



Weaver

CONSTRUCTION MANAGEMENT

3679 S Huron Street, Suite 404 Englewood, Colorado 80110

Phone: (303) 789-4111 FAX: (303) 789-4310

SUBMITTAL TRANSMITTAL

August 17, 2012

Submittal No: 15800-019

PROJECT: **Harold Thompson Regional WRF**
Birdsall Rd.
Fountain, CO 80817
Job No. 2908

ENGINEER: **GMS, Inc.**
611 No. Weber St., #300
Colorado Springs, CO 80903
719-475-2935 Roger Sams

OWNER: **Lower Fountain Metropolitan
Sewage Disposal District**
901 S. Santa Fe Ave.
Fountain, CO 80817
719-382-5303 James Heckman

CONTRACTOR: **Kuck Mechanical Contractors, LLC.**
395 West 67th Street
Loveland, CO 80593
970-461-3553 Melanie Peterson

SUBJECT: RTU at the Blower Building - Tag: HC-1

SPEC SECTION: 15800 - Heating & Ventilating

PREVIOUS SUBMISSION DATES:

DEVIATIONS FROM SPEC: ___ YES X NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver Construction Management and, unless indicated otherwise, has been found to be in conformance with the intent of the contract documents.

Contractor's Stamp:

Engineer's Stamp:

Date: 9/17/12

Reviewed by: John Jacob

(x) Reviewed Without Comments

() Reviewed With Comments

ENGINEER'S
COMMENTS:



395 West 67th Street
P.O. Box 388
Loveland, CO 80539-0388
Phone: (970) 461-3553
Fax: (970) 461-3443

DATE: 08/17/12

SENT TO: Weaver General Contractors

Attn: John Jacob

JOB: Harold D. Thompson WRF (#01135)
9001 Birdsell Rd.
Fountain, CO 80817

SUBMITTAL NO.: 00026

SUBMITTAL DUE:

PACKAGE: n/a

VENDOR NAME: Trane

SPECIFICATION #: 15800

SUBJECT: Blower Bldg - RTU

REVIEW DETAILS:

Review #: 1
Desc: Blower Bldg - RTU
Reviewer: John Jacob
Weaver General Contractors

Received: 08/17/12
Sent: 08/17/12
Returned:
Forwarded:

Priority: Normal
Status: Open
Sepias: 0
Prints: 0

Sent for the following action(s):

- For Approval
- For Distribution
- For Your Use/Files
- As Req'd per

Action Needed:

Sincerely,
Melanie Peterson

Kuck Mechanical Contractors
PM Assistant
395 W. 67th Street
Loveland, CO 80538



TRANE®

Submittal

Prepared For:
GMS Inc

Date: August 17, 2012

Customer P.O. Number:
Customer Project Number:

Sold To:
Kuck Mechanical

Job Number:
Job Name:
HDTWRF

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

Product Summary

Qty	Product
1	3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop

NOTES

-Current Lead time is 4 weeks from submittal approval

Troy Rippe
Trane

Phone: 303 228 2855

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

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 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop16

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

Item	Tag(s)	Qty	Description	Model Number
A1	HC-1 Elec Rm	1	3-10 Ton R410A PKGD Unitary Gas/Electric	YHC092F4EHA--D0C100000000

Product Data - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop**Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm**

DX cooling, gas heat
 High efficiency
 Convertible configuration
 7.5 Ton Dual compressor
 Major design sequence
 460/60/3
 Electro mechanical controls 3 ph
 High gas heat 3ph
 Economizer Dry Bulb 0-100% with Barometric Relief
 Hinged panels/2 in pleated filters Merv 8
 Standard condenser coil w/hail guard
 3H/2C Touchscreen, programmable, remote temperature, remote humidity (Fld)

