



Submittal

Prepared For:
Action Mechanical
Attn: Billy Weaver

Date: May 06, 2024

Engineer:
Swygert & Associates Engineers
Bradley Jasinski, P.E.

Job Name:
Clover High School Fine Arts Addition
Clover, SC

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

Product Summary

Qty Product

- 1 - 6- 25 Ton PKGD Precedent Unitary Rooftop
- 5 - 3-10 Ton R-410 Packaged Heat Pumps (W4C)

Notes:

1. This submittal is based on the mechanical specifications and drawings sealed 3-18-2024.
2. All electrical requirements shall be coordinated / confirmed with electrical contractor prior to ordering equipment.
3. Seismic roof curbs are NOT included and shall be provided by others.
4. The following items are not included by Trane unless otherwise noted:
 - Equipment startup*
 - Emergency stop switches*
 - Smoke detectors or firestats*
 - Control and interlock wiring*
 - Roof curbs or sound attenuation*
 - Seismic restraints*
 - Items not listed in submittal*

APPROVED

By Billy Weaver at 9:46 am, May 07, 2024

Jeff Auten
Trane U.S. Inc.
4501 South Tryon Street
Charlotte, NC 28217
Office Phone: (704) 525-9600

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

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

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Tag Data - 6- 25 Ton PKGD Precedent Unitary Rooftops (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	RTU-2	1	15-Ton Heat Pump Precedent	WSJ180A4S0N**D0C0A2A1A002

Product Data - 6- 25 Ton PKGD Precedent Unitary Rooftops**Item: A1 Qty: 1 Tag(s): RTU-2**

Heat pump, standard efficiency
 R-410A refrigerant
 15 tons nominal cooling capacity
 460 volts, 60 hertz, 3 phase
 Symbio 700 controls
 36 kW electric heat
 Economizer with dry bulb control & barometric relief
 Hinged access panels with 2-in MERV 8 filters
 Through the base electric
 Circuit breaker
 Unpowered 20A convenience outlet
 Advanced controls and BACnet BAS
 Modulating hot gas reheat (HGRH)
 Condensate overflow switch (COS)
 Wall mounted CO2 sensor (Field Installed)
 Room sensor with temperature adjustment and override (Field Installed)
 Wall mounted humidity sensor (Field Installed)
 Low ambient kit (Field Installed)
 Standard 3-year parts, coils & controls warranty
 5-year compressor warranty, parts only

Performance Data - 6- 25 Ton PKGD Precedent Unitary Rooftop

Tags	RTU-2
Cooling Entering Air, DB / WB (F)	80.00 / 67.00
Summer Ambient (F)	95.00
Entering Air in HGRH, DB / WB (F)	73.00 / 64.00
Ambient (In HGRH) (F)	70.00
Heating Entering Air Temperature (F)	70.00
Design Airflow (cfm)	4800
Airflow Application	Downflow
Design ESP (in H2O)	1.000
Gross Total Capacity (MBh)	176.09
Gross Sensible Capacity (MBh)	124.26
Net Total Capacity (MBh)	170.95
Net Sensible Capacity (MBh)	119.12
Net Sensible Heat Ratio (%)	70.00
Coil Leaving Air Temp., DB / WB (F)	55.55 / 54.71
Cooling Leaving Unit, DB / WB (F)	57.77 / 55.67
Fan Motor Heat (MBh)	0.90
Refrigerant charge (HFC-410A) - Ckt 1 (lb)	35.0
Saturated Discharge Temperature (F)	121.42
Saturated Suction Temperature (F)	48.18
Supply Motor Horsepower (hp)	2.900
Supply Operating Horsepower (hp)	1.830
Supply RPM (rpm)	1122
Compressor Power (kW)	12.85
System Power (kW)	17.13
EER @ AHRI (EER)	10.6
IEER @ AHRI (EER)	13.5
AHRI COP @ 47 F (Number)	3.30
AHRI COP @ 17 F (Number)	2.05
MCA (A)	96.00
MOP (A)	100.00
Compressor 1 RLA (A)	16.70
Compressor 2 RLA (A)	8.20
Condenser Fan FLA (A)	1.30
Evaporator Fan FLA (A)	4.60
Electric Heat FLA (A)	43.40
Output Heating Capacity (MBh)	122.94
Heating Leaving Air Temperature (F)	93.19
Approx Installed Weight (lb)	2222.0
Leaving dry bulb w HGRH (F)	73.20
Temperature Rise (HGRH) (F)	20.75
HGRH Capacity (MBh)	113.67
Dew Point Temperature (HGRH) (F)	50.41
Reheat Coil LAT DB (HGRH) (F)	72.05
Reheat Coil LAT WB (HGRH) (F)	59.16
Moisture Removal Rate (HGRH) (gph)	7.64
Evap Coil LAT DB (HGRH) (F)	51.31
Evap Coil LAT WB (HGRH) (F)	50.53
Heat pump Heating Capacity (MBh)	164.29
Heat pump leaving air temperature (F)	106.77
Heat pump heating ambient temperature (F)	47.00
Supply Fan Count (Number)	2.00

Mechanical Specifications - 6- 25 Ton PKGD Precedent Unitary Rooftop
Item: A1 Qty: 1 Tag(s): RTU-2**Heatpump - General**

- Packaged rooftop units cooling, heating capacities, and efficiencies are AHRI Certified within scope of AHRI Standard 210-240 for 12.5 to 25 Tons and ANSIZ21.47 and 10 CFR Part 431 pertaining to Commercial Warm Air Furnaces (all gas heating units).
- Convertible airflow.
- Symbio controls operating range between 40.0 F and 125.0 F in cooling mode standard from the factory. Factory or field-installed low ambient kit extended operating range down to 0°F.
- Factory assembled, internally wired, fully charged with R-410A, and 100 percent run tested to check cooling operation, fan and blower rotation, and control sequence before leaving the factory.
- Colored and numbered wiring internal to the unit for simplified identification.
- Units cULus listed and labeled, classified in accordance for Central Cooling Air Conditioners.

Heatpump - Casing

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

Heatpump - Coils Evaporator and Condenser

- Internally finned, 5/16" copper tubes mechanically bonded to a configured aluminum plate fins are standard.
- Coils are leak tested at the factory to ensure integrity.
- Evaporator coil and condenser coil are leak tested to 600 psig.
- Assembled unit is leak tested to 465 psig.
- Condenser coil is patent pending 1+1+1 hybrid coil, designed with slight gaps for cleaning ease.
- Composite, dual-sloped, removable condensate drain pan is standard.

Heatpump - Coil Guards

- Provides condenser coil protection.

Heatpump - Compressors

- All units have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps.
- Suction gas-cooled motor with voltage utilization range of plus or minus 10 percent of unit nameplate voltage.
- Internal overloads standard with scroll compressors.
- Crankcase heaters are standard on all compressors.
- All units have dual compressors.
- Three stages of cooling available on 12.5 to 17.5 tons units.

Heatpump - Filters

- Optional 2 inch MERV 8 filters included.

Heatpump - Froststat

- Utilized as a safety device.
- Opens to prevent freezing temperatures on evaporator coil.
- Temperature will need to rise to 50.0 F before closing.
- Utilized in low airflow or high outside air applications (cooling only).

Heatpump - Indoor Fan

- Direct drive plenum fan design - 12.5 to 25 tons units.
- Plenum fan design- backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor.

- Supply fan speed adjustments can be made using the Symbio 700 or Mobile App.
- Motors are thermally protected.
- Variable speed direct drive motors are high efficiency.

Heatpump - Unpowered Convenience Outlet

- Unpowered GFCI, 120V/20A, 2 plug, convenience outlet.
- When convenience outlet is powered, a service receptacle disconnect will be available.
- Convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker.-

Heatpump - Through-the-Base Electrical with Circuit Breaker

- Thermal magnetic, molded case, HACR circuit breaker with provisions for through-the-base electrical connections.
- Circuit breaker installed within unit in water tight enclosure.
- Wiring provided from the switch to the unit high voltage terminal block.
- Circuit breaker will provide overcurrent protection, sized per NEC and cULus guidelines, and agency recognized by cULus.

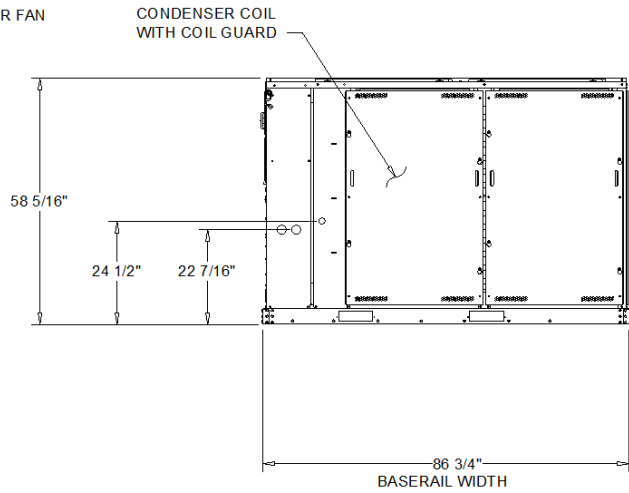
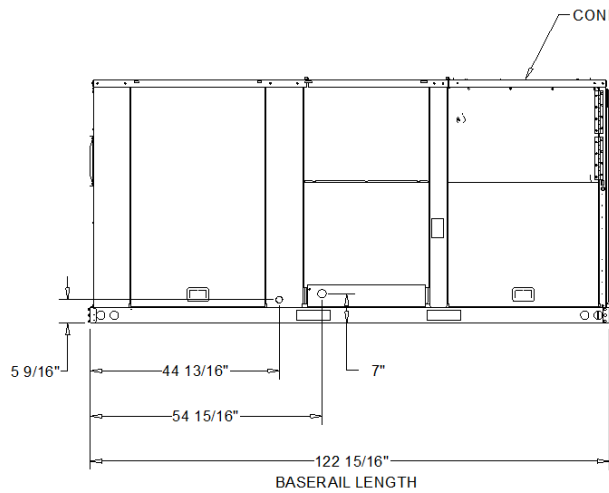
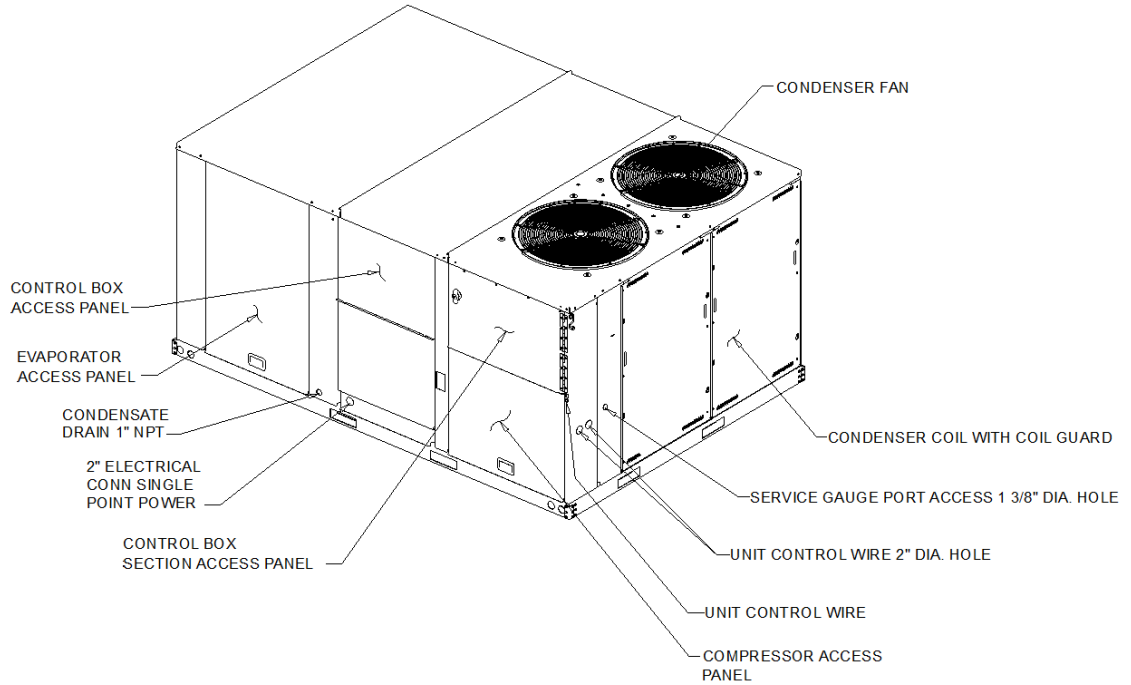
Heatpump - Economizer (Standard)

- Provided with barometric relief.
- 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.
- Barometric relief shall provide a pressure operated damper that shall be gravity closing.
- Barometric relief shall prohibit entrance of outside air during the equipment "off" cycle.
- Arrives in shipping position and shall be moved to the operating position by the installing contractor.

