



# Submittal

**Prepared For:**  
All Bidders

**Date:** December 05, 2013

**Customer P.O. Number:**  
**Customer Project Number:**

**Sold To:**

**Job Number:**  
**Job Name:**  
HVAC Services - Rob - 90 Congress

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

## Product Summary

Qty	Product
1	5 Ton R410A PKGD Unitary Gas/Electric Rooftop
2	

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

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## Table Of Contents

<b>Product Summary</b> .....	<b>1</b>
<b>3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop (Item A1)</b> .....	<b>3</b>
Tag Data .....	3
Product Data .....	3
Mechanical Specifications .....	4
Unit Dimensions .....	6
Weight, Clearance & Rigging Diagram.....	9
Accessory .....	11
<b>Field Installed Options - Part/Order Number Summary</b> .....	<b>15</b>
3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop.....	15

**Tag Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop (Qty: 1)**

Item	Tag(s)	Qty	Description	Model Number
A1	No Tag	1	5 Ton R410A PKGD Gas/Electric	YSC060E1RHA--D0010000030000000000

**Product Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop****Item: A1 Qty: 1**

DX cooling, gas heat  
Standard efficiency  
Convertible configuration  
5 Ton  
208-230/60/1  
Microprocessor controls 1ph  
High gas heat 1ph  
Economizer Dry Bulb 0-100% with Barometric Relief  
Standard condenser coil w/hail guard  
Frostat and crankcase heater 1ph  
Roof curb (Fld)

**Mechanical Specifications - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop****Item: A1 Qty: 1****General**

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

**Casing**

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. 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.

Crankcase heaters shall be included on 6-10 ton units.

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.

**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).

**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.

**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

### **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).

### **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.

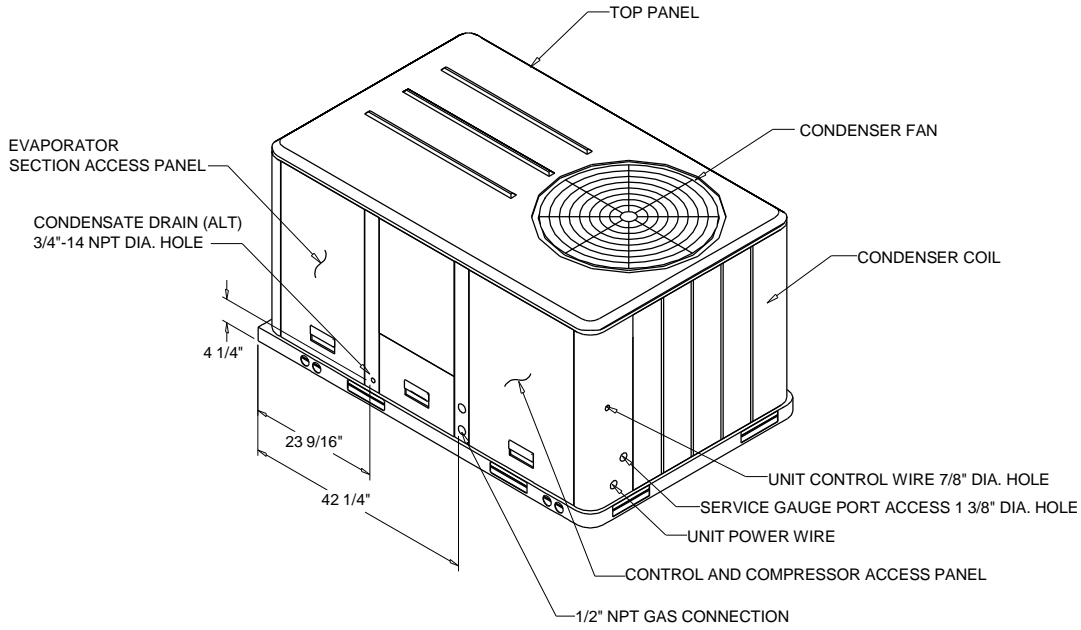
### **Frostat**

This option is to be utilized as a safety device. The Frostat opens when temperatures on the evaporator coil fall below 10°F. The temperature will need to rise to 50°F before closing. This option should be utilized in low airflow or high outside air applications. (Cooling with Electric Heat Only.)

