Submittal

SUBM #- 02

1000 Riverside MHS-PPL
Job # 13431

General Contractor……..... Stroudwater Construction
96 Ocean Street
South Portland, Maine 04106

Submitted By…….. Johnson and Jordan, Inc.
18 Mussey Road
Scarborough, Maine 04074

Subcontractor…….

Supplier……... Trane US Inc.
860 Spring Street Unit 1
Westbrook, Me 04092

Specification Section…….....

Paragraph.....

Item..... RTUs, Dampers, ERV, Gas Unit Heater
Mini Split AC/heat pump.

JOHNSON&JORDAN,INC.
18 Mussey Rd. Scarborough, Me
Approved:_____Approved as noted:_____
Re-Submit_____Reviewed___X____
Subject to Architects approval:_____
Date:___1/27/14____By:Patrick J. Caskin Sr.

Submittal

Trane U.S. Inc.

Date: January 22, 2014

Prepared For:
Johnson & Jordan Inc
18 Mussey Road
Scarborough, ME 04074
Customer P.O. Number: 189992
Customer Project Number: 13431

Job Name:
Portland Public Library MHS
1000 Riverside Street
Portland, ME 04103
Job Number: A223468

Trane is pleased to provide the enclosed submittal for your review and approval.

PACKAGED GAS/ELECTRIC ROOFTOP AIR CONDITIONERS (10 TONS OR LESS)

Notes:

- *Provide equipment tags when known*
- *Not included: Thermostat, controls other than listed*

Dan Broderick
Trane U.S. Inc. dba Trane
860 Spring Street, Unit #1
Westbrook, ME 04092-3824
Phone: (207) 828-1777
Fax: (207) 828-1511
E-Mail: djbroderick@trane.com

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

Qty	***Description***	***Tag(s)***
	Packaged Gas/Electric Rooftop Units	
3	Trane Model YHC092F4RMA 7.5 Ton Packaged Gas/Electric Rooftop Units	
1	Trane Model YHC120E4RMA 10 Ton Packaged Gas/Electric Rooftop Unit	
1	Trane Model YHC047E4RMA 4 Ton Packaged Gas/Electric Rooftop Unit	

Tag Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop (Qty: 5)

Item	Tag(s)	Qty	Description	Model Number
A1	7.5 True VAV	2	7.5Ton R410A Bypass VAV	YHC092F4RMA--GE01A100000000000000000000
A2	7.5 SZ VAV	1	7.5Ton R410A Single Zone VAV	YHC092F4RMA--0601A100000000000000000000
A3	10 Ton SZ VAV	1	10 Ton R410A Single Zone VAV	YHC120E4RMA--0601A100000000000000000000
A4	4 Ton SZ VAV	1	4 Ton R410A Single Zone VAV	YHC047E4RMA--0601A100000000000000000000

Product Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop

All Units

DX cooling, gas heat
High efficiency
Convertible configuration
Major design sequence
460/60/3
Microprocessor controls
Medium gas heat
Standard condenser coil w/hail guard
Through the base electrical w/ Non-fused disconnect
Roof curb (Fld)
Fld = Furnished by Trane U.S. Inc. dba Trane / Installed by Others

Item: A1 Qty: 2 Tag(s): 7.5 True VAV, 7.5 True VAV

7.5 Ton Dual compressor
Economizer Comparative Enthalpy 0-100%
True VAV w/std motor
Power exhaust (Fld)

Item: A2 Qty: 1 Tag(s): 7.5 SZ VAV

7.5 Ton Dual compressor
Single Zone VAV
Humidity duct mounted sensor (Fld)

Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV

10 Ton
Single Zone VAV
Humidity duct mounted sensor (Fld)

Item: A4 Qty: 1 Tag(s): 4 Ton SZ VAV

4 Ton 17 SEER
Single Zone VAV
Humidity duct mounted sensor (Fld)

Mechanical Specifications - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 - A4 Qty: 5 Tag(s): 7.5 True VAV, Y4C-1-1, 7.5 SZ VAV, 10 Ton SZ VAV, 4 Ton SZ VAV

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.

General (Precedent 17 Plus)
The units shall be convertible airflow. The operating range shall be between 125°F and 0°F incooling as standard from the factory for units with microprocessor controls. . 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. Unit's 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 inch, foil-faced, closed-cell insulation. All insulation edges shall be either captured or sealed. The unit's 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.

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 YSC (036, 048, 060, 072, 090, 102, 120); standard on YHC (036, 048, 060, 072, 092, 102, 120).

Compressors (Precedent 17 Plus)
All units shall have direct-drive and hermetic 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.

Two-stage compressor is outstanding for humidity control and light load cooling conditions.

Indoor Fan
The following units shall be equipped with a direct drive plenum fan design (T/YSC120E, T/YHC092,102, 120E). 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. 3-5 ton units (standard efficiency 3-phase or high efficiency 3-phase with optional motor) are belt driven, FC centrifugal fans with adjustable motor sheaves. 3-5 ton units (1-phase or high efficiency 3-phase) have multispeed, direct drive motors. All 6-8½ 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 and 7½-8½ (high efficiency) have variable speed direct drive motors. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

Indoor Fan (Precedent 17 Plus)
All motors shall be thermally protected. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

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.

Single Zone VAV - One Zone Variable Air Volume Mode
Single zone VAV is designed for use in single zone applications like gymnasiums, auditoriums, manufacturing facilities, retail box stores, and any large open spaces, where there is a lot of diversity in the load profile. Single Zone VAV (SZ VAV) is an ideal replacement to yesterdays constant volume (CV) systems, by reducing operating costs while improving occupant comfort. SZ VAV systems combine Trane application, control and system integration knowledge to exactly match fan speed with cooling and heating loads, regardless of the operating condition. Trane algorithms meet/exceed ASHRAE 90.1- 2010, SZ VAV energy-saving recommendations, and those of CA Title 24. The result is an optimized balance between zone temperature control and system energy savings. Depending on your specific application, energy savings can be as much as 20+%.

Note:
Building system modeling in energy simulation software like TRACE is recommended to evaluate performance improvements for your application.

SZ VAV is fully integrated into the ReliaTel Control system and is available today. It provides thesimplest and fastest commissioning in the industry through proven factory-installed, wired, and tested system controllers. All control modules, logic and sensors are factory installed, and tested to assure the highest quality and most reliable system available. This means no special programming of algorithms, or hunting at the jobsite for sensors, boards, etc. that need to be installed in the field. Single zone VAV is a quick and simple solution for many applications and is available from your most trusted rooftop VAV system solution provider- Trane.

Evaporator and Condenser Coils
Internally finned, 5/16" copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. The microchannel type condenser coil is standard for the T/YSC 10 ton models and 7½ ton high efficiency models. The microchannel type condenser coil is not offered on the 7½ 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.
All-aluminum construction improves re-cyclability. 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 removable, reversible, double-sloped 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.

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 all 24V 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. 24-volt electromechanical control circuit shall include control transformer and contactor

Controls (Precedent 17 Plus)
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. 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.

High Pressure Control
All units include High Pressure Cutout as standard.

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.

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.

Gas Heating Section
The heating section shall have a progressive tubular heat exchanger design using stainless steel burners and corrosion resistant steel throughout. 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 (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, the 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) and also comply with the California requirement for low NOx emissions (Gas/Electric Only).

Plenum Fan
The following unit shall be equipped with a direct drive plenum fan design (all 10 tons and 7.5-8.5 ton high efficiency units). 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.

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.

Through the Base Electrical Access
An electrical service entrance shall be provided allowing electrical access for both control and main power connections inside the curb and through the base of the unit. Option will allow for field installation of liquid-tight conduit and an external field-installed disconnect switch.

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.

VAV Operation
The VFD shall receive a 0-10 Vdc signal from the unit controls based upon supply static pressure and shall cause the

drive to accelerate or decelerate as required to maintain the supply static pressure setpoint. When subjected to high ambient return conditions the VFD shall reduce its output frequency to maintain operation.

Accessory - Powered Exhaust
The powered exhaust shall provide exhaust of return air, when using an economizer, to maintain better building pressurization.

Accessory - Roof Curb
The roof curb shall be designed to mate with the unit's downflow supply and return and provide support and a water tight installation when installed properly. The roof curb design shall allow field fabricated rectangular supply/return ductwork to be connected directly to the curb. Curb design shall comply with NRCA requirements. Curb shall be shipped knocked down for field assembly and shall include wood nailer strips.

Trane Single Zone Variable Air Volume Control Sequence of Operation (Precedent 17 Plus)
General Standby Mode
During normal occupied periods, when there is no space cooling or heating demands, the user will be able to choose Continuous or Cycling supply fan operation. During this period, if the supply fan is operating due to a Continuous Fan Mode selection or due to a ventilation request, the supply fan will operate at 50% of the user selected, application specific, maximum airflow. The unit controls will be compatible with BACnet and LonTalk Building Automation System communication interfaces.
Cooling Operation
Default Operation:
During Cooling operation, the control will monitor the Space Temperature and Space Cooling setpoint and with a PI control
algorithm determine if active cooling capacity is required. As the Space Temperature deviates from the Space Cooling Setpoint,
the unit controller will calculate an active Discharge Air Cooling setpoint that the economizer (if installed) and compressor outputs
will be controlled to meet. This active Discharge Air Cooling setpoint will be calculated between the Space Cooling setpoint and a
user adjustable minimum (65F Default for Single Zone Variable Air Volume Control). Once the control determines that a discharge
air temperature equal to the user selected minimum (65F Default) is required to meet the space cooling demand, if the space
demand continues to increase, the supply fan speed will be allowed to increase above its minimum speed proportionally to meet
the additional demand.

Alternate Economizer Operation:
Under the Default Operation, as described above, the supply fan speed will remain at minimum speed, as determined by the active
cooling stages, until the space demand requires an increase in supply airflow. The customer will have the ability to choose to allow
the supply fan speed to increase when the economizer is enthalpy enabled in order to realize the maximum cooling capacity of the
economizer, prior to energizing compressor outputs, when the space requires active cooling capacity. All cooling capacity demand
decisions will function as described in the ¿Default Operation¿ section above with the exception of the supply fan speed when the
unit has an active cooling demand and the economizer is enthalpy enabled.
Heating Operation
During Heating operation, the control will monitor the Space Temperature and Space Heating setpoint and with a PI control algorithm determine if active heating capacity is required. As the Space Temperature deviates from the Space Heating Setpoint, the unit controller will increase the supply airflow up to the user selected, application specific, maximum airflow and begin to stage heating outputs (gas or electric) to meet the space demand.
The customer will also have the ability to enable Supply Air Tempering control which will allow the unit to bring on one stage of heating when the discharge air temperature falls below the Space Heating Setpoint - 10°F and the unit is operating in a minimum ventilation state with the supply fan running (not actively heating or cooling). The supply fan output will increase to the user selected, application specific, maximum airflow during Supply Air Tempering operation.

Electrical / General Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 2 Tag(s): 7.5 True VAV, 7.5 True VAV

ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)

Model:	YHC092F	Oversized Motor
Unit Operating Voltage:	414-506	MCA:
Unit Primary Voltage:	460	MFS:
Unit Secondary Voltage	--	MCB:
Unit Hertz:	60	
Unit Phase:	3	
EER	12.6	

Standard Motor		Field Installed Oversized Motor	
MCA:	19.9	MCA:	N/A
MFS:	25.0	MFS:	N/A
MCB:	25.0	MCB:	N/A

HEATING PERFORMANCE

HEATING - GENERAL DATA

Heating Model:	Medium
Heating Input (BTU):	150,000/105,000
Heating Output (BTU):	120,000/84,000
No. Burners:	3
No. Stages	2

Gas Inlet Pressure

Natural Gas (Min/Max):	4.5/14
LP (Min/Max)	11.0/14.0
Gas Pipe Connection Size:	3/4"

INDOOR MOTOR

Standard Motor		Oversized Motor		Field Installed Oversized Motor	
Number:	1	Number:		Number:	N/A
Horsepower:	3.6	Horsepower:		Horsepower:	N/A
Motor Speed (RPM):	--	Motor Speed (RPM):		Motor Speed (RPM):	N/A
Phase	3	Phase		Phase	N/A
Full Load Amps:	4.3	Full Load Amps:		Full Load Amps:	N/A
Locked Rotor Amps:	--	Locked Rotor Amps:		Locked Rotor Amps:	N/A

COMPRESSOR Circuit 1/2

Number:	2
Horsepower:	4.1/2.4
Phase:	3
Rated Load Amps:	7.1/4.7
Locked Rotor Amps:	52.0/38.0

OUTDOOR MOTOR

Number:	1
Horsepower:	0.75
Motor Speed (RPM):	1100
Phase:	1
Full Load Amps:	2.0
Locked Rotor Amps:	6.2

POWER EXHAUST ACCESSORY (3)

(Field Installed Power Exhaust)

Phase:	1
Horsepower:	0.87
Motor Speed (RPM):	1075
Full Load Amps:	3.3
Locked Rotor Amps:	6.8

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.

Performance Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 2 Tag(s): 7.5 True VAV, 7.5 True VAV

Job Information

Portland Public Library MHS - 1000 Riverside
Portland ME
(B16)Daniel Broderick

Tag	7.5 True VAV, Y4C-1-1		
Quantity	2	Model number	YHC092

Unit Information

Tonnage	7.5 Ton Dual compressor	Unit function	DX cooling, gas heat
Min. unit operating weight	1026.0 lb	Max. unit operating weight	586 kg
Design Airflow	3000 cfm		

Cooling Information

Gross Total Capacity	92.00 MBh	Gross Sensible Capacity	68.63 MBh
Gross Latent Capacity	23.37 MBh	Net Total Capacity	88.23 MBh
Net Sensible Capacity	64.85 MBh	Net Sensible Heat Ratio	0.74 Number
Cooling Entering DB	80.00 F	Cooling Entering WB	67.00 F
Cooling Leaving Unit DB	60.30 F	Cooling Leaving Unit WB	57.67 F
Ambient Temp	95.00 F		

Heating Information

Heating capacity	Medium gas heat 3ph	Input Heating Capacity	150.00 MBh
Output Heating Capacity	120.00 MBh	Heating EAT	60.00 F
Heating LAT	97.30 F	Heating Delta T	37.30 F

Motor/Electrical Information

Voltage	460/60/3	Design ESP	1.000 in H2O
Indoor Motor Power	1.02 kW	Indoor mtr operating power	1.37 bhp
Indoor RPM	1243 rpm	Outdoor Motor Power	0.71 kW
Compressor Power	6.06 kW	System Power	7.79 kW
MCA	19.90 A	MOP	25.00 A
Compressor 1 RLA	7.10 A	Evaporator fan FLA	4.30 A
Condenser fan FLA	2.00 A		

Electrical values provided are estimated only and are subject to change without notice and may differ from nameplate values.

Field installed low or high static drive kits may be needed. Please check the fan performance tables in the product catalog for application ranges.

1/21/2014 Product Version 2002.09.04.1

Performance Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 2 Tag(s): 7.5 True VAV, 7.5 True VAV

Job Information

TRANE

Portland Public Library MHS - 1000 Riverside
Portland ME
(B16)Daniel Broderick

Tag	7.5 True VAV, Y4C-1-1		
Quantity	2	Model number	YHC092

Information for LEED Projects

ASHRAE 90.1	Yes	IEER	14.50
Refrig charge (HFC-410A) - ckt 1	5.5 lb	Compressor Power	6.06 kW
Refrig charge (HFC-410A) - ckt 2	4.2 lb	Outdoor Motor Power	0.71 kW
Rated capacity (AHRI)	89.00 MBh	Indoor mtr operating power	1.37 bhp
EER @ AHRI Conditions	12.6 EER	Exhaust fan power	0.65 kW

Note: This product meets the minimum equipment efficiency requirements of ASHRAE Standard 90.1-2007 and -2010 (which are based on AHRI standard rating conditions) and, therefore, also meets the LEED "Minimum Energy Performance" prerequisite in the Energy and Atmosphere section. The power data listed above is at actual user-entered conditions. Refer to the product catalog for performance at AHRI standard rating conditions.

The LEED Green Building Rating System™, developed by the U.S. Green Building Council, provides independent, third-party verification that a building project meets green building and performance measures.

Electrical values provided are estimated only and are subject to change without notice and may differ from nameplate values.

Field installed low or high static drive kits may be needed. Please check the fan performance tables in the product catalog for application ranges.

1/21/2014 Product Version 2002.09.04.1

Electrical / General Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A2 Qty: 1 Tag(s): 7.5 SZ VAV

ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)

		Oversized Motor	
Model:	YHC092F	MCA:	N/A
Unit Operating Voltage:	414-506	MFS:	N/A
Unit Primary Voltage:	460	MCB:	N/A
Unit Secondary Voltage	--		
Unit Hertz:	60		
Unit Phase:	3		
EER	12.6		

Standard Motor		Field Installed Oversized Motor	
MCA:	19.9	MCA:	N/A
MFS:	25.0	MFS:	N/A
MCB:	25.0	MCB:	N/A

HEATING PERFORMANCE

HEATING - GENERAL DATA

Heating Model:	Medium
Heating Input (BTU):	150,000/105,000
Heating Output (BTU):	120,000/84,000
No. Burners:	3
No. Stages	2

Gas Inlet Pressure	
Natural Gas (Min/Max):	4.5/14
LP (Min/Max)	11.0/14.0
Gas Pipe Connection Size:	3/4"

INDOOR MOTOR

Standard Motor		Oversized Motor		Field Installed Oversized Motor	
Number:	1	Number:	N/A	Number:	N/A
Horsepower:	3.6	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:	4.3	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:	7.1/4.7
Locked Rotor Amps:	52.0/38.0

OUTDOOR MOTOR

Number:	1
Horsepower:	0.75
Motor Speed (RPM):	1100
Phase:	1
Full Load Amps:	2.0
Locked Rotor Amps:	6.2

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.

Performance Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A2 Qty: 1 Tag(s): 7.5 SZ VAV

Job Information

TRANE

Portland Public Library MHS - 1000 Riverside
Portland ME
(B16)Daniel Broderick

Tag	7.5 SZ VAV		
Quantity	1	Model number	YHC092

Unit Information

Tonnage	7.5 Ton Dual compressor	Unit function	DX cooling, gas heat
Min. unit operating weight	1026.0 lb	Max. unit operating weight	586 kg
Design Airflow	3000 cfm		

Cooling Information

Gross Total Capacity	92.00 MBh	Gross Sensible Capacity	68.63 MBh
Gross Latent Capacity	23.37 MBh	Net Total Capacity	89.75 MBh
Net Sensible Capacity	66.38 MBh	Net Sensible Heat Ratio	0.74 Number
Cooling Entering DB	80.00 F	Cooling Entering WB	67.00 F
Cooling Leaving Unit DB	59.83 F	Cooling Leaving Unit WB	57.49 F
Ambient Temp	95.00 F		

Heating Information

Heating capacity	Medium gas heat 3ph	Input Heating Capacity	150.00 MBh
Output Heating Capacity	120.00 MBh	Heating EAT	60.00 F
Heating LAT	97.30 F	Heating Delta T	37.30 F

Motor/Electrical Information

Voltage	460/60/3	Design ESP	0.500 in H2O
Indoor Motor Power	0.62 kW	Indoor mtr operating power	0.84 bhp
Indoor RPM	1079 rpm	Outdoor Motor Power	0.71 kW
Compressor Power	6.06 kW	System Power	7.40 kW
MCA	19.90 A	MOP	25.00 A
Compressor 1 RLA	7.10 A	Evaporator fan FLA	4.30 A
Condenser fan FLA	2.00 A		

Electrical values provided are estimated only and are subject to change without notice and may differ from nameplate values.

Field installed low or high static drive kits may be needed. Please check the fan performance tables in the product catalog for application ranges.

1/21/2014 Product Version 2002.09.04.1

Performance Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A2 Qty: 1 Tag(s): 7.5 SZ VAV

Job Information

TRANE

Portland Public Library MHS - 1000 Riverside
Portland ME
(B16)Daniel Broderick

Tag	7.5 SZ VAV		
Quantity	1	Model number	YHC092

Information for LEED Projects

ASHRAE 90.1	Yes	IEER	15.00
Refrig charge (HFC-410A) - ckt 1	5.5 lb	Compressor Power	6.06 kW
Refrig charge (HFC-410A) - ckt 2	4.2 lb	Outdoor Motor Power	0.71 kW
Rated capacity (AHRI)	89.00 MBh	Indoor mtr operating power	0.84 bhp
EER @ AHRI Conditions	12.6 EER	Exhaust fan power	0.65 kW

Note: This product meets the minimum equipment efficiency requirements of ASHRAE Standard 90.1-2007 and -2010 (which are based on AHRI standard rating conditions) and, therefore, also meets the LEED "Minimum Energy Performance" prerequisite in the Energy and Atmosphere section. The power data listed above is at actual user-entered conditions. Refer to the product catalog for performance at AHRI standard rating conditions.

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Electrical values provided are estimated only and are subject to change without notice and may differ from nameplate values.

Field installed low or high static drive kits may be needed. Please check the fan performance tables in the product catalog for application ranges.

1/21/2014 Product Version 2002.09.04.1

Electrical / General Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV

ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)

		Oversized Motor	
Model:	YHC120E	MCA:	N/A
Unit Operating Voltage:	414-506	MFS:	N/A
Unit Primary Voltage:	460	MCB:	N/A
Unit Secondary Voltage	--		
Unit Hertz:	60		
Unit Phase:	3		
EER	12.5		
Standard Motor		Field Installed Oversized Motor	
MCA:	24.9	MCA:	N/A
MFS:	30.0	MFS:	N/A
MCB:	30.0	MCB:	N/A

HEATING PERFORMANCE

HEATING - GENERAL DATA

Heating Model:	Medium
Heating Input (BTU):	200,000/140,000
Heating Output (BTU):	160,000/112,000
No. Burners:	4
No. Stages	2
Gas Inlet Pressure	
Natural Gas (Min/Max):	4.5/14
LP (Min/Max)	10.0/14.0
Gas Pipe Connection Size:	3/4"

INDOOR MOTOR

Standard Motor		Oversized Motor		Field Installed Oversized Motor	
Number:	1	Number:	N/A	Number:	N/A
Horsepower:	3.6	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:	4.3	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:	5.1/3.0
Phase:	3
Rated Load Amps:	8.2/6.0
Locked Rotor Amps:	66.0/44.0

OUTDOOR MOTOR

Number:	1
Horsepower:	0.75
Motor Speed (RPM):	1100
Phase:	3
Full Load Amps:	1.5
Locked Rotor Amps:	4.8

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	3 / 2
Recommended	20"x25"x2"
	20"x30"x2"

REFRIGERANT (2)

Type	R-410
Factory Charge	
Circuit #1	12.8 lb
Circuit #2	11.8 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.

Performance Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV

Job Information

Portland Public Library MHS - 1000 Riverside
Portland ME
(B16)Daniel Broderick

Tag	10 Ton SZ VAV		
Quantity	1	Model number	YHC120

Unit Information

Tonnage	10 Ton	Unit function	DX cooling, gas heat
Min. unit operating weight	1369.0 lb	Max. unit operating weight	756 kg
Design Airflow	4000 cfm		

Cooling Information

Gross Total Capacity	117.47 MBh	Gross Sensible Capacity	92.29 MBh
Gross Latent Capacity	25.18 MBh	Net Total Capacity	112.93 MBh
Net Sensible Capacity	87.75 MBh	Net Sensible Heat Ratio	0.78 Number
Cooling Entering DB	80.00 F	Cooling Entering WB	67.00 F
Cooling Leaving Unit DB	60.01 F	Cooling Leaving Unit WB	58.08 F
Ambient Temp	95.00 F		

Heating Information

Heating capacity	Medium gas heat 3ph	Input Heating Capacity	200.00 MBh
Output Heating Capacity	160.00 MBh	Heating EAT	60.00 F
Heating LAT	97.30 F	Heating Delta T	37.30 F

Motor/Electrical Information

Voltage	460/60/3	Design ESP	0.500 in H2O
Indoor Motor Power	1.22 kW	Indoor mtr operating power	1.64 bhp
Indoor RPM	1365 rpm	Outdoor Motor Power	0.60 kW
Compressor Power	7.61 kW	System Power	9.43 kW
MCA	22.10 A	MOP	30.00 A
Compressor 1 RLA	8.20 A	Evaporator fan FLA	4.30 A
Condenser fan FLA	1.50 A		

Electrical values provided are estimated only and are subject to change without notice and may differ from nameplate values.

Field installed low or high static drive kits may be needed. Please check the fan performance tables in the product catalog for application ranges.

1/21/2014 Product Version 2002.09.04.1

Performance Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV

Job Information

Portland Public Library MHS - 1000 Riverside
Portland ME
(B16)Daniel Broderick

Tag	10 Ton SZ VAV		
Quantity	1	Model number	YHC120

Information for LEED Projects

ASHRAE 90.1	Yes	IEER	14.50
Refrig charge (HFC-410A) - ckt 1	12.8 lb	Compressor Power	7.61 kW
Refrig charge (HFC-410A) - ckt 2	12.8 lb	Outdoor Motor Power	0.60 kW
Rated capacity (AHRI)	113.00 MBh	Indoor mtr operating power	1.64 bhp
EER @ AHRI Conditions	12.5 EER	Exhaust fan power	0.65 kW

Note: This product meets the minimum equipment efficiency requirements of ASHRAE Standard 90.1-2007 and -2010 (which are based on AHRI standard rating conditions) and, therefore, also meets the LEED "Minimum Energy Performance" prerequisite in the Energy and Atmosphere section. The power data listed above is at actual user-entered conditions. Refer to the product catalog for performance at AHRI standard rating conditions.

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Field installed low or high static drive kits may be needed. Please check the fan performance tables in the product catalog for application ranges.

