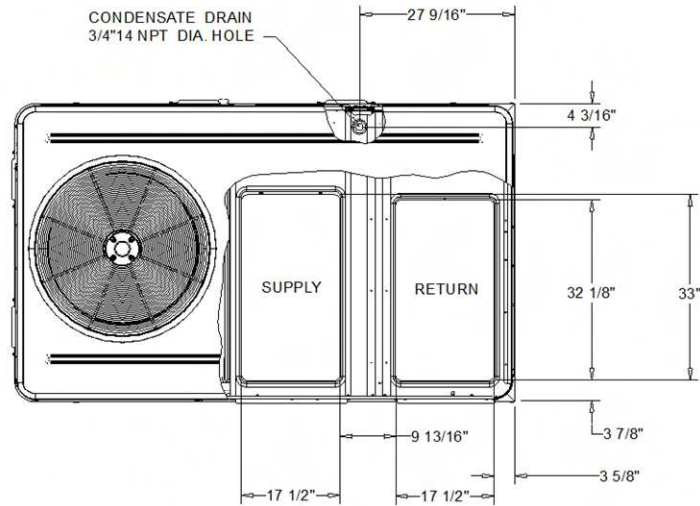


DX COOLING / GAS HEAT STANDARD EFFICIENCY

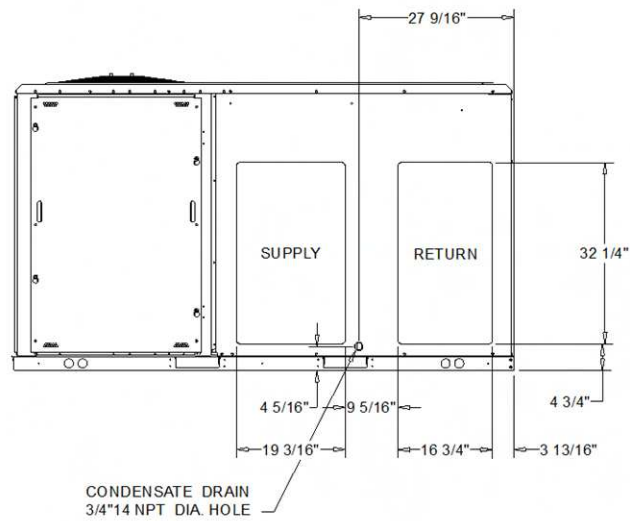
DIMENSION DRAWING

Dimensional Drawings - Packaged Rooftop Unit

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



PLAN VIEW OF DOWNFLOW OPENINGS



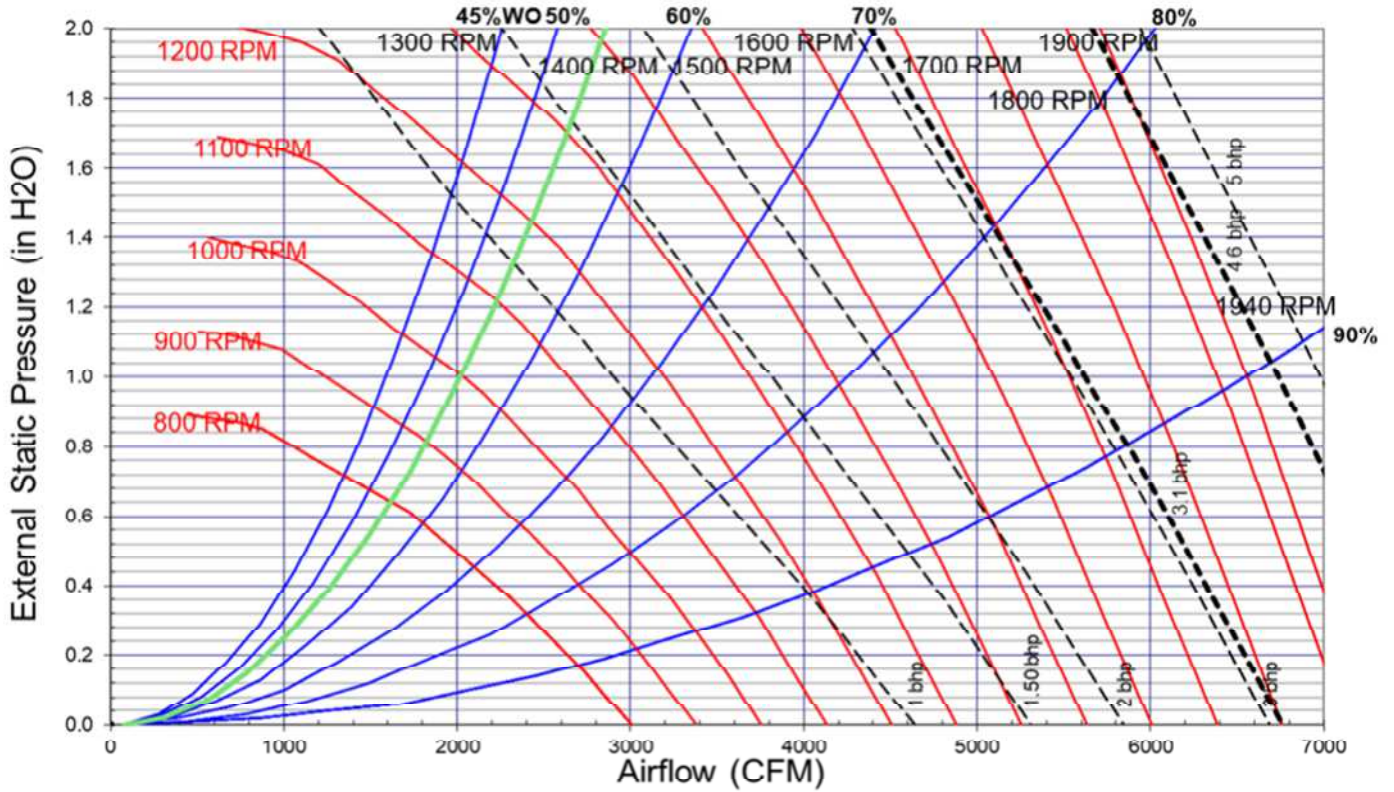
HORIZONTAL AIR FLOW OPENING

DX COOLING / GAS HEAT STANDARD EFFICIENCY

DIMENSION DRAWING

Dimensional Drawings - Packaged Rooftop Unit
 Item: A1 Qty: 1 Tag(s): AHU-W

TSJ072-120*, Downflow, Std Filter, Wet Coil, Cooling Only

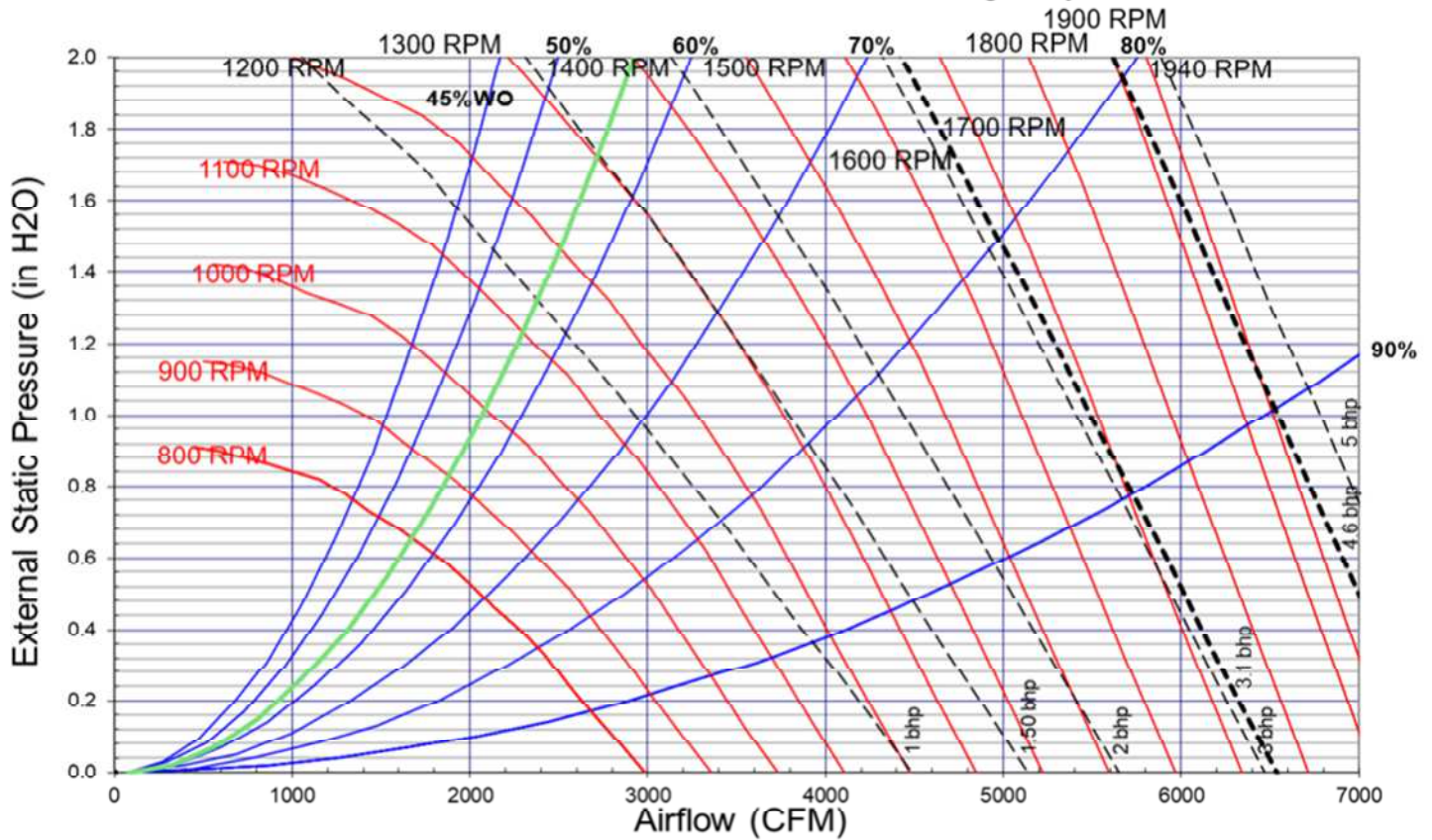


Note: Fan Curves are for TSJ/WSJ units. For YSJ units, add additional static pressure for Gas Heat Exchanger (ref. RT-PRC098*, table 47)