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

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

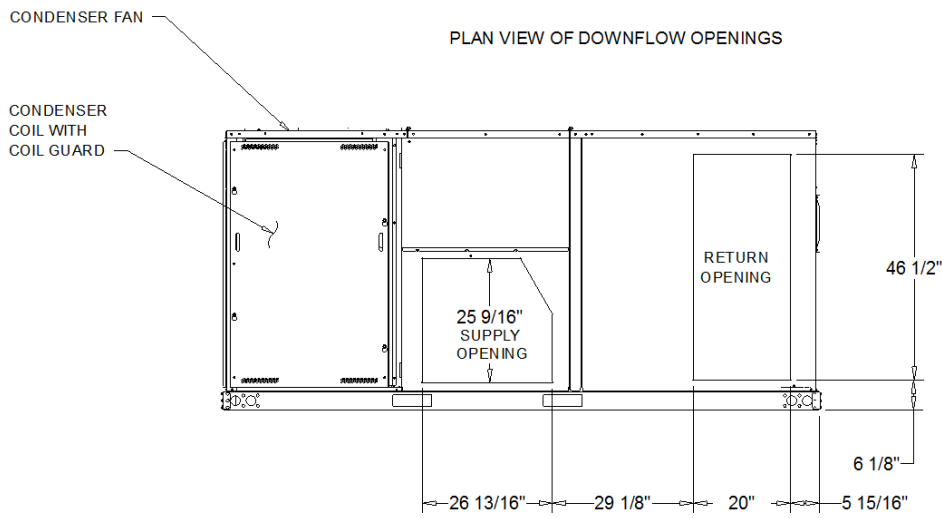
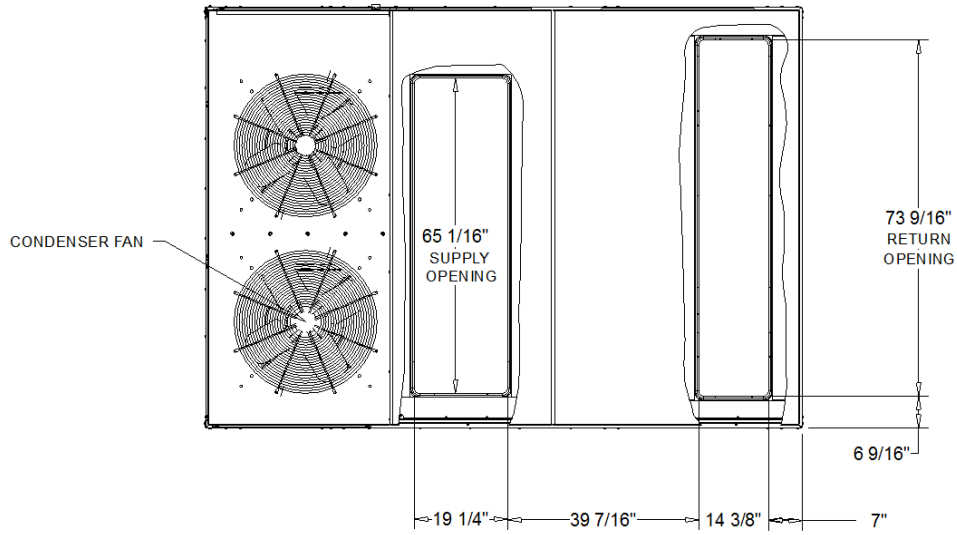


HEAT PUMP / ELECTRIC HEAT STANDARD EFFICIENCY

DIMENSION DRAWING

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

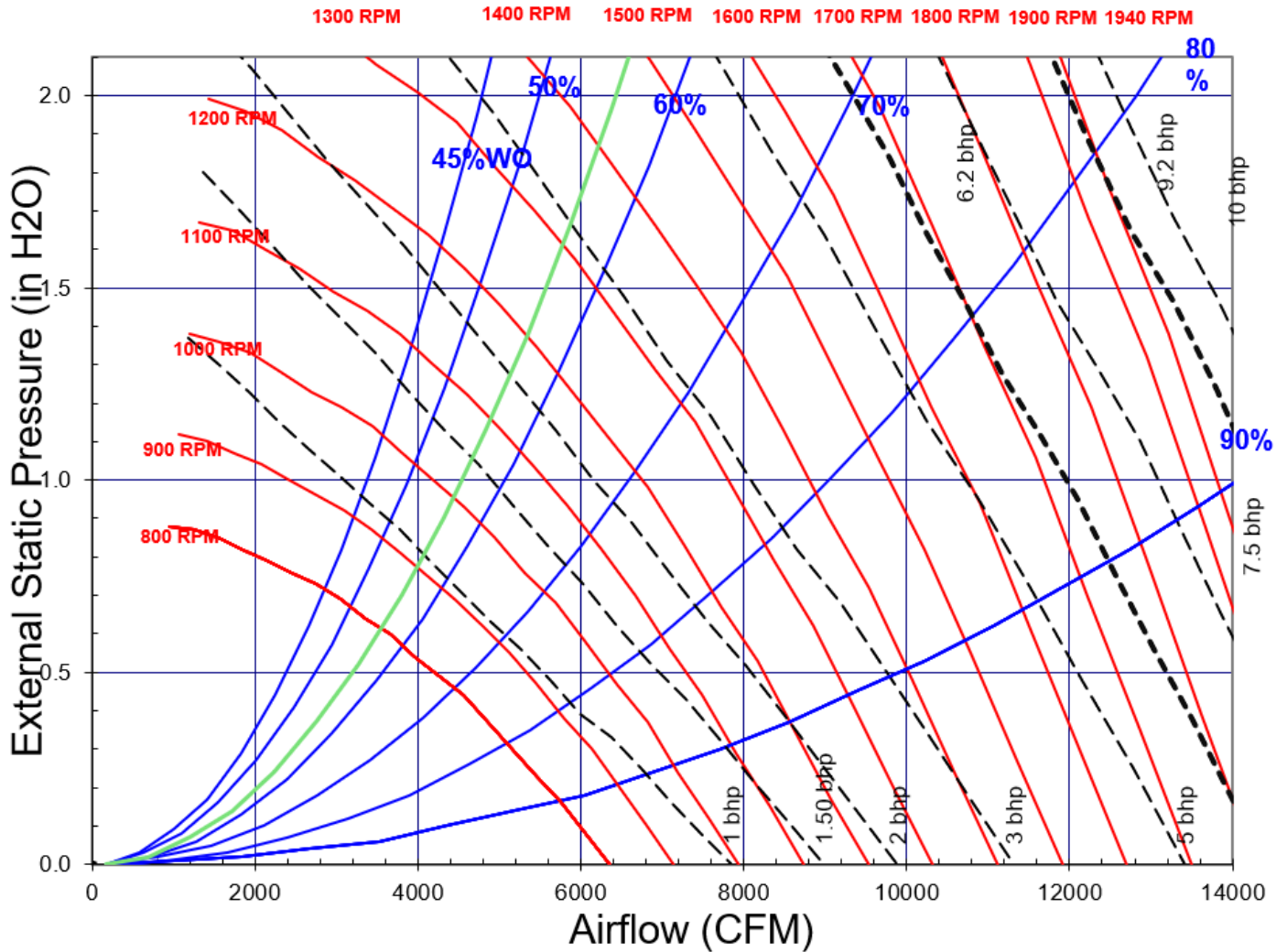


HEAT PUMP / ELECTRIC HEAT STANDARD EFFICIENCY

DIMENSION DRAWING

Dimensional Drawings - 6- 25 Ton PKGD Precedent Unitary Rooftops
Item: A1 Qty: 1 Tag(s): RTU-2

TSJ180-300*, Downflow, Std Filter, Wet Coil, Cooling Only



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

Weight, Clearance & Rigging - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

NOTES:

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

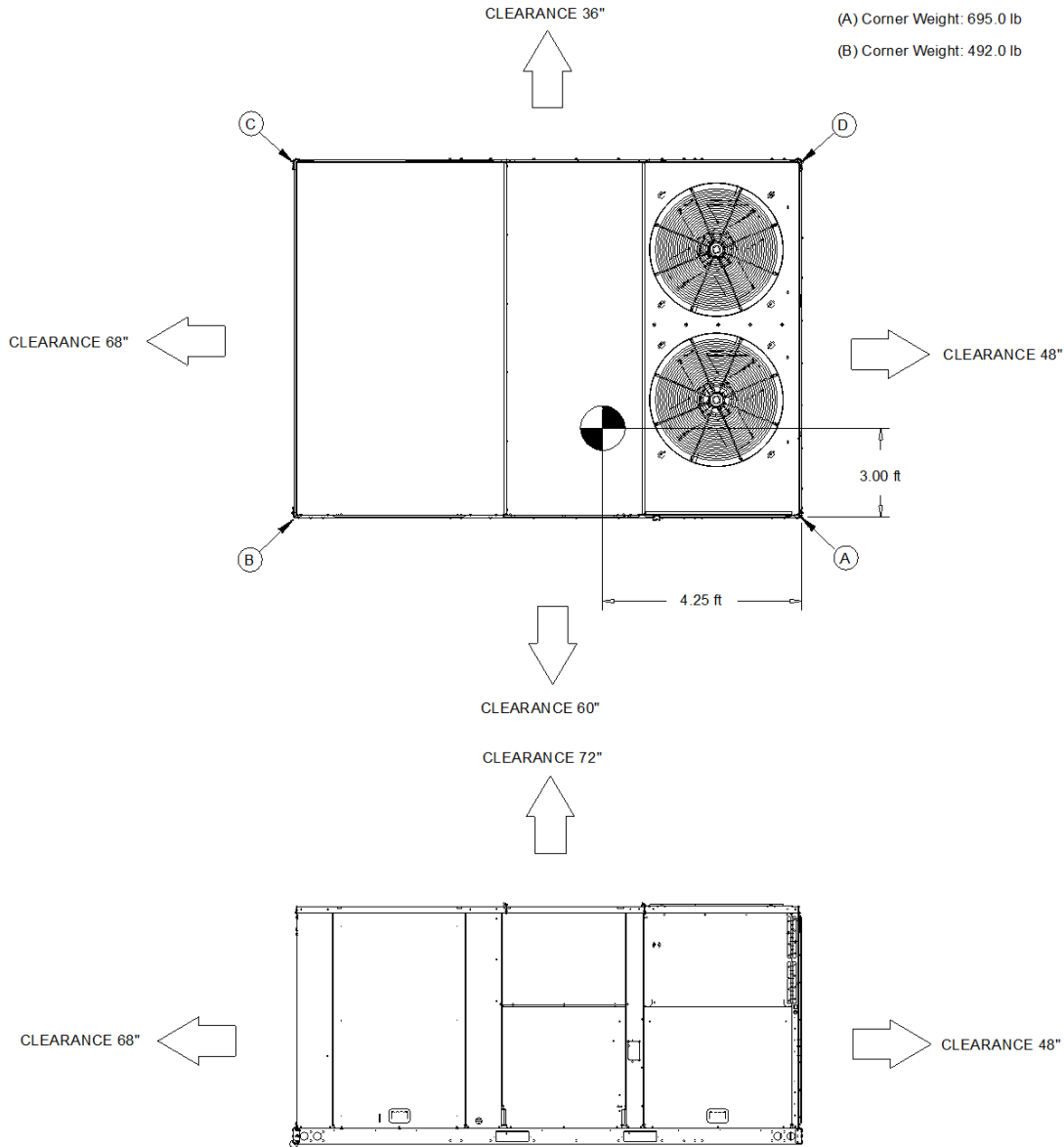
Approximate Installed Weight: 2,222.0 lb

(A) Corner Weight: 695.0 lb

(C) Corner Weight: 348.0 lb

(B) Corner Weight: 492.0 lb

(D) Corner Weight: 491.0 lb

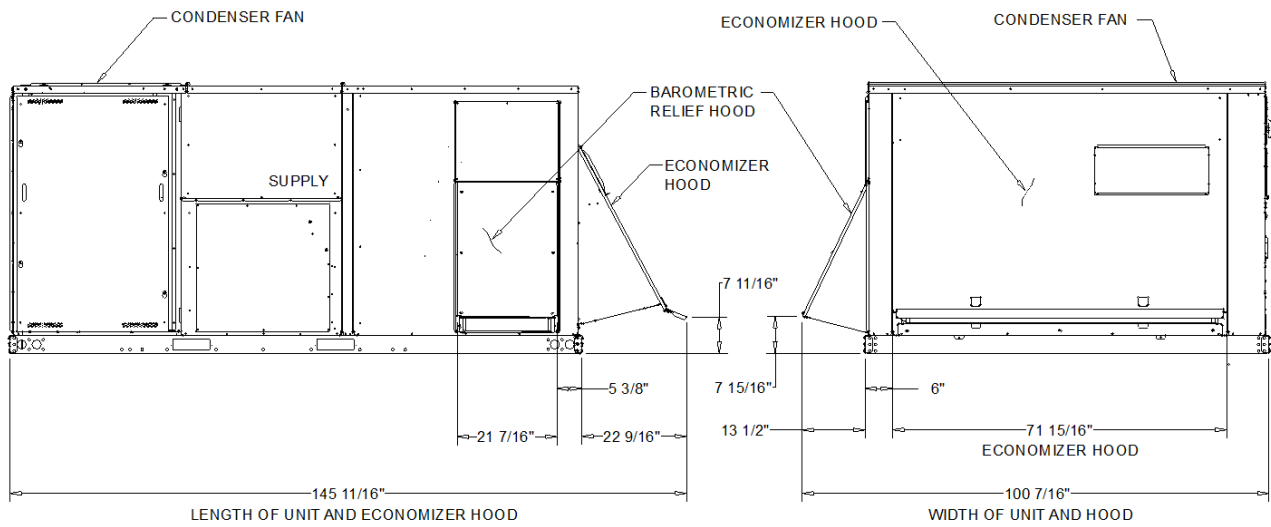
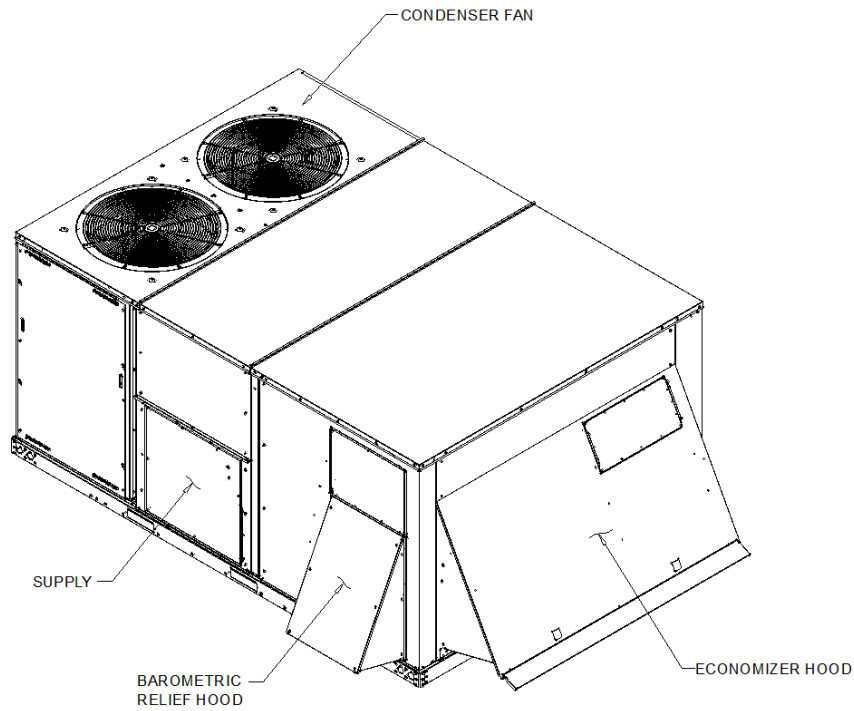