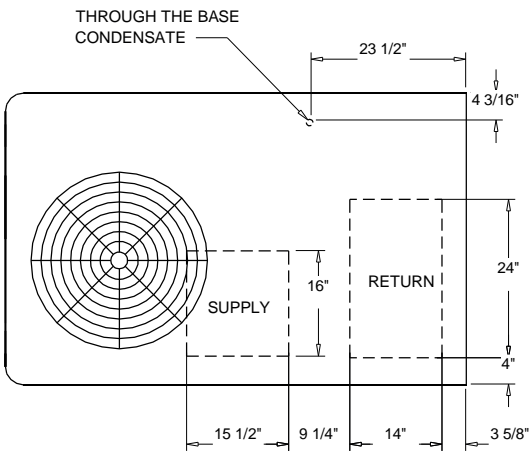
### **Accessory - Roof Curb**

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.

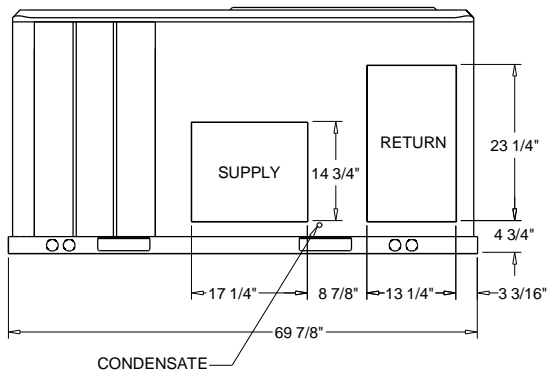
**Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop**  
**Item: A1 Qty: 1**



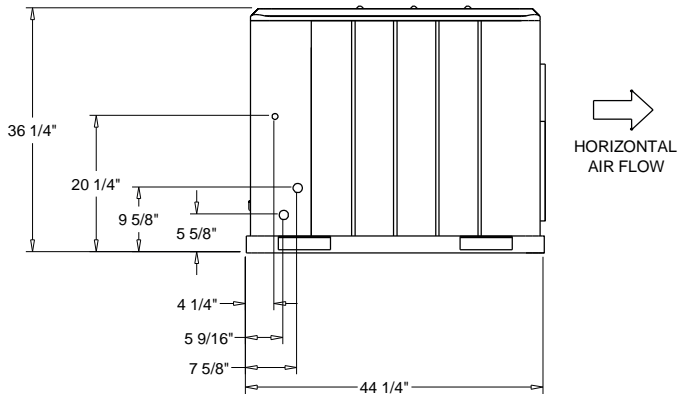
- NOTES:  
 1. THRU -THE -BASE GAS AND ELECTRICAL IS NOT STANDARD ON ALL UNITS.  
 2. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION



PLAN VIEW UNIT  
 DIMENSION DRAWING

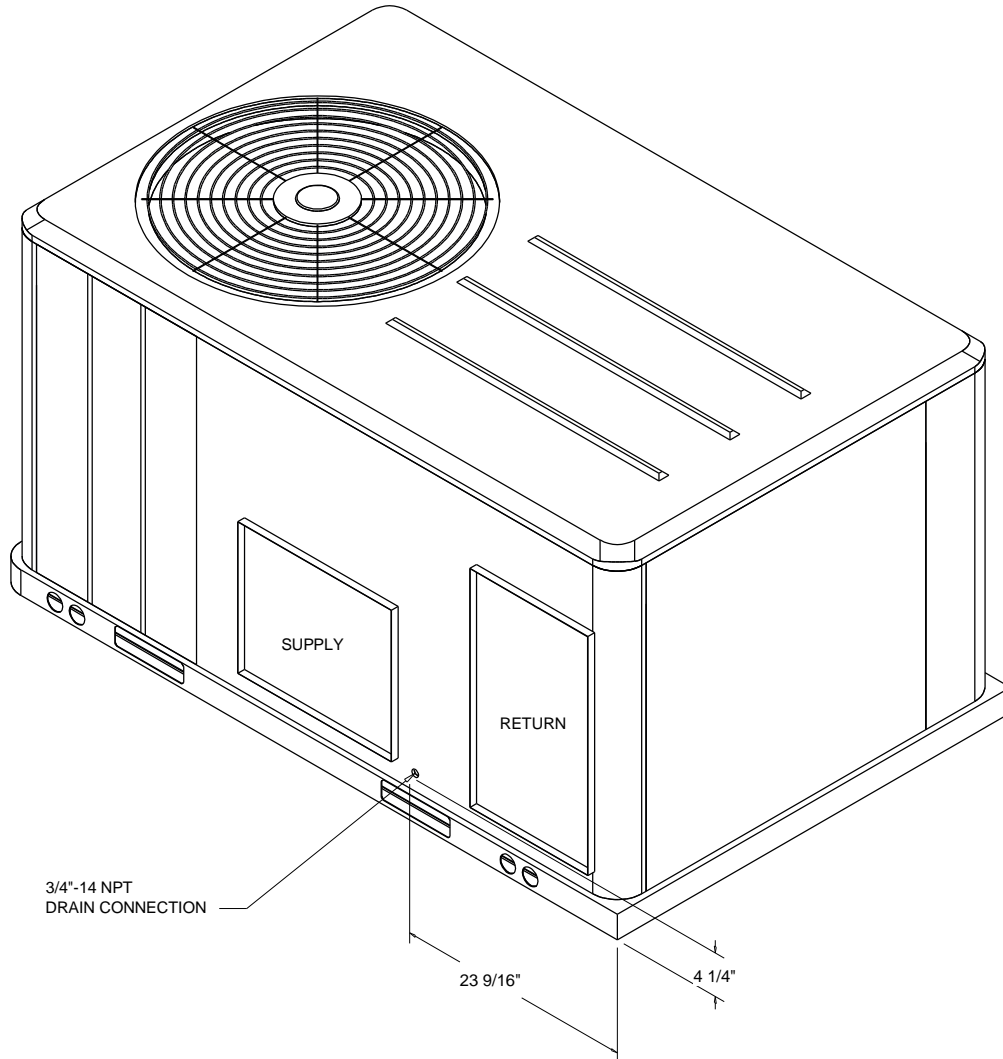


PACKAGED GAS / ELECTRICAL  
 DIMENSION DRAWING



Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop

Item: A1 Qty: 1

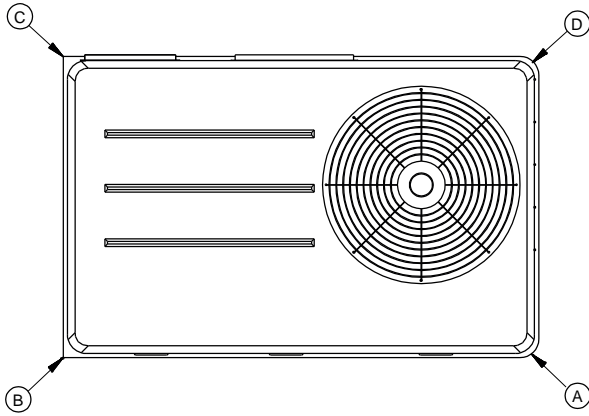


ISOMETRIC-PACKAGED COOLING





**Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop**  
 Item: A1 Qty: 1

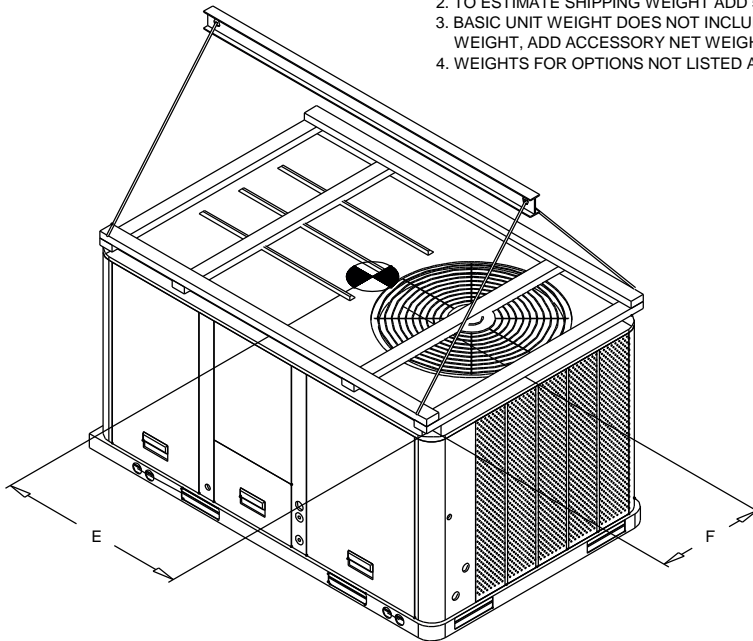


PACKAGED GAS / ELECTRICAL  
 CORNER WEIGHT

**INSTALLED ACCESSORIES NET WEIGHT DATA**

ACCESSORY		WEIGHTS			
ECONOMIZER		26.0 lb			
MOTORIZED OUTSIDE AIR DAMPER					
MANUAL OUTSIDE AIR DAMPER					
BAROMETRIC RELIEF					
OVERSIZED MOTOR					
BELT DRIVE MOTOR					
POWER EXHAUST					
THROUGH THE BASE ELECTRICAL/GAS (FIOPS)					
UNIT MOUNTED CIRCUIT BREAKER (FIOPS)					