Dimensional Drawings - Packaged Rooftop Unit
Item: A1 Qty: 1 Tag(s): AHU-W

Saved to L: Drive

TSJ072-120*, Horizontal, Std Filter, Wet Coil, Cooling Only



Note: Fan Curves are for TSJ/WSJ units. For YSJ units, add additional static pressure for Gas Heat Exchanger (ref. RT-PRC098*, table 47)

Weight, Clearance & Rigging - Packaged Rooftop Unit

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

NOTES:

- 1. APPROX. INSTALLED WEIGHT INCLUDES ALL SELECTED OPTIONS AND ACCESSORIES.
- 2. CORNER WEIGHTS ARE FOR BASE UNIT ONLY AND DO NOT INCLUDE OPTIONS OR ACCESSORIES.
- 3. WEIGHT INCLUDES BOTH FACTORY AND FIELD INSTALLED ACCESSORY.

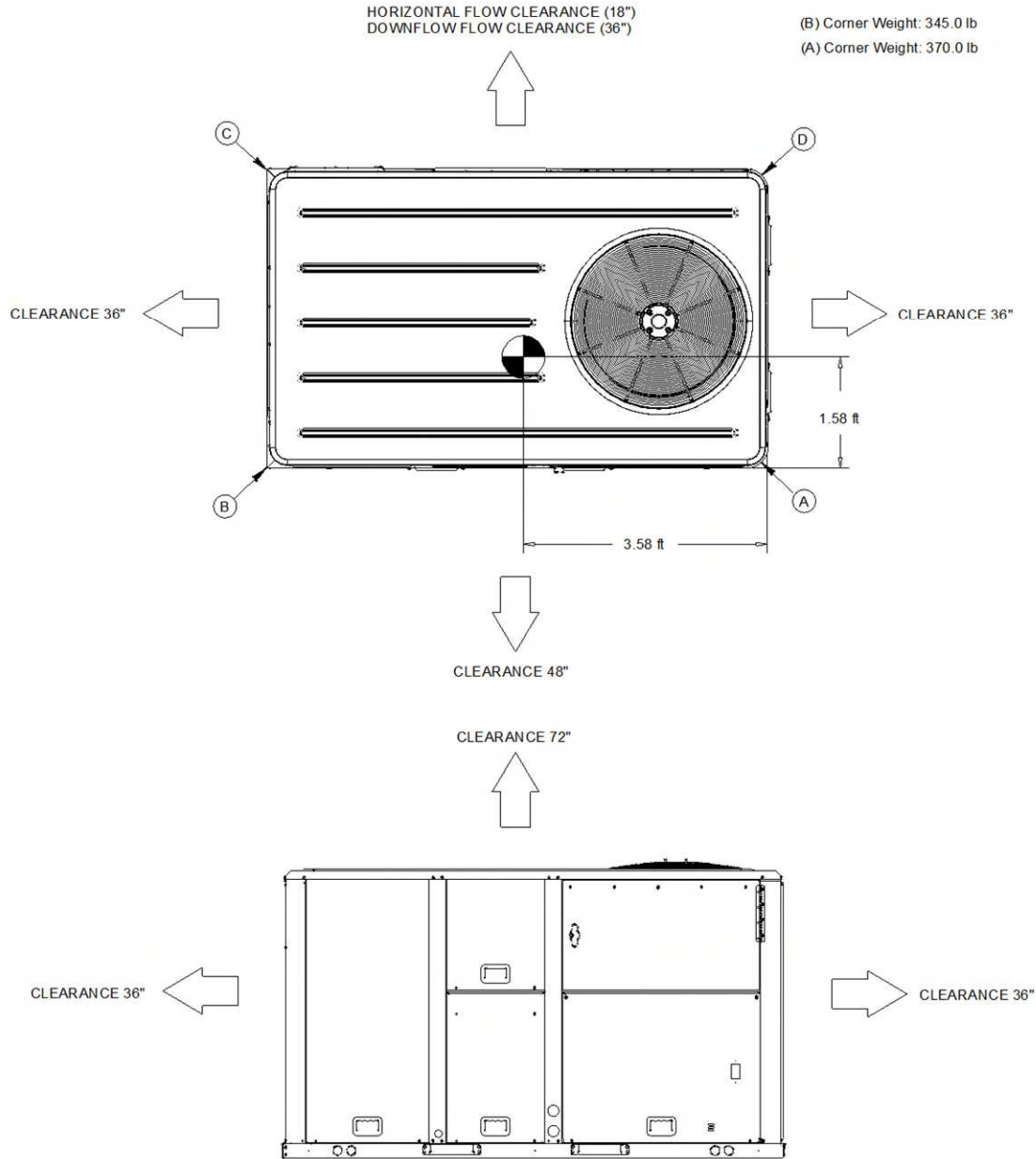
Approximate Installed Weight: 1,171.0 lb

(B) Corner Weight: 345.0 lb

(C) Corner Weight: 199.0 lb

(A) Corner Weight: 370.0 lb

(D) Corner Weight: 213.0 lb

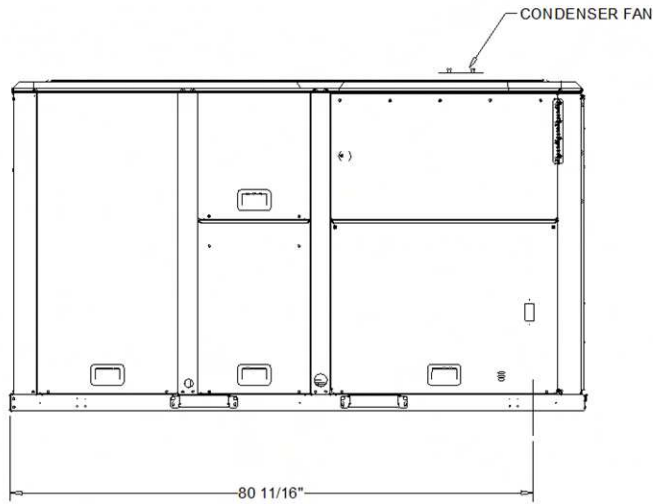
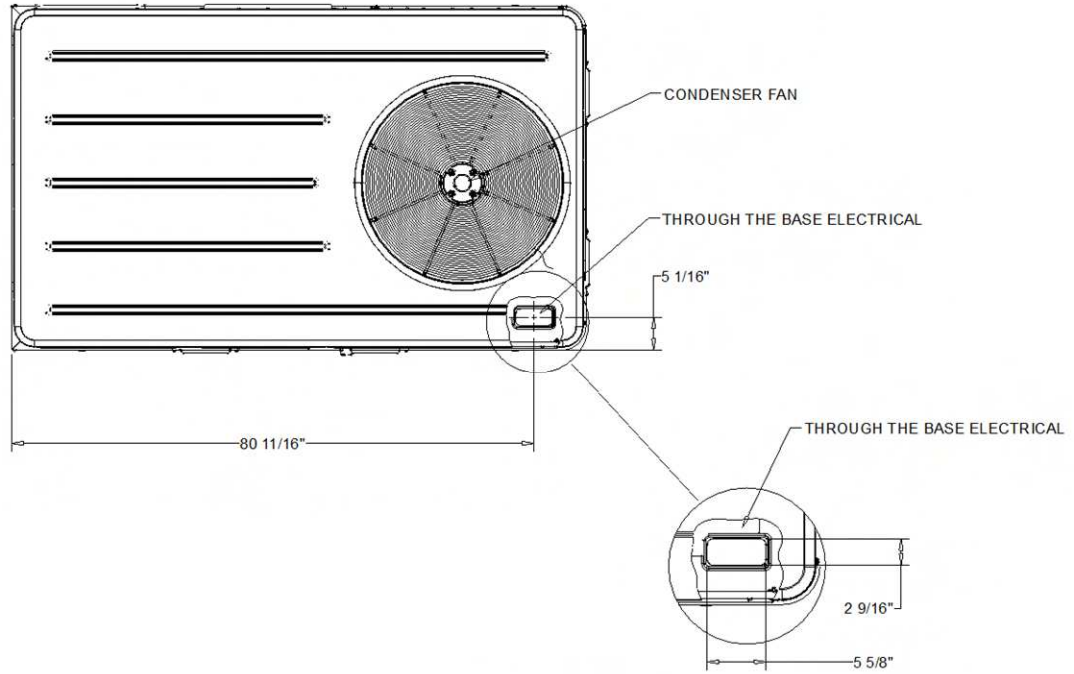