HEAT PUMP / ELECTRIC HEAT STANDARD EFFICIENCY

WEIGHTS AND CLEARANCES

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

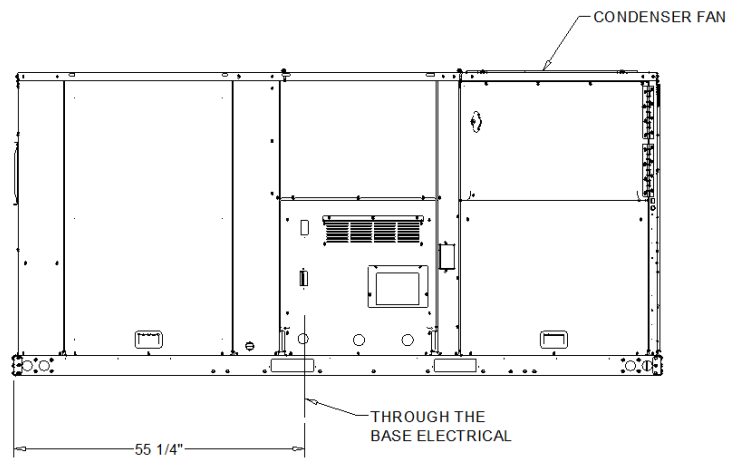
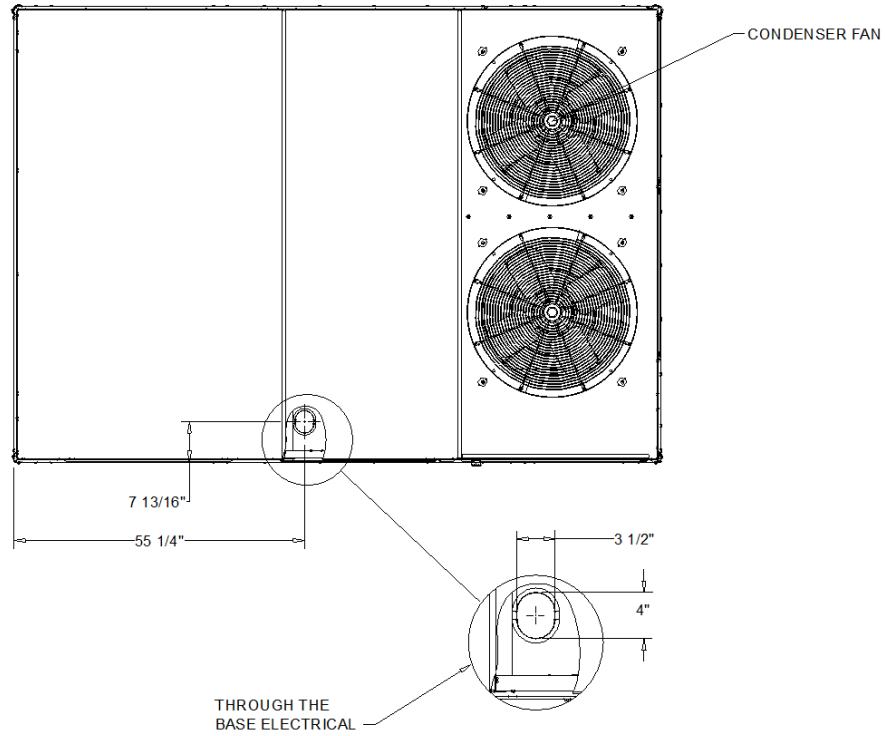


ECONOMIZER AND BAROMETIC AIR DAMPER(S) (OPTION)

HEAT PUMP / ELECTRIC HEAT STANDARD EFFICIENCY

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

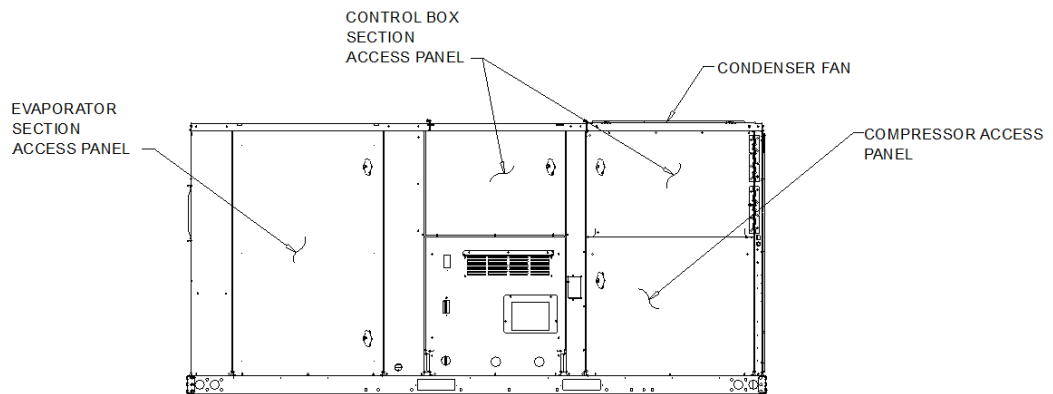
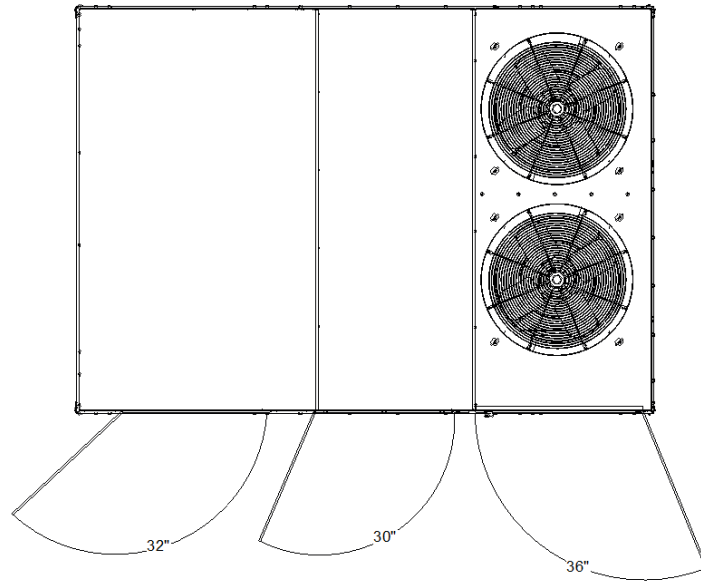


THROUGH-THE-BASE ELECTRICAL (OPTION)

HEAT PUMP / ELECTRIC HEAT STANDARD EFFICIENCY

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

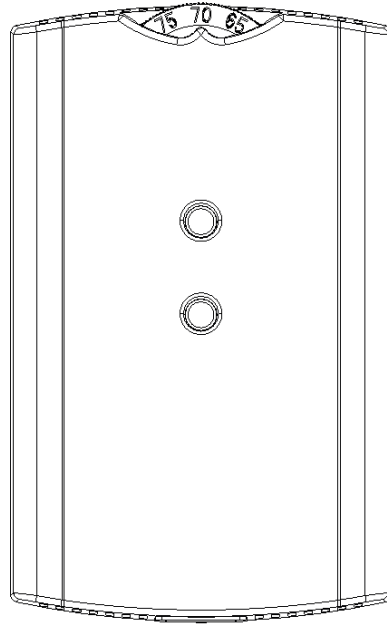


SWING DIAMETER FOR HINGED DOOR(S) (OPTION)

HEAT PUMP / ELECTRIC HEAT STANDARD EFFICIENCY

Accessory - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item: A1 Qty: 1 Tag(s): RTU-2

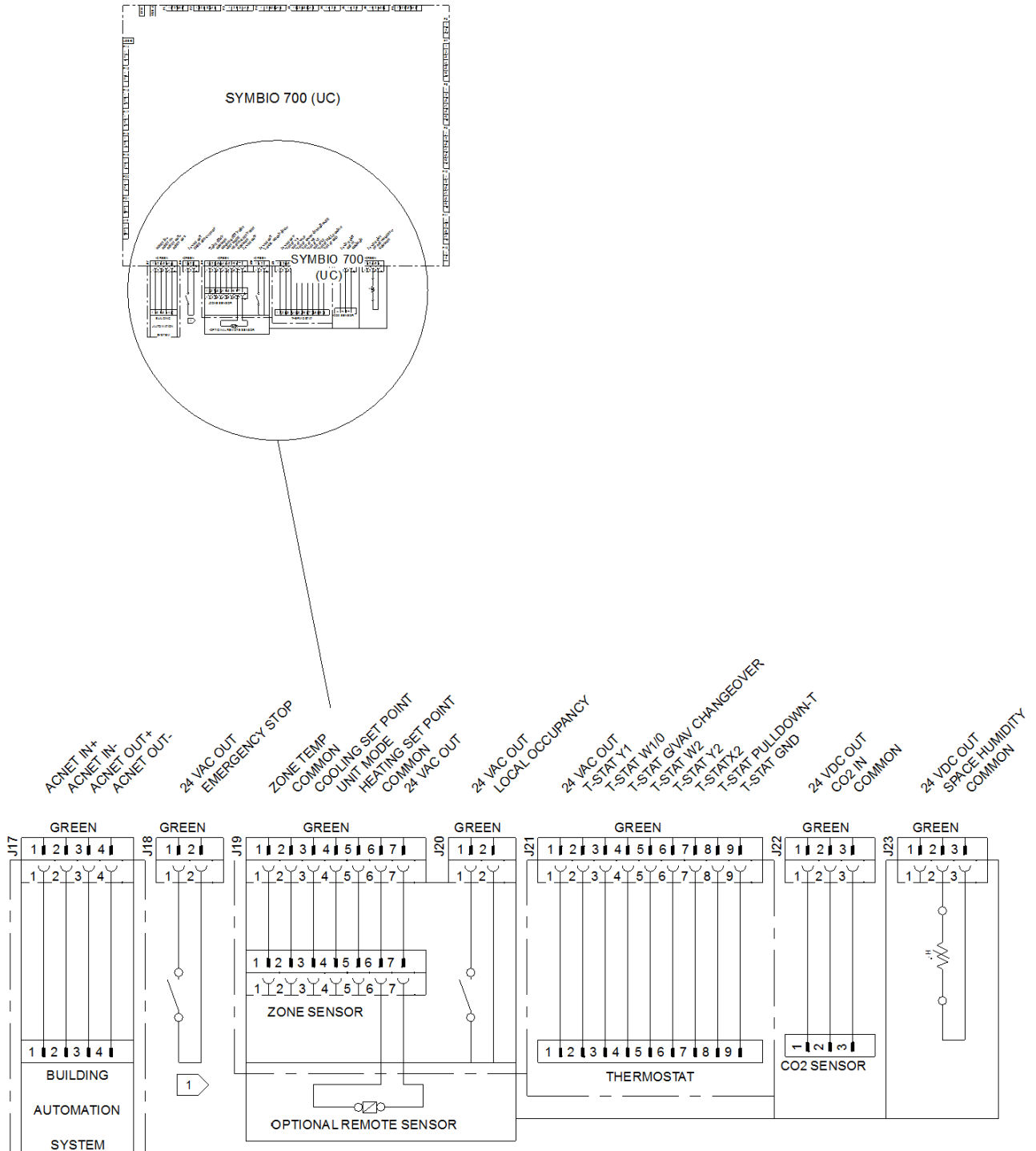


BAYSENS074 - INTEGRATED COMFORT SYSTEM

ZONE SENSOR (ACCESSORY)

Field Wiring - 6- 25 Ton PKGD Precedent Unitary Rooftops
Item: A1 Qty: 1 Tag(s): RTU-2

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



SYMBIO 700 (J17, j18, J19, J20, J21, J22, AND J23)

FIELD WIRING DRAWING

Tag Data - 3-10Ton R-410 Packaged Heat Pumps (W4C) (Qty: 5)

Item	Tag(s)	Qty	Description	Model Number
B1	RTU-1, RTU-5	2	4-Ton Heat Pump Precedent	WSC048H4REA**D0C1A2A6000A
B2	RTU-3	1	10-Ton Heat Pump Precedent	WSC120H4RKB**D0C1A2A6000AA
B3	RTU-4, RTU-6	2	3-Ton Heat Pump Precedent	WSC036H4RBA**D0C1A2A6000A