1/21/2014 Product Version 2002.09.04.1

Electrical / General Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A4 Qty: 1 Tag(s): 4 Ton SZ VAV

ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)

		Oversized Motor	
Model:	YHC047E	MCA:	N/A
Unit Operating Voltage:	414-506	MFS:	N/A
Unit Primary Voltage:	460	MCB:	N/A
Unit Secondary Voltage	--		
Unit Hertz:	60		
Unit Phase:	3		
SEER	17.5		

Standard Motor		Field Installed Oversized Motor	
MCA:	13.7	MCA:	N/A
MFS:	20.0	MFS:	N/A
MCB:	20.0	MCB:	N/A

HEATING PERFORMANCE

HEATING - GENERAL DATA

Heating Model:	"
Heating Input (BTU):	
Heating Output (BTU):	
No. Burners:	
No. Stages	

Gas Inlet Pressure

Natural Gas (Min/Max):	4.5/14.0
LP (Min/Max)	11.0/14.0
Gas Pipe Connection Size:	1/2"

INDOOR MOTOR

Standard Motor		Oversized Motor		Field Installed Oversized Motor	
Number:	1	Number:	N/A	Number:	N/A
Horsepower:	1.0	Horsepower:	N/A	Horsepower:	N/A
Motor Speed (RPM):	--	Motor Speed (RPM):	N/A	Motor Speed (RPM):	N/A
Phase	1	Phase	N/A	Phase	N/A
Full Load Amps:	9.4	Full Load Amps:	N/A	Full Load Amps:	N/A
Locked Rotor Amps:	N/A	Locked Rotor Amps:	N/A	Locked Rotor Amps:	N/A

COMPRESSOR Circuit 1/2

Number:	1
Horsepower:	3.6
Phase:	3
Rated Load Amps:	6.4
Locked Rotor Amps:	41.0

OUTDOOR MOTOR

Number:	1
Horsepower:	0.40
Motor Speed (RPM):	1075
Phase:	1
Full Load Amps:	1.0
Locked Rotor Amps:	2.2

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

Factory Charge

Circuit #1	10.8
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.

Performance Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A4 Qty: 1 Tag(s): 4 Ton SZ VAV

Job Information

Portland Public Library MHS - 1000 Riverside
Portland ME
(B16)Daniel Broderick

Tag	4 Ton SZ VAV		
Quantity	1	Model number	YHC047

Unit Information

Tonnage	4 Ton 17 SEER	Unit function	DX cooling, gas heat
Min. unit operating weight	725.0 lb	Max. unit operating weight	443 kg
Design Airflow	1600 cfm		

Cooling Information

Gross Total Capacity	50.50 MBh	Gross Sensible Capacity	37.22 MBh
Gross Latent Capacity	13.28 MBh	Net Total Capacity	49.18 MBh
Net Sensible Capacity	35.90 MBh	Net Sensible Heat Ratio	0.73 Number
Cooling Entering DB	80.00 F	Cooling Entering WB	67.00 F
Cooling Leaving Unit DB	59.56 F	Cooling Leaving Unit WB	57.21 F
Ambient Temp	95.00 F		

Heating Information

Heating capacity	Medium gas heat 3ph	Input Heating Capacity	80.00 MBh
Output Heating Capacity	64.00 MBh	Heating EAT	60.00 F
Heating LAT	97.30 F	Heating Delta T	37.30 F

Motor/Electrical Information

Voltage	460/60/3	Design ESP	0.500 in H2O
Indoor Motor Power	0.32 kW	Indoor mtr operating power	0.43 bhp
Indoor RPM	758 rpm	Outdoor Motor Power	0.34 kW
Compressor Power	3.08 kW	System Power	3.74 kW
MCA	13.70 A	MOP	20.00 A
Compressor 1 RLA	6.40 A	Evaporator fan FLA	9.40 A
Condenser fan FLA	1.00 A		

Electrical values provided are estimated only and are subject to change without notice and may differ from nameplate values.

Field installed low or high static drive kits may be needed. Please check the fan performance tables in the product catalog for application ranges.

1/21/2014 Product Version 2002.09.04.1

Performance Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A4 Qty: 1 Tag(s): 4 Ton SZ VAV

Job Information

Portland Public Library MHS - 1000 Riverside
Portland ME
(B16)Daniel Broderick

Tag	4 Ton SZ VAV		
Quantity	1	Model number	YHC047

Information for LEED Projects

ASHRAE 90.1	Yes		
Refrig charge (HFC-410A) - ckt 1	10.8 lb	Compressor Power	3.08 kW
Refrig charge (HFC-410A) - ckt 2	0.0 lb	Outdoor Motor Power	0.34 kW
Rated capacity (AHRI)	49.00 MBh	Indoor mtr operating power	0.43 bhp
SEER @ AHRI	17.50 btuh/watt	Exhaust fan power	0.65 kW

Note: This product meets the minimum equipment efficiency requirements of ASHRAE Standard 90.1-2007 and -2010 (which are based on AHRI standard rating conditions) and, therefore, also meets the LEED "Minimum Energy Performance" prerequisite in the Energy and Atmosphere section. The power data listed above is at actual user-entered conditions. Refer to the product catalog for performance at AHRI standard rating conditions.

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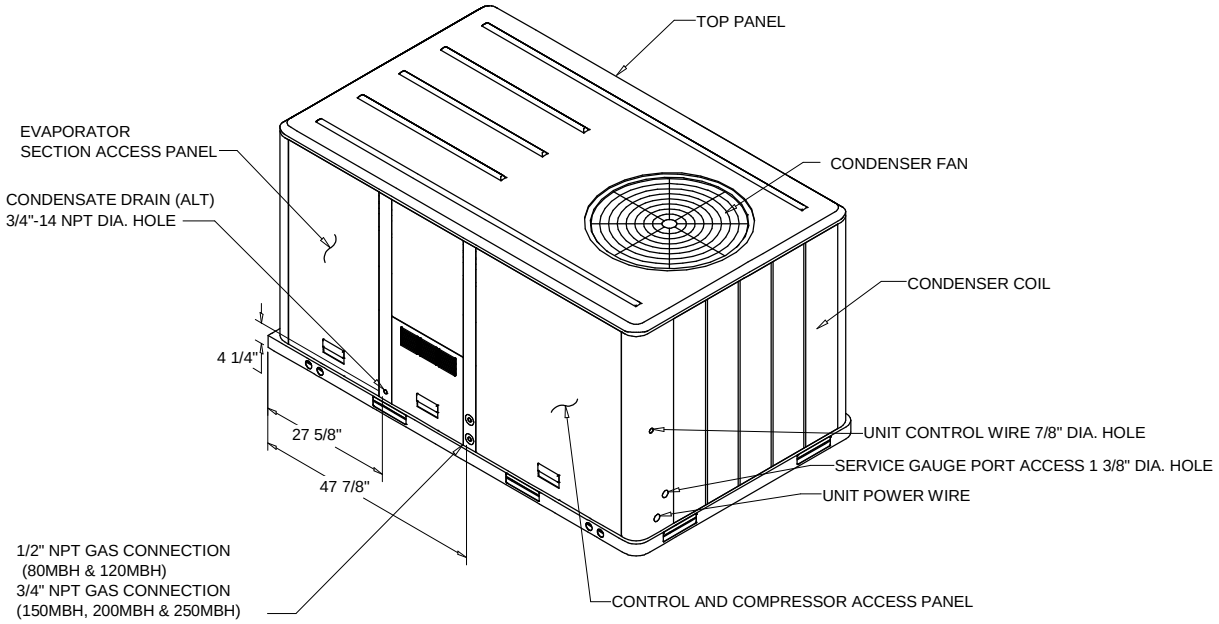
Electrical values provided are estimated only and are subject to change without notice and may differ from nameplate values.

Field installed low or high static drive kits may be needed. Please check the fan performance tables in the product catalog for application ranges.

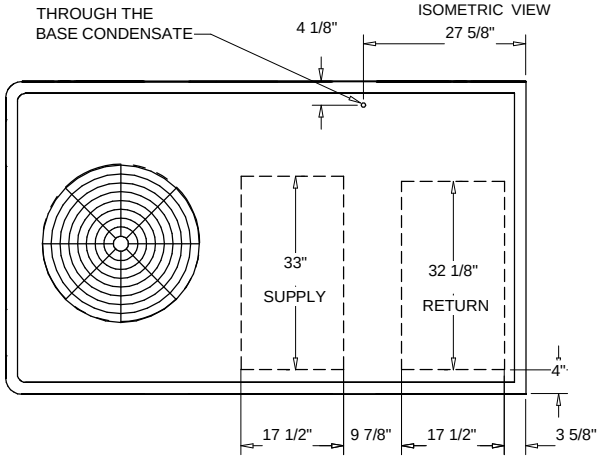
1/21/2014 Product Version 2002.09.04.1

Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1, A2 Qty: 3 Tag(s): 7.5 True VAV, 7.5 True VAV, 7.5 SZ VAV



PACKAGED GAS / ELECTRICAL

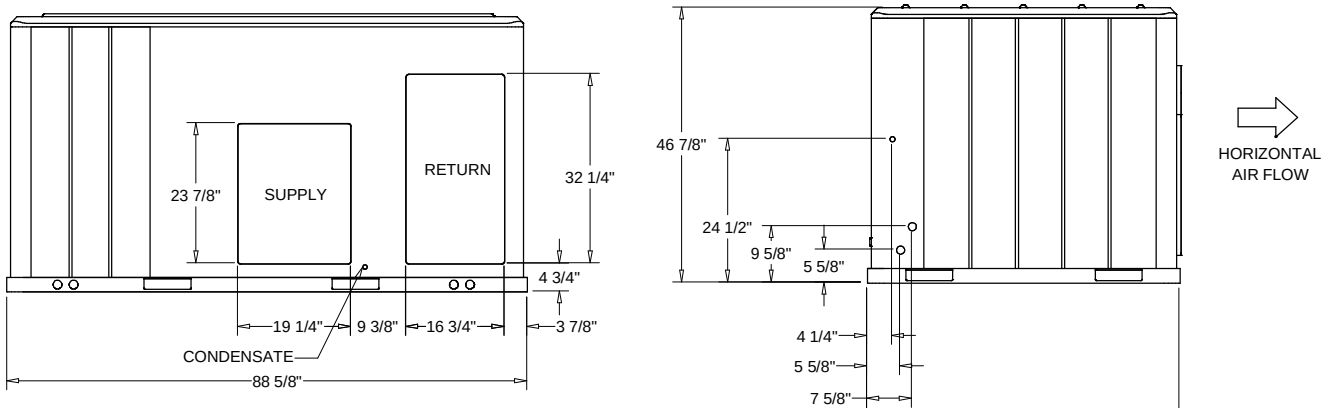
ISOMETRIC VIEW



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

PLAN VIEW UNIT

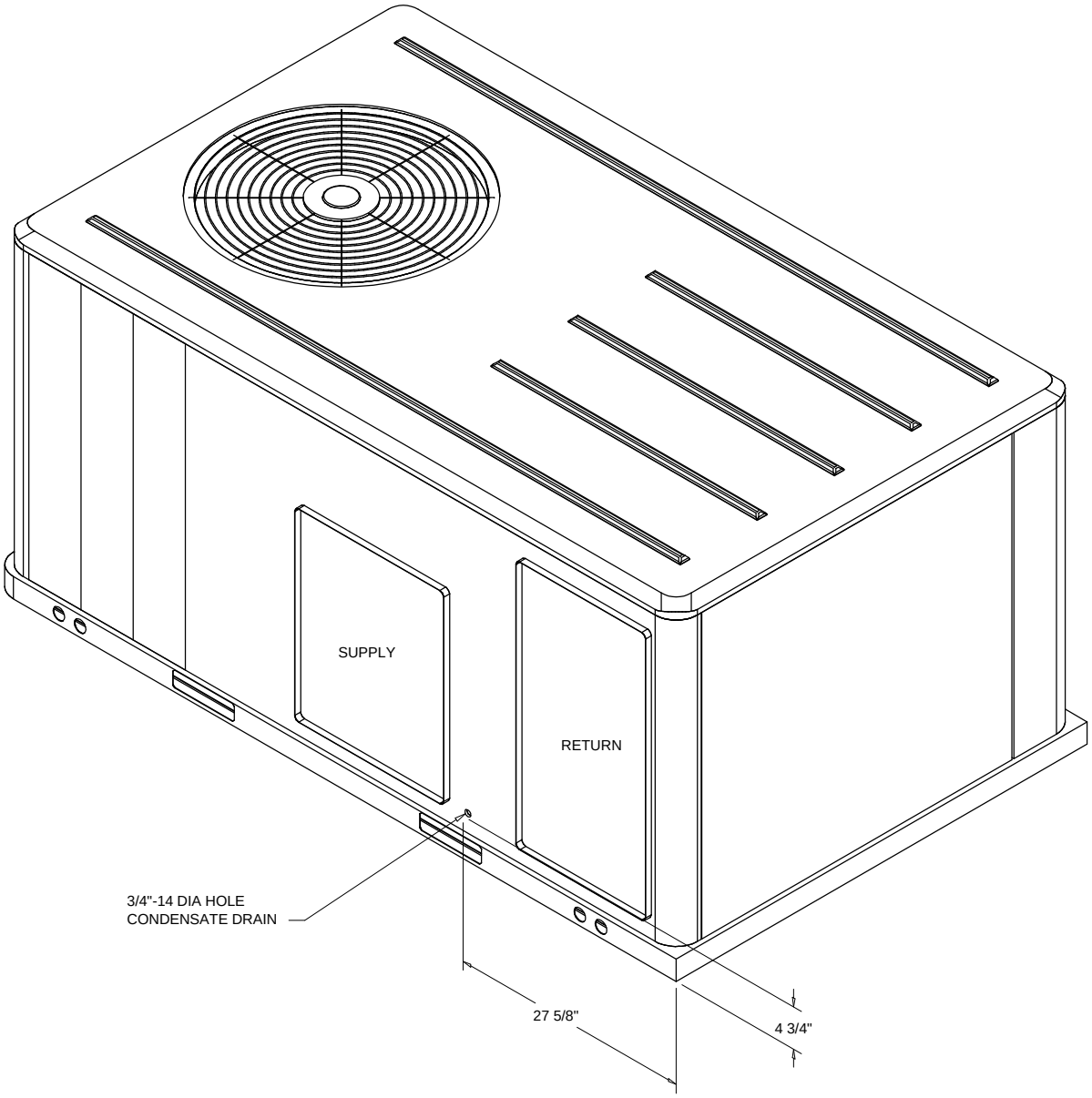
DIMENSION DRAWING



PACKAGED GAS / ELECTRICAL

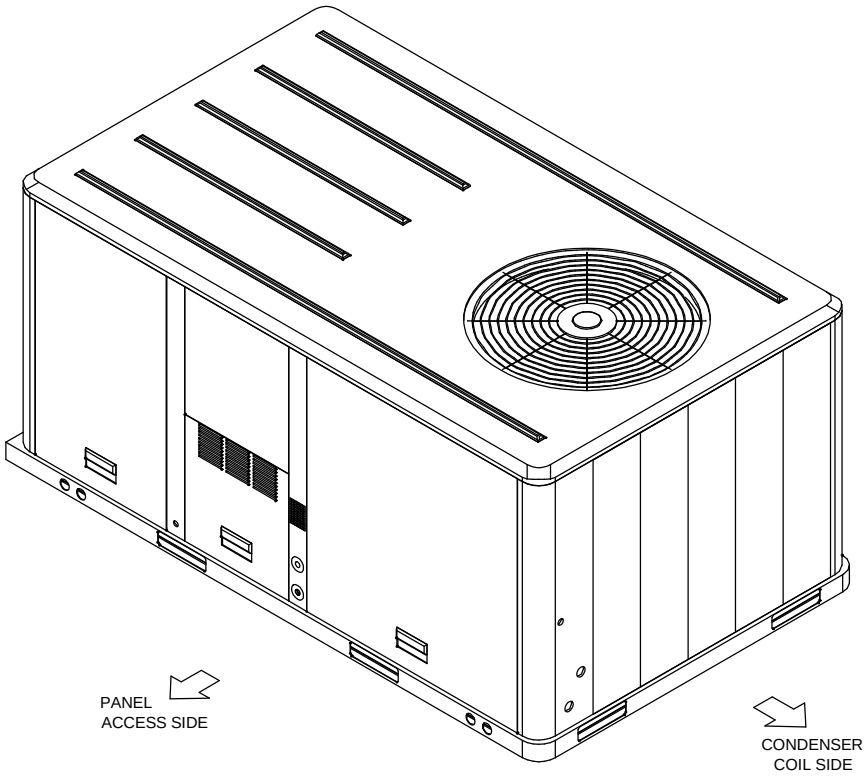
DIMENSION DRAWING

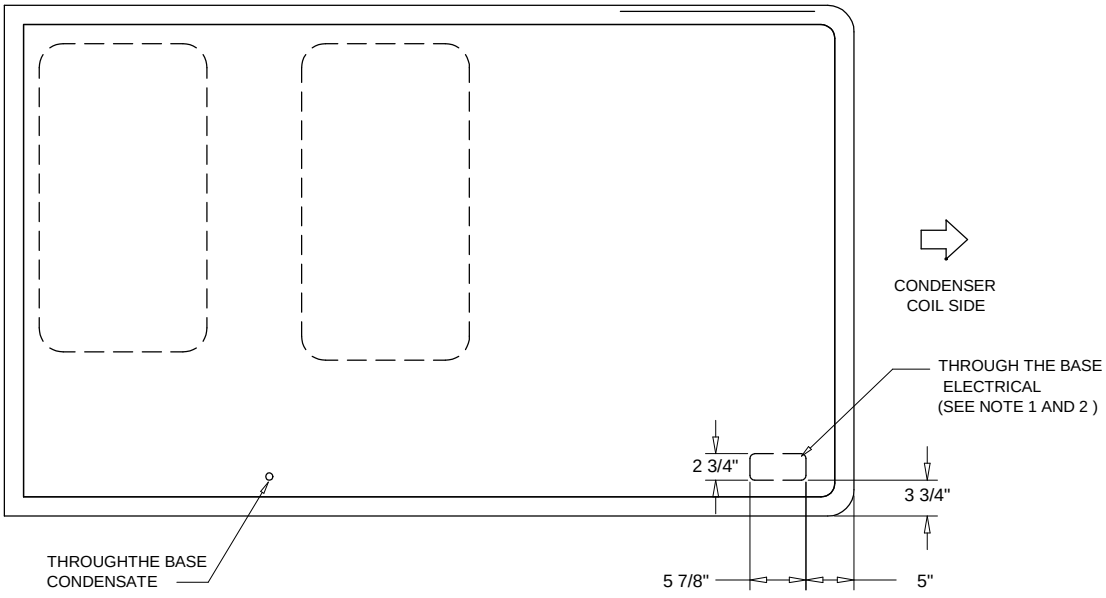
Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1, A2 Qty: 3 Tag(s): 7.5 True VAV, 7.5 True VAV, 7.5 SZ VAV



ISOMETRIC-PACKAGED COOLING

Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1, A2, A4 Qty: 4 Tag(s): 7.5 True VAV, 7.5 True VAV, 7.5 SZ VAV, 4 Ton SZ VAV



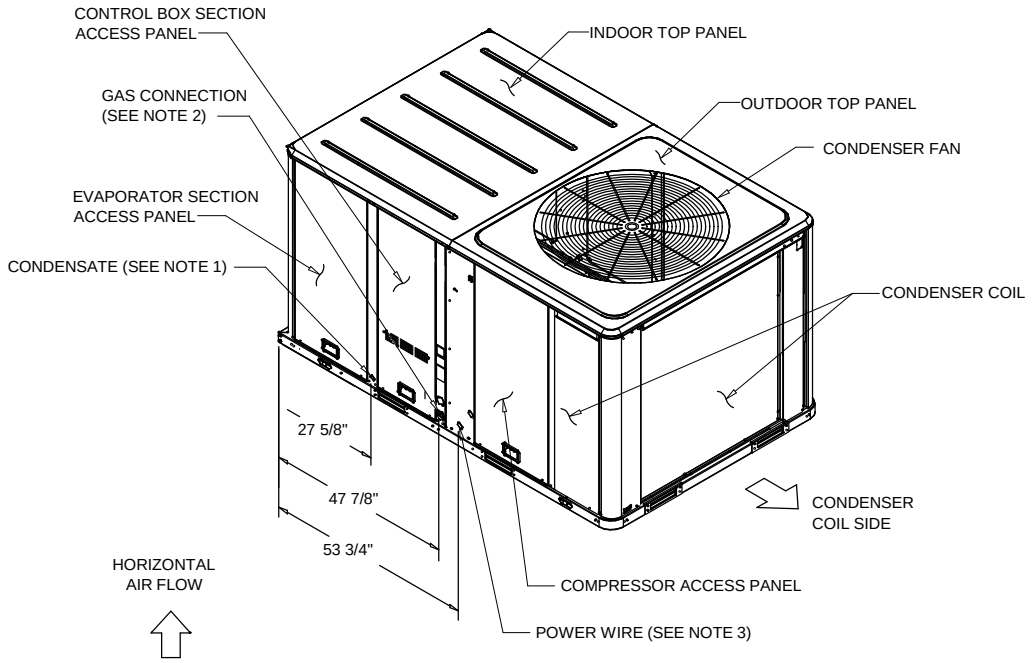


NOTES:
1. THRU -THE -BASE GAS AND ELECTRICAL IS NOT STANDARD. VERIFY OPTION IN PRODUCT DATA IN THIS DOCUMENT.
2. VERIFY WEIGHT, CONNECTION, OPTION CONFIGURATION AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION

THRU THE BASE ELECTRICAL

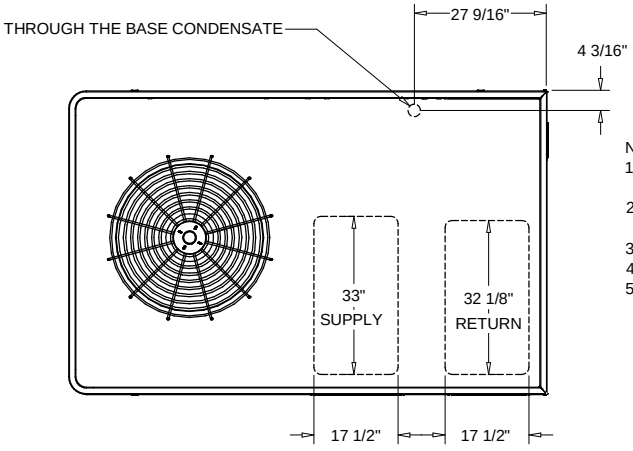
PLAN / ISO VIEW DRAWING

Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV



PACKAGED GAS / ELECTRICAL

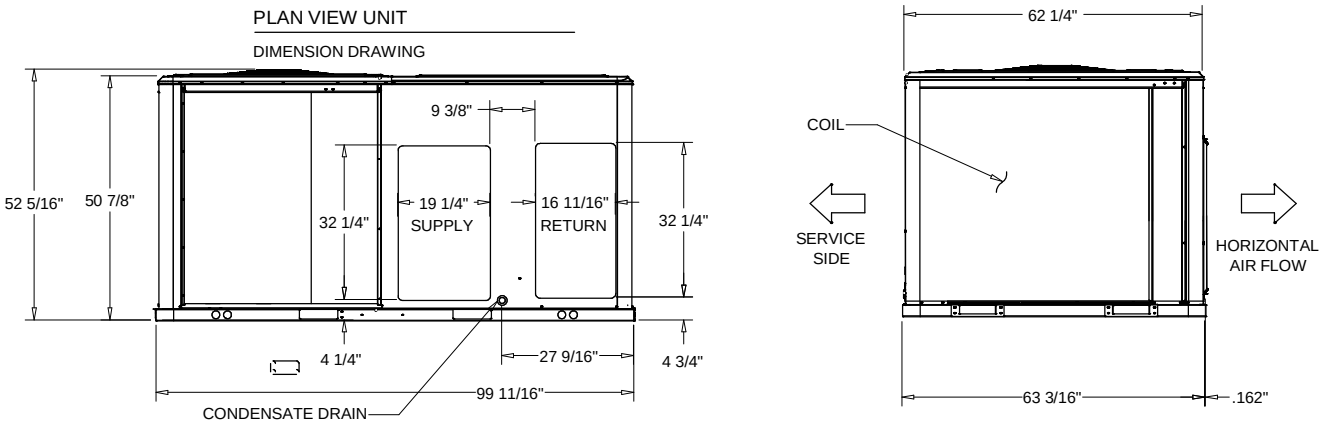
ISOMETRIC VIEW



NOTES:
1. ALTERNATE CONDENSATE DRAIN CONNECTION 3/4" - 14 NPT DIA. HOLE
2. 1/2" NPT GAS CONNECTION (80 mbh, 120 mbh) ; 3/4" NPT GAS CONNECTION (150mbh, 200mbh, 250mbh)
3. UNIT POWER WIRE 1 3/8" DIA. HOLE.
4. THRU -THE -BASE ELECTRICAL AND GAS IS NOT STANDARD ON ALL UNITS.
5. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION

PLAN VIEW UNIT

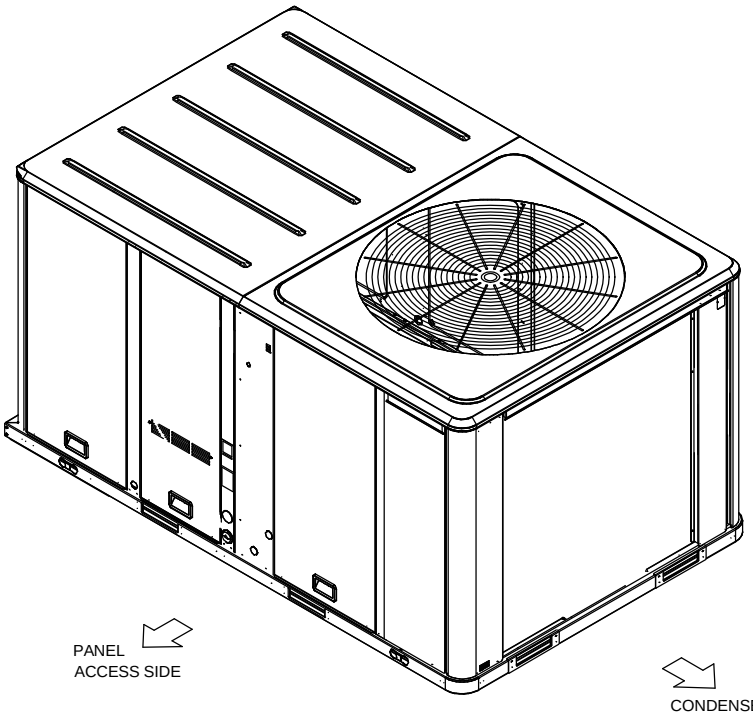
DIMENSION DRAWING

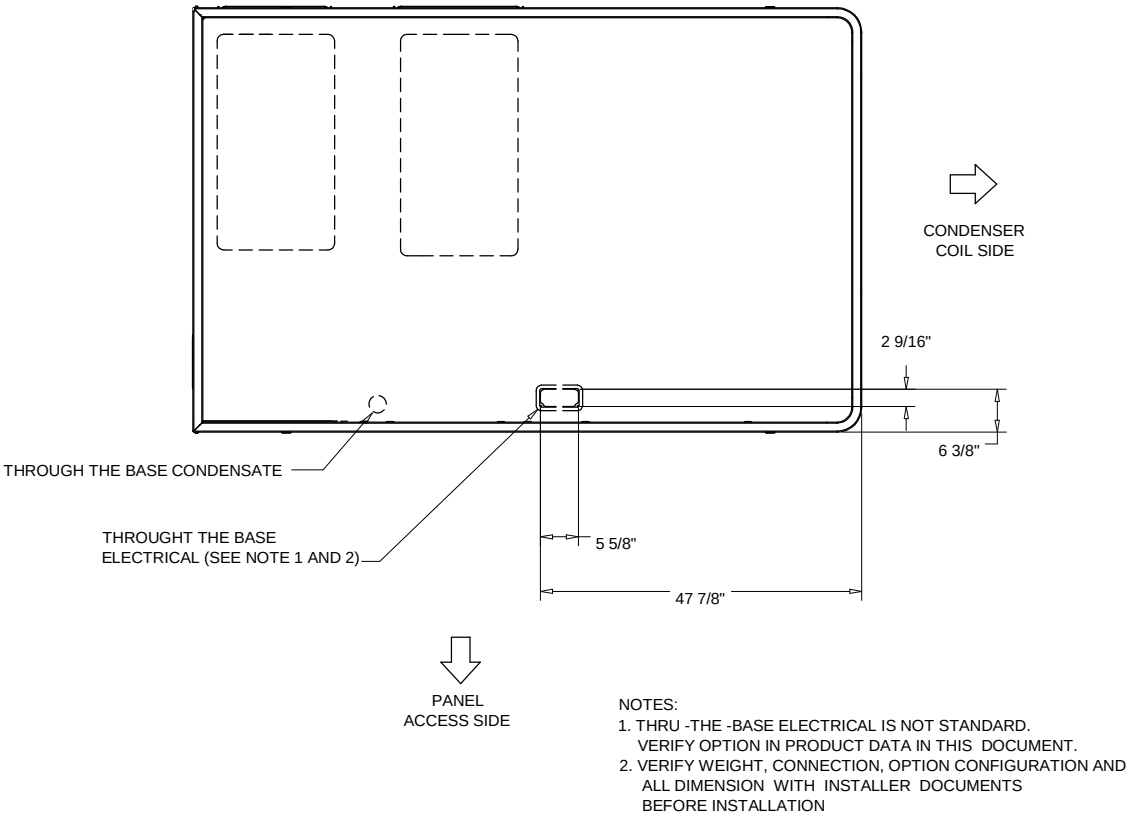


PACKAGED GAS / ELECTRICAL

DIMENSION DRAWING

Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV



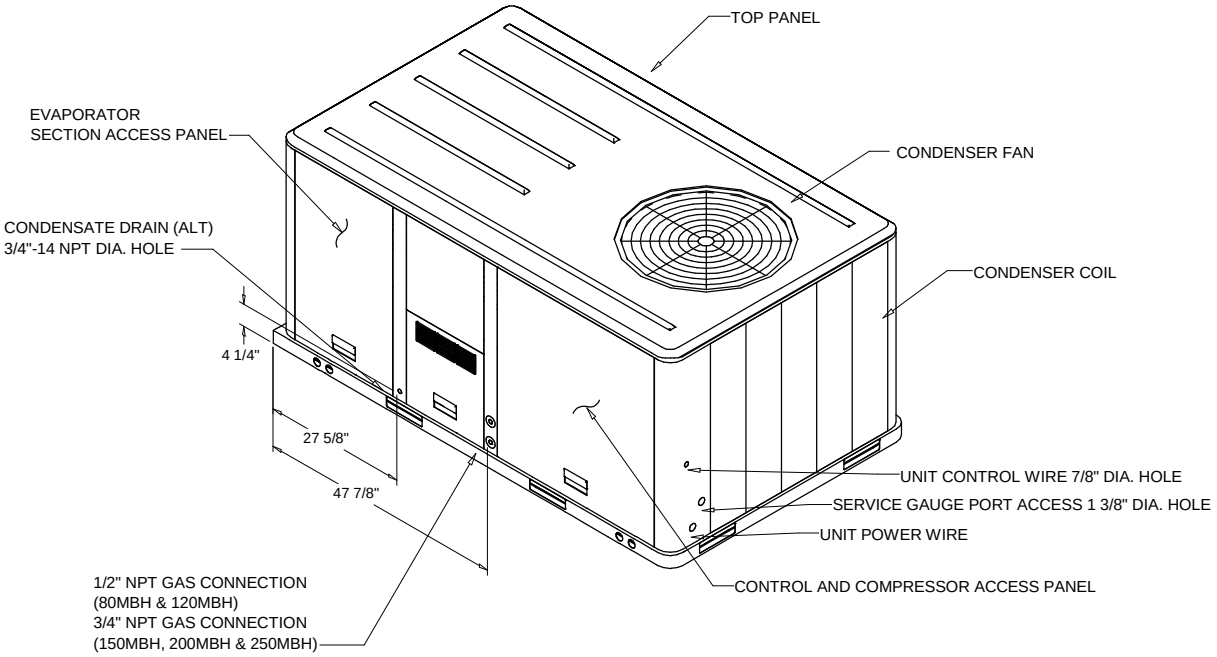


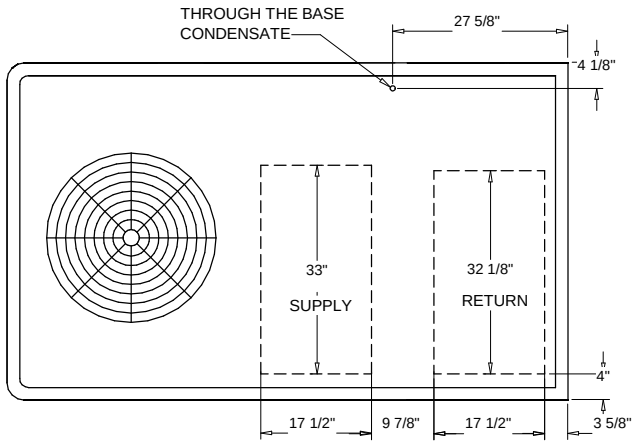
NOTES:
1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD.
   VERIFY OPTION IN PRODUCT DATA IN THIS DOCUMENT.
2. VERIFY WEIGHT, CONNECTION, OPTION CONFIGURATION AND
   ALL DIMENSION WITH INSTALLER DOCUMENTS
   BEFORE INSTALLATION

THRU THE BASE ELECTRICAL

PLAN / ISO VIEW DRAWING

Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A4 Qty: 1 Tag(s): 4 Ton SZ VAV

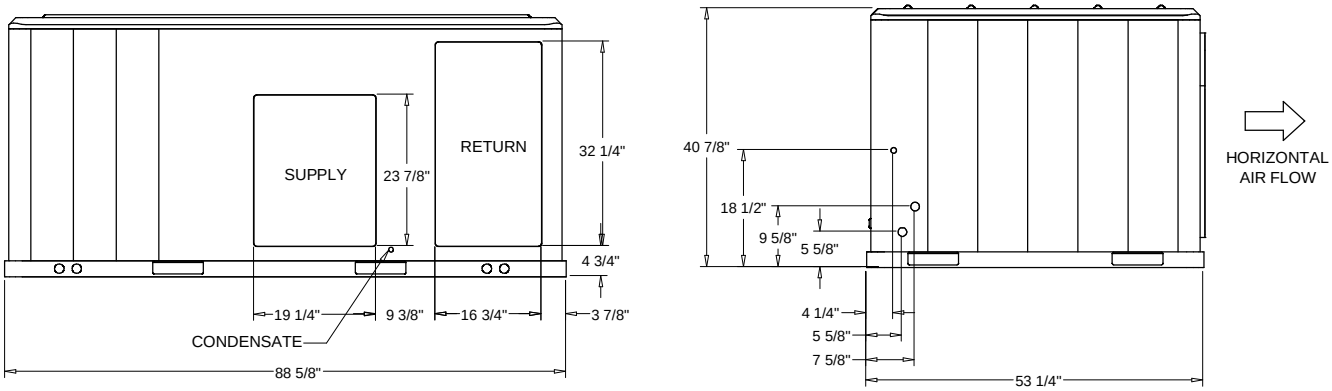




PLAN VIEW UNIT

DIMENSION DRAWING

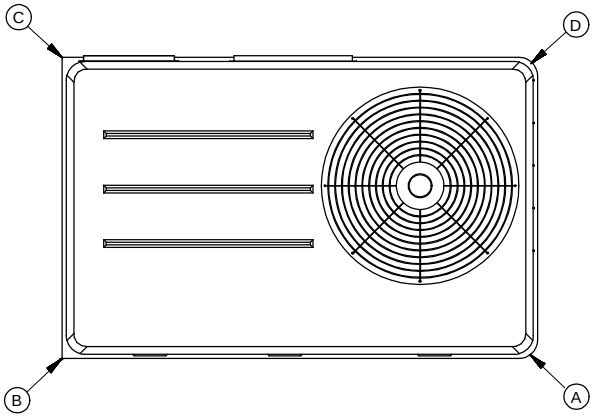
NOTES:
1. THRU -THE -BASE ELECTRICAL AND GAS IS NOT STANDARD ON ALL UNITS.
2. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION



PACKAGED GAS / ELECTRICAL

DIMENSION DRAWING

Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 2 Tag(s): 7.5 True VAV, 7.5 True VAV



PACKAGED GAS / ELECTRICAL

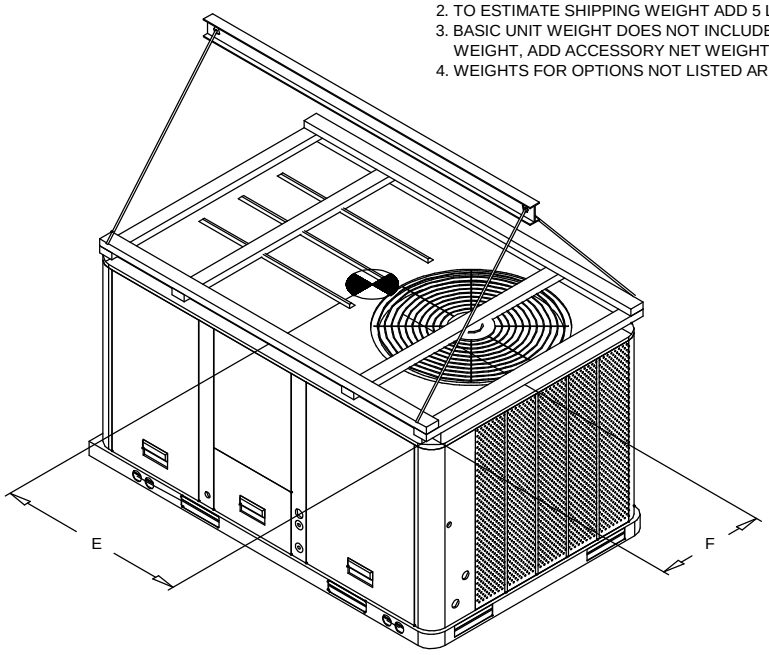
CORNER WEIGHT

INSTALLED ACCESSORIES NET WEIGHT DATA

ACCESSORY	WEIGHTS
ECONOMIZER	36.0 lb
MOTORIZED OUTSIDE AIR DAMPER	
MANUAL OUTSIDE AIR DAMPER	
BAROMETRIC RELIEF	
OVERSIZED MOTOR	
BELT DRIVE MOTOR	
POWER EXHAUST	80.0 lb
THROUGHT THE BASE ELECTRICAL/GAS (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	20.0 lb
SMOKE DETECTOR, SUPPLY / RETURN	
NOVAR CONTROL	
STAINLESS STEEL HEAT EXCHANGER	
REHEAT	
ROOF CURB	78.0 lb

BASIC UNIT WEIGHTS		CORNER WEIGHTS				CENTER OF GRAVITIY	
SHIPPING	NET	(A)	340.0 lb	(C)	249.0 lb	(E) LENGHT	(F) WIDTH
1124.0 lb	1026.0 lb	(B)	233.0 lb	(D)	204.0 lb	41"	23"

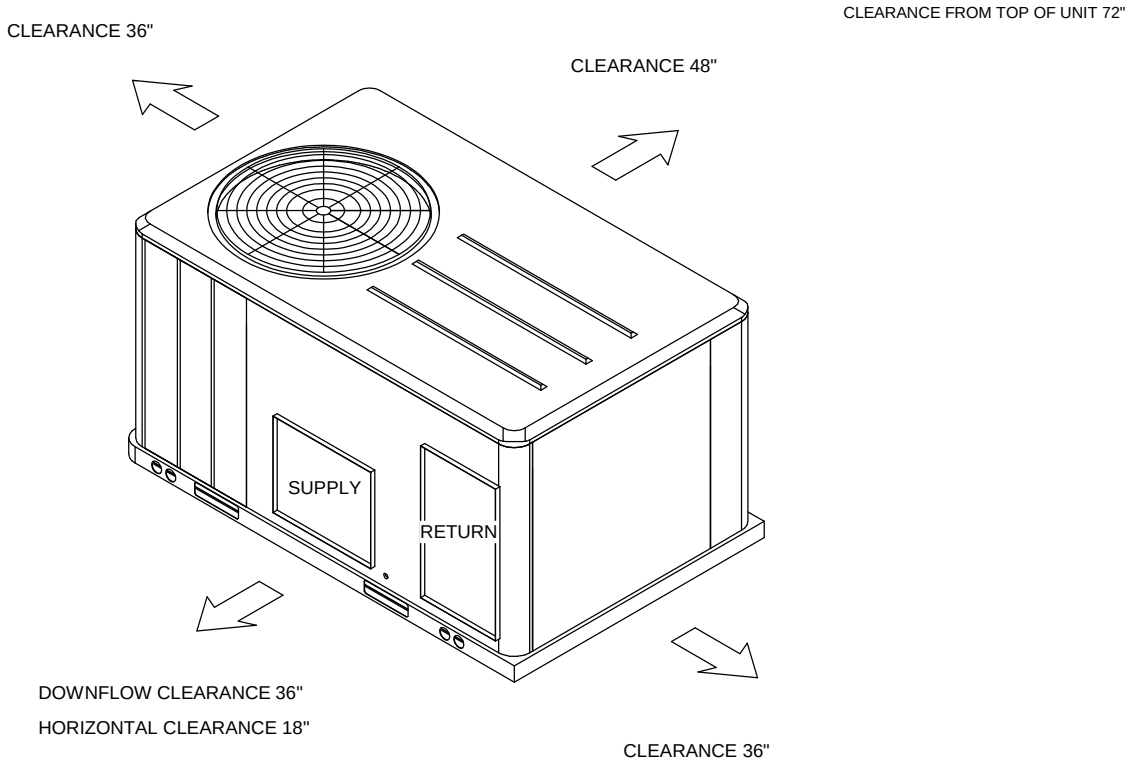
NOTE:
1. CORNER WEIGHTS ARE GIVEN FOR INFORMATION ONLY.
2. TO ESTIMATE SHIPPING WEIGHT ADD 5 LBS TO NET WEIGHT.
3. BASIC UNIT WEIGHT DOES NOT INCLUDE ACCESSORY WEIGHT. TO OBTAIN TOTAL WEIGHT, ADD ACCESSORY NET WEIGHT TO BASIC UNIT WEIGHT.
4. WEIGHTS FOR OPTIONS NOT LISTED ARE <5 LBS.



PACKAGED GAS / ELECTRICAL

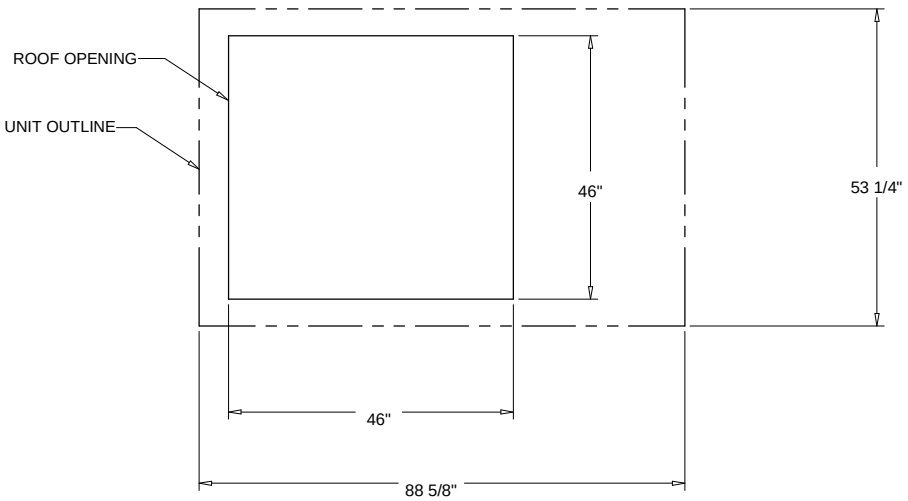
RIGGING AND CENTER OF GRAVITY

Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1, A2, A4 Qty: 4 Tag(s): 7.5 True VAV, 7.5 True VAV, 7.5 SZ VAV, 4 Ton SZ VAV



PACKAGED GAS / ELECTRIC

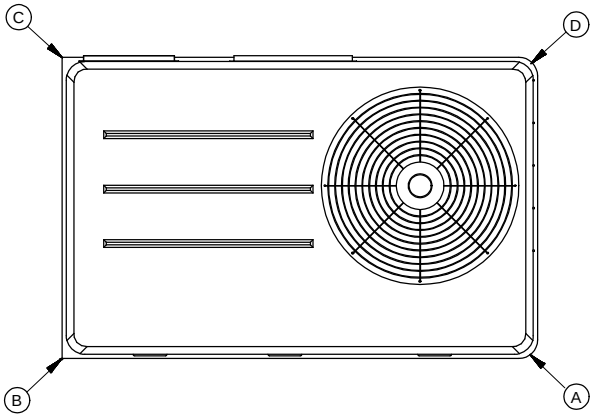
CLEARANCE



PACKAGED GAS / ELECTRIC

DOWNFLOW TYPICAL ROOF OPENING

Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A2 Qty: 1 Tag(s): 7.5 SZ VAV



PACKAGED GAS / ELECTRICAL

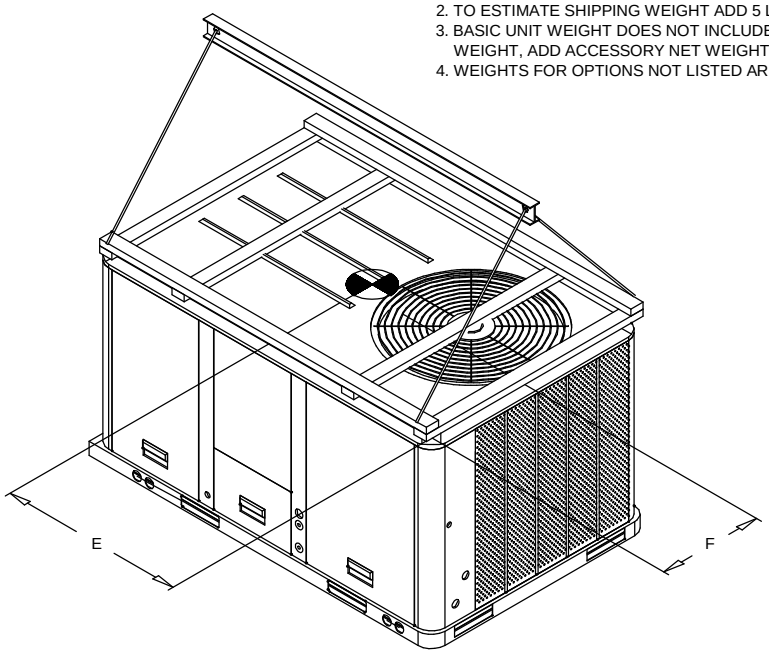
CORNER WEIGHT

INSTALLED ACCESSORIES NET WEIGHT DATA

ACCESSORY	WEIGHTS
ECONOMIZER	
MOTORIZED OUTSIDE AIR DAMPER	
MANUAL OUTSIDE AIR DAMPER	
BAROMETRIC RELIEF	
OVERSIZED MOTOR	
BELT DRIVE MOTOR	
POWER EXHAUST	
THROUGHT THE BASE ELECTRICAL/GAS (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	20.0 lb
SMOKE DETECTOR, SUPPLY / RETURN	
NOVAR CONTROL	
STAINLESS STEEL HEAT EXCHANGER	
REHEAT	
ROOF CURB	78.0 lb

BASIC UNIT WEIGHTS		CORNER WEIGHTS				CENTER OF GRAVITIY	
SHIPPING	NET	(A)	340.0 lb	(C)	249.0 lb	(E) LENGHT	(F) WIDTH
1124.0 lb	1026.0 lb	(B)	233.0 lb	(D)	204.0 lb	41"	23"

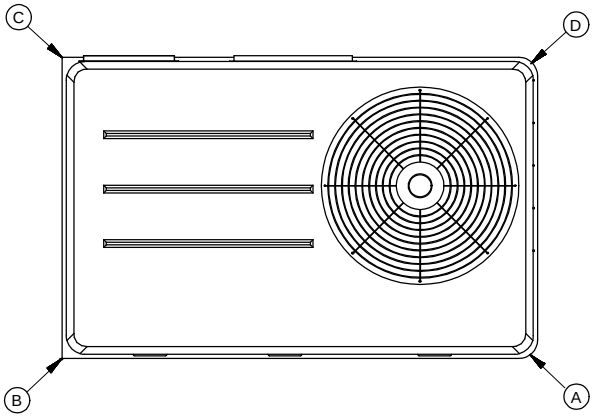
NOTE:
1. CORNER WEIGHTS ARE GIVEN FOR INFORMATION ONLY.
2. TO ESTIMATE SHIPPING WEIGHT ADD 5 LBS TO NET WEIGHT.
3. BASIC UNIT WEIGHT DOES NOT INCLUDE ACCESSORY WEIGHT. TO OBTAIN TOTAL WEIGHT, ADD ACCESSORY NET WEIGHT TO BASIC UNIT WEIGHT.
4. WEIGHTS FOR OPTIONS NOT LISTED ARE <5 LBS.



PACKAGED GAS / ELECTRICAL

RIGGING AND CENTER OF GRAVITY

Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV



PACKAGED GAS / ELECTRICAL

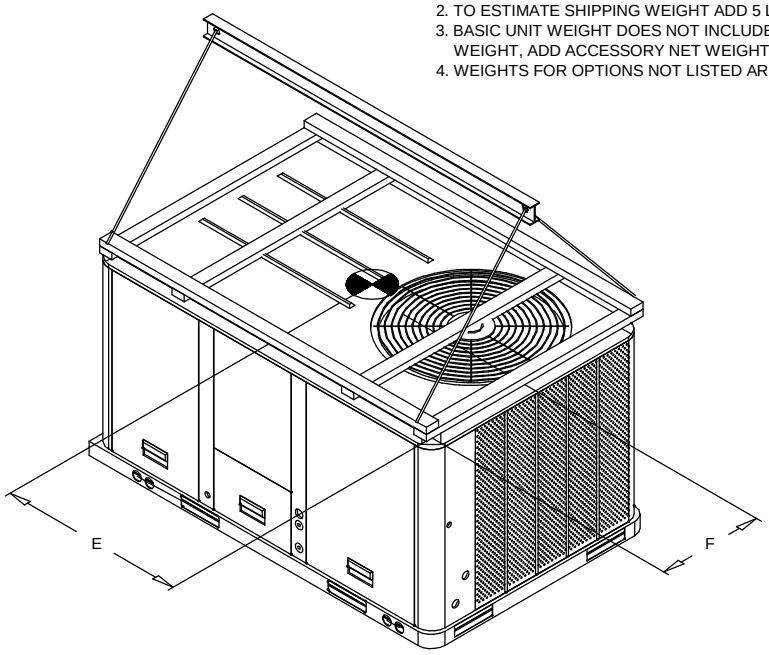
CORNER WEIGHT

INSTALLED ACCESSORIES NET WEIGHT DATA

ACCESSORY	WEIGHTS
ECONOMIZER	
MOTORIZED OUTSIDE AIR DAMPER	
MANUAL OUTSIDE AIR DAMPER	
BAROMETRIC RELIEF	
OVERSIZED MOTOR	
BELT DRIVE MOTOR	
POWER EXHAUST	
THROUGHT THE BASE ELECTRICAL/GAS (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	
STAINLESS STEEL HEAT EXCHANGER	
REHEAT	
ROOF CURB	89.0 lb

BASIC UNIT WEIGHTS		CORNER WEIGHTS				CENTER OF GRAVITIY	
SHIPPING	NET	(A)	386.0 lb	(C)	299.0 lb	(E) LENGHT	(F) WIDTH
1563.0 lb	1369.0 lb	(B)	379.0 lb	(D)	305.0 lb	49"	28"

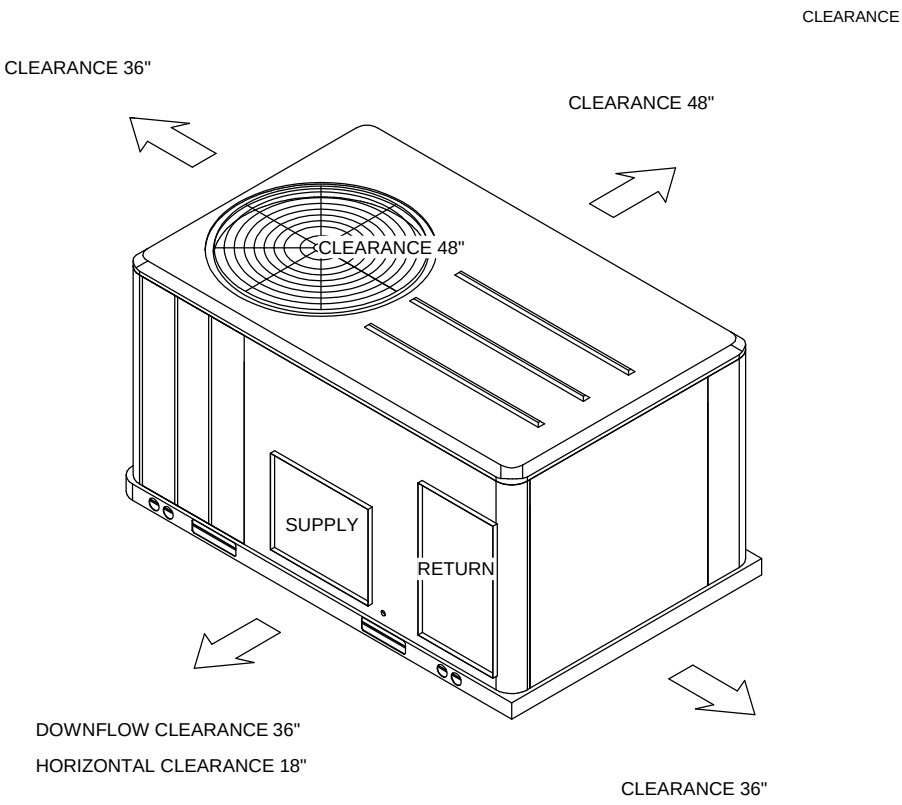
NOTE:
1. CORNER WEIGHTS ARE GIVEN FOR INFORMATION ONLY.
2. TO ESTIMATE SHIPPING WEIGHT ADD 5 LBS TO NET WEIGHT.
3. BASIC UNIT WEIGHT DOES NOT INCLUDE ACCESSORY WEIGHT. TO OBTAIN TOTAL WEIGHT, ADD ACCESSORY NET WEIGHT TO BASIC UNIT WEIGHT.
4. WEIGHTS FOR OPTIONS NOT LISTED ARE <5 LBS.