UNIT MOUNTED DISCONNECT (FIOPS)					
POWERED CONVENIENCE OUTLET (FIOPS)					
HINGED DOORS (FIOPS)					
HAIL GUARD		12.0 lb			
SMOKE DETECTOR, SUPPLY / RETURN					
NOVAR CONTROL					
STAINLESS STEEL HEAT EXCHANGER					
REHEAT					
ROOF CURB		61.0 lb			
BASIC UNIT WEIGHTS		CORNER WEIGHTS		CENTER OF GRAVITY	
SHIPPING	NET	(A)	(C)	(E) LENGHT	(F) WIDTH
688.0 lb	613.0 lb	(B) 158.0 lb	(D) 155.0 lb	31"	19"

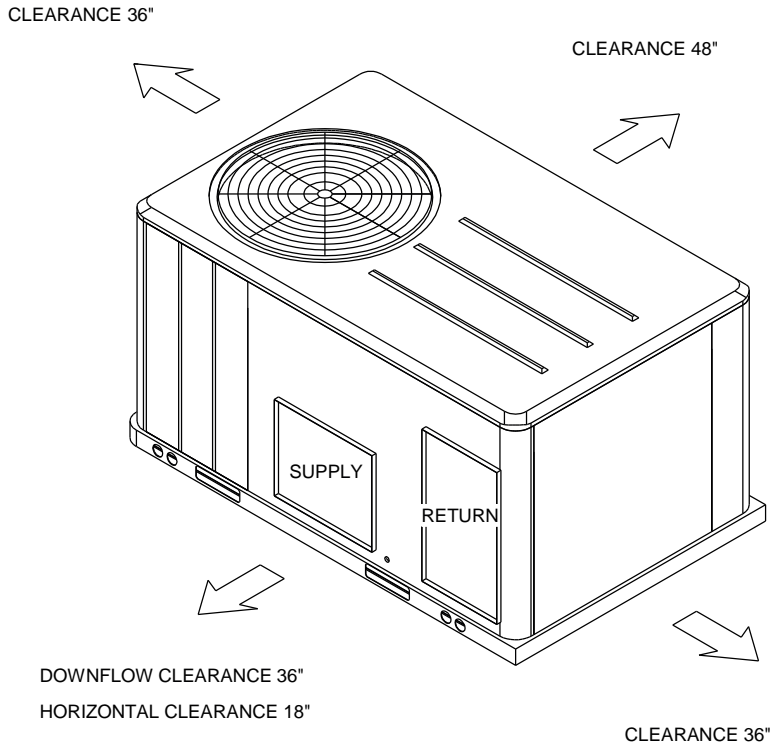
- NOTE:
1. CORNER WEIGHTS ARE GIVEN FOR INFORMATION ONLY.
  2. TO ESTIMATE SHIPPING WEIGHT ADD 5 LBS TO NET WEIGHT.
  3. BASIC UNIT WEIGHT DOES NOT INCLUDE ACCESSORY WEIGHT. TO OBTAIN TOTAL WEIGHT, ADD ACCESSORY NET WEIGHT TO BASIC UNIT WEIGHT.
  4. WEIGHTS FOR OPTIONS NOT LISTED ARE <5 LBS.