Product Data - 3-10Ton R-410 Packaged Heat Pump (W4C)**All Units**

DX heat pump, standard efficiency
 Convertible airflow
 460 volts, 60 hertz, 3 phase
 Microprocessor controls
 Economizer with dry bulb control & barometric relief
 Hinged access panels/2-inch pleated filters, MERV 8
 Standard condenser coil w/hail guard
 Through the base electrical
 Circuit breaker
 Unpowered convenience outlet
 BACnet communications interface
 Condensate drain pan overflow switch
 Hot gas reheat coil, on-off control
 Wall mounted humidity sensor (Field Installed)
 Room sensor with temperature adjustment and override (Field Installed)

Item: B1 Qty: 2 Tag(s): RTU-1, RTU-5

4 tons nominal cooling capacity
 12 kW electric heat @ 480 volts, derate to unit voltage

Item: B2 Qty: 1 Tag(s): RTU-3

10 tons nominal cooling capacity
 27 kW electric heat @ 480 volts, derate to unit voltage
 Demand control ventilation
 Wall mounted CO2 sensor (Field Installed)

Item: B3 Qty: 2 Tag(s): RTU-4, RTU-6

3 tons nominal cooling capacity
 6 kW electric heat @ 480 volts, derate to unit voltage

Performance Data - 3-10 Ton R-410 Packaged Heat Pumps (W4C)

Tags	RTU-1, RTU-5	RTU-3	RTU-4, RTU-6
Airflow application	Downflow	Downflow	Downflow
Design Airflow (cfm)	1600	3200	1200
Cooling Entering Air, DB / WB (F)	80.00 / 67.00	80.00 / 67.00	80.00 / 67.00
Ambient Temperature (F)	95.00	95.00	95.00
Cooling Leaving Air, DB / WB (F)	58.80 / 57.43	56.99 / 55.92	58.15 / 56.80
Gross Total Capacity (MBh)	49.94	114.60	39.43
Gross Sensible Capacity (MBh)	38.45	85.35	29.42
Net total capacity (MBh)	48.29	110.44	38.38
Net sensible capacity (MBh)	36.80	81.20	28.37
Output htg capacity (MBh)	47.07	101.74	35.50
Electric heat output (MBh)	40.98	92.21	20.49
Heating EAT (F)	70.00	70.00	70.00
Heating ambient temp (F)	47.00	47.00	47.00
Heating delta T (F)	27.24	29.44	27.39
Design ESP (in H2O)	0.600	1.000	0.600
Indoor mtr operating power (bhp)	0.66	1.43	0.39
Indoor srpm (rpm)	1058	1307	897
Compressor power (kW)	3.52	8.70	2.93
System power (kW)	4.24	10.71	3.42
IPLV @ AHRI (IPLV)	14.3	14.1	14.3
MCA (A)	30.00	64.00	20.00
MOP (A)	30.00	70.00	20.00
Compressor 1 RLA (A)	6.30	14.40	6.60
Evaporator fan FLA (A)	2.50	3.60	1.70
Condenser fan FLA (A)	0.70	1.60	0.55
Electric Heat FLA (A)	14.40	32.50	7.20
Evaporator face area (sq ft)	8.74	12.36	8.74
Evaporator face velocity (ft/min)	183	259	137
Evaporator fin spacing (Per Foot)	192	192	192
Evaporator rows (Each)	3.00	4.00	3.00
Fan motor heat (MBh)	0.64	1.61	0.41
Evap Coil Leaving Air Temp, DB / WB (F)	56.40 / 56.30	55.32 / 55.25	55.64 / 55.55
Approx. Reheat Coil Capacity (MBH)	29.82	59.69	22.70
Leaving DB in Reheat (F)	75.75	70.45	75.88
Leaving Dew Point in Reheat (F)	55.83	53.35	55.39
Reheat Temp. Rise (F)	17.17	14.71	17.44
Moisture Removal Rate (GPM)	1.46	4.04	1.19
Refrig charge (HFC-410A) - ckt 1 (lb)	9.3	16.3	7.7
ASHRAE 90.1	Yes	Yes	Yes
Saturated Suction Temp 1 (F)	49.71	48.43	50.42
Saturated Discharge Temp 1 (F)	115.74	121.68	116.46
SEER/IEER @ AHRI conditions	14.30	14.10	14.30
EER @ AHRI Conditions (EER)	12.3	11.0	12.1
Indoor Fan Type	BC Plenum	BC Plenum	FC Centrifugal
Indoor Fan Drive Type	Variable Direct	Variable Direct	Direct
Outdoor Fan Type	Propeller	Propeller	Propeller
Outdoor Fan Drive Type	Direct	Direct	Direct
Outdoor Fan Quantity	1	1	1
Heating Type	Electric	Electric	Electric
Heating Stages	2	2	1

Mechanical Specifications - 3-10 Ton R-410 Packaged Heat Pumps
Item: B1 - B3 Qty: 5 Tag(s): RTU-1, RTU-5, RTU-3, RTU-4, RTU-6**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. 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.

Case

Unit casing shall be constructed of zinc coated, heavy gauge, and 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. 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. 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" 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.

2" Pleated Filters

2" pleated media filters (MERV 8) shall be provided on all units.

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.

Refrigerant Circuits

Service pressure ports, and refrigerant line filter driers are factory-installed as standard. An area shall be provided for replacement suction line driers.

Evaporator and Condenser Coils

Internally finned, 5/16" copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 650 psig and pressure tested to 450 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.

Condensate Overflow Switch

This option shall shut the unit down in the event that a clogged condensate drain line prevents proper condensate removal from the unit.

Tool-less Hail Guards

Tool-less, hail protection quality coil guards are provided for condenser coil protection.

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.

Indoor Fan

Standard efficiency units come standard with direct drive motors. All motors shall be thermally protected. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

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. Microprocessor controls shall be provided. 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.

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.

BACnet Communications

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

Unpowered Convenience Outlet

This is a GFCI, 120v/15amp, 2 plug, convenience outlet will be unpowered. When the convenience outlet is powered, a service receptacle disconnect will be available. The convenience outlet is powered from the line side of the disconnect or circuit breaker, and therefore will not be affected by the position of the disconnect or circuit breaker.

Hinged Access Doors

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

Electric Heaters

Electric heat modules shall be available for installation within basic unit. Electric heater elements shall be constructed of heavy-duty nickel chromium elements internally delta connected for 240 volt, wye connected for 480 and 600 volt. Staging shall be achieved through ReliaTel. Each heater package shall have automatically reset high limit control operating through heating element contactors. All heaters shall be individually fused from the factory, where required, and shall meet all NEC and CEC requirements when properly installed. Power assemblies shall provide single point connection. Electric heat modules shall be UL listed or CSA certified.

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. 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 Circuit Breaker

This option is a thermal magnetic, molded case, HACR Circuit Breaker with provisions for through the base electrical connections. The circuit breaker will be installed in a water tight enclosure in the unit with access through a swinging door. Wiring will be provided from the switch to the unit high voltage terminal block. The circuit breaker will provide overcurrent protection, be sized per NEC and UL guidelines, and be agency recognized by UL/CSA.

Control Specification (if applied in a system with a system-level controller)**A. CONTROL SYSTEM OVERVIEW:**

Control System shall include a System Controller, all controllers for HVAC equipment and ancillary devices (such as lights and exhaust fans), wireless communication between the System Controller, equipment controllers, and space sensors, and all wiring and end devices required. Control System to be fully programmed and commissioned by the installing contractor.

B. TOUCH SCREEN DISPLAY:

Control System shall include a 10" color Touch Screen Display for use by building occupants to adjust zone temperature setpoints, override lighting and HVAC equipment for after-hours use, modify schedules, and view service notifications. This display shall have PIN access for users and provide setpoint adjustment limits.

C. MOBILE APP:

Control System manufacturer shall provide a Mobile App for iOS and Android devices to allow occupants to perform the same functions (listed above) as the Touch Screen Display.

D. WEB BROWSER INTERFACE:

System Controller shall have an embedded Web Browser Interface to allow the installer and service providers to make adjustments to system control parameters and view trend logs and other service information.

E. SYSTEM CONTROLLER:

System Controller shall provide scheduling and coordination of all HVAC equipment, exhaust fans, and controlled lighting devices. The System Controller shall include a software application that coordinates the operation of rooftop units and VAV terminals. The System Controller shall support multiple system types, including Single-Zone Constant Volume, Single-Zone VAV, Changeover Bypass, Changeover VAV, and Multiple-Zone VAV with Terminal Heat (electric or hot water). The System Controller shall provide energy optimization strategies including Night Setback, Optimal Start, Fan Pressure Optimization, Discharge Air Temperature Reset, and Demand-Controlled Ventilation.

F. REMOTE ACCESS/NETWORK SECURITY:

Installer shall provide secure remote access to the Control System to enable the owner or service provider to access the system remotely using the Mobile App or Web Browser Interface. The Control System must be secured behind a firewall and not allow any inbound ports to be open or exposed to the internet. Control System manufacturer shall provide a remote access portal accessible by the owner and/or a service provider (as authorized by the owner).

Sequence of Operation (if applied in a SINGLE-ZONE CONSTANT-VOLUME SYSTEM)**A. SYSTEM OPERATING MODES:**

The System Controller shall send the equipment controllers Occupied/Unoccupied, Morning Warm-up/Pre-cool, and Heat/Cool modes. If communication is lost, the equipment controllers shall operate using default modes and setpoints.

1. NIGHT SETBACK:

During unoccupied mode, the system shall shut off. If the zone temperature drifts to the unoccupied heating or cooling setpoint, the system shall start up to heat or cool the zone, while the OA damper remains closed (unless economizing).

2. OPTIMAL START:

The System Controller shall automatically determine the optimal start time, such that each zone reaches its occupied setpoint just in time for scheduled occupancy.

3. DEMAND-CONTROLLED VENTILATION:

For those zones equipped with an occupancy sensor or CO2 sensor, outdoor airflow shall be reset based on occupancy status and/or measured CO2 concentration.

B. SINGLE-ZONE CONSTANT-VOLUME SYSTEM**1. OCCUPIED HEAT/COOL:**

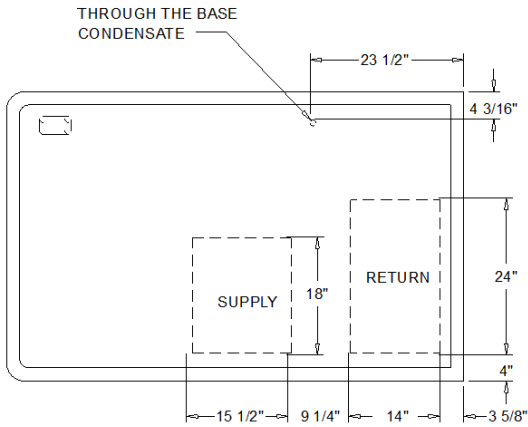
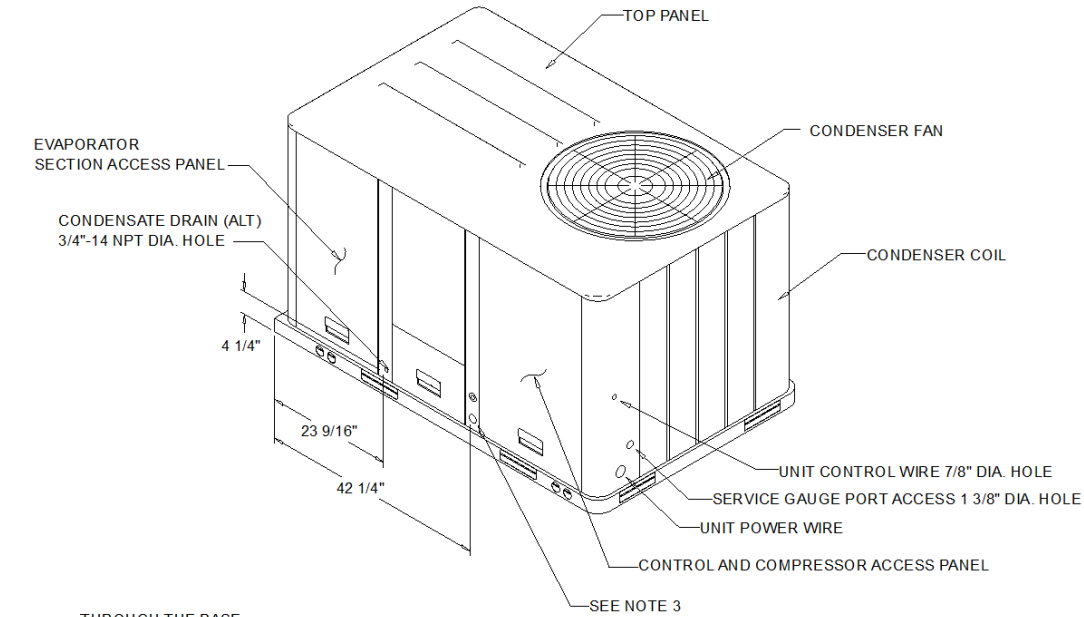
The RTU shall operate the supply fan continuously and modulate (or cycle) compressors, modulate (or stage) heat, and/or enable airside economizing to maintain zone temperature at setpoint. The OA damper shall open to bring in the required amount of ventilation.