PACKAGED GAS / ELECTRICAL

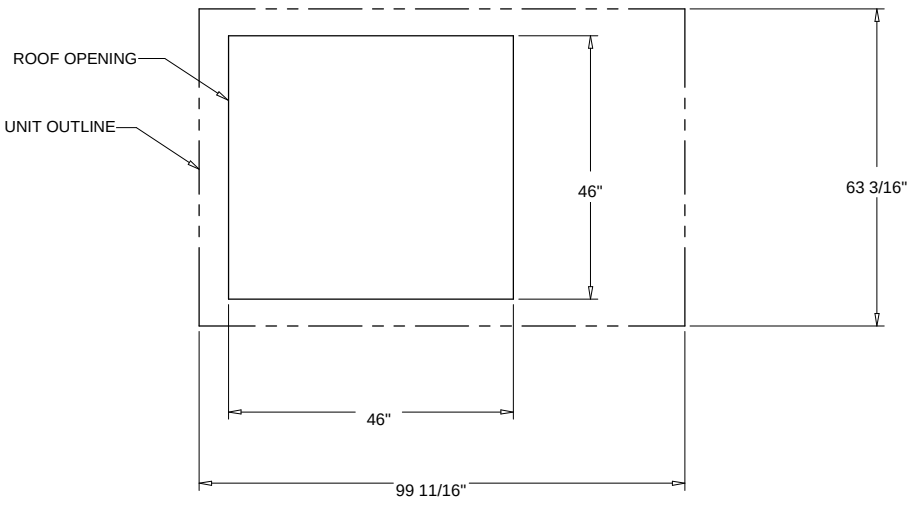
RIGGING AND CENTER OF GRAVITY

Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV



PACKAGED GAS / ELECTRIC

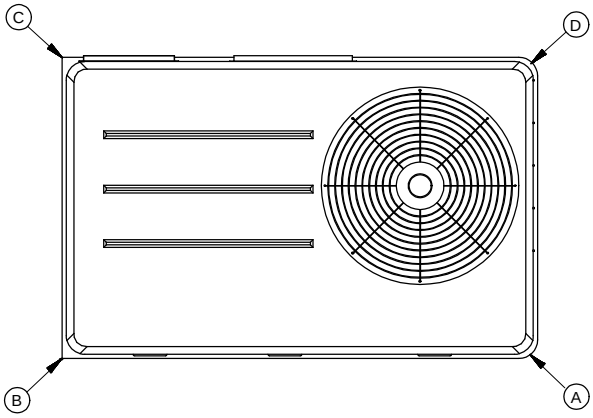
CLEARANCE



PACKAGED GAS / ELECTRIC

DOWNFLOW TYPICAL ROOF OPENING

Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A4 Qty: 1 Tag(s): 4 Ton SZ VAV



PACKAGED GAS / ELECTRICAL

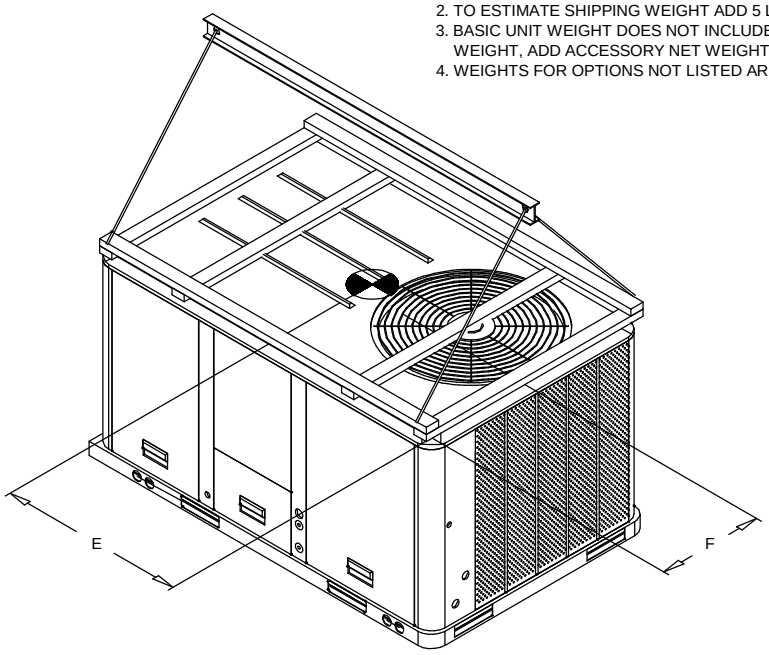
CORNER WEIGHT

INSTALLED ACCESSORIES NET WEIGHT DATA

ACCESSORY	WEIGHTS
ECONOMIZER	
MOTORIZED OUTSIDE AIR DAMPER	
MANUAL OUTSIDE AIR DAMPER	
BAROMETRIC RELIEF	
OVERSIZED MOTOR	
BELT DRIVE MOTOR	
POWER EXHAUST	
THROUGHT THE BASE ELECTRICAL/GAS (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	20.0 lb
SMOKE DETECTOR, SUPPLY / RETURN	
NOVAR CONTROL	
STAINLESS STEEL HEAT EXCHANGER	
REHEAT	
ROOF CURB	78.0 lb

BASIC UNIT WEIGHTS		CORNER WEIGHTS				CENTER OF GRAVITIY	
SHIPPING	NET	(A)	238.0 lb	(C)	148.0 lb	(E) LENGHT	(F) WIDTH
858.0 lb	763.0 lb	(B)	200.0 lb	(D)	176.0 lb	40"	23"

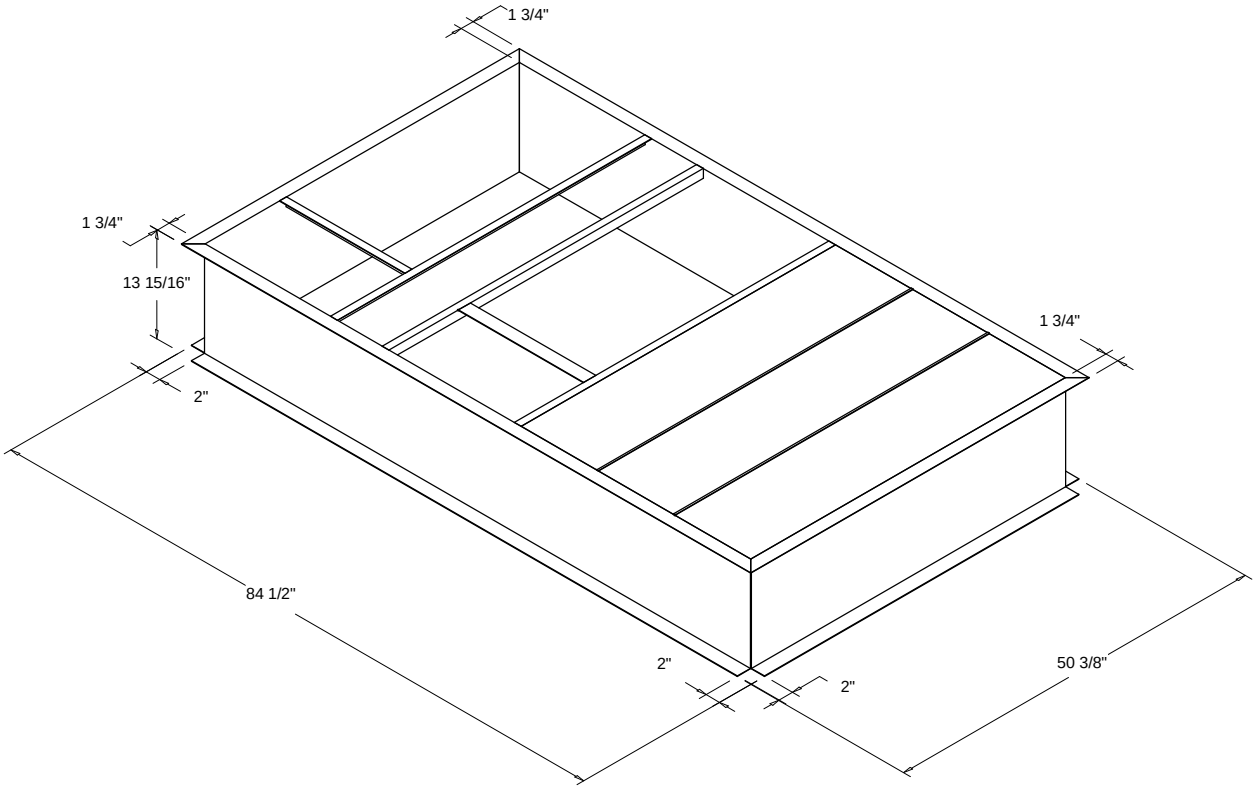
NOTE:
1. CORNER WEIGHTS ARE GIVEN FOR INFORMATION ONLY.
2. TO ESTIMATE SHIPPING WEIGHT ADD 5 LBS TO NET WEIGHT.
3. BASIC UNIT WEIGHT DOES NOT INCLUDE ACCESSORY WEIGHT. TO OBTAIN TOTAL WEIGHT, ADD ACCESSORY NET WEIGHT TO BASIC UNIT WEIGHT.
4. WEIGHTS FOR OPTIONS NOT LISTED ARE <5 LBS.



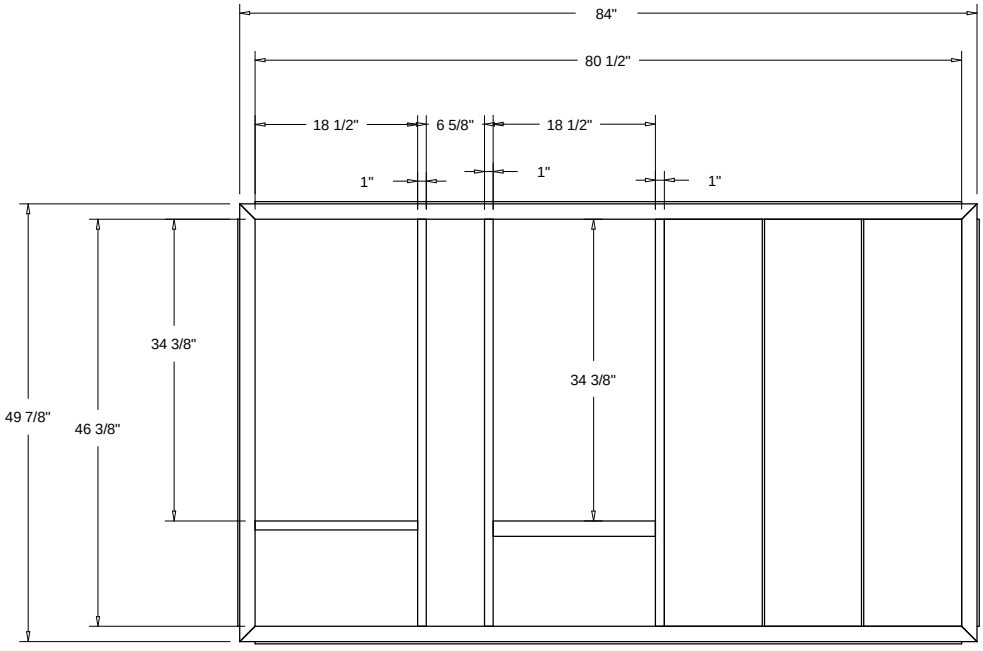
PACKAGED GAS / ELECTRICAL

RIGGING AND CENTER OF GRAVITY

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1, A2, A4 Qty: 4 Tag(s): 7.5 True VAV, 7.5 True VAV, 7.5 SZ VAV, 4 Ton SZ VAV



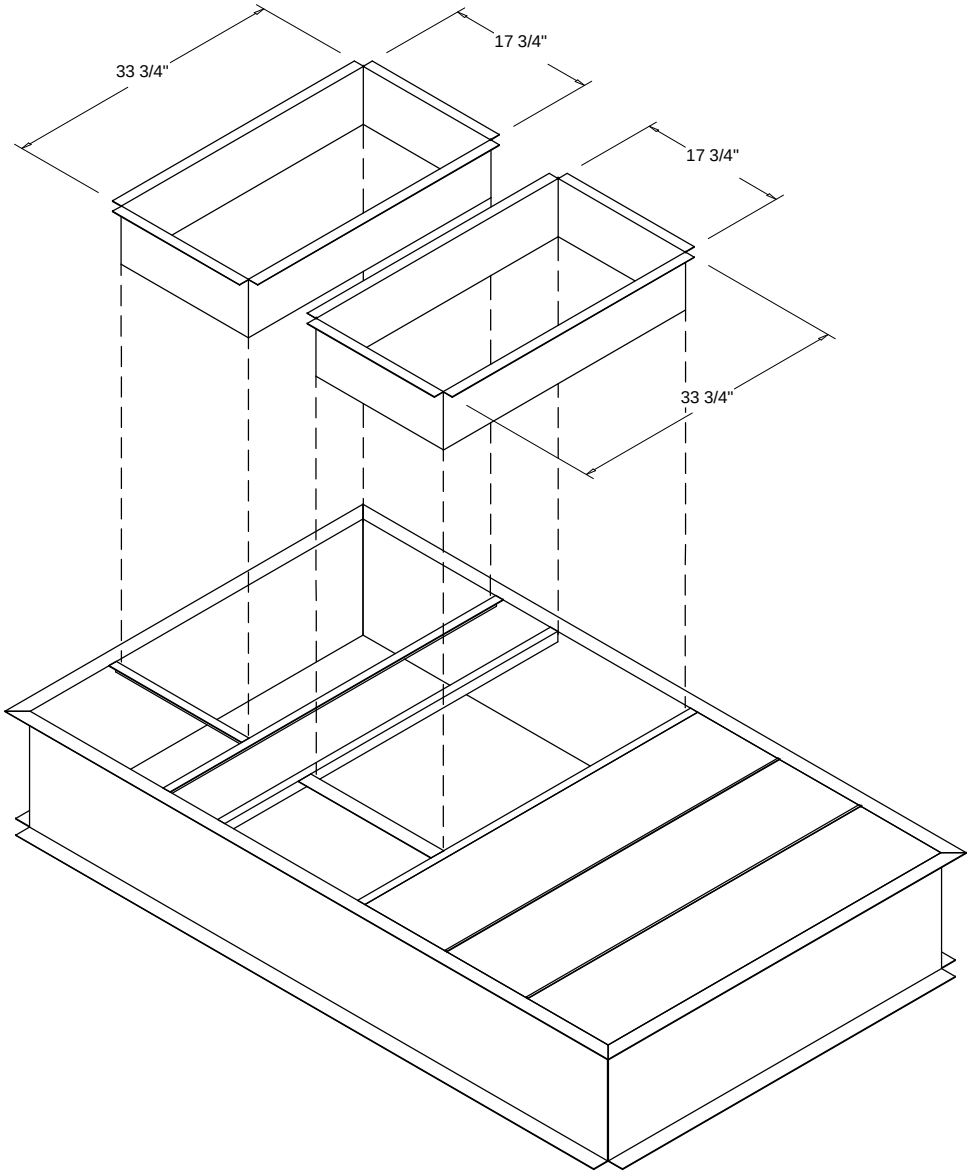
ACCESSORY - ROOF TOP CURB



ACCESSORY - ROOF TOP CURB

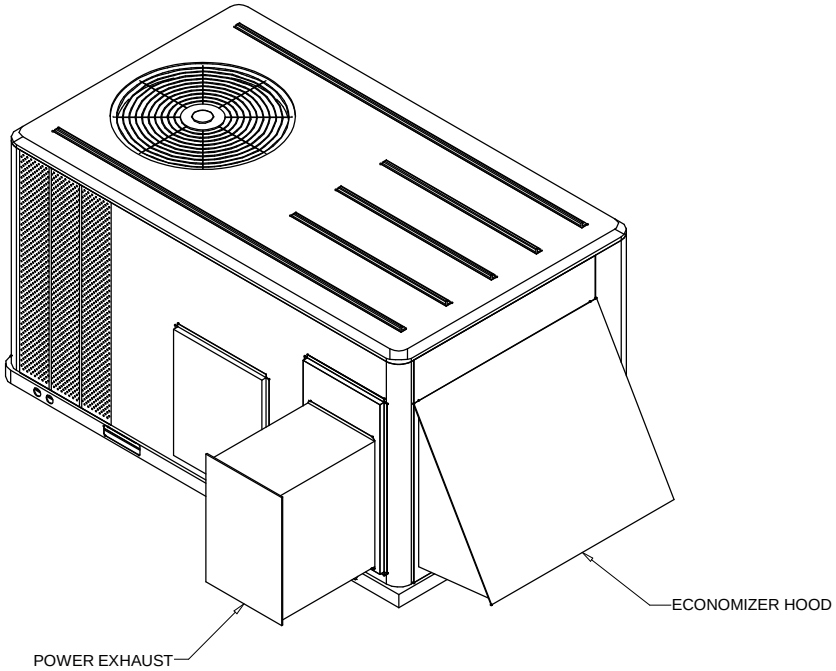
Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1, A2, A4 Qty: 4 Tag(s): 7.5 True VAV, 7.5 True VAV, 7.5 SZ VAV, 4 Ton SZ VAV

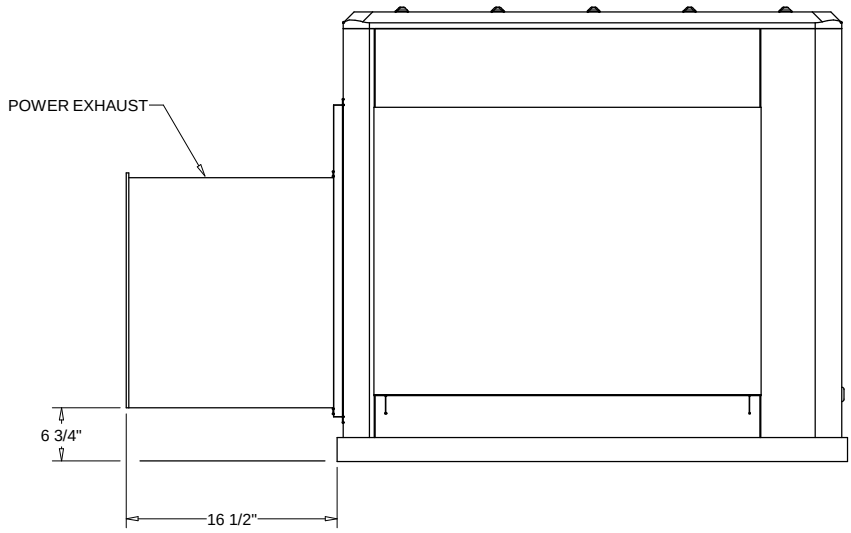
Downflow Duct Connections - Field Fabricated
All Flanges - 1 1/4"



ACCESSORY - DUCT CONNECTIONS

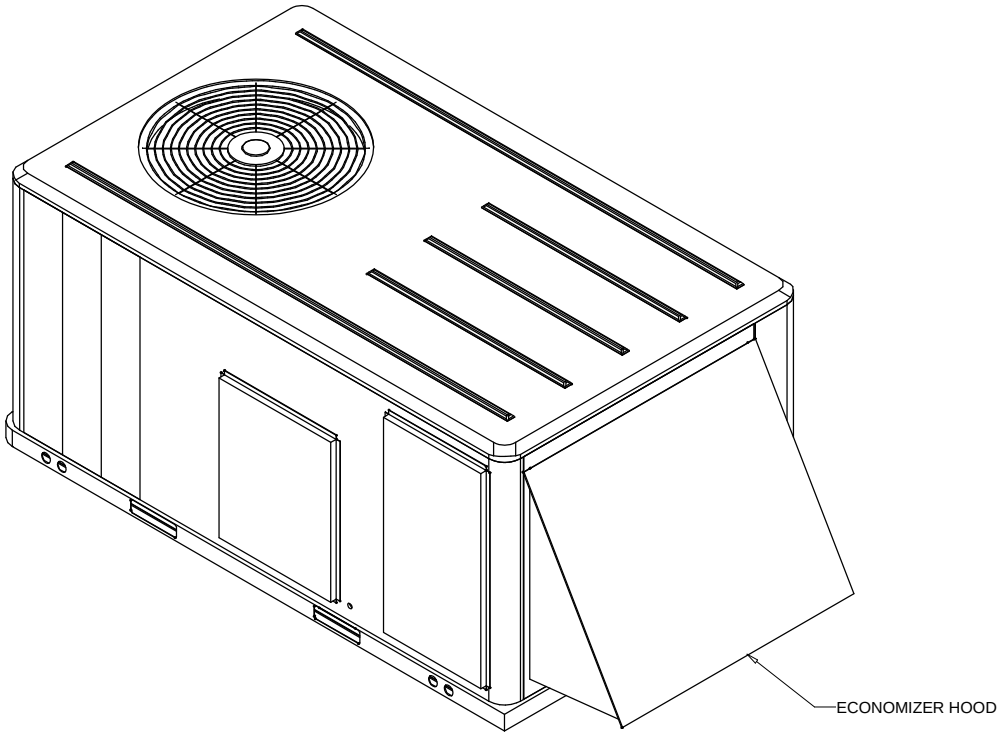
Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 2 Tag(s): 7.5 True VAV, 7.5 True VAV

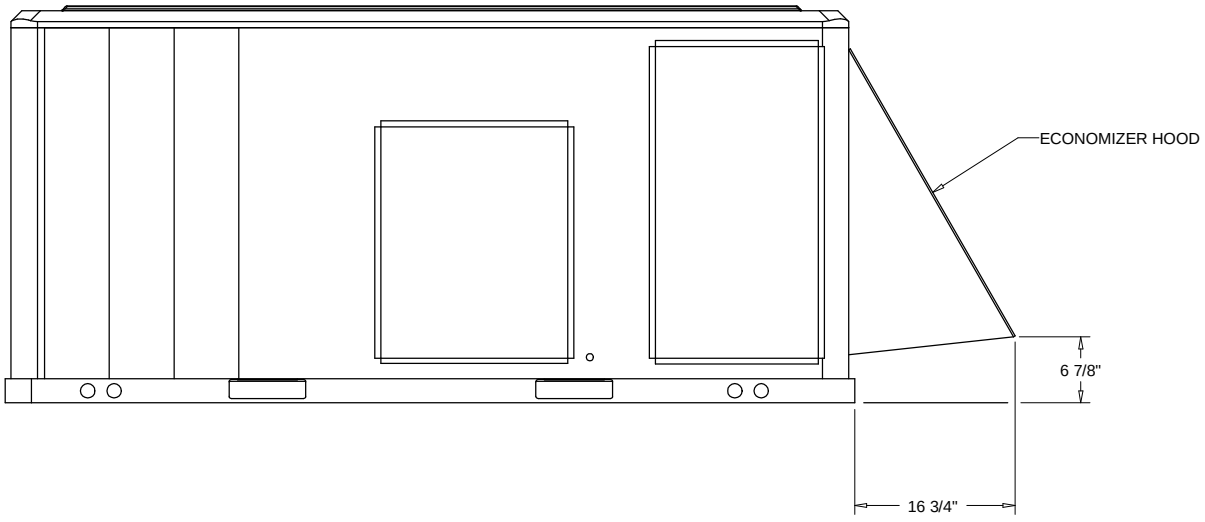




POWER EXHAUST AND HOOD
ACCESSORY

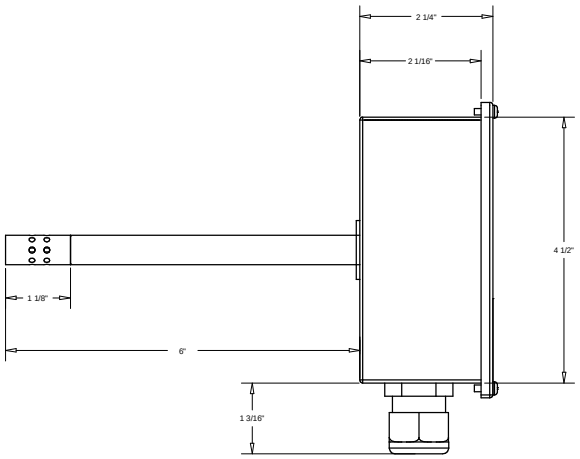
Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 2 Tag(s): 7.5 True VAV, 7.5 True VAV