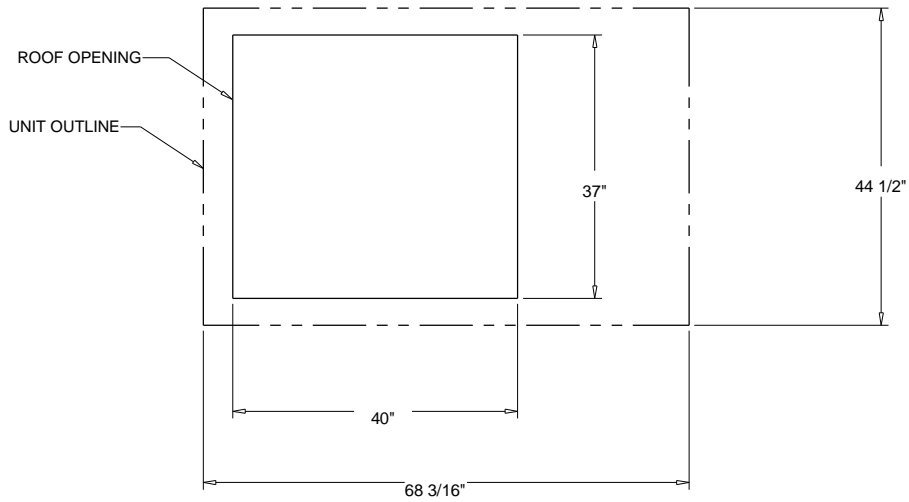
PACKAGED GAS / ELECTRICAL  
 RIGGING AND CENTER OF GRAVITY

**Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop**  
Item: A1 Qty: 1

CLEARANCE FROM TOP OF UNIT 72"