DX COOLING / GAS HEAT STANDARD EFFICIENCY

WEIGHTS AND CLEARANCES

Accessory - Packaged Rooftop Unit

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

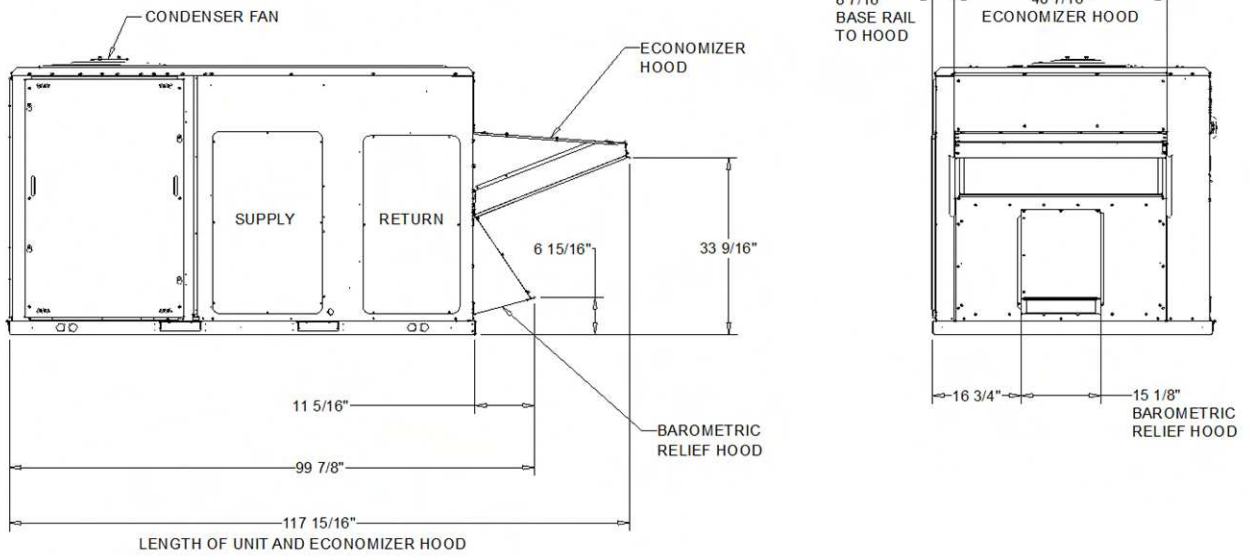
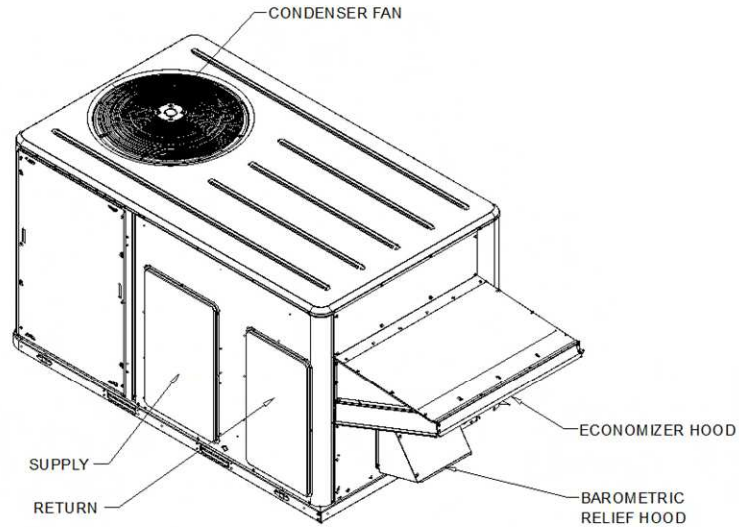


THROUGH-THE-BASE ELECTRICAL (OPTION)

DX COOLING / GAS HEAT STANDARD EFFICIENCY

Accessory - Packaged Rooftop Unit

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

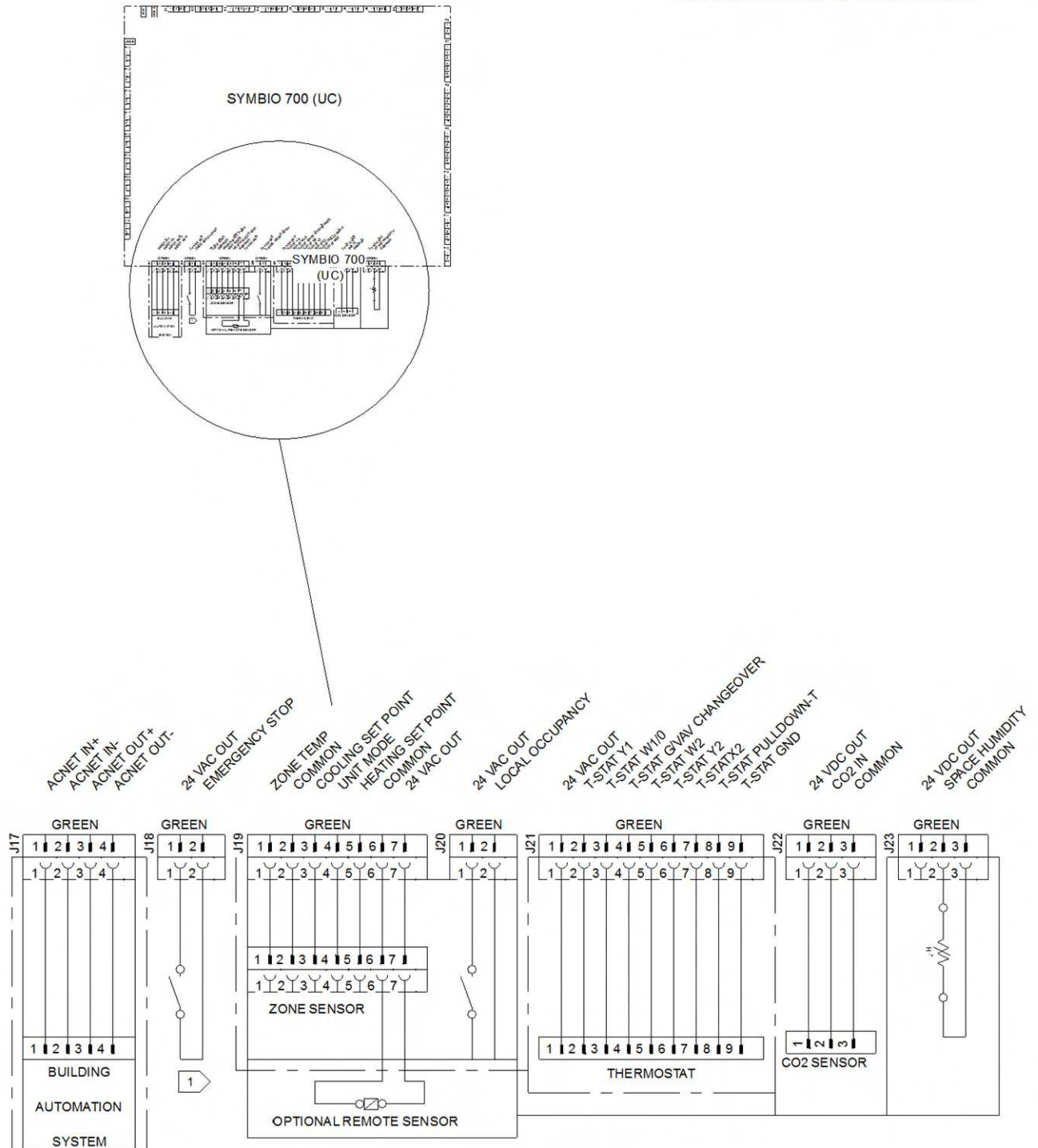


LOW LEAK ECONOMIZER AIR DAMPER (OPTION)

DX COOLING / GAS HEAT STANDARD EFFICIENCY

Field Wiring - Packaged Rooftop Unit
 Item: A1 Qty: 1 Tag(s): AHU-W

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



SYMBIO 700 (J17, J18, J19, J20, J21, J22, AND J23)

FIELD WIRING DRAWING

Tag Data - Packaged Rooftop Unit (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
B1	AHU-H	1	27 1/2-50 Ton Packaged Commercial Roofto	YCD360C4P*6D3GE60B*D**G0HB0MK0RT000*0000 X*****1

Product Data - Packaged Rooftop Unit

Item: B1 Qty: 1 Tag(s): AHU-H

- Standard Unit
- DX Cooling, natural gas heat
- Downflow supply and upflow return
- 30 ton 60 Hertz
- R-410A + Symbio 700
- 460 Volt 60 Hertz 3 Phase
- Modulating high gas heat capacity w/ stainless steel heat exchanger
- 100% Power exhaust w/ Stratitrac building pressure control
- 4" MERV 14 High efficiency, throwaway filters
- 15 hp supply motor
- 800 RPM
- 0-100% Economizer, differential enthalpy control
- VAV (Single zone) with supply VFD
- Thru-the-base electrical provision
- Factory powered ground fault convenience outlet with disconnect switch
- Ventilation override
- Louvered condenser coil hail guards
- Adv Ctrl & BACnet/Modbus Comm. (BCI)
- 5k SCCR
- Stainless steel drain pan
- eStage, High efficiency unit
- Clogged filter switch
- Modulating hot gas reheat
- Duct mounted humidity sensor (Field Installed)
- Plenum Curb (Field Installed)
- Year 2 Parts Warranty Whole Unit
- Year 1 Labor Warranty Whole Unit
- 1st Year Refrigerant Warranty

Provide with interior UV lights.