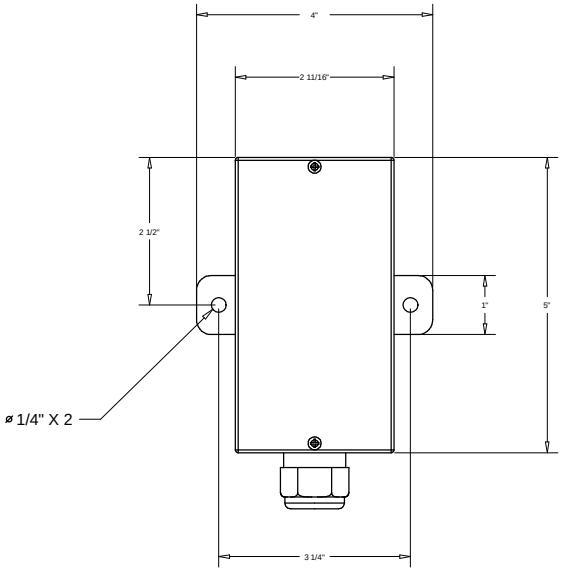


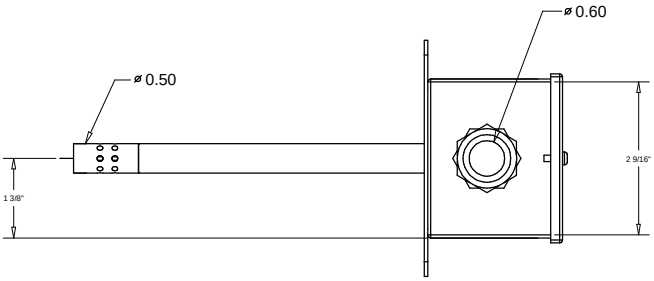


ACCESSORY - ECONOMIZER HOOD

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A2 - A4 Qty: 3 Tag(s): 7.5 SZ VAV, 10 Ton SZ VAV, 4 Ton SZ VAV





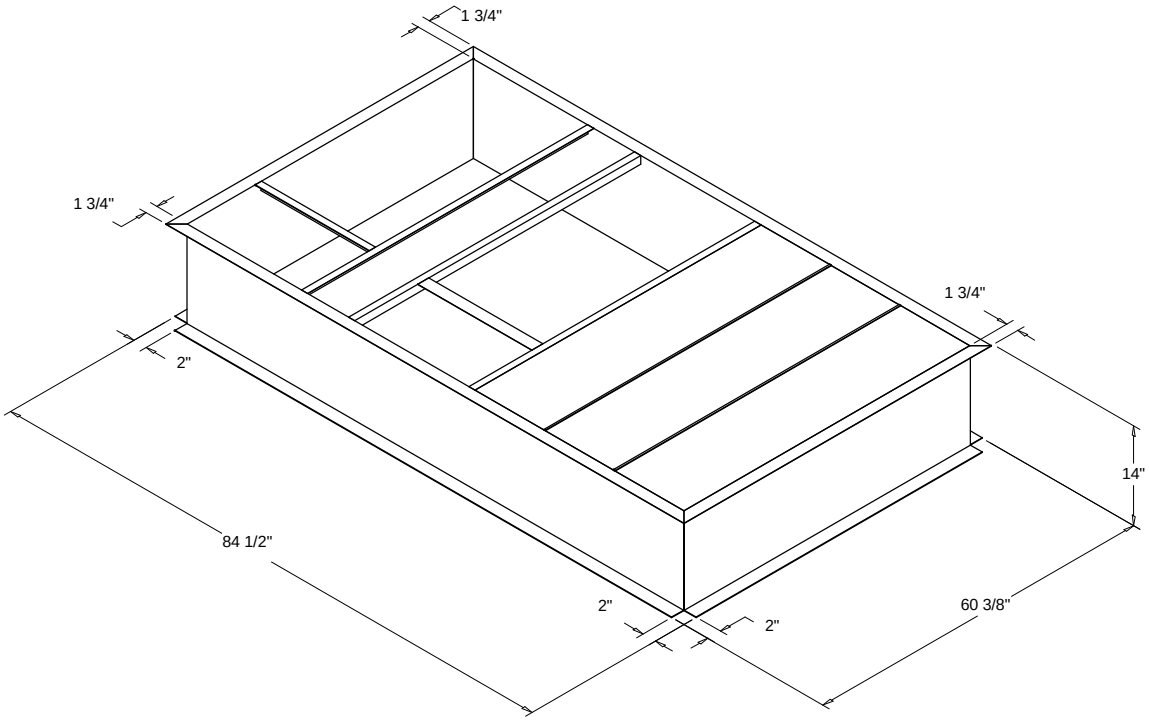


NOTES:
1. SEE ENGINEERING SPECIFICATION FOR DETAILS.
2. VERIFY ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION.

BAYSENS037A - DUCT MOUNT HUMIDITY SENSOR

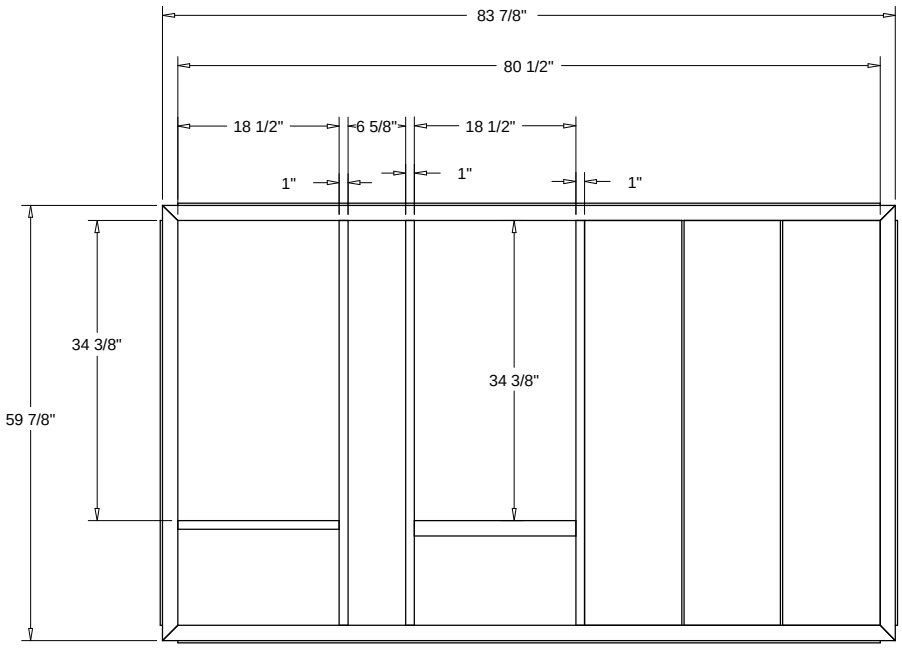
ACCESSORY

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV



GAS / ELECTRICAL ISCMETRIC ROOF TOP CURB

ACCESSORY

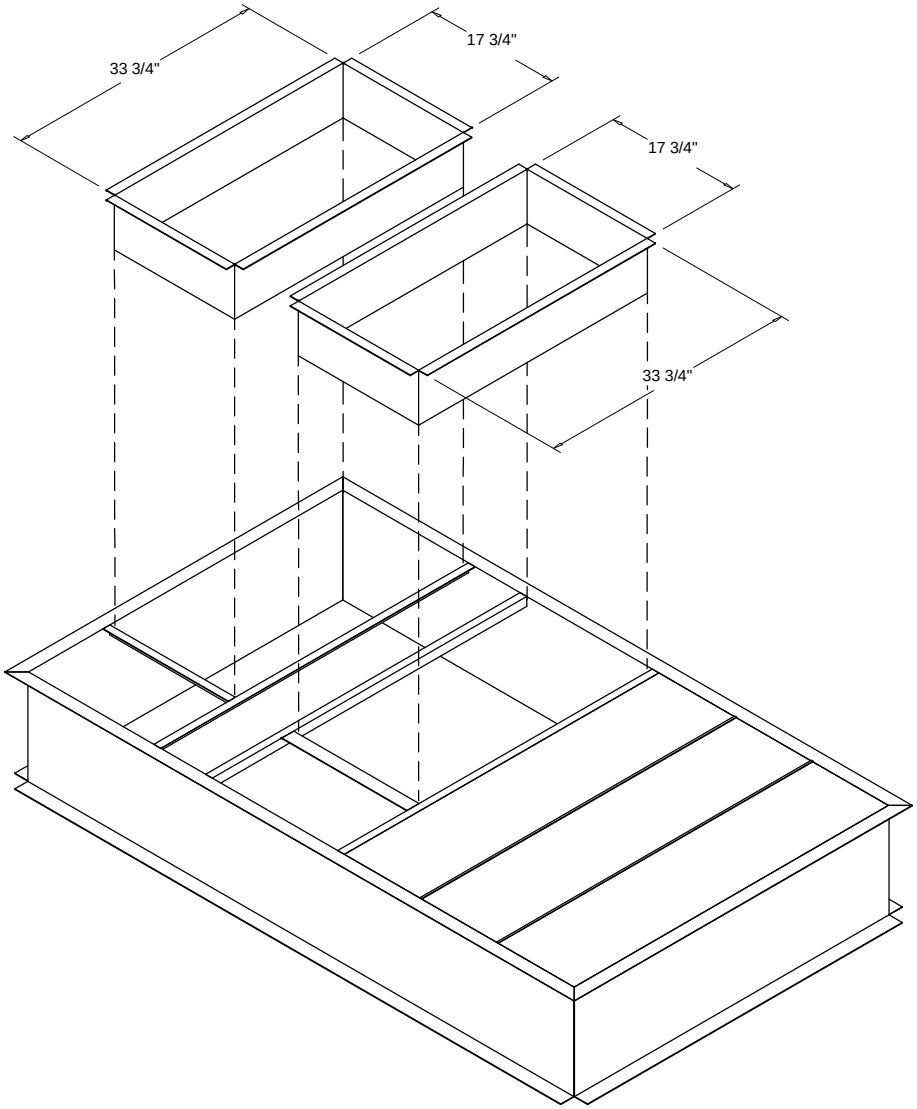


GAS / ELECTRICAL TOP VIEW ROOF TOP CURB

ACCESSORY

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A3 Qty: 1 Tag(s): 10 Ton SZ VAV

Downflow Duct Connections - Field Fabricated
All Flanges - 1 1/4"



DUCT CONNECTIONS

ACCESSORY

Submittal

Trane U.S. Inc.

Date: January 22, 2014

Prepared For:
Johnson & Jordan Inc
18 Mussey Road
Scarborough, ME 04074
Customer P.O. Number: 189992
Customer Project Number: 13431

Job Name:
Portland Public Library MHS
1000 Riverside Street
Portland, ME 04103
Job Number: A223468

Trane is pleased to provide the enclosed submittal for your review and approval.

PACKAGED GAS/ELECTRIC ROOFTOP AIR CONDITIONERS (20 TONS)

Notes:

- *Provide equipment tag when known*
- *Not included: Thermostat, controls and accessories other than listed*

Dan Broderick
Trane U.S. Inc. dba Trane
860 Spring Street, Unit #1
Westbrook, ME 04092-3824
Phone: (207) 828-1777
Fax: (207) 828-1511
E-Mail: djbroderick@trane.com

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

Qty	***Description***	***Tag(s)***
	Packaged Gas/Electric Rooftop Unit	
1	Trane Model YHD240F4RHA 20 Ton Packaged Gas/Electric Rooftop Unit	

Tag Data - Packaged Gas/Electric Rooftop Units (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	20 Ton SZ V AV	1	12 1/2 -25 Ton Packaged Unitary Gas/Ele	YHD240F4RHA--0A01A100A000000000000000000

Product Data - Packaged Gas/Electric Rooftop Units

Item: A1 Qty: 1 Tag(s): 20 Ton SZ VAV

Gas/Electric
High efficiency
Downflow
20 Ton
460/60/3
Reliatel control
Gas Heat - High
Single zone VAV standard w shaft ground
Standard condenser coil with hail guard
Through the base electric with unit mounted non-fused disconnect
TXV
Roof curb (Fld)
High static drive (Fld)
Fld = Furnished by Trane U.S. Inc. dba Trane / Installed by Others

Mechanical Specifications - Packaged Gas/Electric Rooftop Units
Item: A1 Qty: 1 Tag(s): 20 Ton SZ VAV

General
The units shall be dedicated downflow or horizontal airflow. The operating range shall be between 115°F and 0°F in cooling as standard from the factory for all units. Cooling performance shall be rated in accordance with AHRI 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 UL listed and labeled, classified in accordance to UL 1995/C 22.2, 236-05 3rd Edition.

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. Cabinet construction shall allow for all maintenance on one side of the unit. In order to ensure a water and air tight seal, service panels shall have lifting handles and no more than three screws to remove. All exposed vertical panels and top covers in the indoor air section shall be insulated with a 1/2 inch, 1 pound density foil-faced, fire-resistant, permanent, odorless, glass fiber material. The base of the downflow unit shall be insulated with 1/2 inch, 1 pound density foil-faced, closed-cell material. The downflow unit's base pan shall have no penetrations within the perimeter of the curb other than the raised 11/8 inch high 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.

Unit Top
The top cover shall be one piece, or where seams exist, double hemmed and gasket sealed to prevent water leakage.

Filters
Two inch standard filters shall be factory supplied on all units. Optional two inch pleated media filters shall be available.

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 nameplate voltage. Internal overloads shall be provided with the scroll compressors. All models shall have crankcase heaters, phase monitors and low and high pressure control as standard.

Crankcase Heaters
These band heaters provide improved compressor reliability by warming the oil to prevent migration during off-cycles or low ambient conditions. These are standard on all Voyager models.

Refrigerant Circuits
Each refrigerant circuit shall have independent fixed orifice or 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.

Evaporator and Condenser Coils
Microchannel coils will be burst tested by the manufacturer. Internally finned, 5/16¿ copper tubes mechanically bonded to a configured aluminum plate fin shall be standard for evaporator coils. Microchannel condenser coils shall be standard on all units. Coils shall be leak tested to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 225 psig and pressure tested to 450 psig. Sloped condensate drain pans are standard.

Gas Heating Section
The heating section shall have a drum and tube heat exchanger design using corrosion resistant steel components. A forced combustion blower shall supply premixed fuel to a single burner ignited by a pilotless hot surface ignition system. In order to provide reliable operation, a negative pressure gas valve shall be used on standard furnaces and a pressure switch on furnaces with modulating heat that requires blower operation to initiate gas flow. On an initial call for heat, the combustion blower shall purge the heat exchanger 45 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat. Units shall be suitable for use with natural gas or propane (field installed kit) and shall also comply with California requirements for low NOx emissions. The 12½- 25 tons shall have two stage heating (Gas/Electric Only).

Outdoor Fans
The outdoor fan shall be direct-drive, statically and dynamically balanced, draw-through in the vertical discharge

position. The fan motor(s) shall be permanently lubricated and shall have built-in thermal overload protection.

Indoor Fan
Units above shall have belt driven, FC centrifugal fans with adjustable motor sheaves. Units with standard motors shall have an adjustable idler-arm assembly for quick-adjustment of fan belts and motor sheaves. All motors shall be thermally protected. Oversized motors shall be available for high static application. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

Single Zone VAV - One Zone Variable Air Volume Mode
Single zone VAV is designed for use in single zone applications like gymnasiums, auditoriums, manufacturing facilities, retail box stores, and any large open spaces, where there is a lot of diversity in the load profile. Single Zone VAV (SZ VAV) is an ideal replacement to yesterdays constant volume (CV) systems, by reducing operating costs while improving occupant comfort. SZ VAV systems combine Trane application, control and system integration knowledge to exactly match fan speed with cooling and heating loads, regardless of the operating condition. Trane algorithms meet/exceed ASHRAE 90.1- 2010, SZ VAV energy-saving recommendations, and those of CA Title 24. The result is an optimized balance between zone temperature control and system energy savings. Depending on your specific application, energy savings can be as much as 20+%.

Note:
Building system modeling in energy simulation software like TRACE is recommended to evaluate performance improvements for your application.

SZ VAV is fully integrated into the ReliaTel Control system and is available today. It provides the simplest and fastest commissioning in the industry through proven factory-installed, wired, and tested system controllers. All control modules, logic and sensors are factory installed, and tested to assure the highest quality and most reliable system available. This means no special programming of algorithms, or hunting at the jobsite for sensors, boards, etc. that need to be installed in the field. Single zone VAV is a quick and simple solution for many applications and is available from your most trusted rooftop VAV system solution provider- Trane.

Variable Frequency Drive
Variable Frequency Drives are factory installed and tested to provide supply fan motor speed
Modulation. VFDs on the supply fan, as compared to inlet guide vanes or discharge dampers, are quieter, more efficient, and are eligible for utility rebates. All VFDs are designed to allow bypass if required. Bypass control will simply provide full nominal airflow in the event of drive failure. Bypass mode is indicated in the unit wiring manual. Modulating gas heat models with SZVAV allow tighter space temperature control with less temperature swing.

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. ReliaTel 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. A centralized control shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.

High Pressure Cutout
This option is offered for units that do not have High Pressure cutout as standard.

Discharge Line Thermostat
A bi-metal element discharge line thermostat is installed as a standard option on the discharge line of each system. This standard option provides extra protection to the compressors against high discharge temperatures in case of loss of charge, extremely high ambient and other conditions which could drive the discharge temperature higher. Discharge line thermostat is wired in series with high pressure control. When the discharge temperature rises above the protection limit, the bi-metal disc in the thermostat switches to the off position, opening the 24 VAC circuit. When the temperature on the discharge line cools down, the bi-metal disc closes the contactor circuit, providing power to the compressor. When the thermostat opens the fourth time, the ReliaTel control must be manually reset to resume operation on that stage.

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

Through the Base Electrical with Disconnect Switch
Three-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 RT-PRC028-EN 121 enclosure with access through a swinging door. Factory 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.

Shaft Gounding Ring (FIYSHGR001,002A) 12.5-25 Ton

Shaft grounding rings shall be factory installed on all VFD driven motors to provide a conductive discharge path away from the motor bearings to ground. Bearing Protection Ring shall be maintenance free circumferential ring of conductive micro fibers that discharges voltages to ground.

Accessory - Roof Curb - Downflow

The roof curb shall be designed to mate with the downflow unit and provide support and a water tight installation when installed properly. The roof curb design shall allow field-fabricated rectangular supply/return ductwork to be connected directly to the curb. Curb design shall comply with NRCA requirements. Curb shall be shipped knocked down for field assembly and shall include wood nailer strips.

Accessory - High Static Drive

The high static drive option shall allow the standard motor on the 12½ and 20 ton units to operate with improved external static capabilities.

Electrical/General Data - Packaged Gas/Electric Rooftop Units
Item: A1 Qty: 1 Tag(s): 20 Ton SZ VAV

ELECTRICAL / GENERAL DATA

GENERAL PERFORMANCE

Model (Ton): (10)(11)(12)(13)(14)	YHD240F (20.0)
Unit Operating Voltage Range:	414-506
Unit Primary Voltage:	460
Unit Secondary Voltage:	-
Unit Hertz:	60
Unit Phase:	3
EER: (7)	11.0

Standard Motor (1) (3) (4)

Minimum Circuit Ampacity:	50.0
Maximum Fuse Size:	60.0
Maximum (HACR) Circuit Breaker:	60.0

Standard Oversized Motor (6) (4)

Minimum Circuit Ampacity:	
Maximum Fuse Size:	
Maximum (HACR) Circuit Breaker:	

Accessory Oversized Motor (6) (4)

Minimum Circuit Ampacity:	
Maximum Fuse Size:	
Maximum (HACR) Circuit Breaker:	

GAS HEATING

Heating Models:	High
Heating and 1 Stage Input (Btu/h)	400,000 / 300,000
Heating and 1 Stage Output (Btu/h):	324,000 / 243,000
Min./Max. Gas Input -	
Pressure Natural or LP (in w.c):	2.5/14.0
Gas Connection Pipe Size:	3/4"

COMPRESSOR

	Circuit #1 / 2
Number:	2
Horsepower:	11.7/6.9
Phase:	3
Rated Load Amps:	19.2/12.4
Locked Rotor Amps:	147.0/100.0

INDOOR MOTOR

Standard Motor

Number:	1
Horsepower:	5.0
Motor Speed (RPM):	3,450
Phase:	3
Full Load Amps:	7.6
Locked Rotor Amps:	54.9

Standard Oversized Motor (6)

Number:	
Horsepower:	
Motor Speed (RPM):	
Phase:	
Full Load Amps:	
Locked Rotor Amps:	

Accessory Oversized Motor (6)

Number:	
Horsepower:	
Motor Speed (RPM):	
Phase:	
Full Load Amps:	
Locked Rotor Amps:	

OUTDOOR MOTOR

Number: (8)	2
Horsepower:	1.0
Motor speed (RPM):	1,125
Phase:	1
Full Load Amps:	2.9
Locked Rotor Amps:	5.8

POWER EXHAUST

(Field Installed Power Exhaust)

Horsepower:	N/A
Motor Speed (RPM):	N/A
Phase:	N/A
Full Load Amps:	N/A
Locked Rotor Amps:	N/A

COMBUSTION BLOWER MOTOR

(Gas-Fired Heating only)

Horsepower:	0.1
Motor Speed (RPM):	3500/2800
Phase:	1
Full Load Amps:	0.8
Locked Rotor Amps:	2.00

FILTER

Type:	Throwaway
Furnished:	Yes
Number:	8 / 4
Recommended Size:	20"x20"x2" / 20"x16"x2"

REFRIGERANT

	Circuit #1 / 2
Type: (2)	R-410
Factory Charge Circuit #1 / 2:	12.0 lb / 7.1 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 does not include Heater.
5. Value include Standard Motor.
6. Value include Oversized Motor
7. EER is rated at AHRI conditions and in accordance with DOE test procedures.
8. For Compressor Motors and Condenser Fan Motors: Amp draw for each motor; multiply value by number of motors to determine total amps.
9. HP for each compressor.
10. TXV/Face-Split Option (Downflow Only) YCD211E3,4,W (EER):12; (System Power kW): 17.33; (Refrigerant Control): Expansion Valve;
11. TXV/Face-Split Option (Downflow Only) YCD241E3,4,W (EER):11; (System Power kW): 22; (Refrigerant Control): Expansion Valve;
12. TXV/Face-Split Option (Downflow Only) YCD301E3,4,W (EER):11; (System Power kW): 25.45; (Refrigerant Control): Expansion Valve;
13. Outdoor Sound Rating shown is tested in accordance with AHRI Standard 270 or 370.
14. AFUE is rated in accordance with DOE test procedures.

Performance Data - Packaged Gas/Electric Rooftop Units
Item: A1 Qty: 1 Tag(s): 20 Ton SZ VAV

TRANE

Portland Public Library MHS - 1000 Riverside

Tag	20 Ton SZ VAV		
Quantity	1	Model number	YHD240

Unit Information

Tonnage	20 Ton	Unit function	Gas/Electric
Min. Unit Operating Weight	2004.0 lb	Max Unit Operating Weight	2434.0 lb
Design Airflow	8000 cfm		

Cooling Information

Gross Total Capacity	246.14 MBh	Gross Sensible Capacity	168.40 MBh
Gross Latent Capacity	77.75 MBh	Net Total Capacity	233.08 MBh
Net Sensible Capacity	155.33 MBh	Net Sensible Heat Ratio	0.67 Number
Cooling Entering Dry Bulb	76.00 F	Cooling Entering Wet Bulb	65.00 F
Cooling Leaving Unit DB	58.37 F	Cooling Leaving Unit WB	55.37 F
Ambient Temp	95.00 F		

Heating Information

Heating capacity	Gas Heat - High	Output Htg Capacity	324.00 MBh
Output Htg Capacity w/Fan	337.07 MBh	Heating EAT	
Heating LAT	37.33 F		

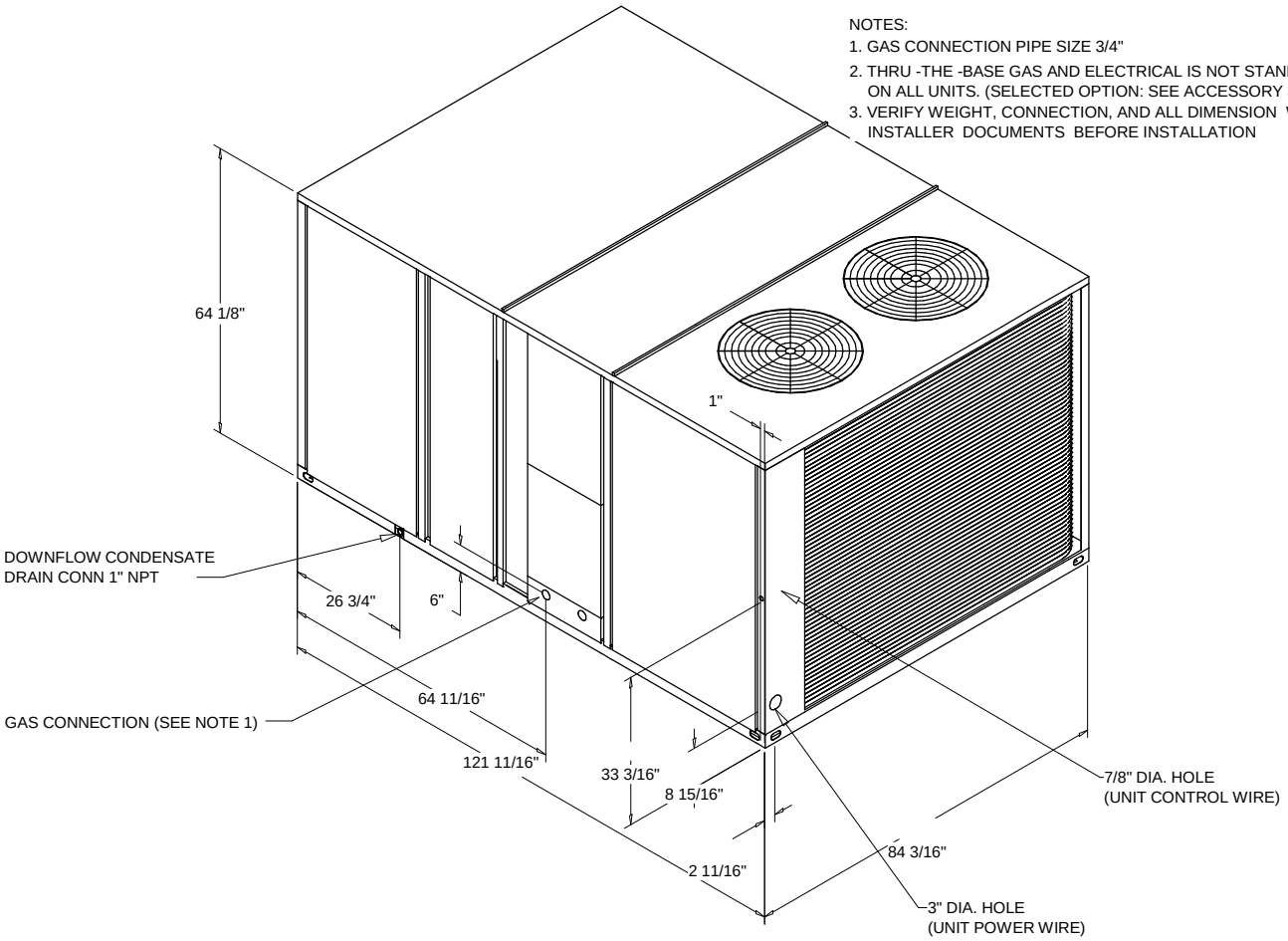
Motor/Electrical Information

Voltage	460/60/3	Design ESP	0.750 in H2O
Indoor Motor Power	3.09 kW	Indoor Mtr. Operating Power	4.15 bhp
Indoor RPM	701 rpm	Outdoor Motor Power	2.07 kW
Compressor Power	17.35 kW	System Power	22.52 kW
MCA	50.00 A	MOP	60.00 A
Compressor 1 RLA	20.40 A	Compressor 2 RLA	12.70 A
Evaprator Fan FLA	7.60 A	Condenser Fan FLA	2.90 A