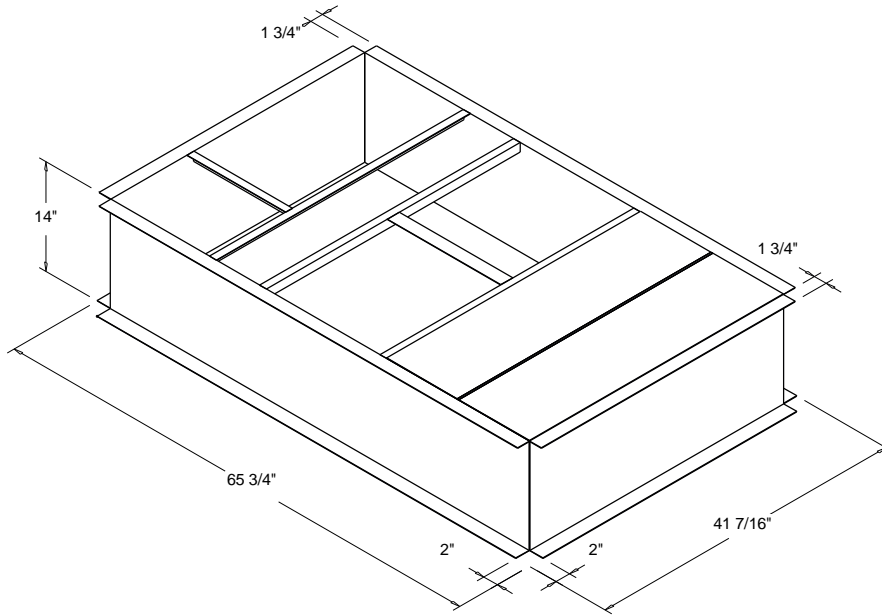


PACKAGED GAS / ELECTRIC  
CLEARANCE

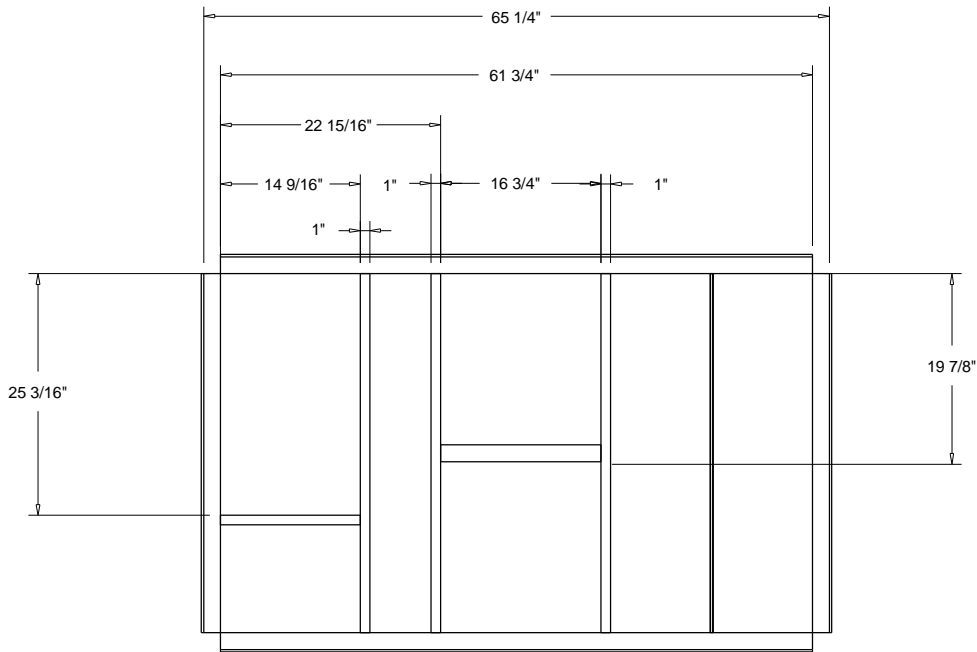


PACKAGED GAS / ELECTRIC  
DOWNFLOW TYPICAL ROOF OPENING

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop  
Item: A1 Qty: 1



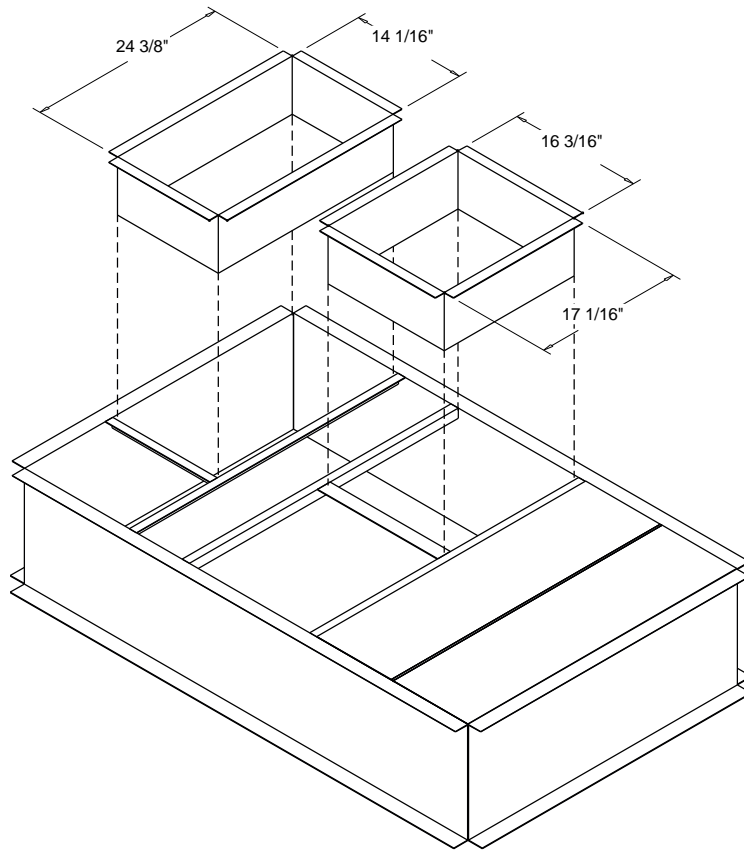
GAS / ELECTRICAL ISOMETRIC ROOF TOP CURB  
ACCESSORY