Does Not Include catwalks, railings, etc. Contractor is responsible for unit height/installation meeting electric code.

Performance Data - 27 1/2-50 Ton Packaged Commercial Rooftop (VOYAGER3)

Tags	AHU-H
Design airflow (cfm)	9700
Elevation (ft)	0.00
Cooling EDB (F)	76.00
Cooling EWB (F)	63.00
Ambient temp (F)	105.00
Leaving unit DB (F)	54.58
Leaving unit WB (F)	52.12
Leaving coil DB (F)	50.31
Leaving coil WB (F)	50.24
Net total capacity (MBh)	285.43
Net sensible capacity (MBh)	209.28
Net sensible heat ratio (%)	0.73
Input htg capacity (MBh)	600.00
Output htg capacity (MBh)	486.00
Heating EAT (F)	55.00
Heating LAT (F)	101.60
Heating delta T (F)	46.60
ESP (in H2O)	1.990
Total static pressure (in H2O)	3.249
Actual Supply Motor BHP (bhp)	11.68
Indoor speed (rpm)	818
Supply Motor Power (kW) (kW)	8.72
Outdoor motor power (kW)	0.00
Compressor power (kW)	27.35
System power (kW)	39.33
EER @ AHRI (EER)	11.2
IEER @ AHRI (EER)	15.4
Min circuit ampacity (A)	91.00
Max overcurrent protection (A)	110.00
Min disconnect switch size (A)	100.00
Compressor 1 RLA (A)	14.70
Compressor 2 RLA (A)	20.50
Compressor 3 RLA (A)	20.50
Supply fan FLA (A)	18.00
Condenser fan FLA (A)	2.20
Condenser fan count (Each)	3.00
Exhaust fan FLA (A)	2.20
Exhaust fan count (Each)	2.00
Electric heater FLA (A)	0.00
Crankcase heater FLA (A)	1.00
Max Condenser Ambient (F)	115.00
Ambient Temp Calc (F)	-10.00
Estimated operating weight (lb)	5686.0
Refrig charge - ckt 1 (lb)	51.0
Entering DX DB in HGRH (F)	73.00
Entering DX WB in HGRH (F)	64.00
Ambient in HGRH mode (F)	75.00
Reheat Setpoint (LUDB in HGRH) (F)	70.00
Reheat latent capacity (MBh)	157.75
Reheat sensible capacity (MBh)	186.13
Leaving unit dew point in HGRH (F)	49.24
Moisture removal (gpm)	0.28

Basis of design MOP = 100 A.
Coordinate with electrical contractor.

Mechanical Specifications - Packaged Rooftop Unit**Item: B1 Qty: 1 Tag(s): AHU-H****High Efficiency Unit (eStage)**

This option shall provide five stages of mechanical cooling with the ability to be at or below 25% compressor displacement at stage one. Service valves shall also be provided factory installed and include suction and discharge 3-way shutoff valves.

Modulating Hot Gas Reheat

A reheat condenser coil shall be factory installed downstream of the unit evaporator coil. Modulating valves shall control the flow of refrigerant between the indoor reheat and outdoor condensers in response to the unit discharge air temperature in order to dehumidify the space. The modulating valve shall always apply to circuit 1.

Phase and Voltage Monitor

Standard on all Voyager Commercial units. Shall protect 3-phase equipment from phase loss, phase reversal, and low voltage. Any fault condition shall send the unit into an auto stop condition. cULus approved.

Refrigerant Circuits

Each refrigerant circuit shall have independent thermostatic expansion devices, service pressure ports and refrigerant line filter driers factory-installed as standard. An area shall be provided for replacement suction line driers.

Outdoor Fans

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

Louvered Hail Guard

Louvered, hail protection quality coil guards are available for condenser coil protection.

Stainless Steel Drain Pans

Sloped stainless steel evaporator coil drain pans shall be durable, long-lasting and highly corrosion resistant.

High/Low Modulating Gas Heat

The heating section shall have a drum and tube heat exchanger(s) design with primary and secondary surfaces of corrosion resistant aluminized steel or optional stainless steel (all modulating gas heat units shall have stainless steel). A forced combustion blower shall supply premixed fuel to a single burner ignited by a pilotless shot surface ignition system. In order to provide reliable operation, a regulated gas valve shall be used that requires blower operation to initiate gas flow. On an initial call for heat, the combustion blower shall purge the heat exchanger(s) 45 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat. Modulating gas turn down ratio on high fire units is accomplished by allowing the furnaces to act independently of one another. The modulating bank is activated first and is allowed to modulate itself to meet the heating needs. If the modulating bank is unable to meet the need at high fire, the second bank is turned on and then the first bank again modulates to the appropriate level. This system creates a nearly seamless range of capacity from low fire on the modulating bank to high fire of both furnaces together. Modulating gas heat units shall be suitable for use with natural gas only.

Indoor Fan, 60 Hz Supply Motor

Unit will have belt driven, forward curve, centrifugal fans with fixed motor sheaves. The supply fan motors will be circuit breaker protected. All 60 Hz supply fan motors meet the Energy Independence and Security Act of 2009 (EISA).

Bypass control

Provides full nominal airflow in the event of drive failure.

Variable Frequency Drive

Unit shall include factory-installed and tested variable frequency drive[s] (VFD) to provide motor speed modulation. The VFD shall receive a 0-10VDC speed signal from the unit controller. The drive will respond to the signal by accelerating or decelerating to maintain the controlling set point (duct static, space pressure, etc). VFD shall also include the following features:

1. Designed, constructed, and tested in accordance with NEMA ICS, NFPA, and IEC standards and housed in a plastic IP20 enclosure.
2. DC link reactors on both the positive and negative rails of the DC bus equal to 3% impedance to minimize power line harmonics.
3. Full rated output current continuously - 110% of rated current for 60 seconds and 160% of rated current for up to 0.5 second while starting.
4. Isolation between the Drive's power circuitry and control circuitry to ensure operator safety and to protect connected electronic control equipment from damage caused by voltage spikes, current surges, and ground loop currents.
5. Audible noise reduction through automatic adjustment of the carrier frequency and frequency avoidance.
6. Rated at 40C with a standard operating range of -10 to 50C (14 to 124F) ambient temperatures and 0 to 95% relative humidity
7. Self-diagnostics and motor protections such as: cULus listed overload, phase loss, and internal thermal overload.
8. Off/Stop and Auto/Start selector switches to start and stop the AC Drive and determine the speed reference.
 - a. On units with bypass, an AC Drive/Off/Bypass hand selector switch shall be provided in the unit control box
 - b. In DRIVE mode speed reference shall be provided by a 0-10 VDC analog input
9. A keypad interface which shall be programmable by language and feature multiple lines for easy reading
10. Controlled and/or accessible points such as AC Drive Start/Stop, speed reference, and fault diagnostics.
11. Meter points such as motor power in HP, motor power in kW, motor kW-hr, motor current, motor voltage, hours run, DC link voltage, thermal load on motor, Thermal load on AC Drive and Heatsink temperature.
12. Troubleshooting features such as:
 - a. AC Drive memory storage of the last 10 faults and related operational data
 - b. Four simultaneous displays: frequency or speed, run time, output amps and output power
 - c. Keypad which shall display: Reference Signal Value, Output Frequency in Hz or percent, Output Amps, Motor HP, Motor kW, kW
13. Coated circuit boards for protection against corrosive environments
14. Field readable BACnet points to allow for communication of stauts, setpoints and diagnostics to the BAS.

Single Zone Variable Air Volume

Single zone VAV option shall be provided with all necessary controls to operate a rooftop unit based on maintaining two temperature setpoints; the discharge air and zone. Option shall include factory-installed variable frequency drive (VFD) to provide supply fan motor speed modulation. During One Zone VAV cooling, the unit will maintain zone cooling setpoint by modulating the supply fan speed more or less to meet zone load demand, and the unit will maintain discharge temperature to the discharge cooling setpoint by modulating economizer if available and staging dx cooling.

Modulating 100 Percent Exhaust Fan with Statitrac Control Option

A differential pressure control system, (Statitrac), shall use a differential pressure transducer to compare indoor building pressure to outdoor ambient atmospheric pressure and shall turn the exhaust fans on and off and modulate the barometric exhaust dampers to control the building pressure to within the adjustable, specified dead band that shall be adjustable at the RTVM board.

4" High Efficiency Filters - MERV 14

4" High Efficiency MERV 14 filters will be standard.

Clogged Filter Indication

This optional factory installed differential pressure switch allows dirty filter indication at the zone sensor with service LED. When closed, the dirty filter witch will light the service LED on the zone sensor and allow the unit to continue normal operation.

Economizer w Differential Enthalpy Control

Economizer shall be factory installed. The assembly shall include: fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness, and fixed dry bulb control. Differential enthalpy control shall be a factory or field installed option.

Ventilation Override

Ventilation Override shall allow a binary input from the fire/life safety panel to cause the unit to override standard operation and assume one of two factory preset ventilation sequences, three factory preset ventilation sequences, exhaust, pressurization or purge. The three sequences shall be selectable based open a binary select input.