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

Tags	HC-1 Elec Rm
Design Airflow (cfm)	3300
Airflow Application	Horizontal
Elevation (ft)	5420.00
Cooling Entering DB (F)	78.00
Cooling Entering WB (F)	61.00
Ent Air Relative Humidity (%)	40.50
Ambient Temp (F)	95.00
Evap Coil Leaving Air Temp (DB) (F)	57.08
Evap Coil Leaving Air Temp (WB) (F)	51.87
Cooling Leaving Unit DB (F)	58.43
Cooling Leaving Unit WB (F)	52.38
Gross Total Capacity (MBh)	83.31
Gross Sensible Capacity (MBh)	63.17
Gross Latent Capacity (MBh)	20.14
Net Total Capacity (MBh)	79.22
Net Sensible Capacity (MBh)	59.08
Net Sensible Heat Ratio (Number)	0.75
Heating EAT (F)	60.00
Heating LAT (F)	105.10
Heating Delta T (F)	45.10
Input Heating Capacity (MBh)	156.64
Output Heating Capacity (MBh)	125.31
Output Heating Cap. w/Fan (MBh)	129.40
Design ESP (in H2O)	0.800
Component SP (in H2O)	0.220
Field supplied drive kit required	None
Indoor mtr operating power (bhp)	1.48
Indoor RPM (rpm)	1363
Indoor Motor Power (kW)	1.10
Outdoor Motor Power (kW)	0.71
Compressor Power (kW)	6.24
System Power (kW)	8.06
IPLV @ AHRI (IPLV)	14.5
MCA (A)	19.90
MOP (A)	25.00
Compressor 1 RLA (A)	7.10

Tags	HC-1 Elec Rm
Compressor 2 RLA (A)	4.70
Evaporator fan FLA (A)	4.30
Condenser fan FLA (A)	2.00
Evaporator face area (sq ft)	12.36
Evaporator rows (Each)	4.00
Evaporator fin spacing (Per Foot)	192
Evaporator face velocity (ft/min)	267
Min. unit operating weight (lb)	1156.0
Max. unit operating weight (lb)	1388.0
Fan motor heat (MBh)	4.09
Dew Point (F)	48.51
Rated capacity (AHRI) (MBh)	89.00
Exhaust fan power (kW)	0.65
Refrig charge (HFC-410A) - ckt 1 (lb)	5.5
Refrig charge (HFC-410A) - ckt 2 (lb)	4.2
ASHRAE 90.1	Yes
Saturated Suction Temp Circuit 1 (F)	50.18
Saturated Discharge Temp Circuit 1 (F)	115.39
Saturated Suction Temp Circuit 2 (F)	52.12
Saturated Discharge Temp Circuit 2 (F)	112.65
IEER ()	14.50
EER @ AHRI Conditions (EER)	12.6
Total Static Pressure (in H2O)	1.020

Mechanical Specifications - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop**Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm****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.

Two-Inch Pleated Filters

2" pleated media filters shall be available on all models.

Compressors

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

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).

Hinged Access Doors

Sheet metal hinges are available on the Filter/Evaporator, Supply Fan/Heat, and the Compressor/Control Access Doors.

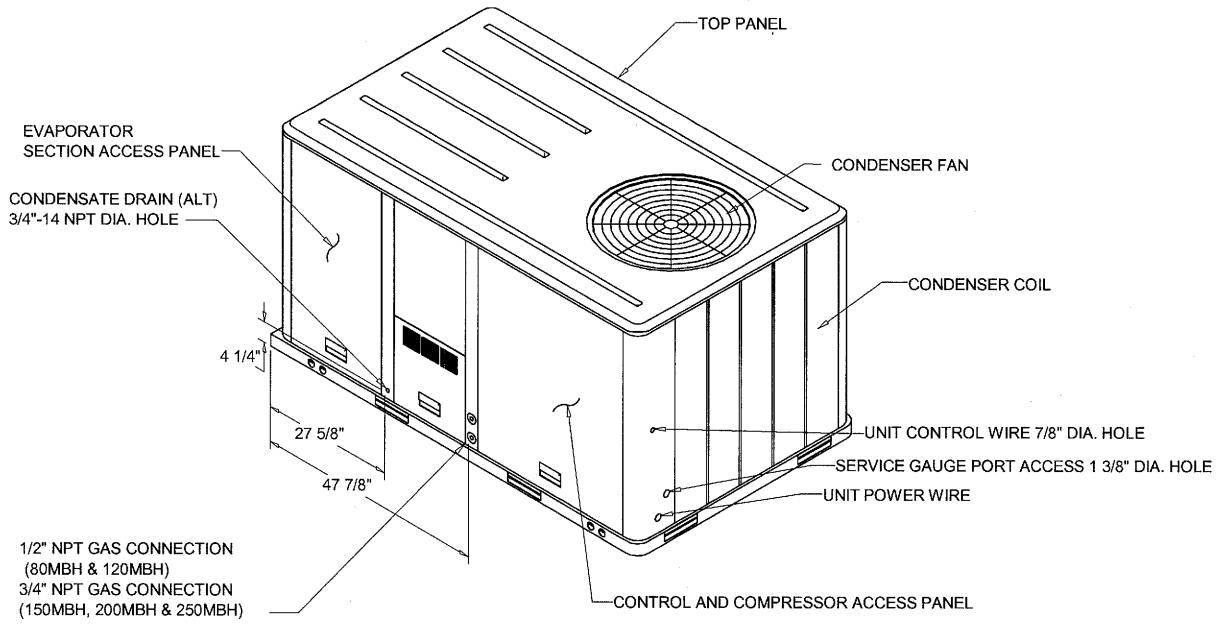
Plenum Fan

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.