2. MORNING WARM-UP/PRE-COOL:

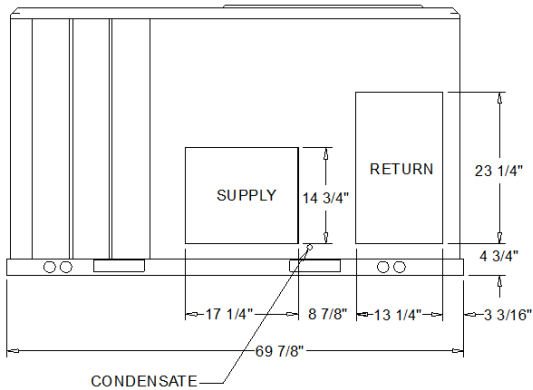
The RTU shall operate the supply fan and modulate (or cycle) compressors or modulate (or stage) heat to raise/lower zone temperature to its occupied setpoint. The OA damper shall remain closed, unless economizing.

Dimensional Drawings - 3-10 Ton R-410 Packaged Heat Pumps

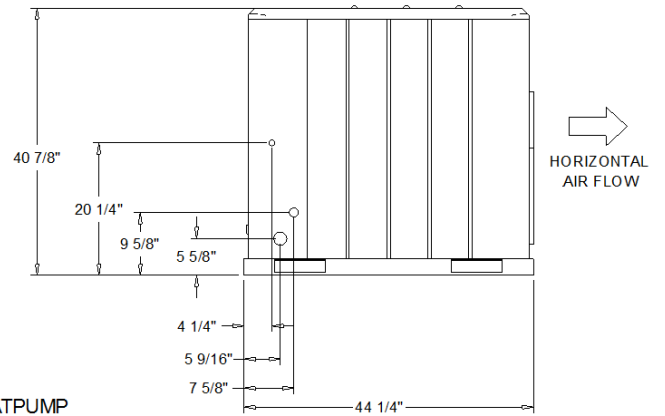
Item: B1, B3 Qty: 4 Tag(s): RTU-1, RTU-5, RTU-4, RTU-6



PLAN VIEW UNIT
DIMENSION DRAWING

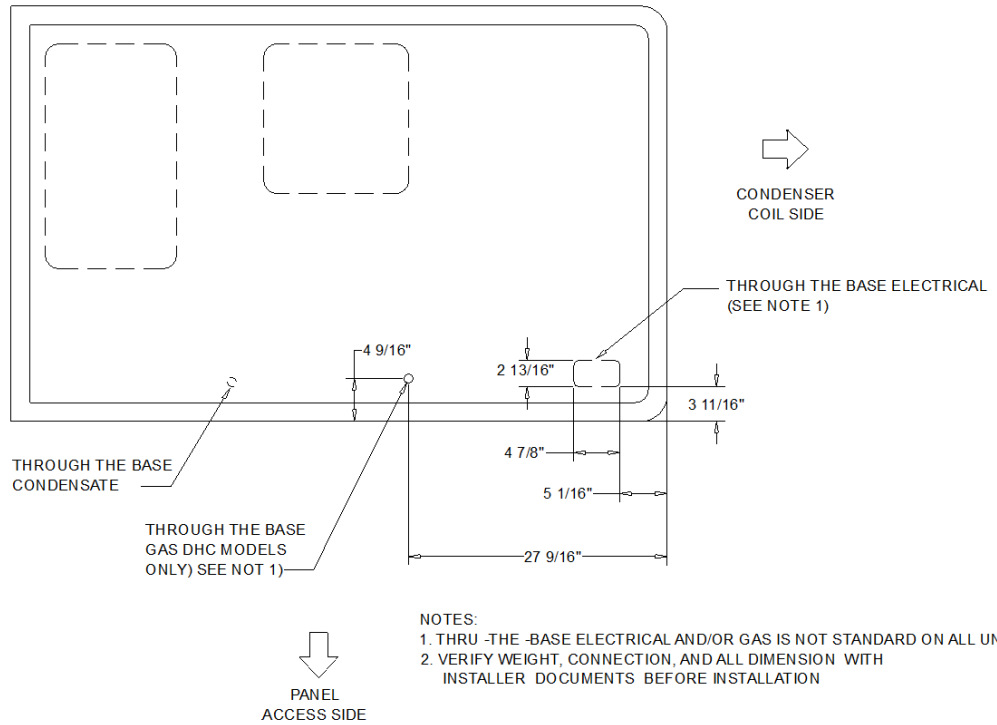
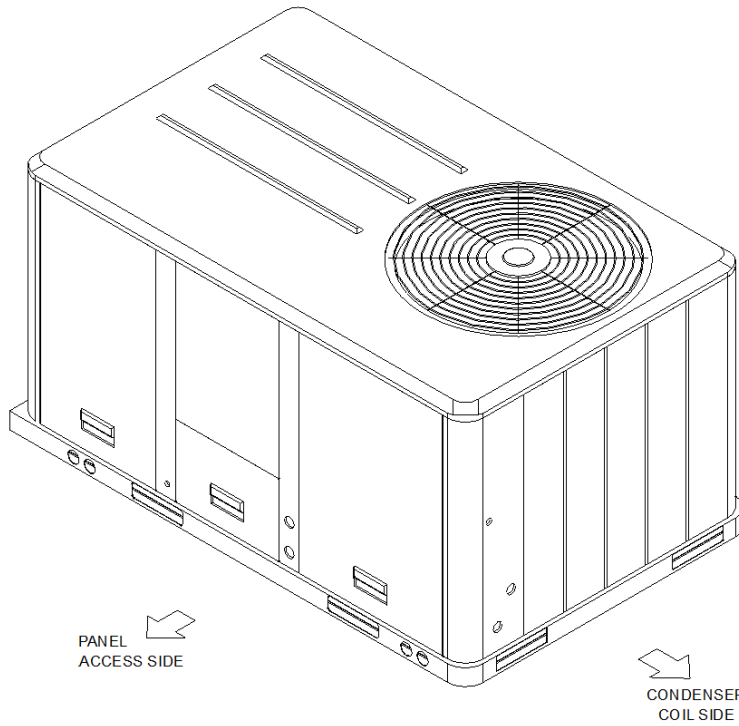


PACKAGED HEATPUMP
DIMENSION DRAWING



Dimensional Drawings - 3-10 Ton R-410 Packaged Heat Pumps

Item: B1, B3 Qty: 4 Tag(s): RTU-1, RTU-5, RTU-4, RTU-6



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

THRU THE BASE ELECTRICAL
PLAN / ISO VIEW DRAWING

Dimensional Drawings - 3-10 Ton R-410 Packaged Heat Pumps

Item: B1 Qty: 2 Tag(s): **RTU-1, RTU-5**

ELECTRICAL / GENERAL DATA

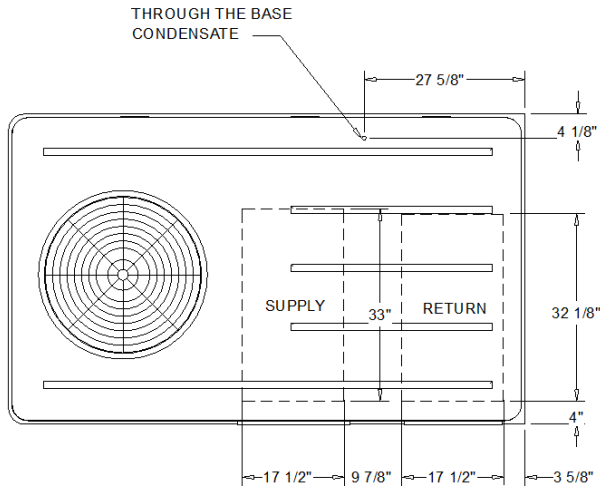
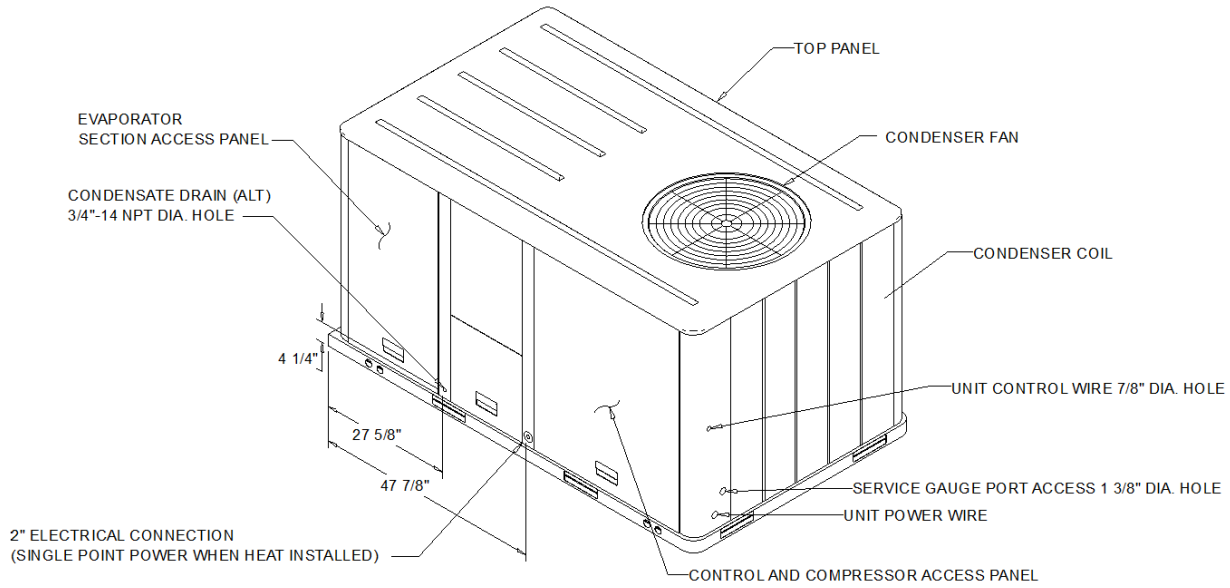
<p>GENERAL ⁽²⁾⁽⁴⁾⁽⁶⁾</p> <p>Model: WSC048H Oversized Motor</p> <p>Unit Operating Voltage: 414-506</p> <p>Unit Primary Voltage: 460</p> <p>Unit Secondary Voltage: --</p> <p>Unit Hertz: 60</p> <p>Unit Phase: 3</p> <p>SEER 12.3/14.3</p> <p>Standard Motor</p> <p>Minimum Circuit Ampacity: 12.0</p> <p>Maximum Fuse Size: 15.0</p> <p>Maximum (HACR) Circuit Breaker: 15.0</p>		<p>WITH HEATER</p> <p>Heater kW Rating : 12.0</p> <p>Stage: 2</p> <p>MCA: 30.0</p> <p>MFS: 30.0</p> <p>MCB: 30.0</p>																						
<p>MCA: N/A</p> <p>MFS: N/A</p> <p>MCB: N/A</p>		<p>Oversized Motor</p> <p>Field Installed Oversized Motor</p> <p>MCA: N/A</p> <p>MFS: N/A</p> <p>MCB: N/A</p>																						
<p>INDOOR MOTOR</p> <table border="0"> <tr> <td>Standard Motor</td> <td>Oversized Motor</td> <td>Field Installed Oversized Motor</td> </tr> <tr> <td>Number: 1</td> <td>Number: N/A</td> <td>Number: N/A</td> </tr> <tr> <td>Horsepower: 1.0</td> <td>Horsepower: N/A</td> <td>Horsepower: N/A</td> </tr> <tr> <td>Motor Speed (RPM): -</td> <td>Motor Speed (RPM): N/A</td> <td>Motor Speed (RPM): N/A</td> </tr> <tr> <td>Phase: 3</td> <td>Phase: N/A</td> <td>Phase: N/A</td> </tr> <tr> <td>Full Load Amps: 2.5</td> <td>Full Load Amps: N/A</td> <td>Full Load Amps: N/A</td> </tr> <tr> <td>Locked Rotor Amps: -</td> <td>Locked Rotor Amps: N/A</td> <td>Locked Rotor Amps: N/A</td> </tr> </table>				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: 3	Phase: N/A	Phase: N/A	Full Load Amps: 2.5	Full Load Amps: N/A	Full Load Amps: N/A	Locked Rotor Amps: -	Locked Rotor Amps: N/A	Locked Rotor Amps: N/A
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: 3	Phase: N/A	Phase: N/A																						
Full Load Amps: 2.5	Full Load Amps: N/A	Full Load Amps: N/A																						
Locked Rotor Amps: -	Locked Rotor Amps: N/A	Locked Rotor Amps: N/A																						
<p>COMPRESSOR Circuit 1/2</p> <p>Number: 1</p> <p>Horsepower: 3.8</p> <p>Phase: 3</p> <p>Rated Load Amps: 6.3</p> <p>Locked Rotor Amps: -</p>		<p>OUTDOOR MOTOR</p> <p>Number: 1</p> <p>Horsepower: 0.40</p> <p>Motor Speed (RPM): 1100</p> <p>Phase: 3</p> <p>Full Load Amps: 0.7</p> <p>Locked Rotor Amps: -</p>																						
<p>POWER EXHAUST ACCESSORY ^(3,7)</p> <p>(Field Installed Power Exhaust)</p> <p>Phase: N/A</p> <p>Horsepower: N/A</p> <p>Motor Speed (RPM): N/A</p> <p>Full Load Amps: N/A</p> <p>Locked Rotor Amps: N/A</p>		<p>FILTERS</p> <p>Type: Throwaway</p> <p>Furnished: Yes</p> <p>Number: 2</p> <p>Recommended: 20"x35"x2"</p>																						
<p>REFRIGERANT ⁽²⁾</p> <p>Type: R410</p> <p>Factory Charge</p> <p>Circuit #1: 9.3 lb</p> <p>Circuit #2: N/A</p>																								

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.
7. Installation of this power exhaust kit will affect unit level MCA and could affect MOP sizing having a direct impact on existing field wiring and unit protection devices. The change in MCA/MOP is the sole responsibility of the field installing party. Trane will not issue new nameplates as a result of this power exhaust accessory installation. FLA of the power exhaust kit option must be added to the MCA of the unit for building supply conductor sizing determination.