Controls

Unit shall be completely factory wired with necessary controls and terminal block for power wiring. Units shall provide an external location for mounting fused disconnect device. The controls shall be provided for all 24 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. The controls shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.

Unit Interrupt Rating (Standard Short Circuit Current Rating-SCCR)

A 5,000 Amp rating shall be applied to the unit enclosure using a non-fused circuit breaker for disconnect switch purposes. Fan motors, compressors, and electric heat circuits shall be provided with protective devices that will provide the unit rated level of fault protection. The unit shall be marked with approved cULus markings and will adhere to cULus regulations.

Through-The-Base Electrical Provision

An electrical service entrance shall be provided which allows access to route all high and low voltage electrical wiring inside the curb, through the bottom of the outdoor section of the unit and into the control box area.

Non-Fused Disconnect Switch

A factory installed non-fused disconnect switch with external handle shall be provided and shall satisfy NEC requirements for a service disconnect. The non-fused disconnect shall be mounted inside the unit control box.

GFI Convenience Outlet (Factory Powered)

A 15A, 115V Ground Fault Interrupter convenience outlet shall be factory installed. It shall be wired and powered from a factory mounted transformer. Unit mounted non-fused disconnect with external handle shall be furnished with factory powered outlet.

BACnet Communications

The BACnet communications interface shall allow the unit to communicate directly with a generic open protocol BACnet MS/TP Network Building Automation System Controls.

Humidity Sensor

This wall or duct-mounted humidity sensor shall be used to control activation of the hot gas reheat dehumidification option. The humidity sensor can be set for humidity levels between 40% and 60% relative humidity.

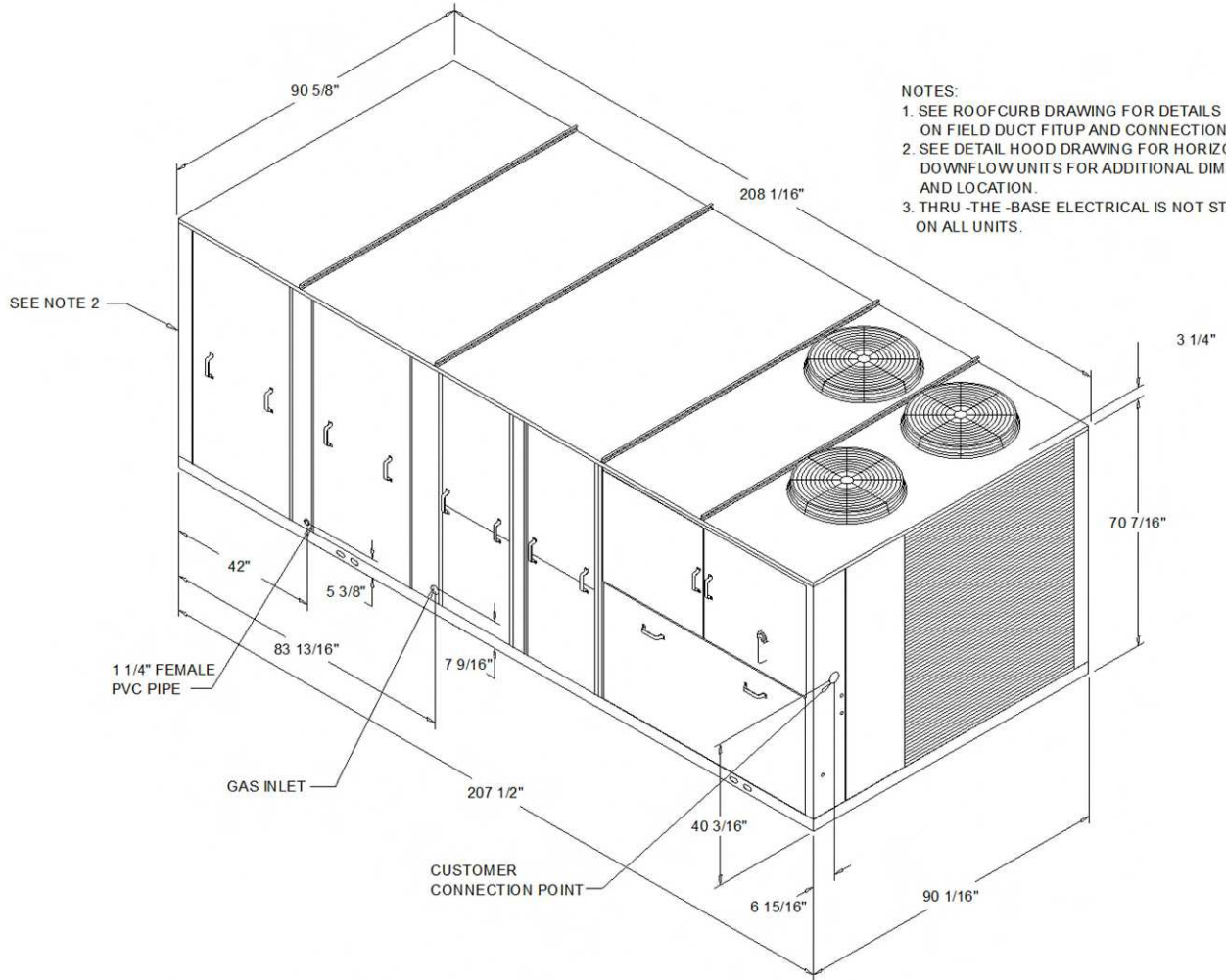
Certified AHRI Performance

Packaged Rooftop units cooling, heating capacities and efficiencies are rated within the scope of the Air-Conditioning, Heating & Refrigeration Institute (AHRI) Certification Program and display the AHRI Certified® mark as a visual confirmation of conformance to the certification sections of AHRI Standard 340-360 (I-P) and ANSI Z83.8/CSA 2.6and 10 CFR Part 431 pertaining to Commercial Warm Air Furnaces. The applications in this catalog specifically excluded from the AHRI certification program are:

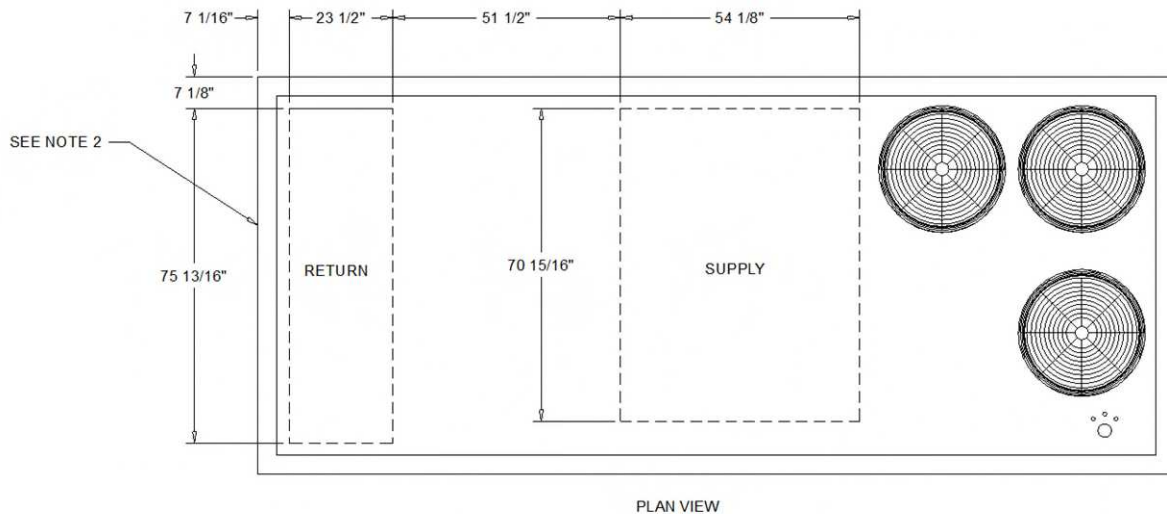
- Ventilation modes
- Heat Recovery

Dimensional Drawings - Packaged Rooftop Unit

Item: B1 Qty: 1 Tag(s): AHU-H



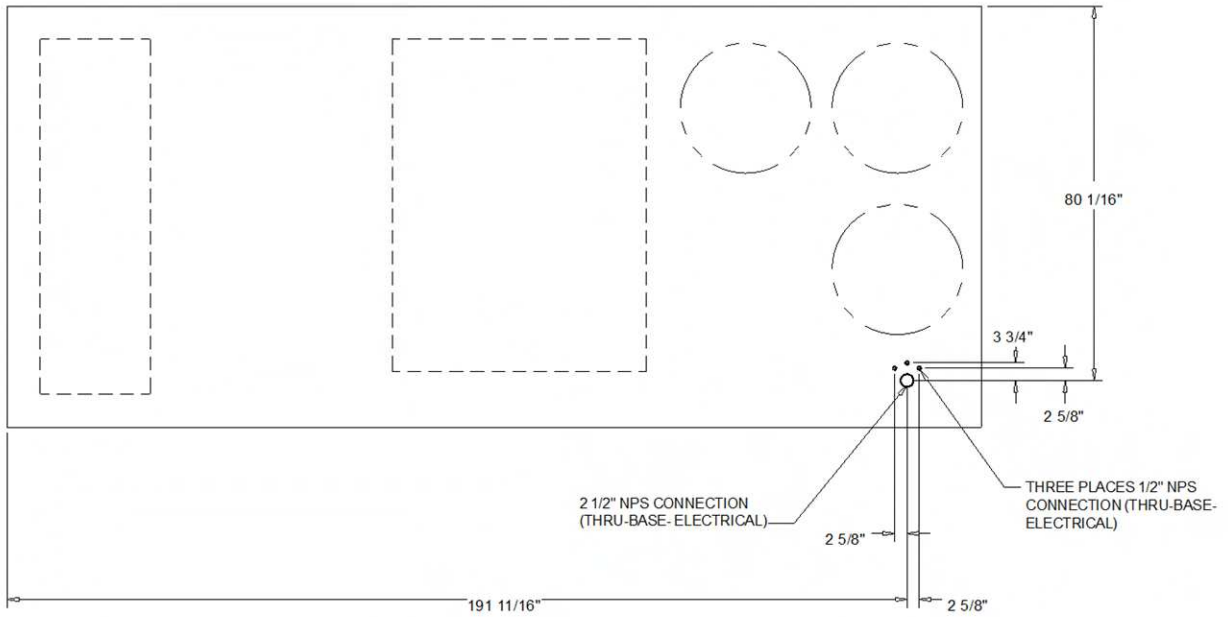
- NOTES:
1. SEE ROOFCURB DRAWING FOR DETAILS ON FIELD DUCT FITUP AND CONNECTIONS
 2. SEE DETAIL HOOD DRAWING FOR HORIZONTAL / DOWNFLOW UNITS FOR ADDITIONAL DIMENSION AND LOCATION.
 3. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.



DOWNFLOW SUPPLY AND UPFLOW RETURN CONFIGURATION
DIMENSIONAL DRAWING

Dimensional Drawings - Packaged Rooftop Unit

Item: B1 Qty: 1 Tag(s): AHU-H

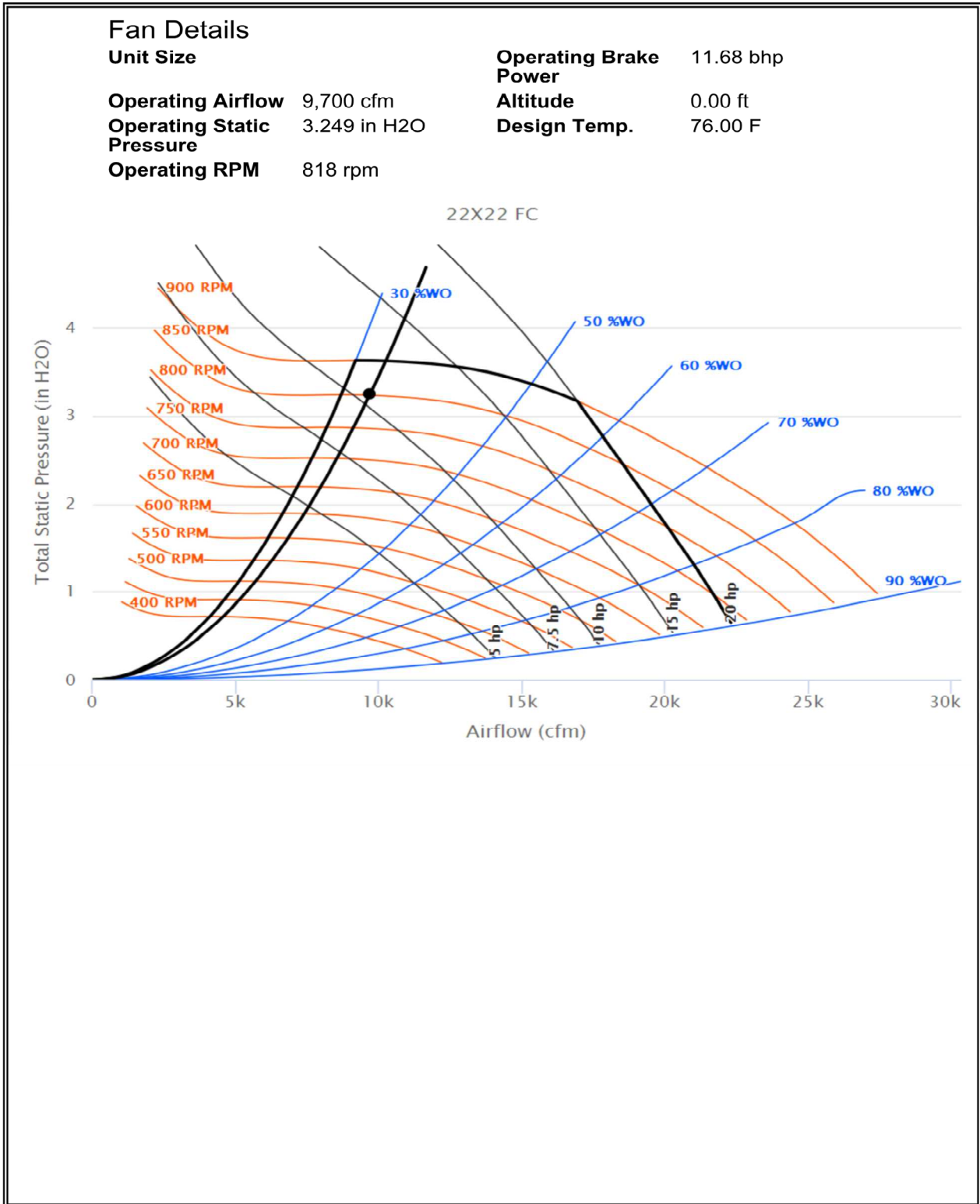


- NOTES:
1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
 2. VERIFY ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION.