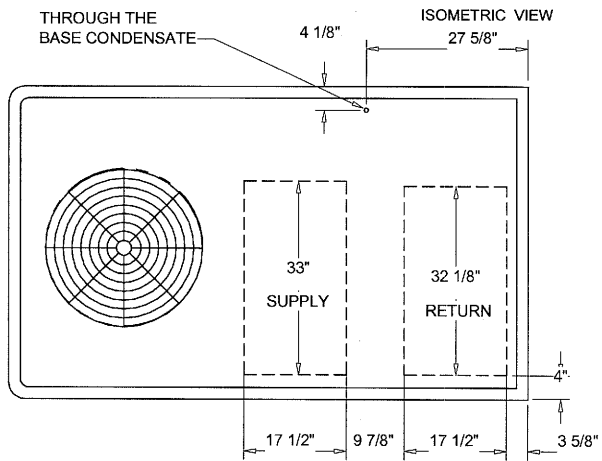
Economizer

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.

Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
 Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm

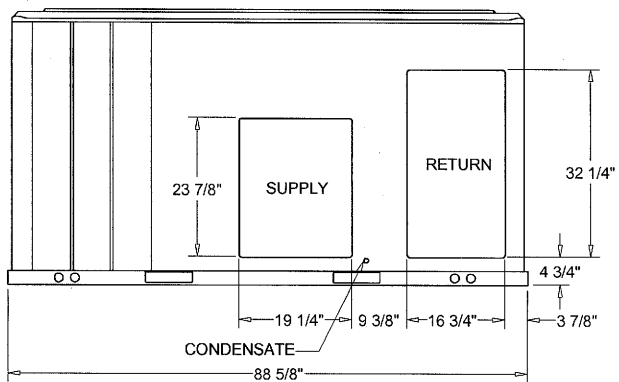


PACKAGED GAS / ELECTRICAL

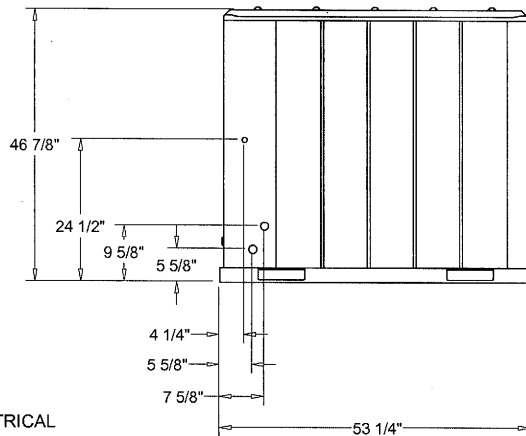


- NOTES:**
 1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
 2. VERIFY ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION.