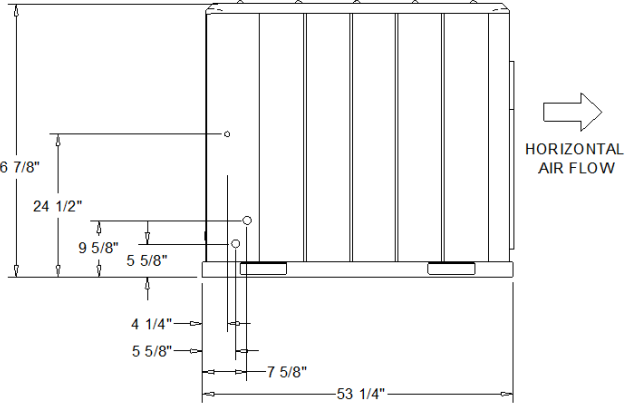
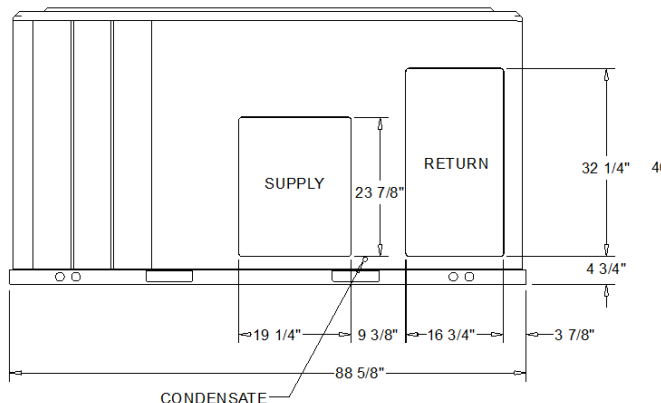
Dimensional Drawings - 3-10 Ton R-410 Packaged Heat Pumps

Item: B2 Qty: 1 Tag(s): RTU-3



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

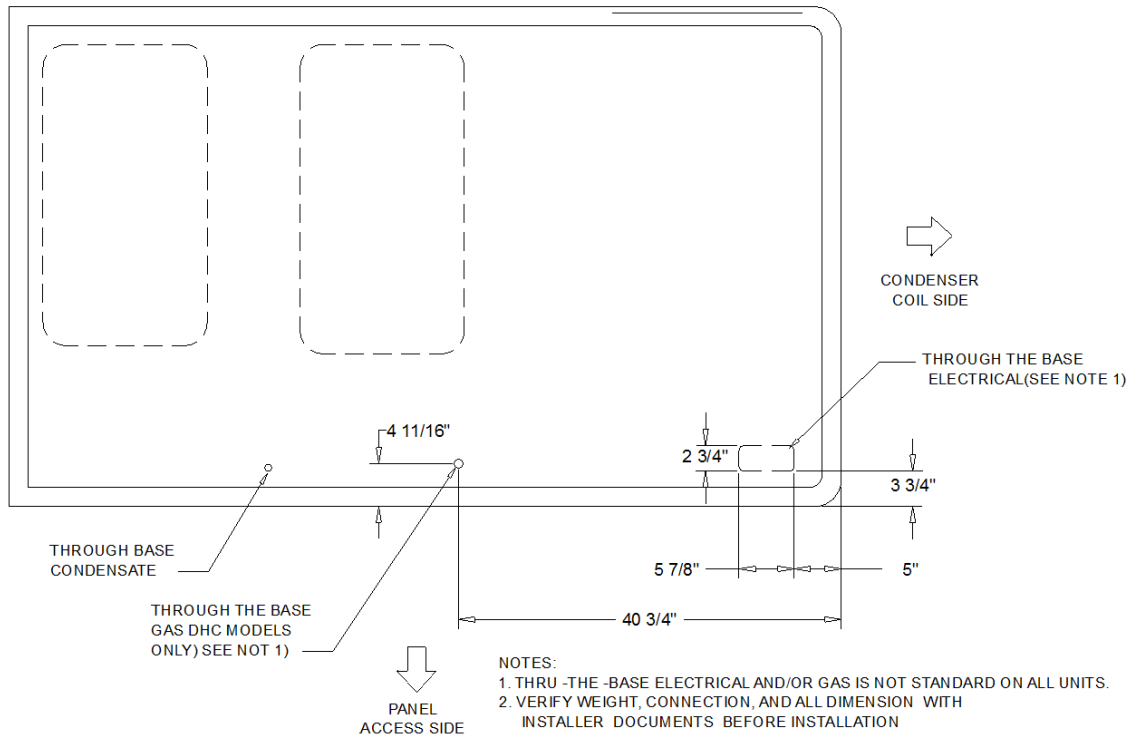
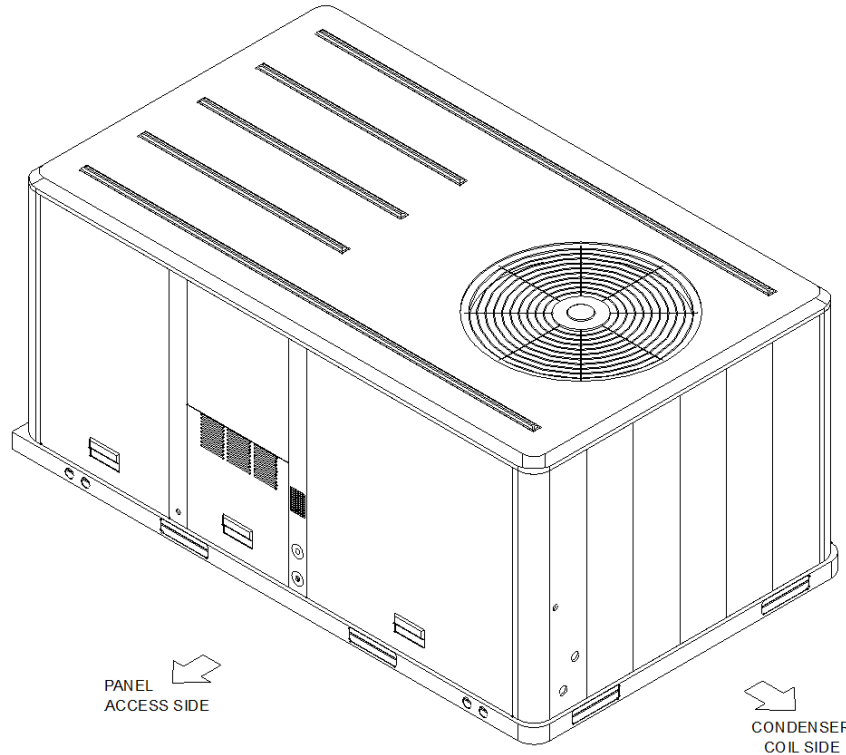
PLAN VIEW UNIT
DIMENSION DRAWING



PACKAGED HEATPUMP
DIMENSION DRAWING

Dimensional Drawings - 3-10 Ton R-410 Packaged Heat Pumps

Item: B2 Qty: 1 Tag(s): RTU-3



THRU THE BASE UTILITIES

PLAN / ISO VIEW DRAWING

Dimensional Drawings - 3-10 Ton R-410 Packaged Heat Pumps

Item: B2 Qty: 1 Tag(s): RTU-3

ELECTRICAL / GENERAL DATA

GENERAL ⁽²⁾⁽⁴⁾⁽⁶⁾ Model: WSC120H Oversized Motor Unit Operating Voltage: 414-506 Unit Primary Voltage: 460 Unit Secondary Voltage: -- Unit Hertz: 60 Unit Phase: 3 EER Standard Motor Minimum Circuit Ampacity: 24.0 Maximum Fuse Size: 35.0 Maximum (HACR) Circuit Breaker: 35.0		WITH HEATER Heater kW Rating : 27.0 Stage: 2 MCA: 64.0 MFS: 70.0 MCB: 70.0 Oversized Motor MCA: N/A MFS: N/A MCB: N/A Field Installed Oversized Motor MCA: N/A MFS: N/A MCB: N/A	
INDOOR MOTOR Standard Motor Number: 1 Horsepower: 2.75 Motor Speed (RPM): -- Phase: 3 Full Load Amps: 3.6 Locked Rotor Amps: --		Outsized 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 Field Installed 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: 1 Horsepower: 10.5 Phase: 3 Rated Load Amps: 14.4 Locked Rotor Amps: -		OUTDOOR MOTOR Number: 1 Horsepower: 0.70 Motor Speed (RPM): 1100 Phase: 3 Full Load Amps: 1.6 Locked Rotor Amps: -	
POWER EXHAUST ACCESSORY ^(3,7) (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: R410 Factory Charge Circuit #1: 16.3 lb Circuit #2:			

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.
7. Installation of this power exhaust kit will affect unit level MCA and could affect MOP sizing having a direct impact on existing field wiring and unit protection devices. The change in MCA/MOP is the sole responsibility of the field installing party. Trane will not issue new nameplates as a result of this power exhaust accessory installation. FLA of the power exhaust kit option must be added to the MCA of the unit for building supply conductor sizing determination.

Dimensional Drawings - 3-10 Ton R-410 Packaged Heat Pumps

Item: B3 Qty: 2 Tag(s): **RTU-4, RTU-6**

ELECTRICAL / GENERAL DATA

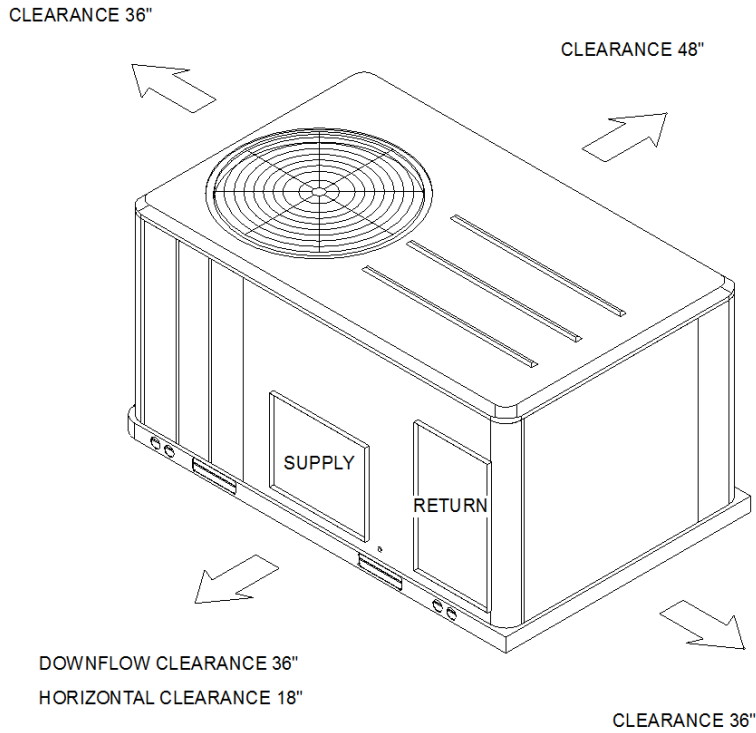
GENERAL ⁽²⁾⁽⁴⁾⁽⁶⁾ Model: WSC036H Oversized Motor Unit Operating Voltage: 414-506 Unit Primary Voltage: 460 Unit Secondary Voltage: -- Unit Hertz: 60 Unit Phase: 3 SEER 12.1/14.3 Standard Motor Minimum Circuit Ampacity: 11.0 Maximum Fuse Size: 15.0 Maximum (HACR) Circuit Breaker: 15.0		WITH HEATER Heater kW Rating : 6.0 Stage: 1 MCA: N/A MFS: N/A MCB: N/A MFS: 20.0 MCB: 20.0 Oversized Motor MCA: N/A MFS: N/A MCB: N/A Field Installed Oversized Motor MCA: N/A MFS: N/A MCB: N/A	
INDOOR MOTOR Standard Motor Number: 1 Horsepower: 0.75 Motor Speed (RPM): -- Phase: 3 Full Load Amps: 1.7 Locked Rotor Amps: -		Outsized 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 Field Installed 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: 1 Horsepower: 3.2 Phase: 3 Rated Load Amps: 6.60 Locked Rotor Amps: -		OUTDOOR MOTOR Number: 1 Horsepower: 0.25 Motor Speed (RPM): 1100 Phase: 3 Full Load Amps: 0.55 Locked Rotor Amps: -	
POWER EXHAUST ACCESSORY ^(3,7) (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: 2 Recommended: 20"x35"x2"	
REFRIGERANT ⁽²⁾ Type: R410 Factory Charge Circuit #1: 7.7 lb Circuit #2: N/A			

NOTES:

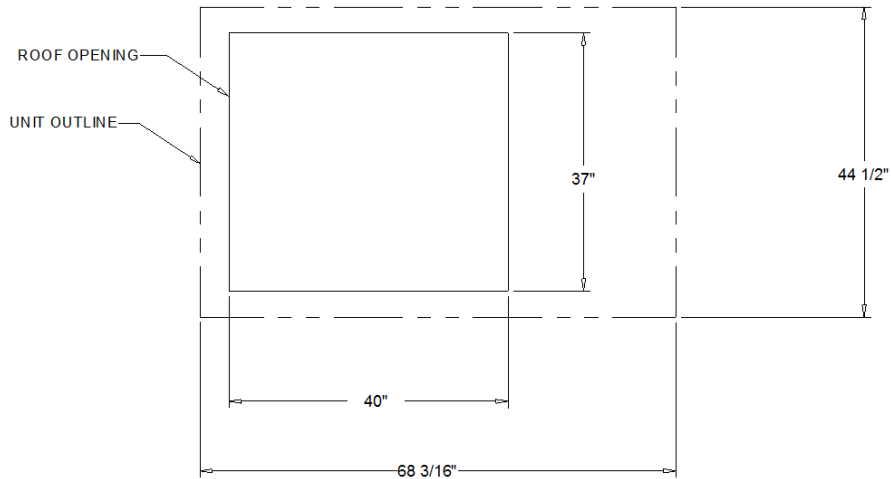
1. Maximum (HACR) Circuit Breaker sizing is for installations in the United States only.
2. Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.
3. Value does not include Power Exhaust Accessory.
4. Value includes oversized motor.
5. Value does not include Power Exhaust Accessory.
6. EER is rated at AHRI conditions and in accordance with DOE test procedures.
7. Installation of this power exhaust kit will affect unit level MCA and could affect MOP sizing having a direct impact on existing field wiring and unit protection devices. The change in MCA/MOP is the sole responsibility of the field installing party. Trane will not issue new nameplates as a result of this power exhaust accessory installation. FLA of the power exhaust kit option must be added to the MCA of the unit for building supply conductor sizing determination.