THRU -THE -BASE ELECTRICAL PROVISION

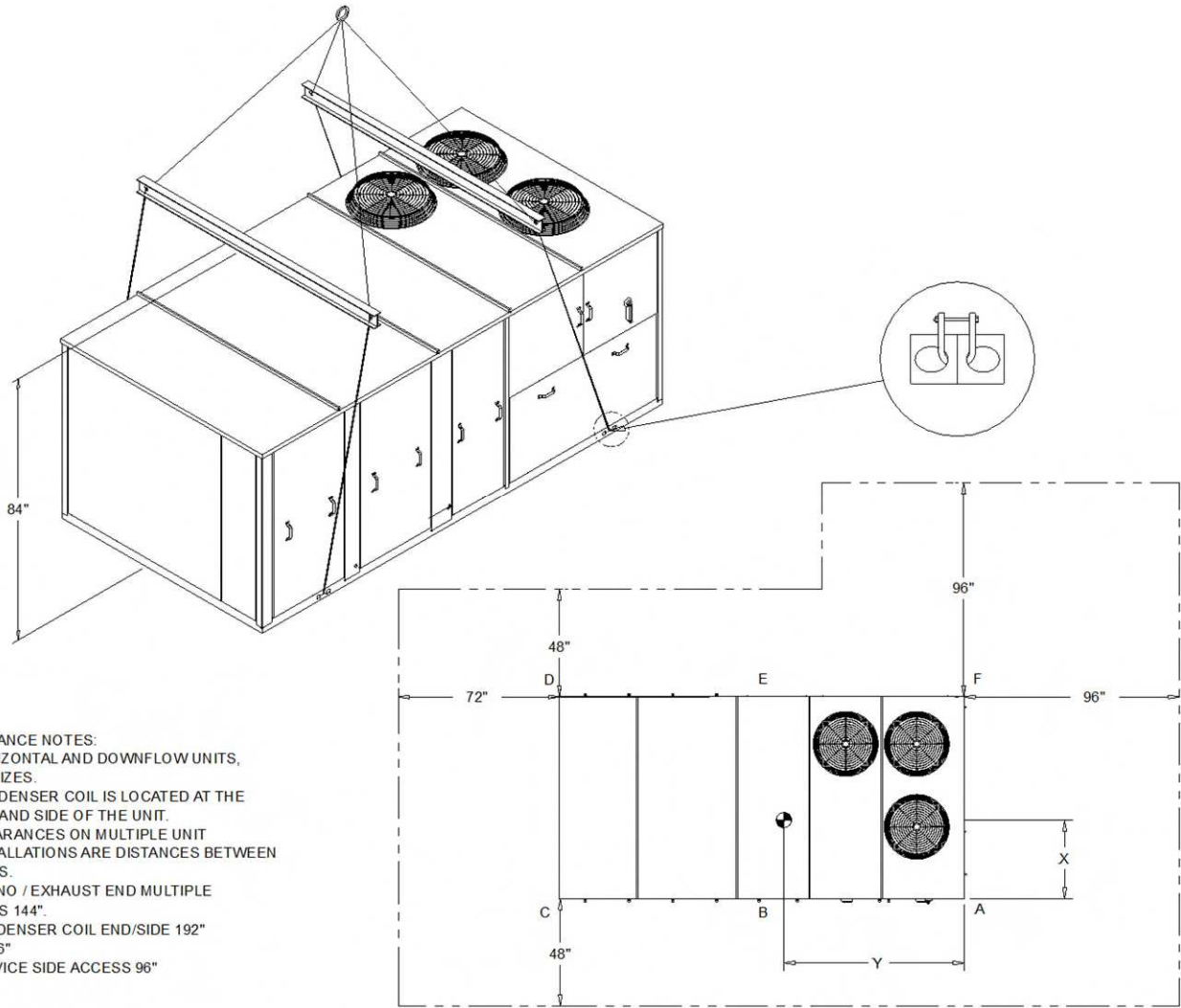
PLAN VIEW

Fan Curve - Packaged Rooftop Unit
Item: B1 Qty: 1 Tag(s): AHU-H



Weight, Clearance & Rigging - Packaged Rooftop Unit

Item: B1 Qty: 1 Tag(s): AHU-H



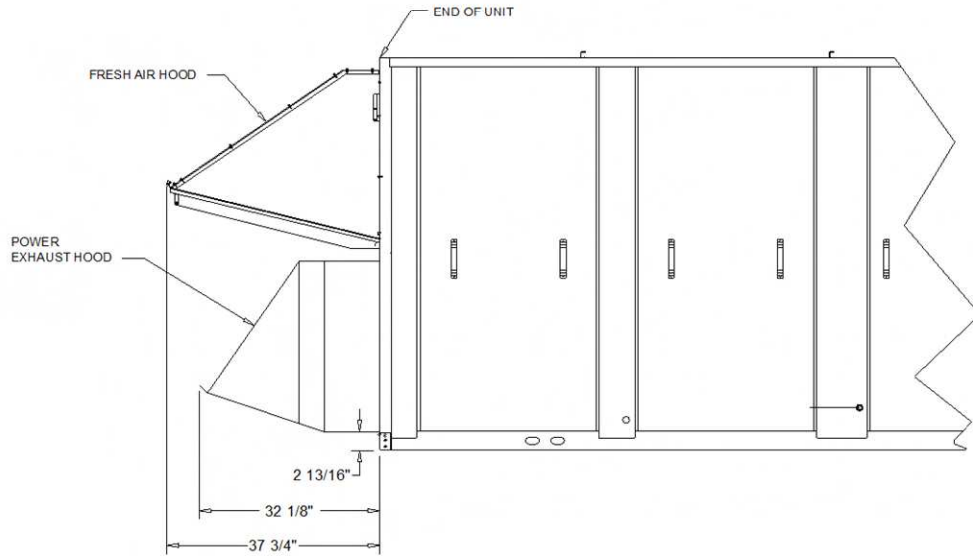
- CLEARANCE NOTES:
1. HORIZONTAL AND DOWNFLOW UNITS, ALL SIZES.
 2. CONDENSER COIL IS LOCATED AT THE END AND SIDE OF THE UNIT.
 3. CLEARANCES ON MULTIPLE UNIT INSTALLATIONS ARE DISTANCES BETWEEN UNITS.
 4. ECONO / EXHAUST END MULTIPLE UNITS 144".
 5. CONDENSER COIL END/SIDE 192" TO 96"
 6. SERVICE SIDE ACCESS 96"

ESTIMATED OPERATING WEIGHT						OPTIONAL COMPONENTS							
OPERATION WEIGHT: 5,686.0 lb													
CENTER OF GRAVITY													
X	43"			Y	84"			POWER EXHAUST	165.0 lb	BARO. RELIEF	N/A	SERVICE VALVES	N/A
CORNER LOADING PERCENTS						ECONOMIZER	260.0 lb	THRU-BASE ELECTRICAL	6.0 lb	DISC. SWITCH	N/A		
A	B	C	D	E	F	MANUAL DAMPERS	N/A	GFI WITH DISCON. SWITCH	85.0 lb	VFD	85.0 lb		
21%	16%	18%	17%	14%	15%	ULTRA LOW LEAK EXH.	N/A	ULTRA LOW LEAK ECON	N/A				
						COIL HAIL GUARD	105.0 lb	MOD. HOT GAS REHEAT	107.0 lb				

- WEIGHT NOTES:
1. THE WEIGHT SHOWN REPRESENTS THE TYPICAL UNIT OPERATING WEIGHT FOR THE CONFIGURATION SELECTED. ESTIMATED AT +/- 10 % OF THE NAMEPLATE WEIGHT.
 2. THE ACTUAL WEIGHT IS STAMPED ON THE UNIT NAMEPLATE.

Accessory - Packaged Rooftop Unit

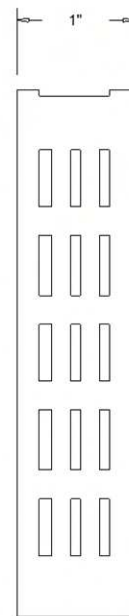
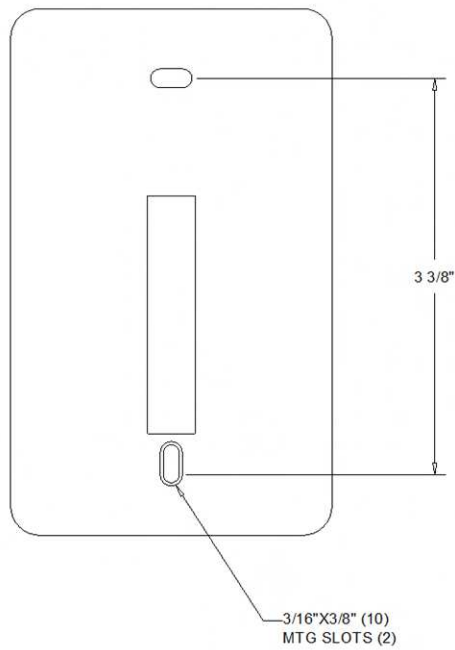
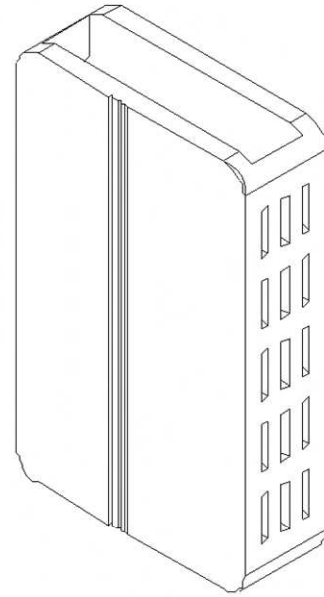
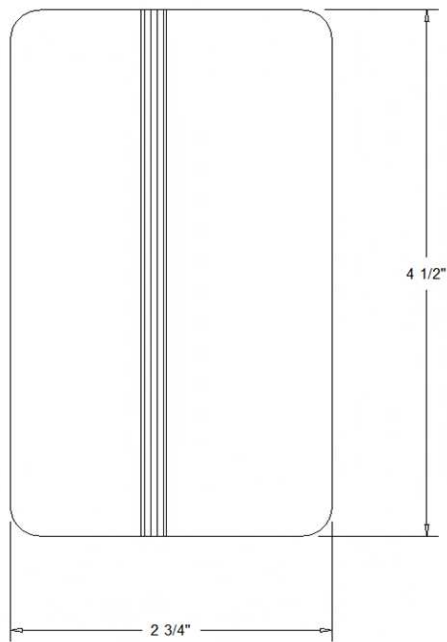
Item: B1 Qty: 1 Tag(s): AHU-H



FRESH AIR AND POWER EXHAUST HOODS FOR DOWNFLOW RETURN
UNIT DETAIL

Accessory - Packaged Rooftop Unit

Item: B1 Qty: 1 Tag(s): AHU-H



BAYSENS037 - HUMIDITY DUCT MOUNTED SENSOR

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 - Packaged Rooftop Unit

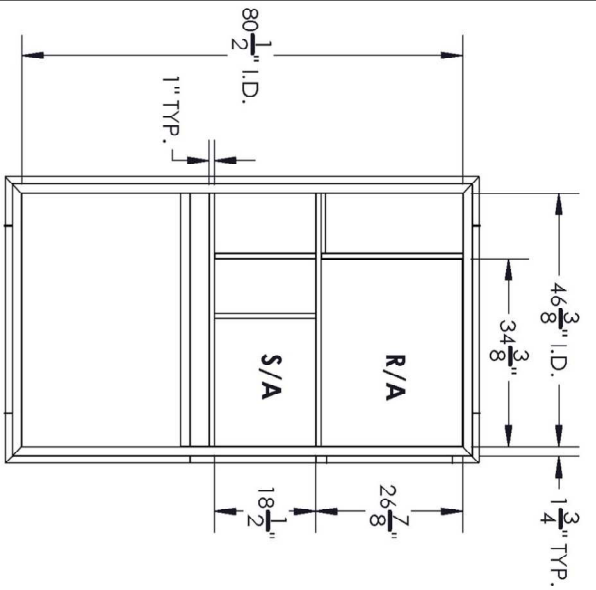
Item	Tag(s)	Qty	Description	Model Number
A1	AHU-W	1	6- 25 Ton PKGD Precedent Unitary Rooftop	YSJ102A4S0M**P2D0A1B 1A0C4010000000000000

Field Installed Option Description	Part/Ordering Number
CO2 wall mounted	FIACO2K001A