GAS / ELECTRICAL TOP VIEW ROOF TOP CURB  
ACCESSORY

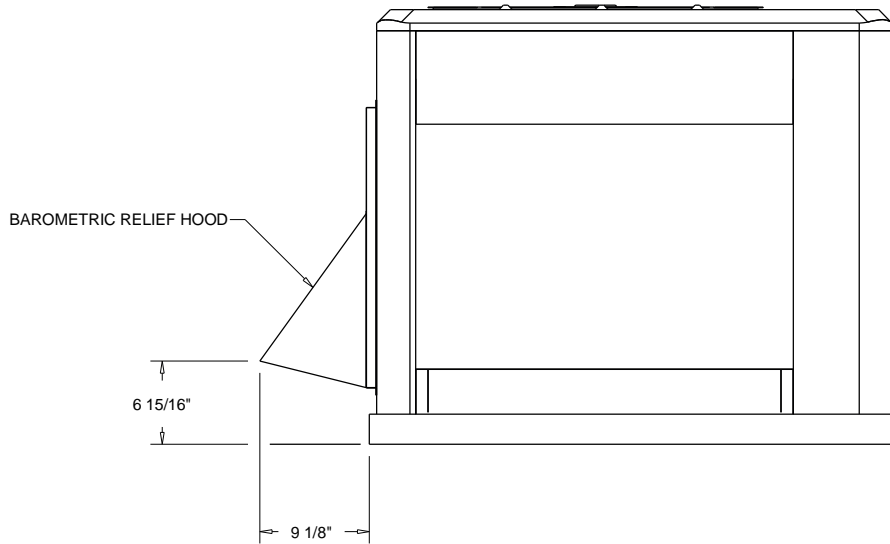
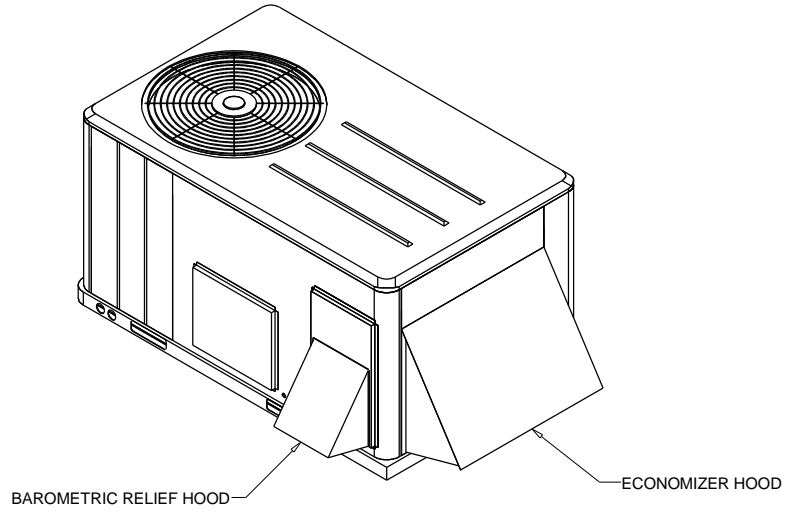
**Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop**  
Item: A1 Qty: 1