Weight, Clearance & Rigging - 3-10 Ton R-410 Packaged Heat Pumps
Item: B1, B3 Qty: 4 Tag(s): RTU-1, RTU-5, RTU-4, RTU-6

CLEARANCE FROM TOP OF UNIT 72"



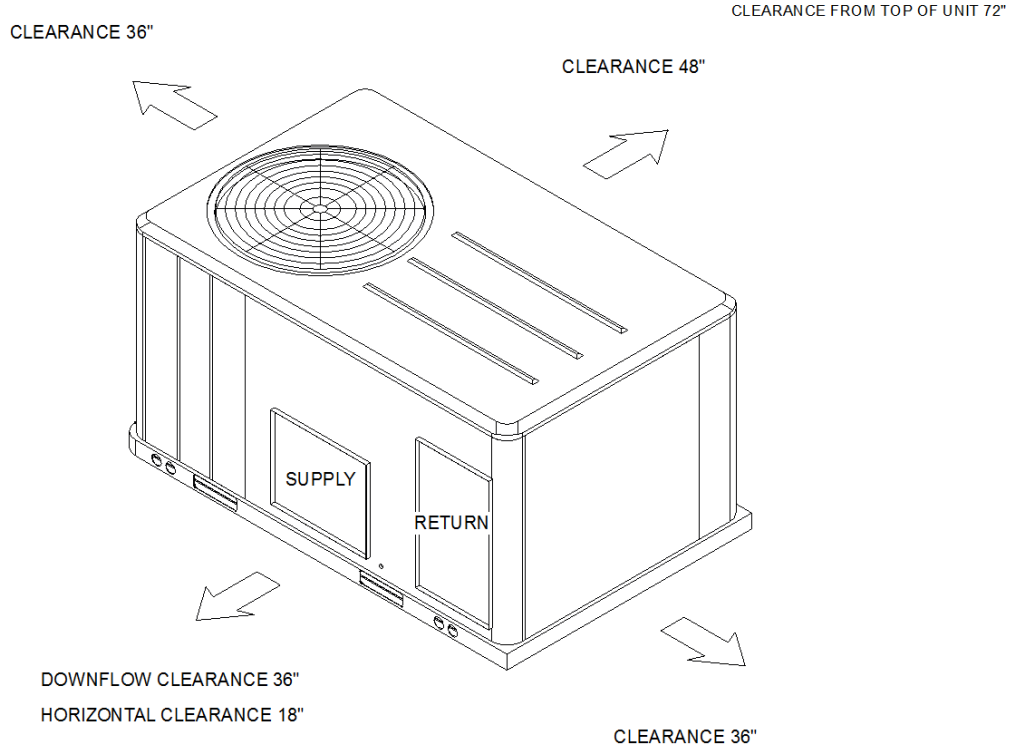
PACKAGED HEAT PUMP
CLEARANCE



PACKAGED HEAT PUMP
DOWNFLOW TYPICAL ROOF OPENING

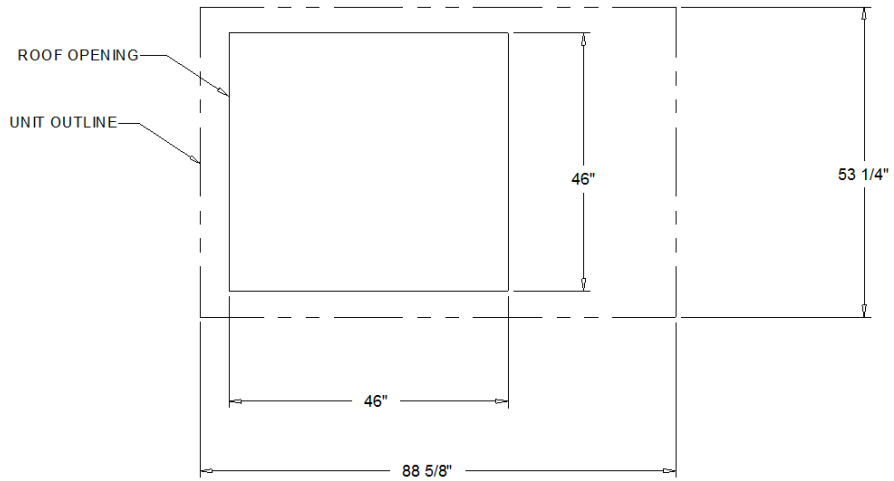
Weight, Clearance & Rigging - 3-10 Ton R-410 Packaged Heat Pumps

Item: B2 Qty: 1 Tag(s): RTU-3



PACKAGED HEAT PUMP

CLEARANCE

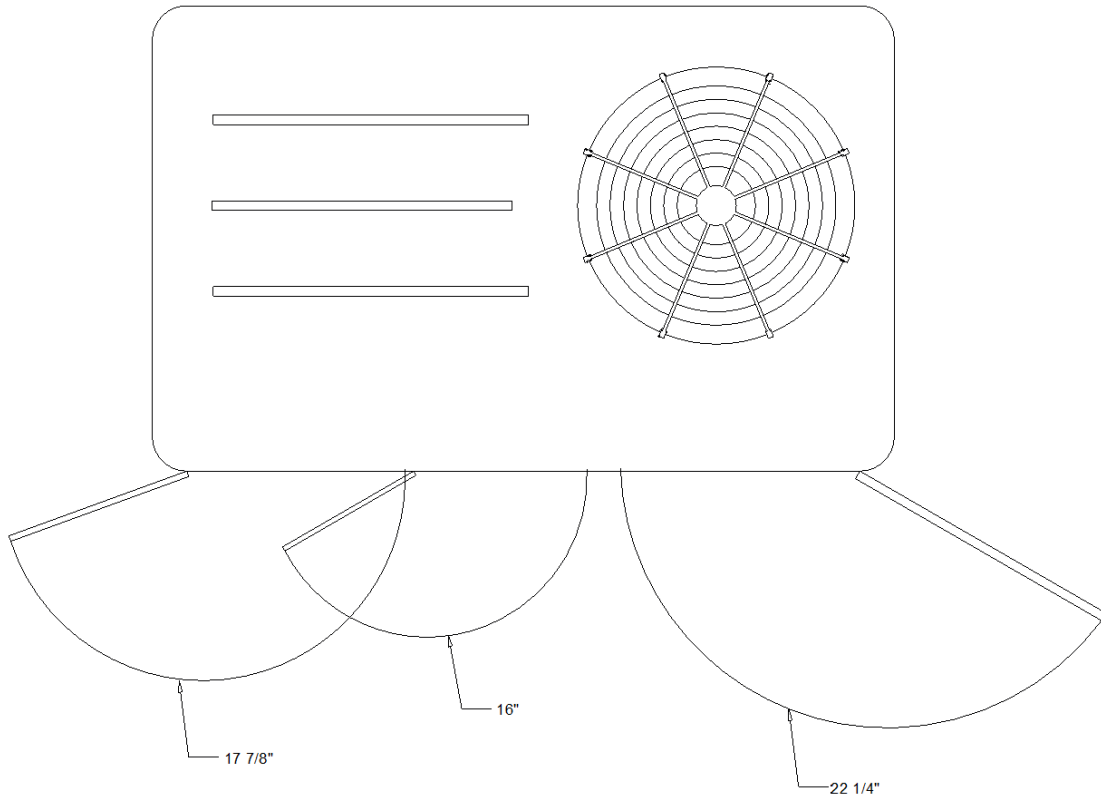


PACKAGED HEAT PUMP

DOWNFLOW TYPICAL ROOF OPENING

Accessory - 3-10 Ton R-410 Packaged Heat Pumps

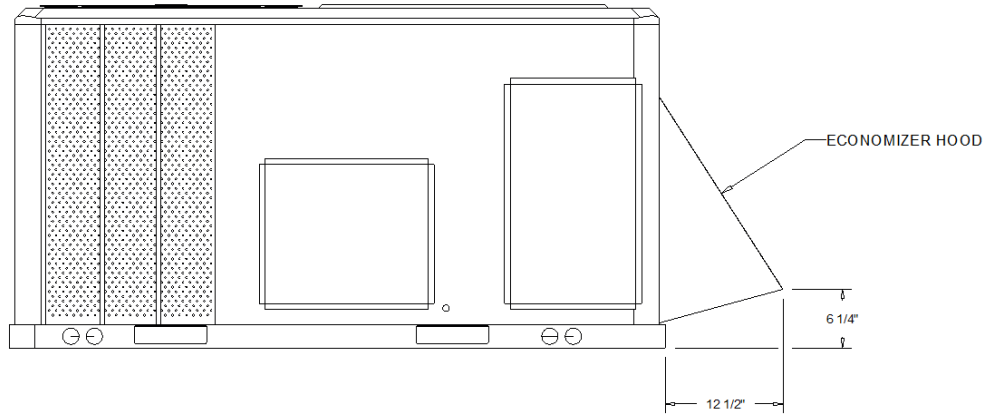
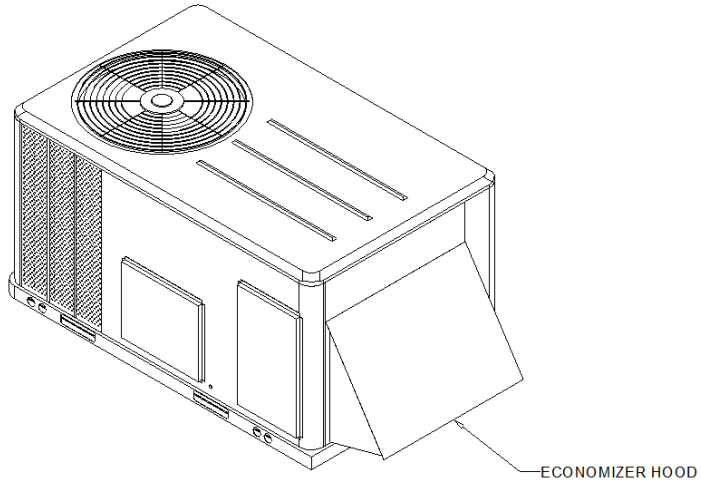
Item: B1, B3 Qty: 4 Tag(s): RTU-1, RTU-5, RTU-4, RTU-6



SWING DIAMETER - HINGED DOOR(S) OPTION

Accessory - 3-10 Ton R-410 Packaged Heat Pumps

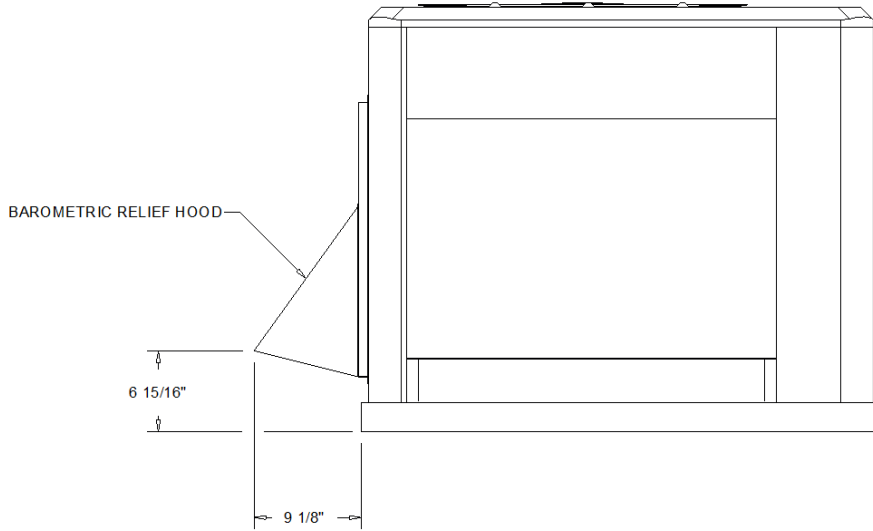
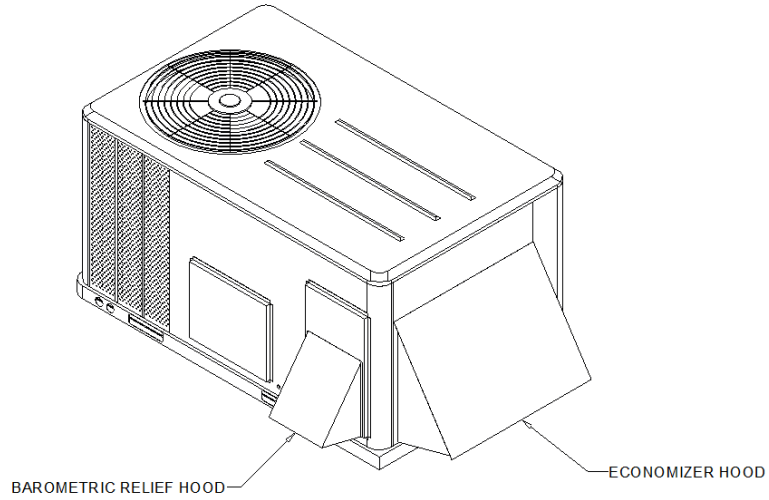
Item: B1, B3 Qty: 4 Tag(s): RTU-1, RTU-5, RTU-4, RTU-6