LEED Information

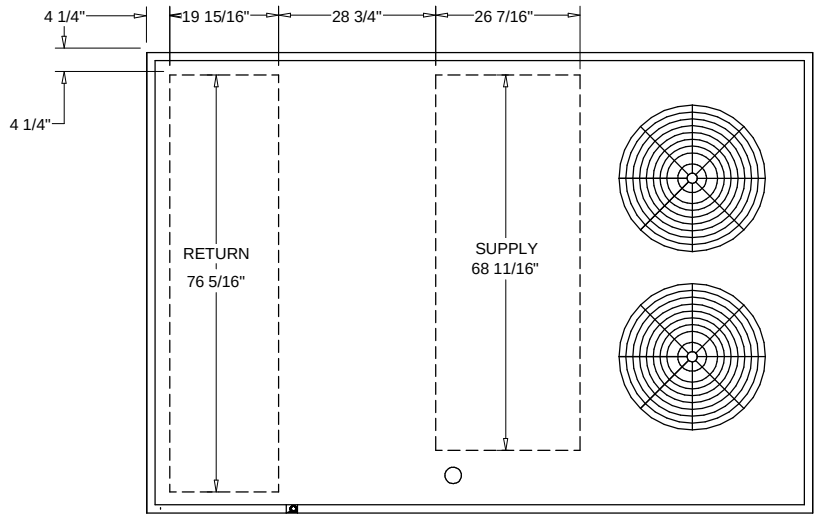
ASHRAE 90.1	Yes		
Refrig charge (HFC-410A) - ckt 1	12.0 lb	Refrig charge (HFC-410A) - ckt 2	7.1 lb
Compressor Power	17.35 kW	Outdoor Motor Power	2.07 kW
Rated capacity (AHRI)	242.00 MBh	Exhaust fan power	0.56 kW
Indoor Mtr. Operating Power	4.15 bhp	SEER @ AHRI	

Unit Dimensions - Packaged Gas/Electric Rooftop Units
Item: A1 Qty: 1 Tag(s): 20 Ton SZ VAV



PACKAGED GAS/ELECTRIC - DOWNFLOW

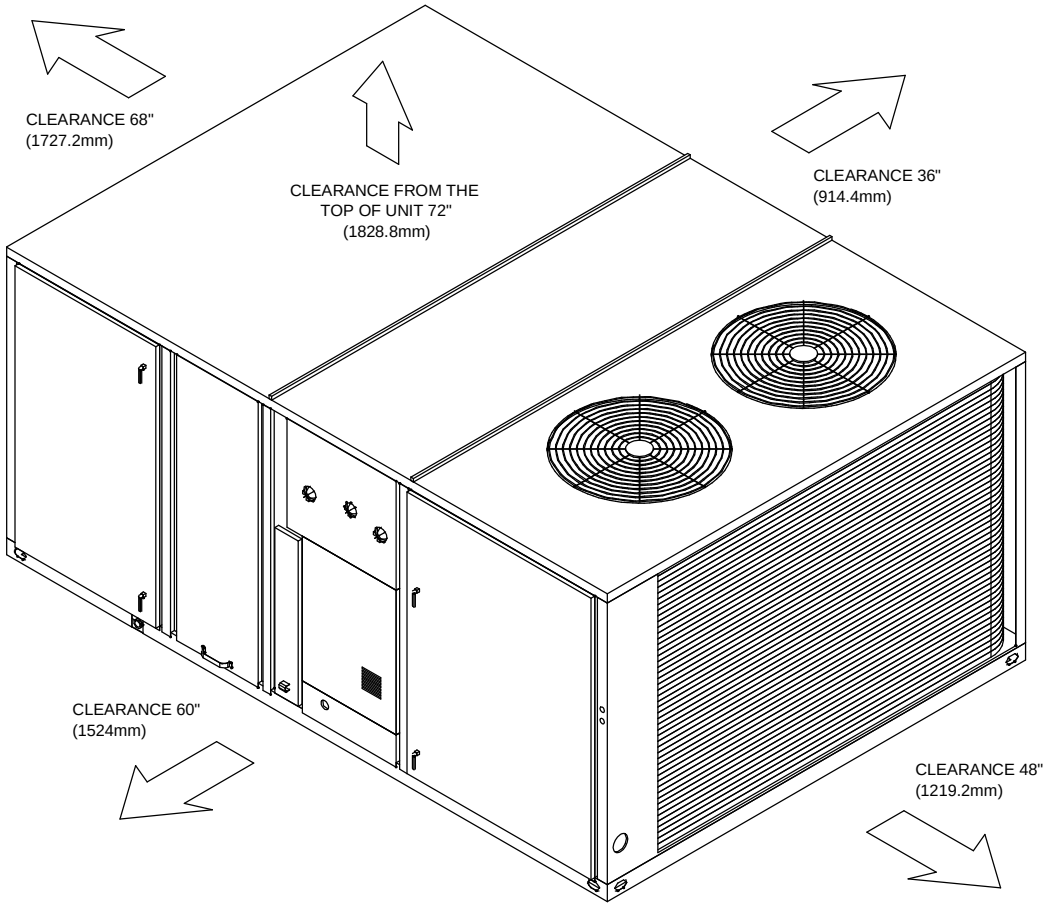
ISOMETRIC DRAWING



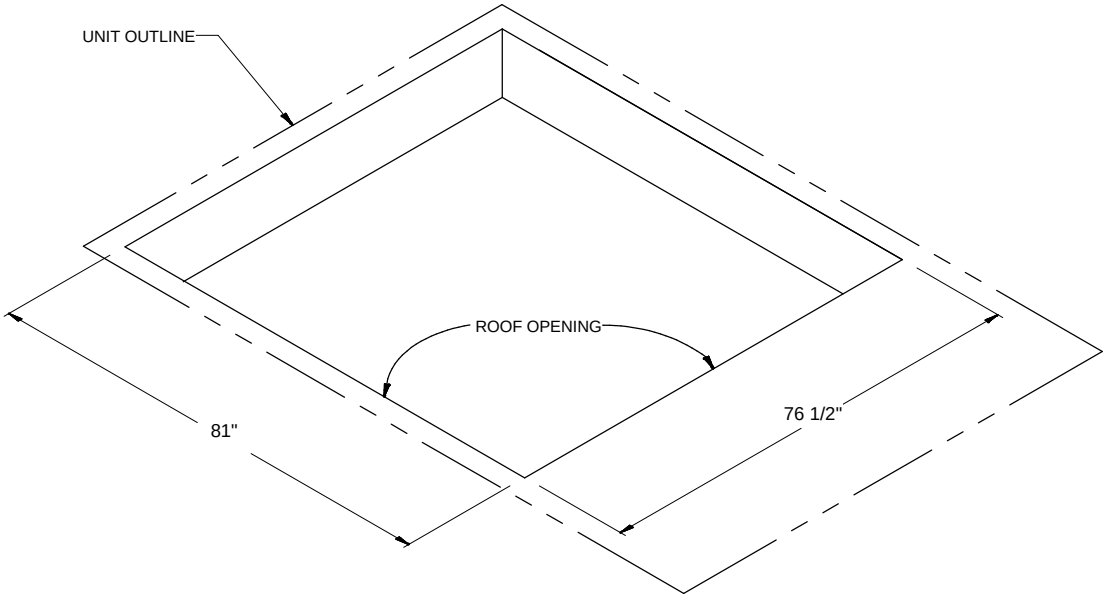
PACKAGED GAS/ELECTRIC - DOWNFLOW

PLAN VIEW DRAWING

Weight, Clearance & Rigging Diagram - Packaged Gas/Electric Rooftop Units
Item: A1 Qty: 1 Tag(s): 20 Ton SZ VAV

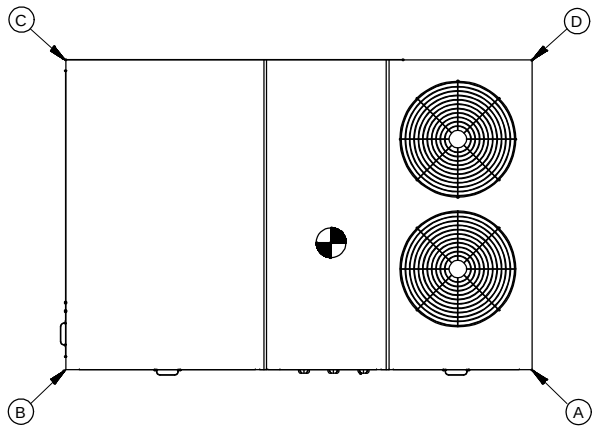


DOWNFLOW-PACKAGED GAS/ELECTRIC CLEARANCE



DOWNFLOW-PACKAGED GAS/ELECTRIC ROOF OPENING CLEARANCE

Weight, Clearance & Rigging Diagram - Packaged Gas/Electric Rooftop Units
Item: A1 Qty: 1 Tag(s): 20 Ton SZ VAV



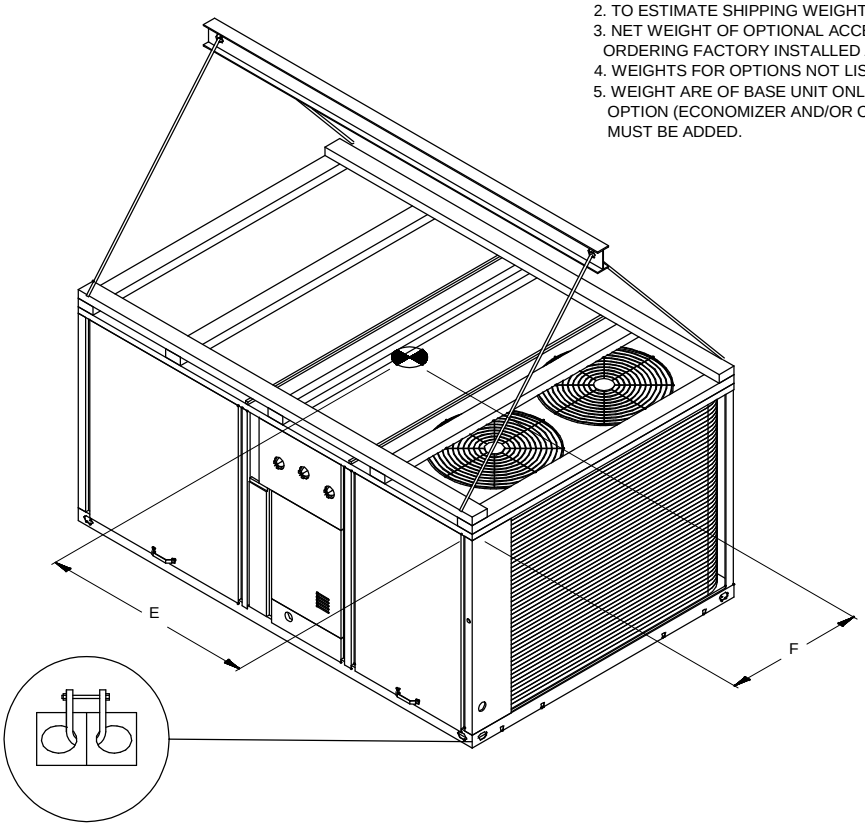
CORNER WEIGHT

INSTALLED OPTIONS NET WEIGHT DATA

Accessory	Accessory
Economizer	
Motorized Outside Air Damper	
Manual Outside air Damper	
Oversized Motor	
High Static Drive	2.0 lb
Thru the Base Electrical	23.0 lb
Unit Mounted Circuit Breaker	
Unit Mounted Disconnect	
Power Exhaust	
Hinged Doors	
Zone Sensor	
LPG Conversion Kit	
Powered Convenience Outlet	
Roof Curb	235.0 lb

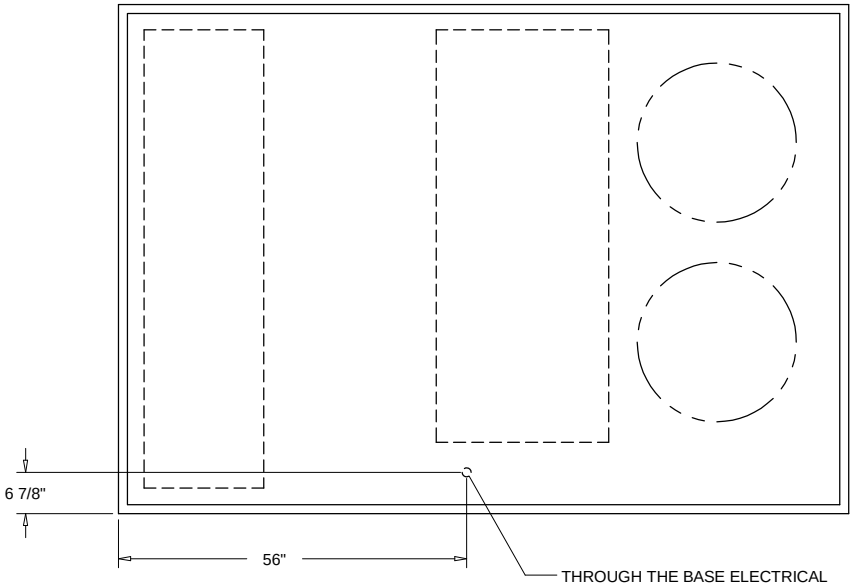
BASE UNIT WEIGHTS		CORNER WEIGHTS				CENTER OF GRAVITY	
SHIPPING	NET	(A)	(B)	(C)	(D)	E	F
2680.0 lb	2203.0 lb	701.0 lb	575.0 lb	421.0 lb	504.0 lb	58"	35"

NOTE:
1. CORNER WEIGHTS ARE GIVEN FOR INFORMATION ONLY.
2. TO ESTIMATE SHIPPING WEIGHT OF OPTION/ACCESSORIES ADD 5 LBS TO NET WEIGHT.
3. NET WEIGHT OF OPTIONAL ACCESSORIES SHOULD BE ADD TO UNIT WEIGHT WHEN ORDERING FACTORY INSTALLED ACCESSORIES.
4. WEIGHTS FOR OPTIONS NOT LISTED ARE < 5 LBS.
5. WEIGHT ARE OF BASE UNIT ONLY. FOR TOTAL WEIGHT, 10 DIGIT FACTORY INSTALLED OPTION (ECONOMIZER AND/OR OVERSIZED MOTOR OR FIOP/ACCESSORY WEIGHT MUST BE ADDED.



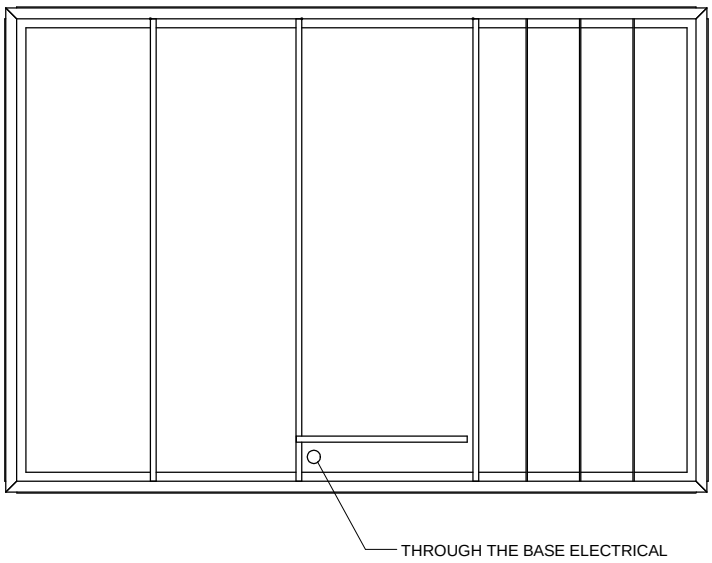
RIGGING AND CENTER OF GRAVITY

Weight, Clearance & Rigging Diagram - Packaged Gas/Electric Rooftop Units
Item: A1 Qty: 1 Tag(s): 20 Ton SZ VAV



THROUHG THE BASE ELECTRICAL

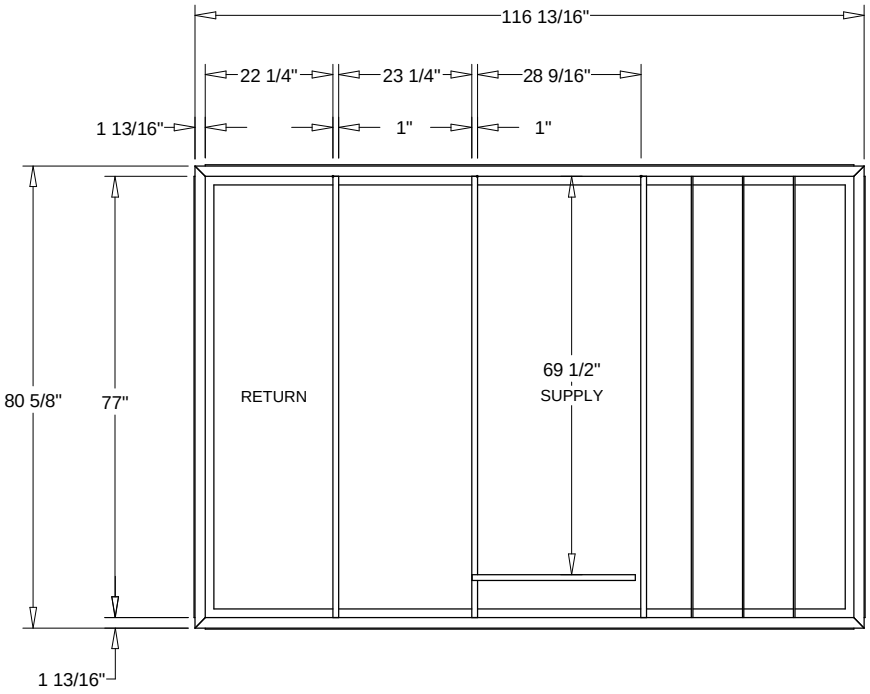
ACCESSORY-PLAN VIEW



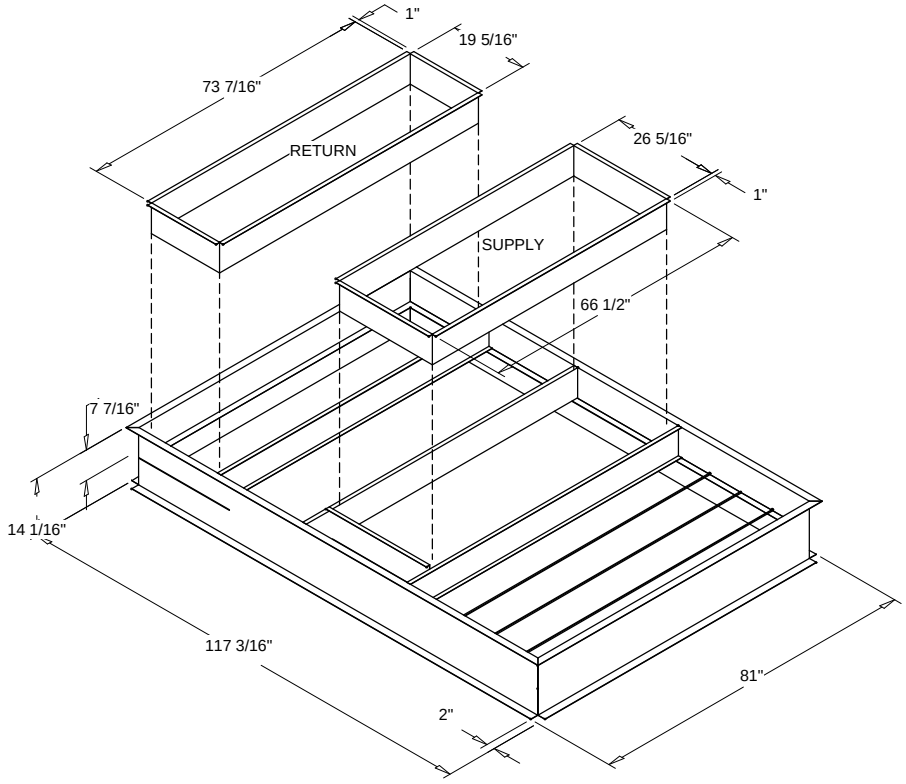
THROUHG THE BASE ELECTRICAL ROOF CURB

ACCESSORY-PLAN VIEW

Accessory - Packaged Gas/Electric Rooftop Units
Item: A1 Qty: 1 Tag(s): 20 Ton SZ VAV



ACCESSORY-ROOF CURB



ACCESSORY-DOWNFLOW DUCT CONNECTIONS

Submittal

Trane U.S. Inc.

Date: January 21, 2014

Prepared For:
Johnson & Jordan Inc
18 Mussey Road
Scarborough, ME 04074
Customer P.O. Number: 189992
Customer Project Number: 13431

Job Name:
Portland Public Library MHS
1000 Riverside Street
Portland, ME 04103
Job Number: A223468

Trane is pleased to provide the enclosed submittal for your review and approval.

ROUND VARIABLE AIR VOLUME DAMPERS

Notes:
-not included: controls or actuators

Dan Broderick
Trane U.S. Inc. dba Trane
860 Spring Street, Unit #1
Westbrook, ME 04092-3824
Phone: (207) 828-1777
Fax: (207) 828-1511
E-Mail: djbroderick@trane.com

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

Qty	***Description***	***Tag(s)***
	Round VAV Dampers	
4	Trane Model VADB16 16” Round VAV Dampers	
2	Trane Model VADB12 12” Round VAV Dampers	
1	Trane Model VADB10 10” Round VAV Damper	
2	Trane Model VADB06 6” Round VAV Dampers	

Tag Data - Variable Air Volume Changeover/Bypass Units (Qty: 9)

Item	Tag(s)	Qty	Model Number
A1	No Tag	4	VADB16
A2	No Tag	2	VADB12
A3	No Tag	1	VADB10
A4	No Tag	2	VADB06

Product Data - Variable Air Volume Changeover/Bypass Units

All Units

Varitrac damper
Without actuator or controls

Item: A1 Qty: 4

16" [406 mm] round damper

Item: A2 Qty: 2

12" [305 mm] round damper

Item: A3 Qty: 1

10" [254 mm] round damper

Item: A4 Qty: 2

6" [152 mm] round damper

Mechanical Specifications - Variable Air Volume Changeover/Bypass Units
Item: A1 - A4 Qty: 9

Round Damper General Data
Cylinder - Rolled and seam welded 18 gauge galvanized steel. The discharge end is roll crimped to fit standard round ductwork.
Damper - A 22 gauge (18 gauge on size 08) galvanized steel damper blade sets against a single rolled bead in the cylinder with a factory provided integral 24 VAC electric actuator.

Damper - 06
300.0 cfm, 6" damper.

Damper - 10
800.0 cfm, 10" damper.

Damper - 12
1100.0 cfm, 12" damper.

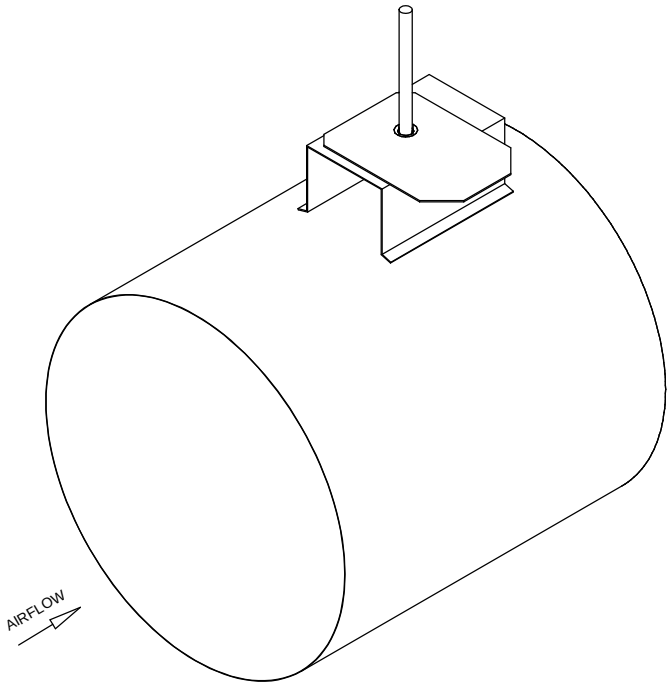
Damper - 16
2000.0 cfm, 16" damper.