PLAN VIEW UNIT
 DIMENSION DRAWING

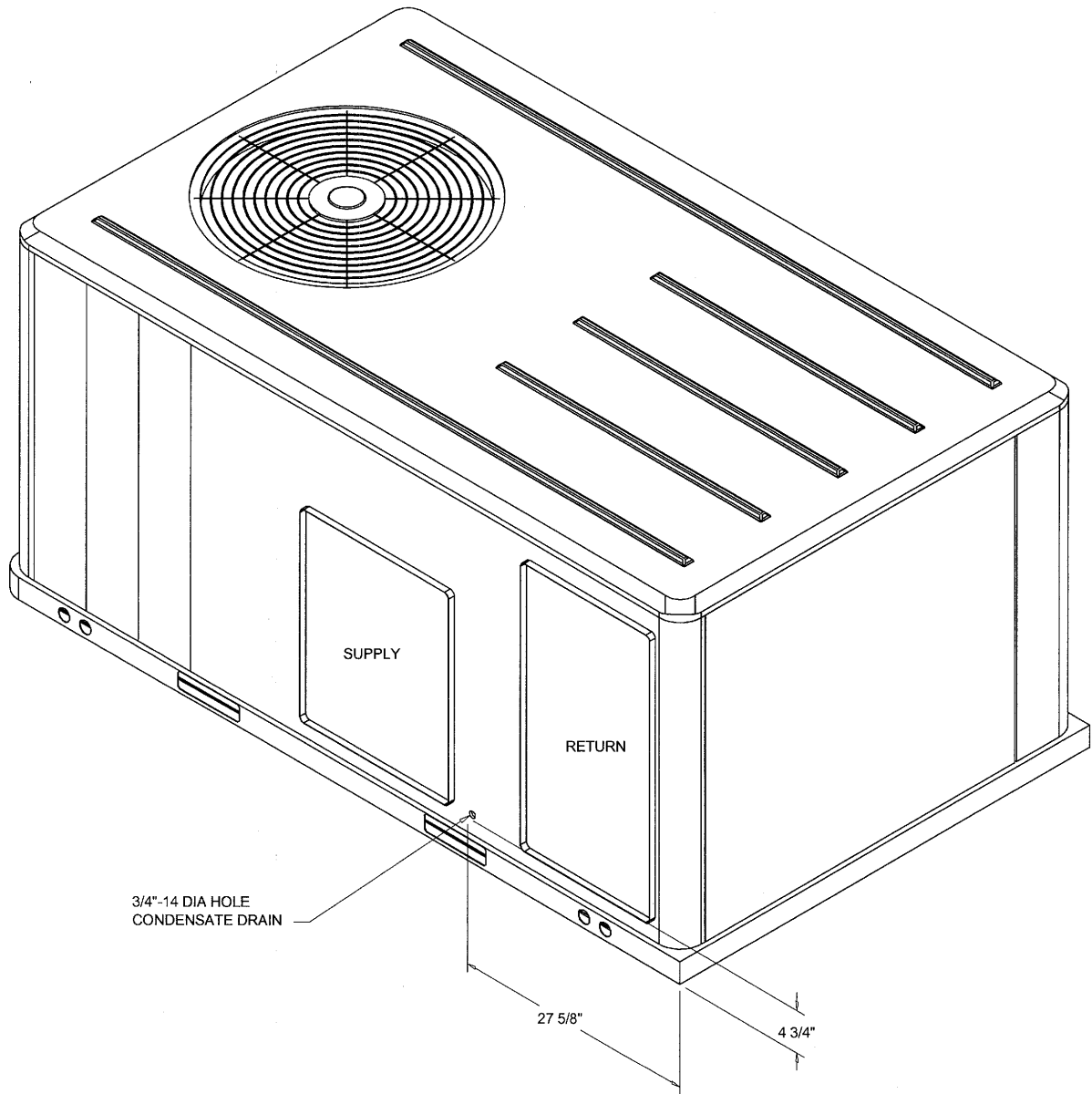


PACKAGED GAS / ELECTRICAL
 DIMENSION DRAWING



➔
 HORIZONTAL
 AIR FLOW

Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm



ISOMETRIC-PACKAGED COOLING

Unit Dimensions - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm

ELECTRICAL / GENERAL DATA

GENERAL ⁽²⁾⁽⁴⁾⁽⁶⁾ Model: YHC092F Oversized Motor Unit Operating Voltage: 414-506 Unit Primary Voltage: 460 Unit Secondary Voltage: -- Unit Hertz: 60 Unit Phase: 3 EER: 12.6 Standard Motor MCA: 19.9 MFS: 25.0 MCB: 25.0		HEATING PERFORMANCE HEATING - GENERAL DATA Heating Model: High 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 Number: 1 Horsepower: 3.6 Motor Speed (RPM): -- Phase: 3 Full Load Amps: 4.3 Locked Rotor Amps: --		Oversized Motor Number: N/A Horsepower: N/A Motor Speed (RPM): N/A Phase: N/A Full Load Amps: N/A Locked Rotor Amps: N/A	
COMPRESSOR Circuit 1/2 Number: 2 Horsepower: 3.8 / 2.7 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 (RRM): 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:

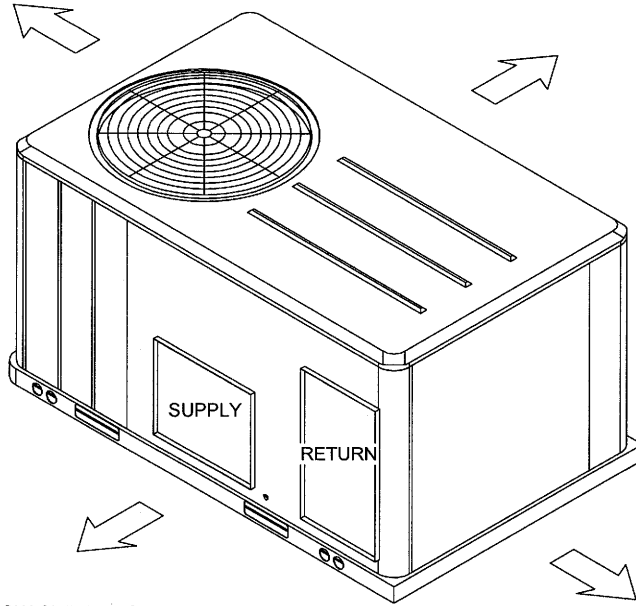
1. Maximum (HACR) Circuit Breaker sizing is for installations in the United States only.
2. Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.
3. Value does not include Power Exhaust Accessory.
4. Value includes oversized motor.
5. Value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

Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm

CLEARANCE 36"

CLEARANCE FROM TOP OF UNIT 72"

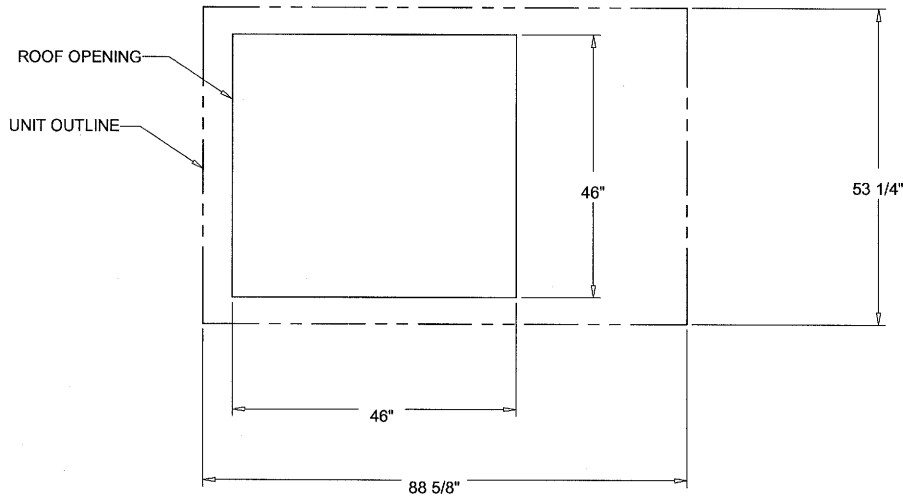
CLEARANCE 48"



DOWNFLOW CLEARANCE 36"
HORIZONTAL CLEARANCE 18"

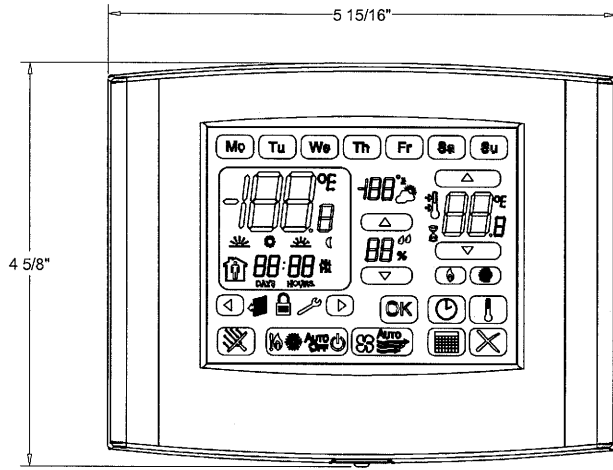
CLEARANCE 36"