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



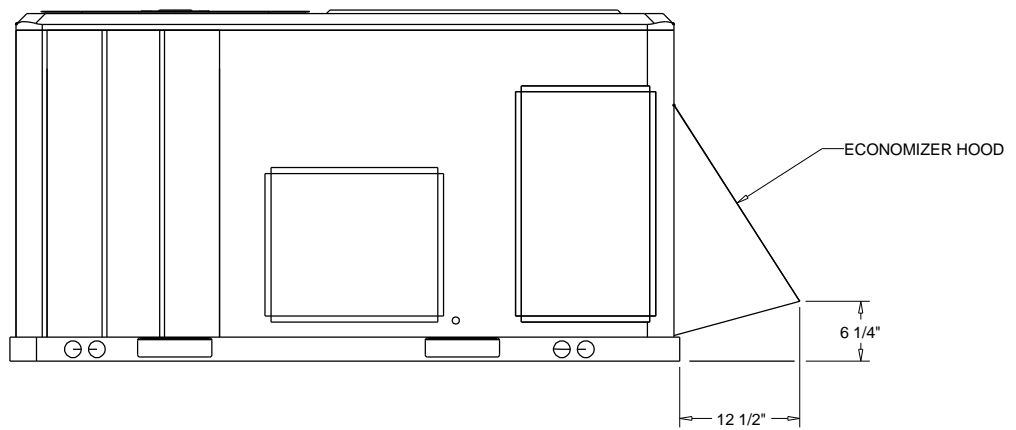
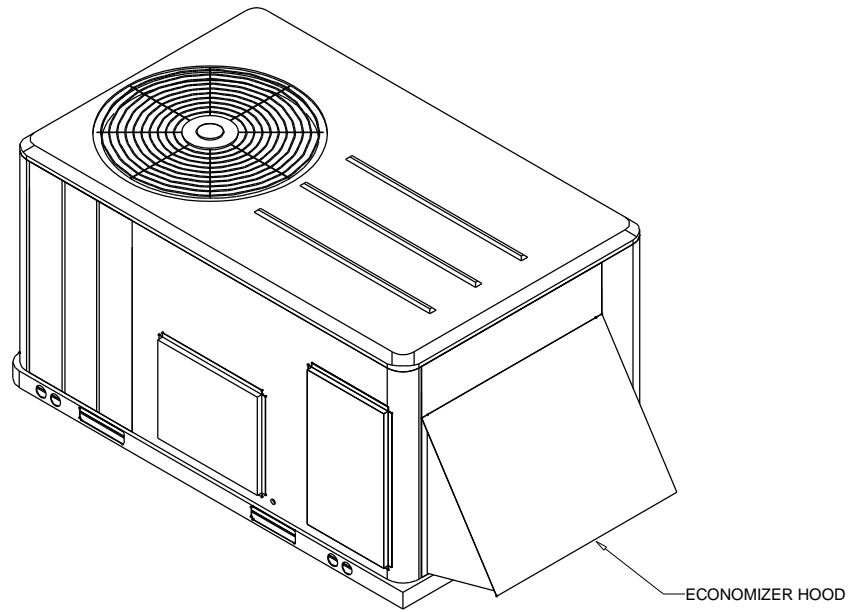
DUCT CONNECTIONS  
ACCESSORY

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop  
Item: A1 Qty: 1



ACCESSORY - BAROMETRIC RELIEF DAMPER HOOD

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop  
Item: A1 Qty: 1



ACCESSORY - ECONOMIZER HOOD

**Field Installed Options - Part/Order Number Summary**

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

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

Item	Tag(s)	Qty	Description	Model Number
A1	No Tag	1	5 Ton R410A PKGD Unitary Gas/Electric	YSC060E1RHA--D 001000003000000 000000000000

Field Installed Option Description	Part/Ordering Number
Roof curb	BAYCURB042A