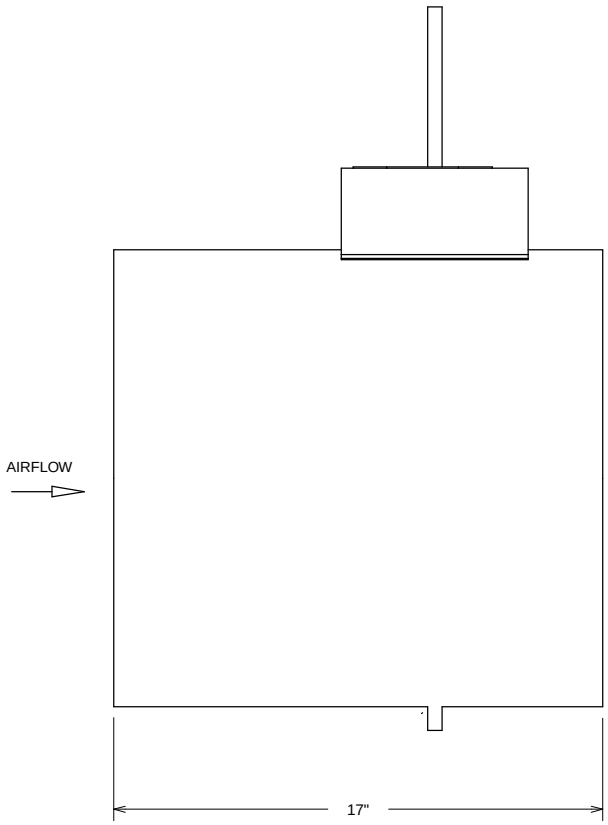
None
Stand off w/mounting plank. No Actuator.

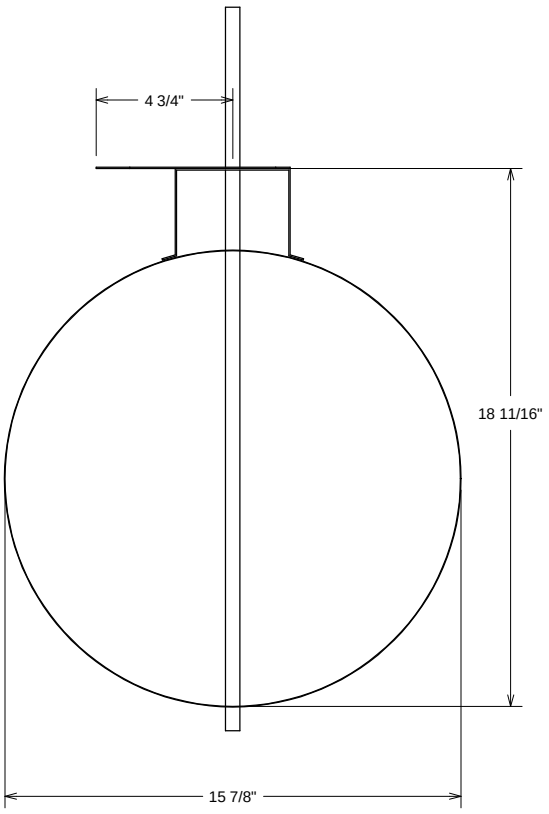
Unit Dimensions - Variable Air Volume Changeover/Bypass Units
Item: A1 Qty: 4

Approximate Dry Weight	12.0 lb

Weights reflected may vary ±5.0 lb based upon options selected.



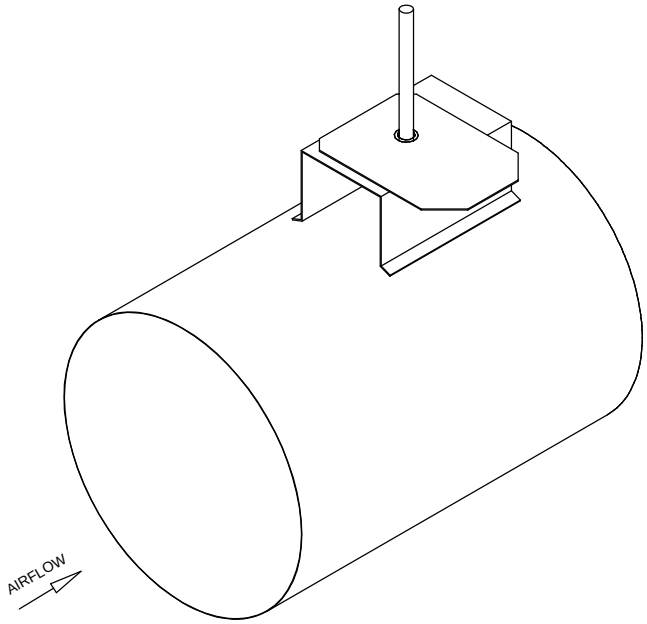


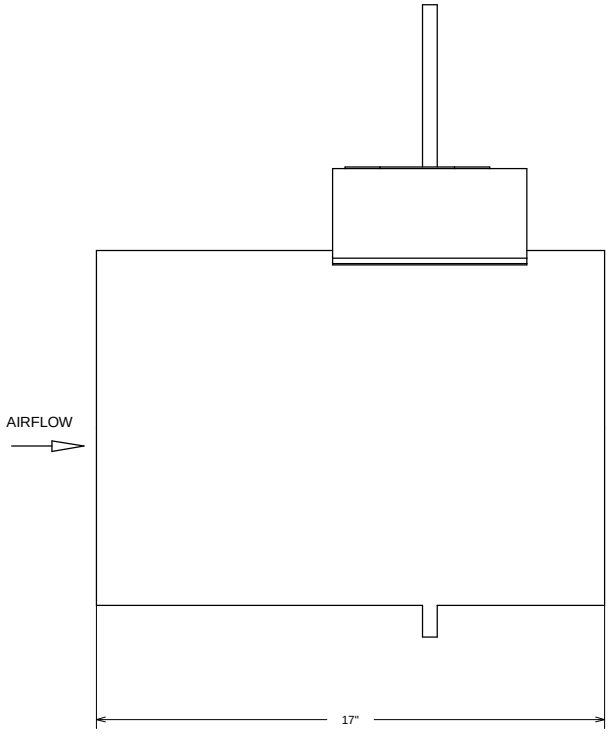


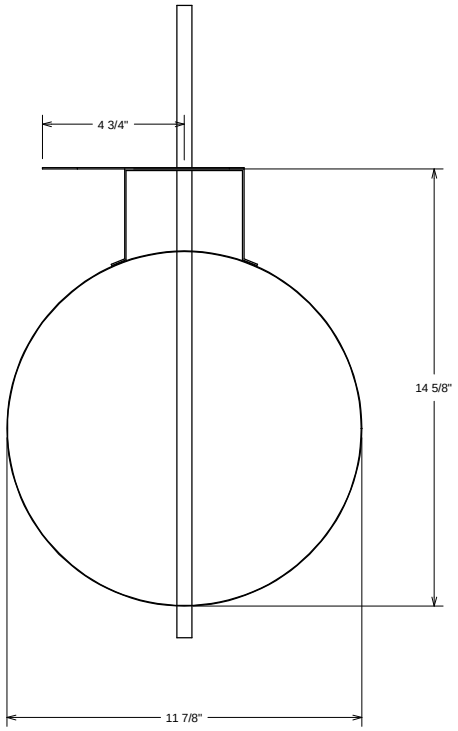
Unit Dimensions - Variable Air Volume Changeover/Bypass Units
Item: A2 Qty: 2

Approximate Dry Weight	9.0 lb

Weights reflected may vary ±5.0 lb based upon options selected.



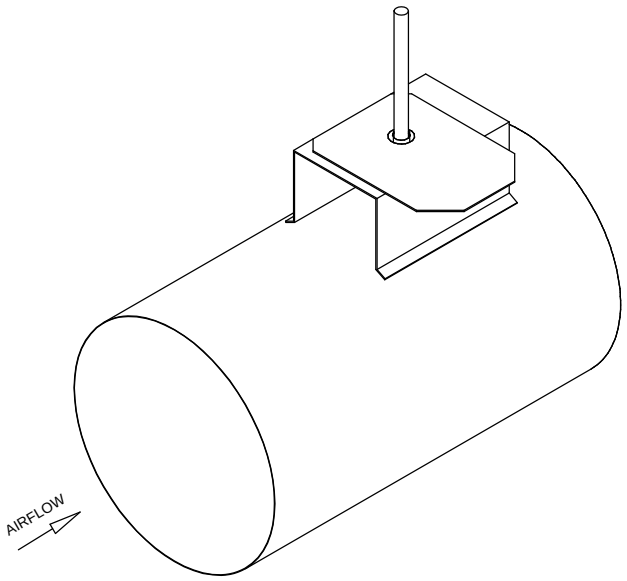


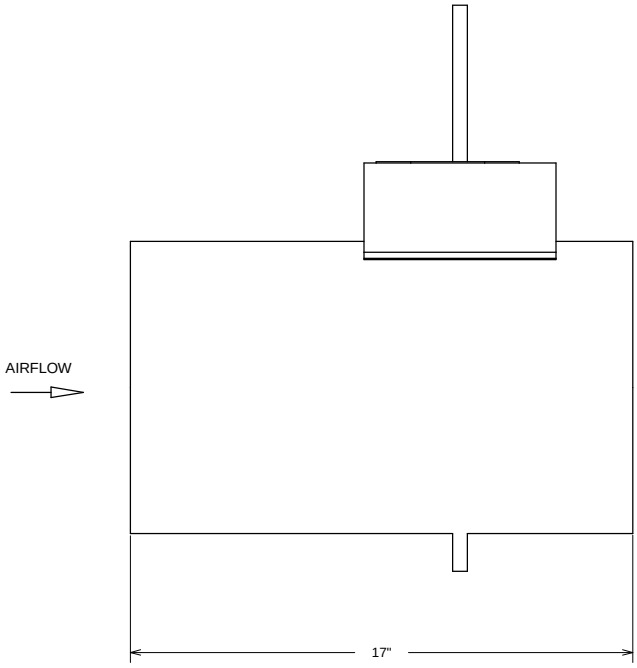


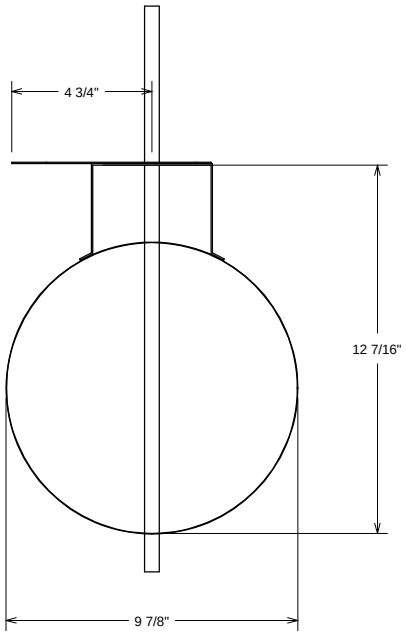
Unit Dimensions - Variable Air Volume Changeover/Bypass Units
Item: A3 Qty: 1

Approximate Dry Weight	8.0 lb

Weights reflected may vary ±5.0 lb based upon options selected.



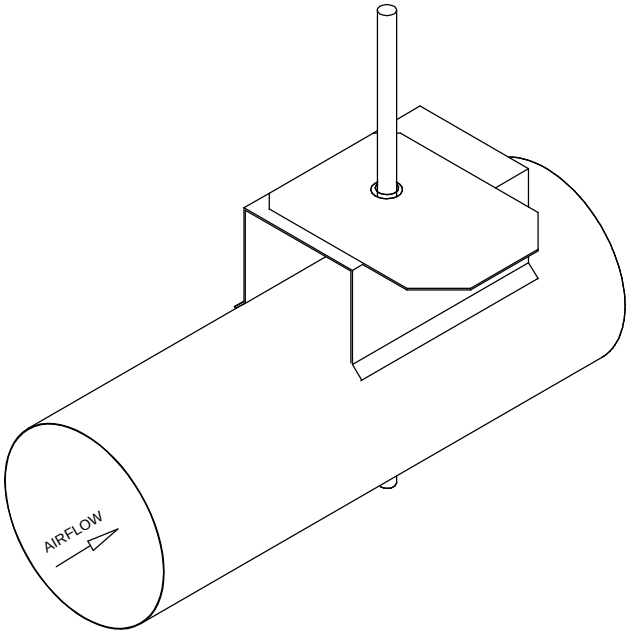


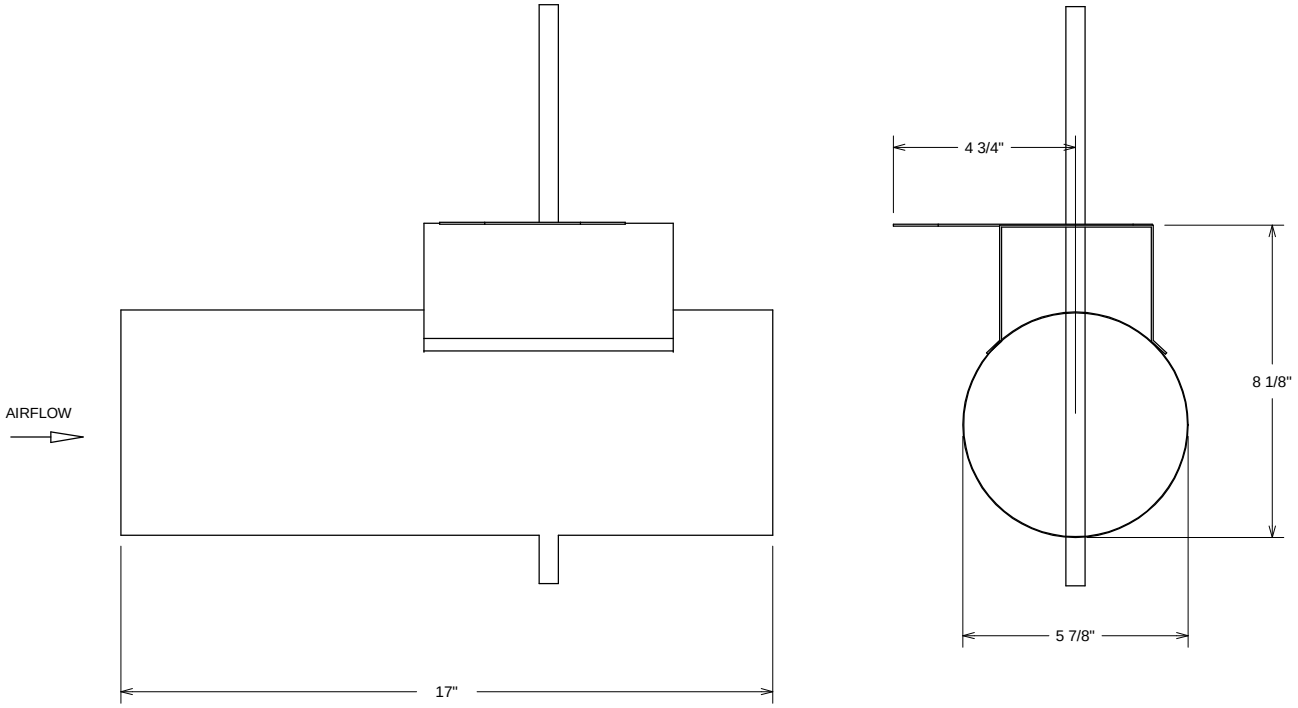


Unit Dimensions - Variable Air Volume Changeover/Bypass Units
Item: A4 Qty: 2

Approximate Dry Weight	6.0 lb

Weights reflected may vary ±5.0 lb based upon options selected.





Submittal

Trane U.S. Inc.

Date: January 22, 2014

Prepared For:
Johnson & Jordan Inc
18 Mussey Road
Scarborough, ME 04074
Customer P.O. Number: 189992
Customer Project Number: 13431

Job Name:
Portland Public Library MHS
1000 Riverside Street
Portland, ME 04103
Job Number: A223468

Trane is pleased to provide the enclosed submittal for your review and approval.

EVERGY RECOVERY UNIT

Notes:

- *Provide equipment tag when known*
- *120v/1ph*
- *Not included: Controls, dampers or accessories*

Dan Broderick
Trane U.S. Inc. dba Trane
860 Spring Street, Unit #1
Westbrook, ME 04092-3824
Phone: (207) 828-1777
Fax: (207) 828-1511
E-Mail: djbroderick@trane.com

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

Qty	***Description***	***Tag(s)***
	Energy Recovery Unit	
1	RenewAire Model EV200 Energy Recovery Unit - 120v/1ph	

EV200

HVI CERTIFIED

cULus LISTED DUCTED HEAT RECOVERY VENTILATOR 89S5

Indoor Unit

G5 Performance

Airflow CFM	ESP in H20	Temp EFF%	Total EFF% Winter/Summer*
122	0.70	81	77/64
149	0.60	79	75/61
168	0.50	78	73/59
176	0.40	78	72/59
186	0.30	77	72/58
192	0.20	77	71/57
207	0.10	76	70/56

* (See HVI certification report on page 11 for complete certified rating).

Specifications

Ventilation Type: Static Plate, Heat and Humidity Transfer

Typical Airflow Range: 100-200 CFM

Number Motors: One double-shaft motor

V	HZ	Phase	Input Watts	FLA
120	60	Single	157 @ 181 CFM	1.5

Control: On board 24 VAC transformer/relay package with switched dry contacts

Filters: MERV 8, spun polyester media. 10-1/2" x 21-3/4" x 1"

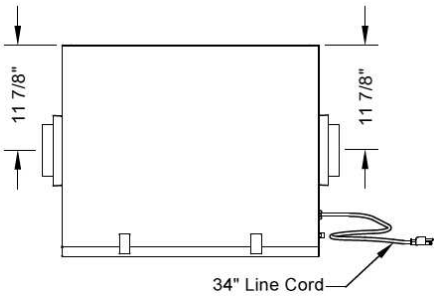
Weight: 70 lbs (unit), 82 lbs (in carton), 125 lbs (on pallet)

Shipping Dimensions: 32"L x 21-1/2"W x 29"H (in carton)
44" L x 34" W x 34" H (on pallet)

~~Controls: PTL – Percentage Timer Control~~
~~FM – Percentage Timer Control with Furnace Interlock~~
~~PBL – Push Button Point-of-Use Controls~~

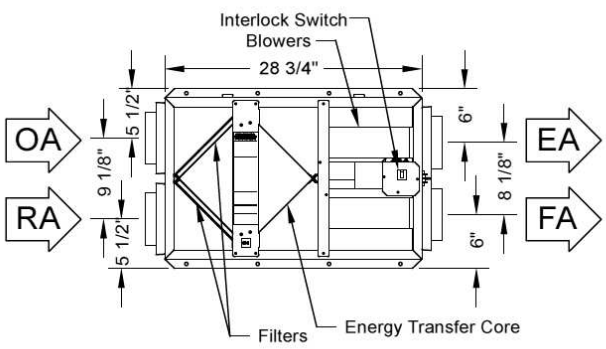
~~Accessories: Wall Caps~~
~~Back Draft Dampers~~

Dimensions

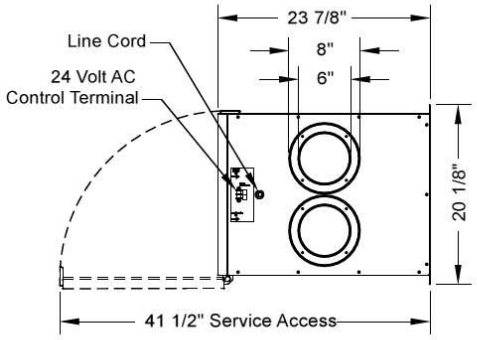


TOP VIEW

EA: Exhaust Air to outdoors
OA: Outdoor Air intake
RA: Room Air to be exhausted
FA: Fresh Air to inside



FRONT VIEW



RIGHT VIEW

RenewAire Energy Recovery Ventilation

RenewAire LLC
4510 Helgesen Drive
Madison, Wisconsin 53718
USA

608.221.4499 telephone
800.627.4499 toll free
608.221.2824 facsimile
www.renewaire.com

Guide Specifications for RenewAire BR70, BR130, EV90, EV90P, GR90, EV130, EV200, EV300 Series Energy Recovery Ventilators

Prepared for the guidance of architects, consulting engineers and mechanical contractors.

Part I - General

A. Product Specification

1. Energy Recovery Ventilator (ERV) shall be a packaged unit as manufactured by RenewAire and shall transfer both heat and humidity using static plate core technology.

B. Quality Assurance

1. The energy recovery ventilator shall be Certified by the Home Ventilating Institute (HVI) under CSA 439. Both a heating and a cooling test must be run to demonstrate year round energy recovery.

2. Manufacturer shall be able to provide evidence of independent testing of the core by Underwriters Laboratory (UL), verifying a maximum flame spread index (FSI) of 25 and a maximum smoke developed index (SDI) of 50 thereby meeting NFPA 90A and NFPA 90B requirements for materials in a compartment handling air intended for circulation through a duct system. The method of test shall be UL Standard 723.

3. Unit shall be Listed under UL 1812 Standard for Ducted Air to Air Heat Exchangers. The unit must pass commercial flammability requirements and shall not be labeled “For Residential Use Only”.

4. The ERV core shall be warranted to be free of manufacturing defects and to retain its functional characteristics, under circumstances of normal use, for a period of ten years from the date of purchase. The balance-of-unit shall be warranted to be free of manufacturing defects and to retain its functional characteristics, under circumstances of normal use, for a period of five years from the date of purchase.

Part II – Performance

A. Energy Transfer

The ERV shall be capable of transferring both sensible and latent energy between airstreams. Latent energy transfer shall be accomplished by direct water vapor transfer from one airstream to the other, without exposing transfer media in succeeding cycles directly to the exhaust air and then to the fresh air.

B. Passive Frost Control

The ERV core shall perform without condensing or frosting under normal operating conditions (defined as outside temperatures above -10°F and inside relative humidity below 40%). Occasional more extreme conditions shall not affect the usual function, performance or durability of the core. No condensate drains will be allowed.

C. Continuous Ventilation

Unit shall have the capacity to operate continuously without the need for bypass, recirculation, pre-heaters, or defrost cycles under normal operating conditions.

D. Positive Airstream Separation

Water vapor transfer shall be through molecular transport by hydroscopic resin and shall not be accomplished by “porous plate” mechanisms. Exhaust and fresh airstreams shall travel at all times in separate passages, and airstreams shall not mix.

RenewAire LLC
4510 Helgesen Drive
Madison, Wisconsin 53718
USA

608.221.4499 telephone
800.627.4499 toll free
608.221.2824 facsimile
www.renewaire.com

E. Laminar Flow

Airflow through the ERV core shall be laminar over the products entire operating airflow range, avoiding deposition of particulates on the interior of the energy exchange plate material.

Part III – Product

A. Construction

1. The energy recovery component shall be of fixed-plate cross-flow construction, with no moving parts.
2. No condensate drain pans or drains shall be allowed and unit shall be capable of operating in both winter and summer conditions without generating condensate.
3. The unit case shall be constructed of 24-gauge steel, with lapped corners and zinc plated screw fasteners. The case shall be finished with textured, powder coat paint (GR90 case shall be constructed of G90 galvanized steel.)
4. Access doors shall provide easy access to blowers, ERV cores, and filters. Doors shall have an airtight compression seal using closed cell foam gaskets.
5. Case walls and doors shall be fully insulated with 1 inch, expanded polystyrene foam insulation faced with a cleanable foil face on all exposed surfaces.
6. The ERV cores shall be protected by a MERV-8 rated, spun polyester, disposable filter in both airstreams.
7. The unit shall have a line-cord power connection and be supplied with an internal 24 VAC transformer and relay (G90 shall have hardwired line voltage connection and be controlled by line voltage controls provided by others.)
8. Standby power draw shall not exceed 1 Watt for the unit along with an optional automatic control.

Submittal

Trane U.S. Inc.

Date: January 21, 2014

Prepared For:
Johnson & Jordan Inc
18 Mussey Road
Scarborough, ME 04074
Customer P.O. Number: 189992
Customer Project Number: 13431

Job Name:
Portland Public Library MHS
1000 Riverside Street
Portland, ME 04103
Job Number: A223468

Trane is pleased to provide the enclosed submittal for your review and approval.

GAS UNIT HEATER

Notes:
- *Natural gas*
- *Not included: Thermostat, hanging rods/isolators*

Dan Broderick
Trane U.S. Inc. dba Trane
860 Spring Street, Unit #1
Westbrook, ME 04092-3824
Phone: (207) 828-1777
Fax: (207) 828-1511
E-Mail: djbroderick@trane.com

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

Qty	***Description***	***Tag(s)***
	Gas Unit Heater	
1	Trane Model GTNE003A Tubular Heat Exchanger Unit Heater	

Tag Data - Indoor Gas Heating Products (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	No Tag	1	GTNE003A	GTNE003ATA

Product Data - Indoor Gas Heating Products

Item: A1 Qty: 1

Tubular heat exchanger unit heater
Natural gas
30 MBH input
115/60/1 main power supply
Single stage, direct spark ignition
Aluminized steel heat exchanger
Open Drip Proof (ODP) motor

Mechanical Specifications - Indoor Gas Heating Products
Item: A1 Qty: 1

General - Separated Combustion T
Unit is completely factory assembled, piped, wired, and test fired. Unit is ETL Certified for residential, commercial and industrial installations, and conforms with the latest ANSI Z83.8/CSA 2.6 Standards for safe and efficient performance. Unit is provided with four point suspension hangers.

Casing T
Casing is die-formed, 20 gauge [1.0 mm] cold rolled steel and finished in baked enamel. The bottom panel is easily removed to provide service access to the burners, direct spark ignition and orifices. Unit provided with independently adjustable horizontal louvers with stops to prevent total closure.

Tubular Heat Exchanger-Aluminized steel
Heat exchanger construction consists of 20 gauge aluminized steel tubes. Tubes shall be of a curved, non-welded serpentine design. Unit shall have a minimum of 82% thermal efficiency.

Flue Collector- Aluminized steel
Flue Collector construction is corrosion resistant aluminized steel.

Fan - Propeller
Fan blades are constructed of aluminum with an aerodynamic contour. All fans are dynamically balanced for quiet, efficient operation and supplied with a protective type fan guard. Rubber-in-shear isolators provide isolation between the fan/motor combination and the unit heater casing.

Unit-115 volt
Unit shall be 115 volt, 60 hertz, single phase

Motor-ODP
Motor is open drip proof with built in thermal overload protection.

Control - Separated Combustion/Hi-Eff Unit Heater
A factory installed junction box is provided for all power connections. Standard unit is provided with a 24-volt combination single-stage redundant gas valve, consisting of a combination, automatic electric gas valve, pressure regulator, and manual shutoff. A flue vent fan relay and combustion air proving switch is also provided. Equipment includes direct spark-ignition with electronic flame supervision. A 24-volt control transformer, high limit and fan time delay relay are provided. The fan time delay relay delays the fan start until the heat exchanger reaches a predetermined temperature. It also allows the fan to operate after burner shutdown, removing residual heat from the heat exchanger.