PACKAGED GAS / ELECTRIC
CLEARANCE

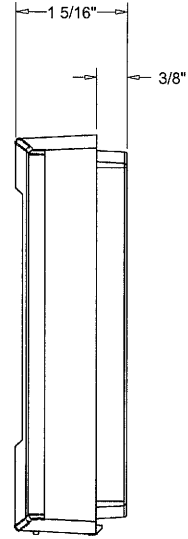


PACKAGED GAS / ELECTRIC
DOWNFLOW TYPICAL ROOF OPENING

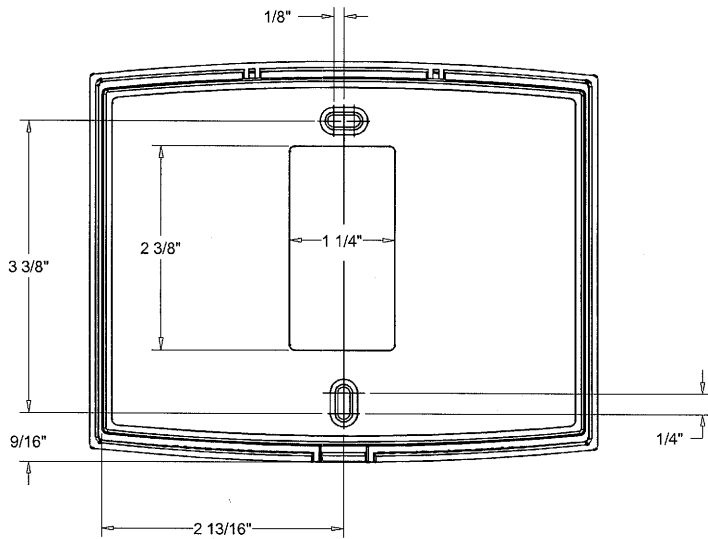
Weight, Clearance & Rigging Diagram - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm



FRONT VIEW



RIGHT SIDE VIEW

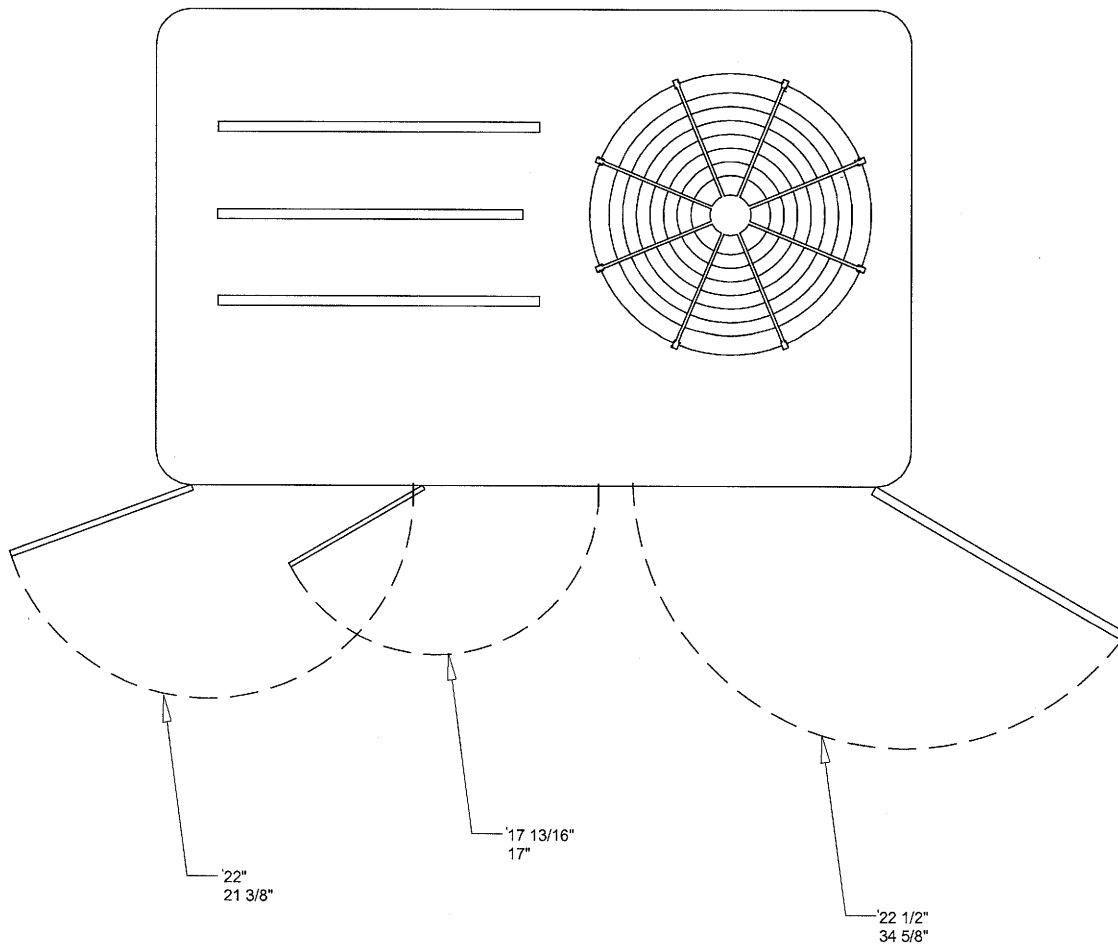


BACK VIEW

BAYSTAT152A PROGRAMMABLE TOUCHSCREEN

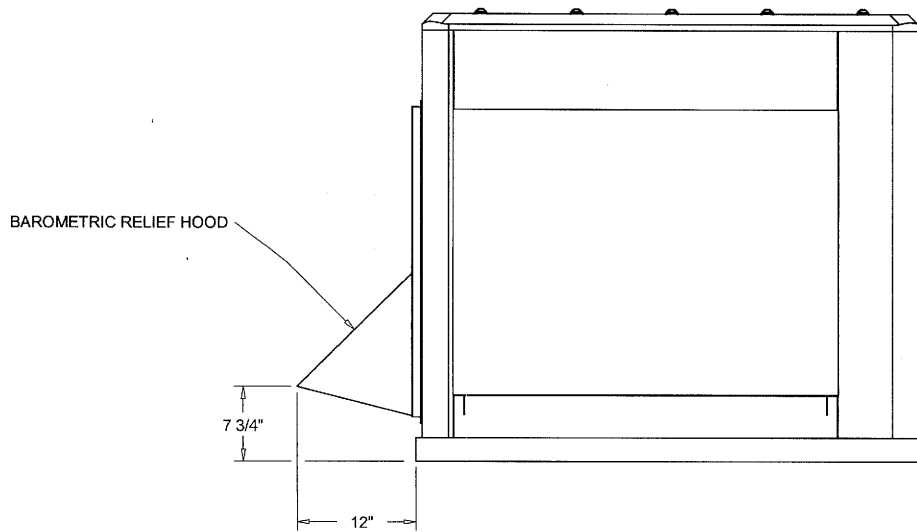
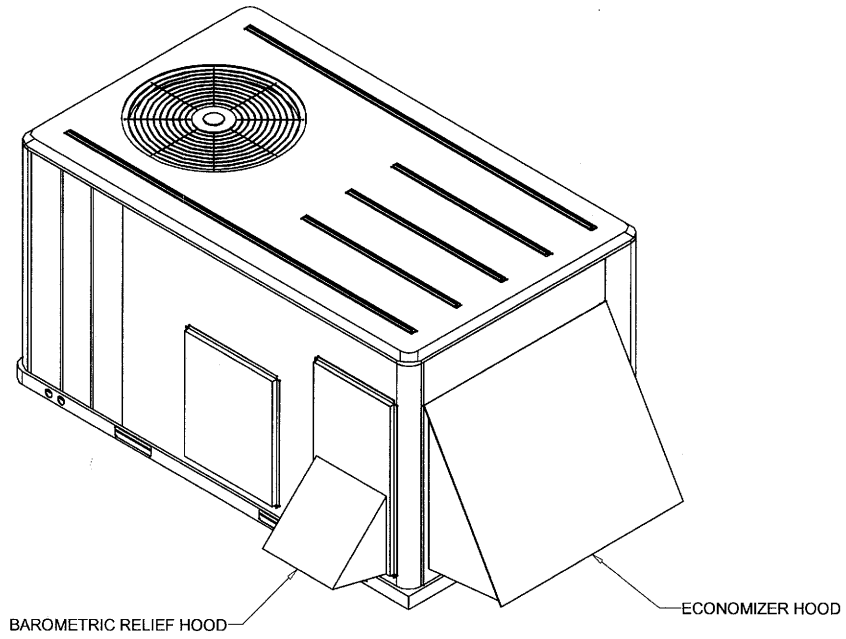
THERMOSTAT - ACCESSORY