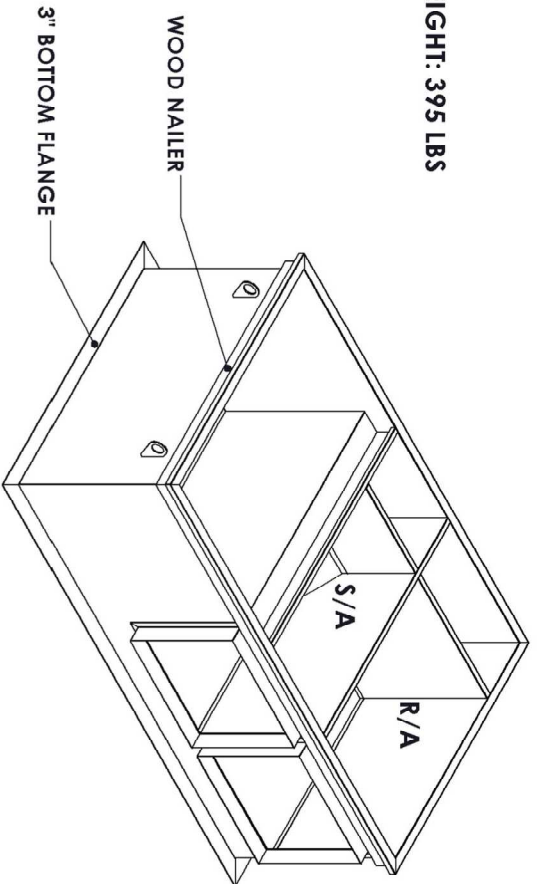
Product Family - Packaged Rooftop Unit

Item	Tag(s)	Qty	Description	Model Number
B1	AHU-H	1	27 1/2-50 Ton Packaged Commercial Roofto	YCD360C4P*6D3GE60B*D**G0HB0MK0RT000*000 0X*****1

Field Installed Option Description	Part/Ordering Number
Duct mounted humidity sensor	BAYSENS037A

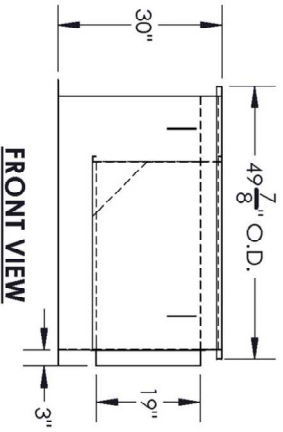


WEIGHT: 395 LBS

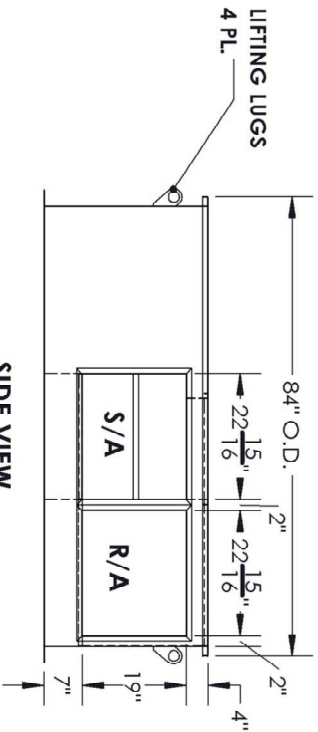


ISOMETRIC VIEW

PLAN VIEW



FRONT VIEW

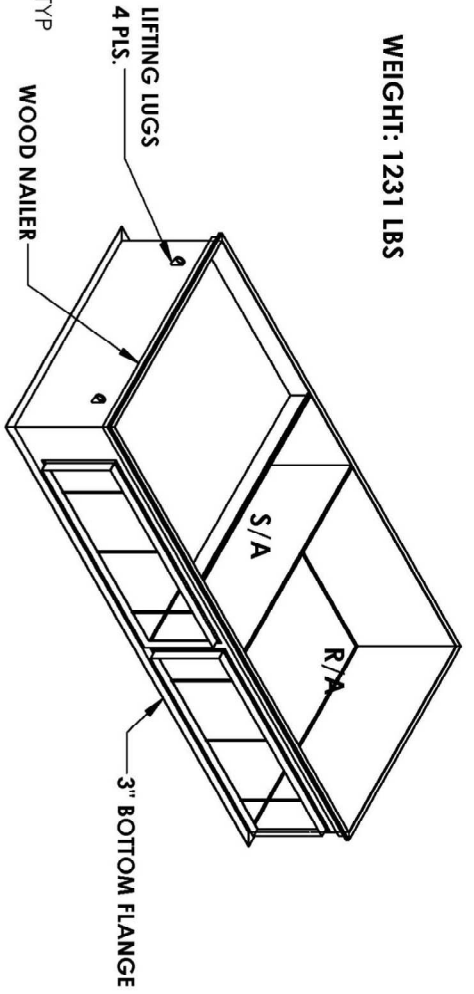
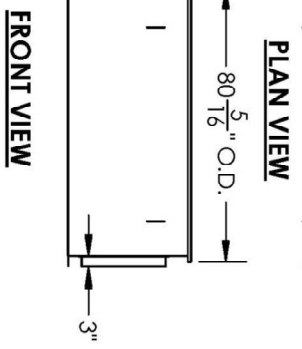
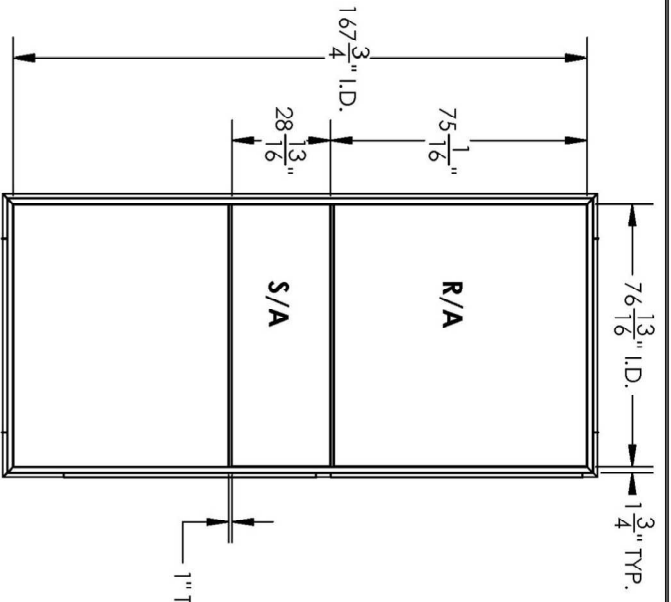


SIDE VIEW

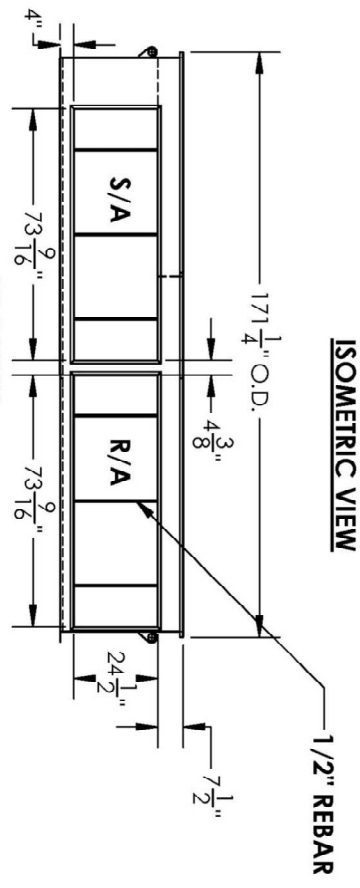
- NOTES:**
1. 14 GA. GALV. STEEL CONSTRUCTION.
 2. INTERNALLY INSULATED WITH 1"-1.5 PCF DENSITY INSULATION
 3. 1" X 4" WOOD NAILER.
 4. 1/4" X 1 1/4" GASKETING.
 5. CONTINUOUS WELDED SEAMS AND CORNERS

- OPTIONS:**
1. VARIOUS HEIGHTS
 2. PITCHED ROOF
 3. FULLY ASSEMBLED - WELDED INSULATED CURB
 4. VIBRATION ISOLATION RAILS
 5. BURGALAR BARS
 6. POWER EXHAUST CURB
 - 7.

APPROVED		DATE	
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS SHOWN ARE IN MILLIMETERS AND DECIMALS ONLY			
DATE		APPROVALS	
8/2/17		DR: MICHAEL	
UNLESS OTHERWISE SPECIFIED SECTION ANGLE		CHIR	
30°/90°		SIPV:	
*203/50/1 *203/50/2		ELEC ENG:	
HARD ANGLE		MECH ENG:	
TYPICAL		MECH BNG:	
TCW43A30HOR22		DWG A NO. 124	
Tennums of Florida Incorporated		DWG NO. 124	
SCALE		SHEET 1 OF 1	
ISS			



WEIGHT: 1231 LBS



- NOTES:**
1. 12 GA. GALV. STEEL CONSTRUCTION INTERNALLY INSULATED WITH 1"-1.5 PCF DENSITY INSULATION
 2. CONTINUOUS WELDED SEAMS AND CORNERS
 3. 1/4" X 1 1/4" GASKETING
 4. SHIPPED FULLY ASSEMBLED

- INSTALLATION INSTRUCTIONS:**
- INSTALL & SECURE CURB ON ROOF AS REQUIRED BY LOCAL BUILDING CODES.
 - APPLY 1/4" X 1 1/4" GASKETING ON CURB. INSTALL & SECURE A/C UNIT ON CURB AS REQUIRED BY LOCAL BUILDING CODE.

APPROVED	DATE	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS SHOWN ARE IN MILLIMETERS AND DECIMALS ONLY	APPROVALS	DATE
		UNLESS OTHERWISE SPECIFIED ON SHEET	DR: SCW	5/17/8
		HARD ANGLE	CHKR:	
			SUPV:	
			ELEC ENG:	
			MECH BNG:	
TCW33036HOR22NB			DWG NO:	
			REV:	
			SHEET	1 OF 1
			SCALE	1/8"