Performance Data - Indoor Gas Heating Products
Item: A1 Qty: 1

Table 9. Tubular Heat Exchanger performance data—model GTND/GTPD

Unit Size		003	004	006	007	009	011	120	015	017	020	025	030	035	040
Input															
	MBh	30	45	60	75	90	105	120	150	175	200	250	300	350	400
	kW	8.8	13.2	17.6	22.0	26.4	30.8	35.2	43.9	51.2	58.6	73.2	87.8	102.5	117.1
Output															
	MBh	24.9	37.35	49.8	61.5	73.8	86.1	98.4	124.5	145.25	166.0	207.5	249.0	290.5	332.0
	kW	7.2	10.9	14.5	18.0	21.6	25.2	28.8	36.4	42.5	48.6	60.7	72.9	85.1	97.2
Thermal Efficiency		83	83	83	82	82	82	82	83	83	83	83	83	83	83
Free Air Delivery															
	cfm	370	550	740	920	1,100	1,300	1,475	2,400	2,850	3,200	3,450	5,000	5,600	5,800
	m^3/s	0.175	0.260	0.349	0.434	0.519	0.614	0.696	1.133	1.346	1.511	1.629	2.361	2.644	2.738
Air Temperature Rise															
	°F	60	60	60	60	60	60	60	47	46	47	54	45	47	51
	°C	15	15	15	15	15	15	15	26	26	26	30	25	26	28
Full Load Amps at 120V		3.0	3.0	4.1	4.1	6.4	6.4	6.4	5.8	8.0	8.0	8.0	11.3	13.5	13.5
Motor Data															
	hp	1/20	1/20	1/12	1/12	1/10	1/10	1/10	1/4	1/3	1/3	1/3	1/4	1/3	1/3
	kW	0.04	0.04	0.06	0.06	0.075	0.075	0.075	0.19	0.25	0.25	0.25	0.19	0.25	0.25
	Type	SP	SP	SP	SP	SP	SP	SP	PSC	PSC	PSC	PSC	PSC	PSC	PSC
	rpm	1,650	1,650	1,050	1,050	1,050	1,050	1,050	1,140	1,140	1,140	1,140	1,140	1,140	1,140
	Amps at 115V	1.9	1.9	2.6	2.6	4.2	4.2	4.2	4.7	5.8	5.8	5.8	9.4	11.6	11.6

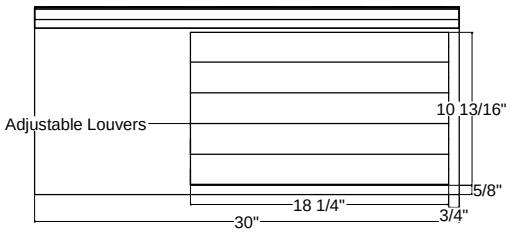
Notes:

1. Ratings are shown for elevations up to 2,000 feet above sea level. Above 2,000 feet, input must be derated 4 percent for each 1,000 feet above sea level.
2. CS = Capacitor Start; SPH = Split Capacitor
3. Standard motors are 115/60/1 open drip-proof.
4. 0.2 maximum external static pressure.
5. Unit amps are based on hot surface pilot ignition.

Unit Dimensions - Indoor Gas Heating Products
Item: A1 Qty: 1

CLEARANCE	SIDE	TOP	BTM	CTL/BOX	FAN	FLUE
GT	1"	1"	1"	1"	18"	1"

MBH	WEIGHT
30	60.0 lb



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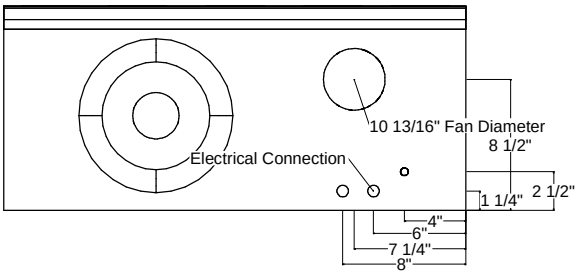

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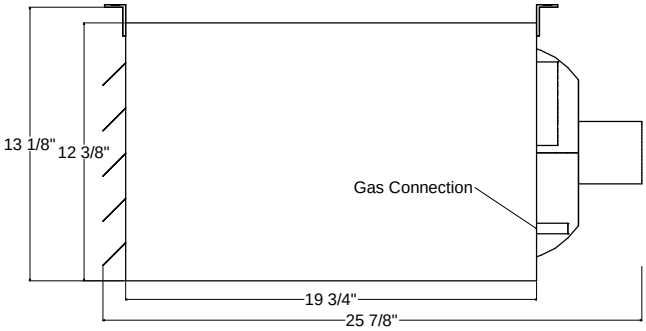

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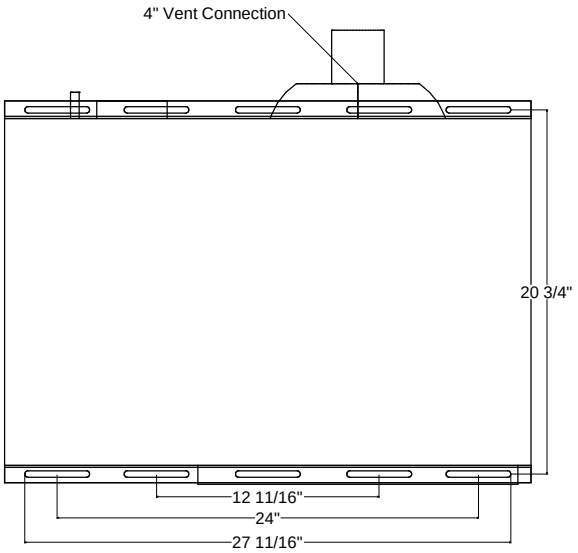


TOP

Submittal

Trane U.S. Inc.

Date: January 22, 2014

Prepared For:
Johnson & Jordan Inc
18 Mussey Road
Scarborough, ME 04074
Customer P.O. Number: 189992
Customer Project Number: 13431

Job Name:
Portland Public Library MHS
1000 Riverside Street
Portland, ME 04103
Job Number: A223468

Trane is pleased to provide the enclosed submittal for your review and approval.

MINI SPLIT HEAT PUMP

Notes:

- *Provide equipment tag when known*
- *208v/1ph*
- *Not included:* ***Line sets*** *or accessories* ***other than listed***

Dan Broderick
Trane U.S. Inc. dba Trane
860 Spring Street, Unit #1
Westbrook, ME 04092-3824
Phone: (207) 828-1777
Fax: (207) 828-1511
E-Mail: djbroderick@trane.com

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

Qty	***Description***	***Tag(s)***
	Mini-Split Heat Pump	
1	LG Model LSU307HV3 Heat Pump Condensing Unit	
1	LG Model LSN307HV3 High Wall Heat Pump	

- 208v/1ph
- Wired programmable thermostat PREMTB10U
- Low ambient Wind baffle to 0°F

Job Name/Location: Portland Public Library MHS - 1000 Riverside **Tag #:**

Date: For: ☐ File ☐ Resubmit

PO No.: ☐ Approval ☐ Other

Architect: GC:

Engr: Mech:

Rep:
(Company) (Project Manager)

LS307HV3

Standard Single Zone Inverter

Outdoor Unit (ODU)-LSU307HV3 Indoor Unit (IDU)-LSN307HV3

LG Life's Good

Performance:

Cooling:

Capacity (Btu/h)	30,000
SEER	18.0
EER	10.0

SEER - Seasonal Energy Efficiency Ratio EER - Energy Efficiency Ratio

Heating:

Capacity (Btu/h)	32,000
HSPF	9.5

HSPF - Heating Seasonal Performance Factor

Cooling Nominal Test Conditions:
Indoor: 80°F DB/67°F WB
Outdoor: 95°F DB/75°F W

Heating Nominal Test Conditions:
Indoor: 70°F DB/60°F WB
Outdoor: 47°F DB/43°F WB

Electrical:

Power Supply (V'/Hz/Ø)	208-230/60/1

Outdoor Unit:

MOP (A)	25
MCA (A)	19
Cooling Rated Amps (A)	15.4
Heating Rated Amps (A)	15.4
Compressor (A)	14.6
Fan Motor (A)	0.25

MOP - Maximum Overcurrent Protection MCA - Minimum Circuit Ampacity

Total Power Input:

Cooling Power Input (kW)	3.0
Heating Power Input (kW)	3.1

Piping:

Liquid Line (in, OD)	3/8
Vapor Line (in, OD)	5/8
Additional Refrigerant (oz/ft)	0.38
Max Pipe Length (ft)[2]	98.4
Piping Length (no add'l refrigerant, ft)	24.6
Max Elevation (ft)	49.2

Controls Features:

- 24-Hour on/off timer
- Auto changeover
- Auto restart
- Auto sleep mode
- Built-in low ambient standard, down to 14°F (cooling mode)
- Chaos swing
- Condensate Sensor Connection
- Defrost control
- Energy saving
- Evaporator frost control
- Inverter (variable speed compressor)
- Jet cool/Jet heat
- Manual power switch
- 3M HAF Filter
- Self-cleaning indoor coil
- Temperature display on indoor unit
- Cooling only function

Optional Accessories:

- ☑ LG Programmable Thermostat - PREMTB10U
- ☐ Dry Contact for third party thermostat - PQDSBNGCM1
- ☑ Low Ambient Wind Baffle (Cooling operation to 0°F) - ZLABGP02A
- ☐ PI-485 - PMNFP14A0

Operating Range:

Outdoor Unit:

Cooling (°F DB)	14-118
Heating (°F WB)	-4-75

Indoor Unit:

Cooling (°F WB)	64-90
Heating (°F DB)	60-86

Unit Data:

Refrigerant Type	R410A
Refrigerant Control	EEV
Refrigerant Charge (lbs)	4.41
ODU Sound Pressure Max (±3 dB(A))[3]	55
IDU Sound Pressure (H/M/L) (±3 dB(A))[3]	49/44/39
ODU Net Weight (lbs)	128
ODU Shipping Weight (lbs)	137
IDU Net Weight (lbs)	36
IDU Shipping Weight (lbs)	42
Heat Exchanger Coating	GoldFin™

Fan:

ODU Type	Propeller
IDU Type	Cross Flow
Fan Speeds (Fan/Cooling/Heating)	4/4/4
Quantity (ODU + IDU)	1 + 1
Motor/Drive	Brushless Digitally Controlled/Direct
ODU Max Air Flow Rate (CFM)	2,119
IDU Air Flow H/M/L (CFM)	770/629/424
Dehumidification (pts/hr)	10.6

Notes:

1. Acceptable operating voltage: 187V - 253V.
2. Piping lengths are equivalent.
3. Sound Pressure levels are tested in an anechoic chamber under ISO Standard 1996.
4. All communication/power cable to be minimum 18 AWG, 4-conductor, stranded, shielded and must comply with applicable local and national code.
5. See Engineering Manual for sensible and latent capacities.
6. Power wiring cable size must comply with the applicable local and national code.
7. The indoor unit comes with a dry helium charge.
8. This data is rated 0 ft above sea level, with 24.6 ft of refrigerant line and a 0 ft level difference between outdoor and indoor units.
9. Must follow installation instructions in the applicable LG installation manual.

Intertek

Inverter

AHRI CERTIFIED™ www.ahridirectory.org
Unitary Small AC
AHRI Standard 210/240
Certification applies only when the complete system is listed with AHRI.

For continual product development, LG reserves the right to change specifications without notice.

Job Name/Location: Portland Public Library MHS - 1000 Riverside

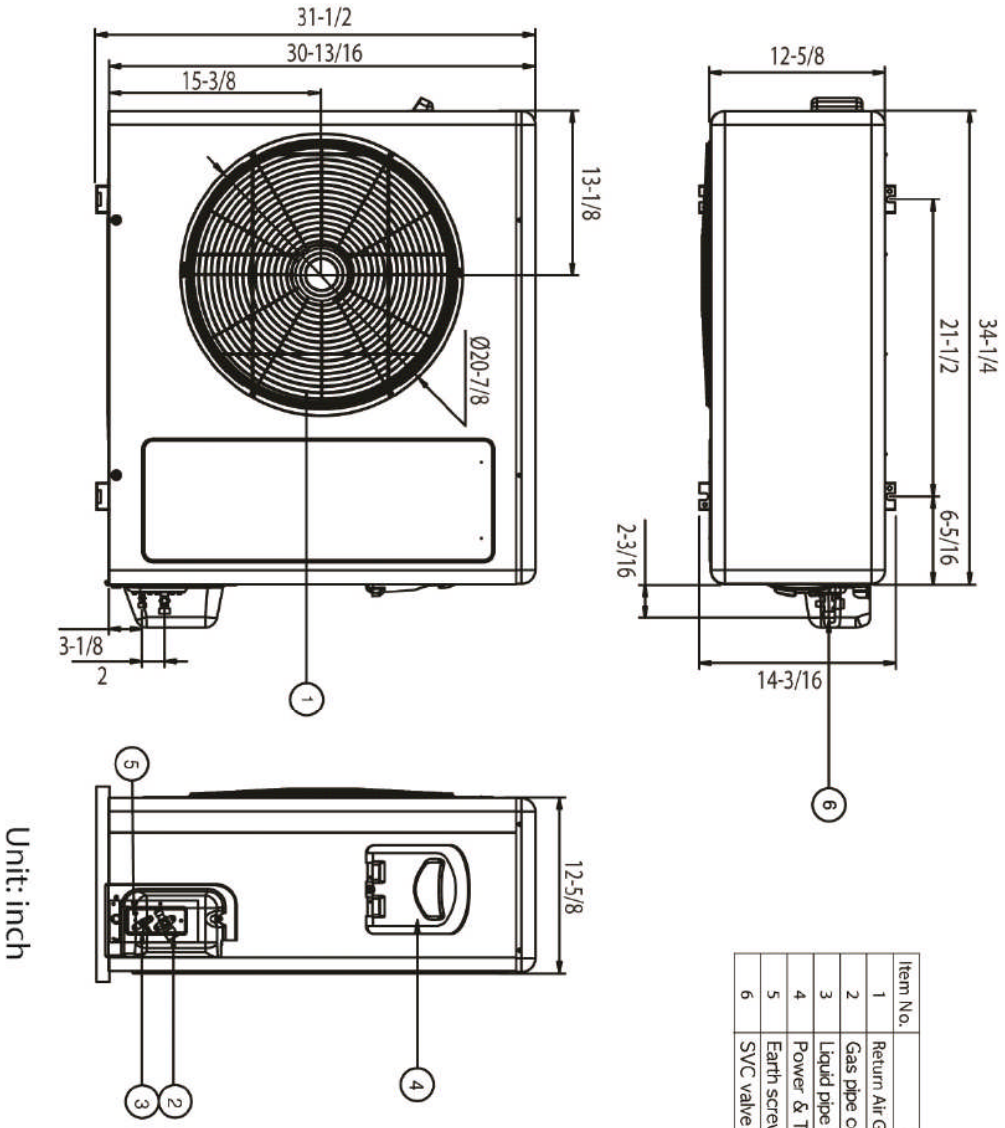
Outdoor Unit (ODU)-LSU307HV3
Standard Single Zone Inverter

LG Life's Good

Tag #:

Date:

PO No.:



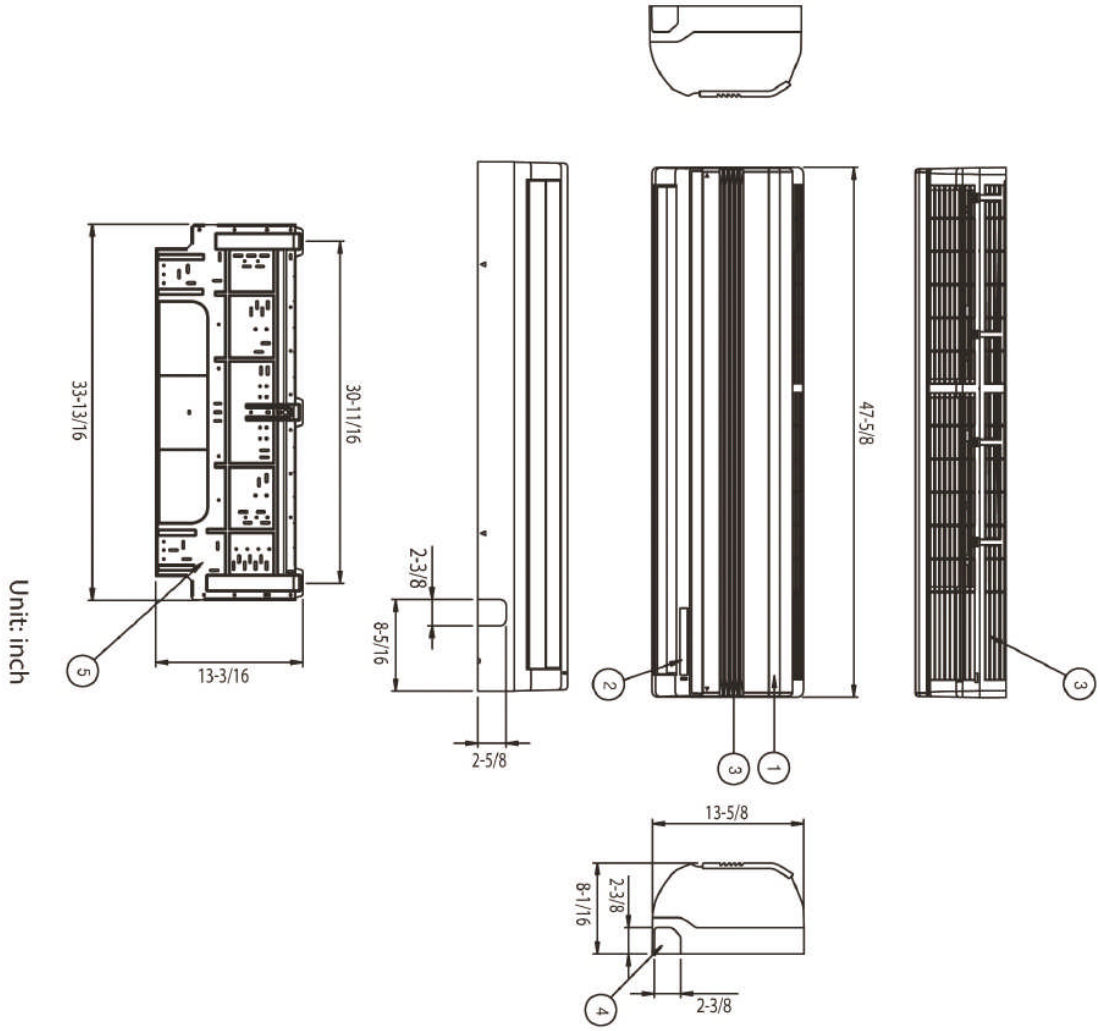
Unit: inch

Item No.	Part Name	Remarks
1	Return Air Grille	
2	Gas pipe connection	
3	Liquid pipe connection	
4	Power & Transmission connection	
5	Earth screw	
6	SVC valve cover	

Indoor Unit (IDU)-LSN307HV3
Standard Single Zone Inverter

LG Life's Good

Tag #:
Date:
PO No.:



Item No.	Part Name	Remarks
1	Front panel	
2	Display & signal receiver	
3	Return Air Grille	
4	Knockout hole	For pipe and cable
5	Installation plate	

Job Name/Location: Portland Public Library MHS - 1000 Riverside **Tag #:**

Date:

PO No.:

For: ☐ File ☐ Resubmit ☐ Approval ☐ Other

Architect: GC:

Engr: Mech:

Rep:

(Company) (Project Manager)

PREMTB10U

LG Programmable Thermostat

LG Life's Good

Electrical:

Power Supply	Powered from indoor unit

Surrounding Conditions:

Operating Temperature	-4-158 °F
Storage Temperature	-4-176 °F
Humidity	0-90% (non-condensing)

Unit Data:

Dimensions	4-3/4" W x 4-3/4" H x 5/8" D
Maximum Number of Indoor Units (per controller)	16
Maximum Number of Controllers (per group)	2

Standard Features:

- 4-1/4" Backlit LCD
- Clock

Basic Functions:

- Room temperature display
- Operation - On/Off
- Mode - Auto/Cool/Dry/Heat/Fan Only (for AC unit)
- Ventilation mode (for ventilator unit)
- Occupied cooling and heating temperature setpoints
- Unoccupied cooling and heating setback temperature setpoints
- Fan speed - Auto/Low/Med/High/Power
- Discharge vanes - Auto/Swing/Fixed[1]
- Controller lock function
- Static pressure setting
- Function setting for plasma filter, electric heat, humidifier, elevation grille, ventilation kit, and auxiliary heat option
- Error code display during unit or system malfunction
- Power failure compensation (48 hours)

Advanced Functions:

- 7-day programmable schedule, 5 events per day with control of occ/unocc, on/off, mode, setpoints, and fan speed
- Two setpoint autochangeover
- Minimum difference between setpoints (0-10°F)
- Setback button
- Timed override button

Notes:

1.Model specific, not available on all models.
2.Communication cable can be extended to a maximum of 164 feet by using the Wired Remote Group Control Cable Assembly (PZCWRCG3) or Wired Remote Extension Cable (PZWRC1), maximum of 4.
3.Must follow installation instructions in the applicable LG installation manual.

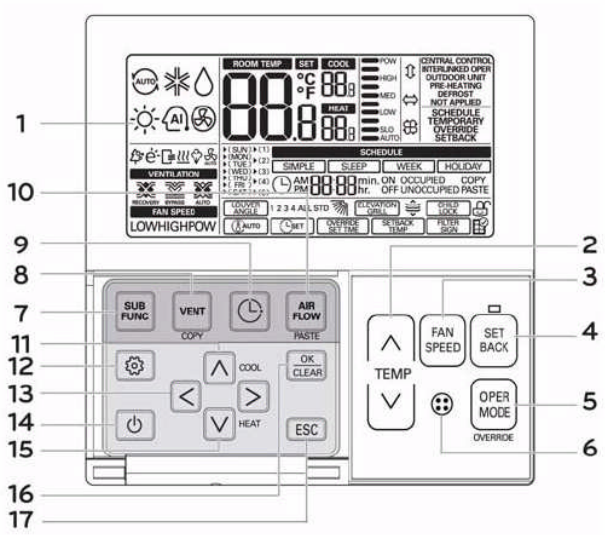
Connectivity:

LG Communications	1 Channel/RS-485 V-Net

Communications Cabling Specifications (V-Net):

Type	Included
Size	AWG 24-3
Length[2]	32 ft

AWG - American Wire Gage



1	Operation indication screen	10	Air flow button
2	Set temperature button	11	Cooling desired temperature
3	Fan Speed button	12	Function setting button
4	Set back button	13	Up, Down, Left, Right button
5	Operation mode[1] selection	14	On/Off button
6	Wireless remote controller	15	Heating desired temperature
7	Sub function button	16	Setting/Cancel button
8	Ventilation button	17	Exit button
9	Reservation button		

For continual product development, LG reserves the right to change specifications without notice.

Job Name/Location: Portland Public Library MHS - 1000 Riverside **Tag #:**

Date:

PO No.:

For: ☐ File ☐ Resubmit ☐ Approval ☐ Other

Architect: GC:

Engr: Mech:

Rep:
(Company) (Project Manager)

Exclusively distributed by:
Washington Metal Fabricators

ZLABGP02A
Low Ambient Wind Baffle Kit

Unit Data:

Net Unit Weight (lbs)	5
Shipping Weight (lbs)	8
Dimensions	23-5/8" x 23-5/8" x 7-15/16"

Fitting Properties:

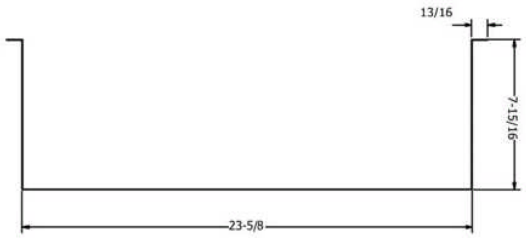
Color	Soft Dove Grey
Material	20 GA Paint Grip

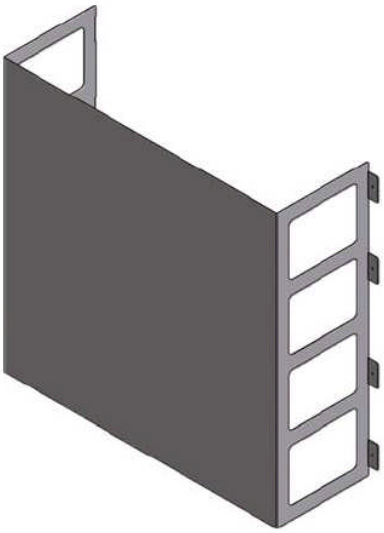
Compatible Outdoor Units:

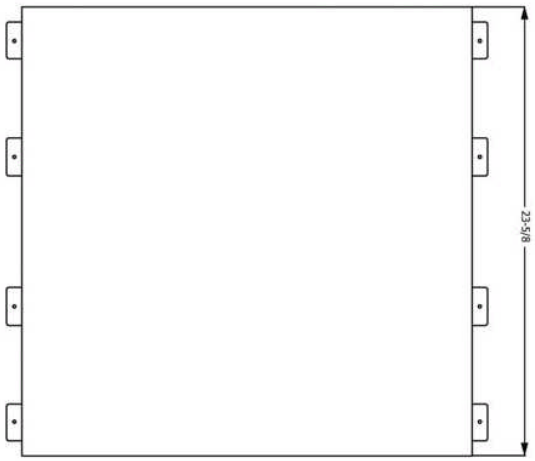
LSU181HSV2
LSU240HSV2
LSU307HV2
LSU360HV2

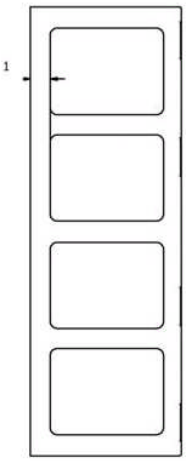
Standard Features:

- Compatible with Standard Inverter wall mount systems
- Allows operation down to 0°F in cooling mode
- Compatible outdoor units are equipped with necessary fan speed control
- 8 zinc plated pan head phillips screws #8 x 1/2"









Unit: inch

For continual product development, LG reserves the right to change specifications without notice.