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm



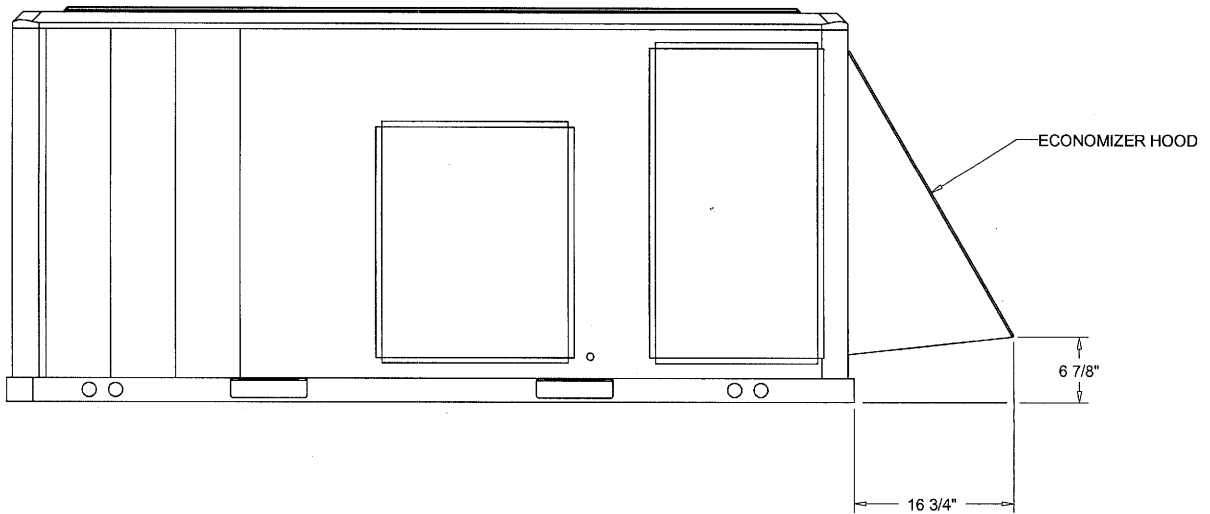
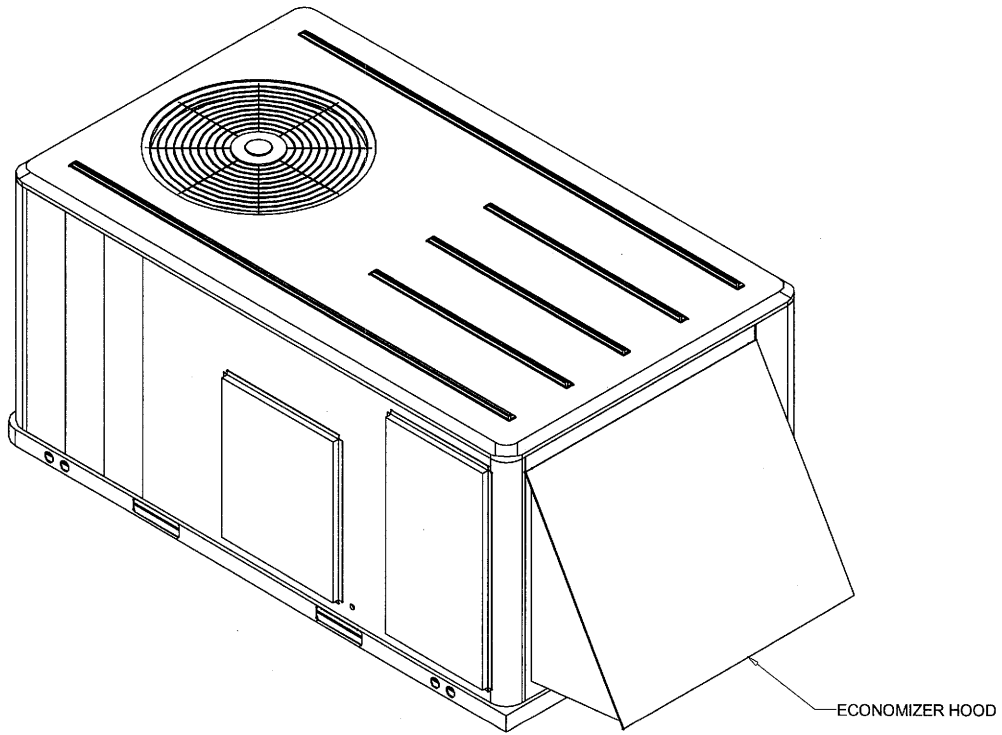
SWING DIAMETER - HINGED DOOR(S) OPTION
ACCESSORY

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm



ACCESSORY - BAROMETRIC RELIEF DAMPER HOOD

Accessory - 3-10 Ton R410A PKGD Unitary Gas/Electric Rooftop
Item: A1 Qty: 1 Tag(s): HC-1 Elec Rm



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	HC-1 Elec Rm	1	3-10 Ton R410A PKGD Unitary Gas/Electric	YHC092F4EHA--D0C10000000

Field Installed Option Description	Part/Ordering Number
3H/2C Touchscreen, programmable, remote temperature, remote humidity	BAYSTAT152A