ACCESSORY - ECONOMIZER HOOD

Accessory - 3-10 Ton R-410 Packaged Heat Pumps

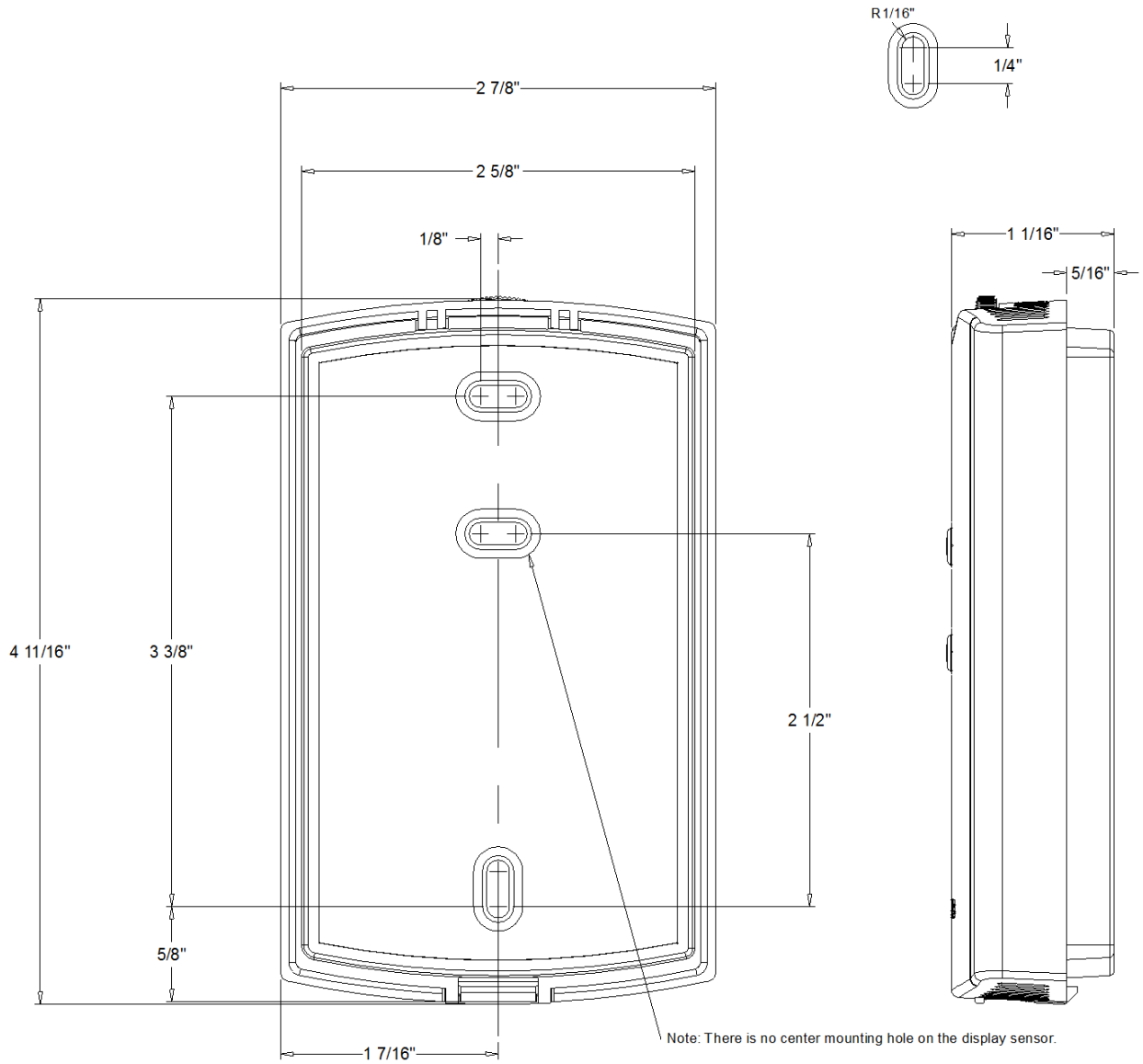
Item: B1, B3 Qty: 4 Tag(s): RTU-1, RTU-5, RTU-4, RTU-6



ACCESSORY - BAROMETRIC RELIEF DAMPER HOOD

Accessory - 3-10 Ton R-410 Packaged Heat Pumps

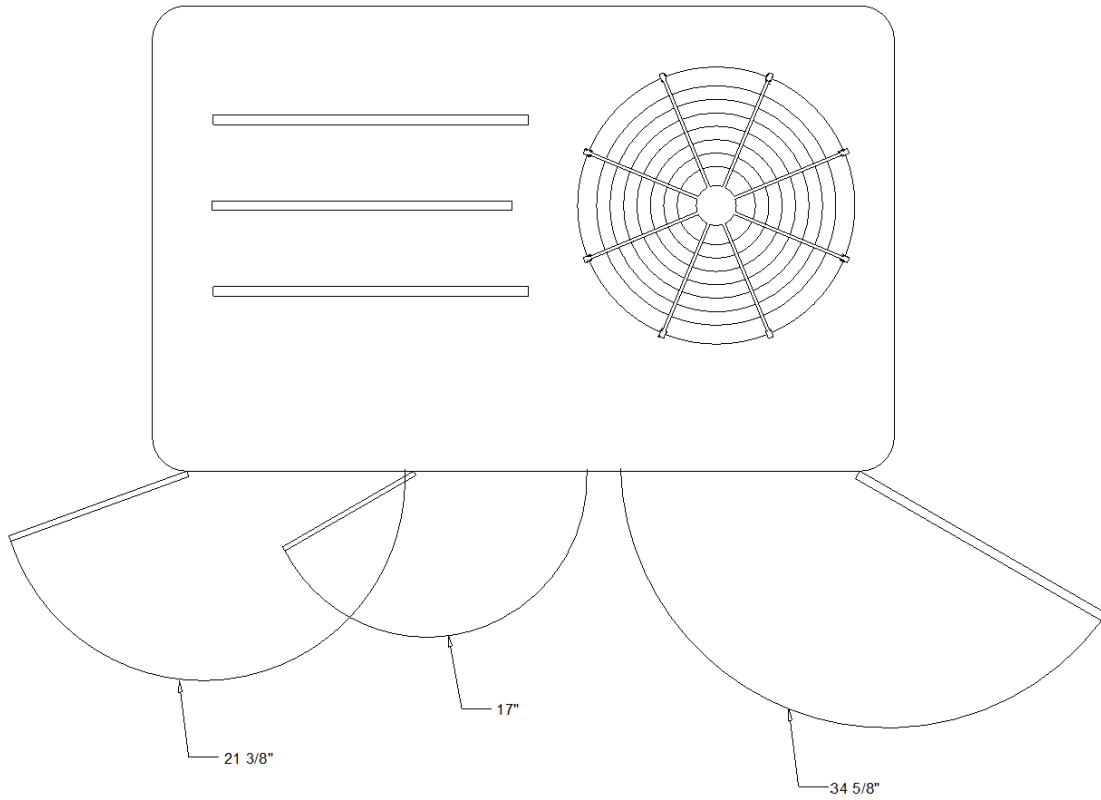
Item: B1 - B3 Qty: 5 Tag(s): RTU-1, RTU-5, RTU-3, RTU-4, RTU-6



BAYSEN074 - ZONE SENSOR
ROOM SENSOR WITH TEMPADJ AND OVERRIDE

Accessory - 3-10 Ton R-410 Packaged Heat Pumps

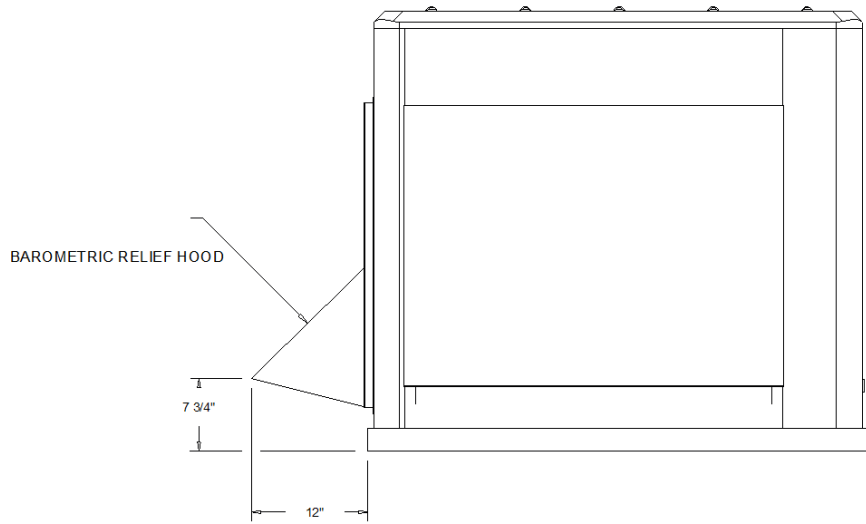
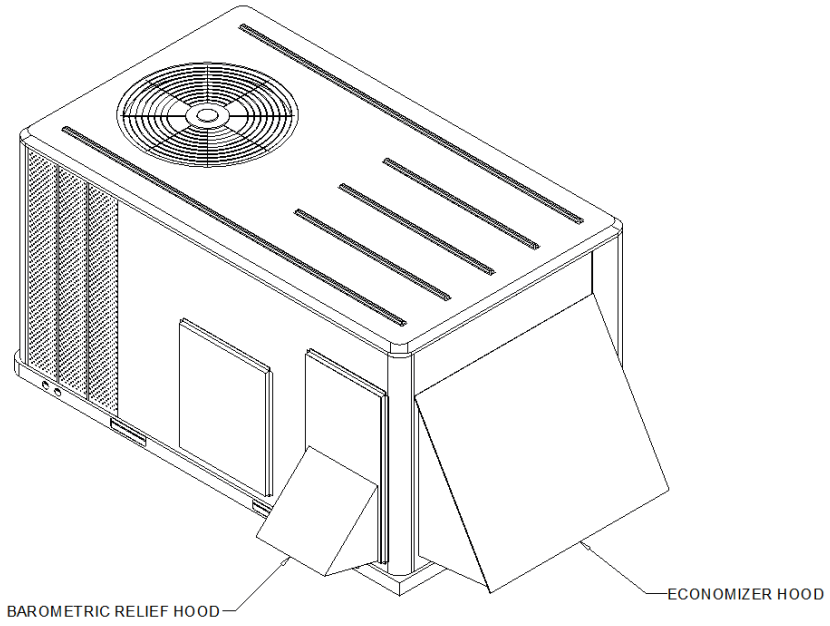
Item: B2 Qty: 1 Tag(s): RTU-3



SWING DIAMETER - HINGED DOOR(S) OPTION

Accessory - 3-10 Ton R-410 Packaged Heat Pumps

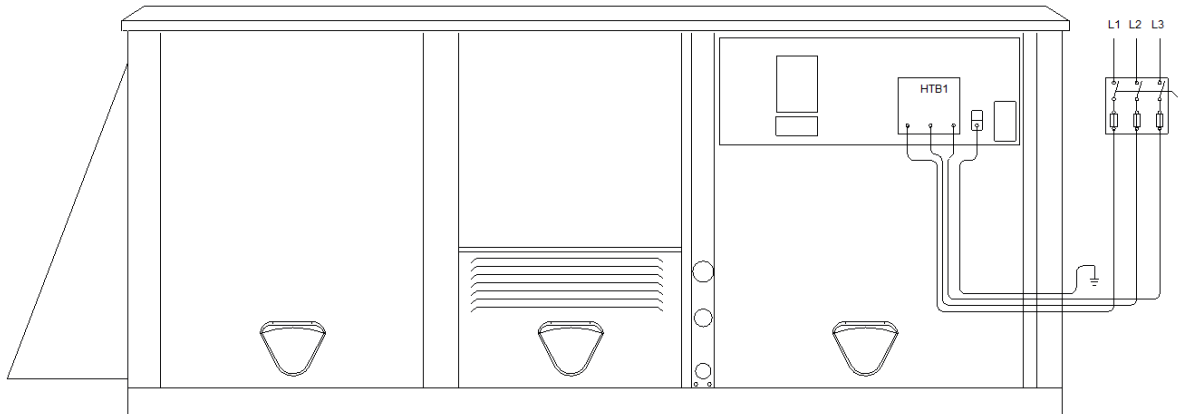
Item: B2 Qty: 1 Tag(s): RTU-3



ACCESSORY - BAROMETRIC RELIEF DAMPER HOOD

Field Wiring - 3-10 Ton R-410 Packaged Heat Pumps

Item: B1 - B3 Qty: 5 Tag(s): RTU-1, RTU-5, RTU-3, RTU-4, RTU-6



ZONE SENSOR WIRE TABLE

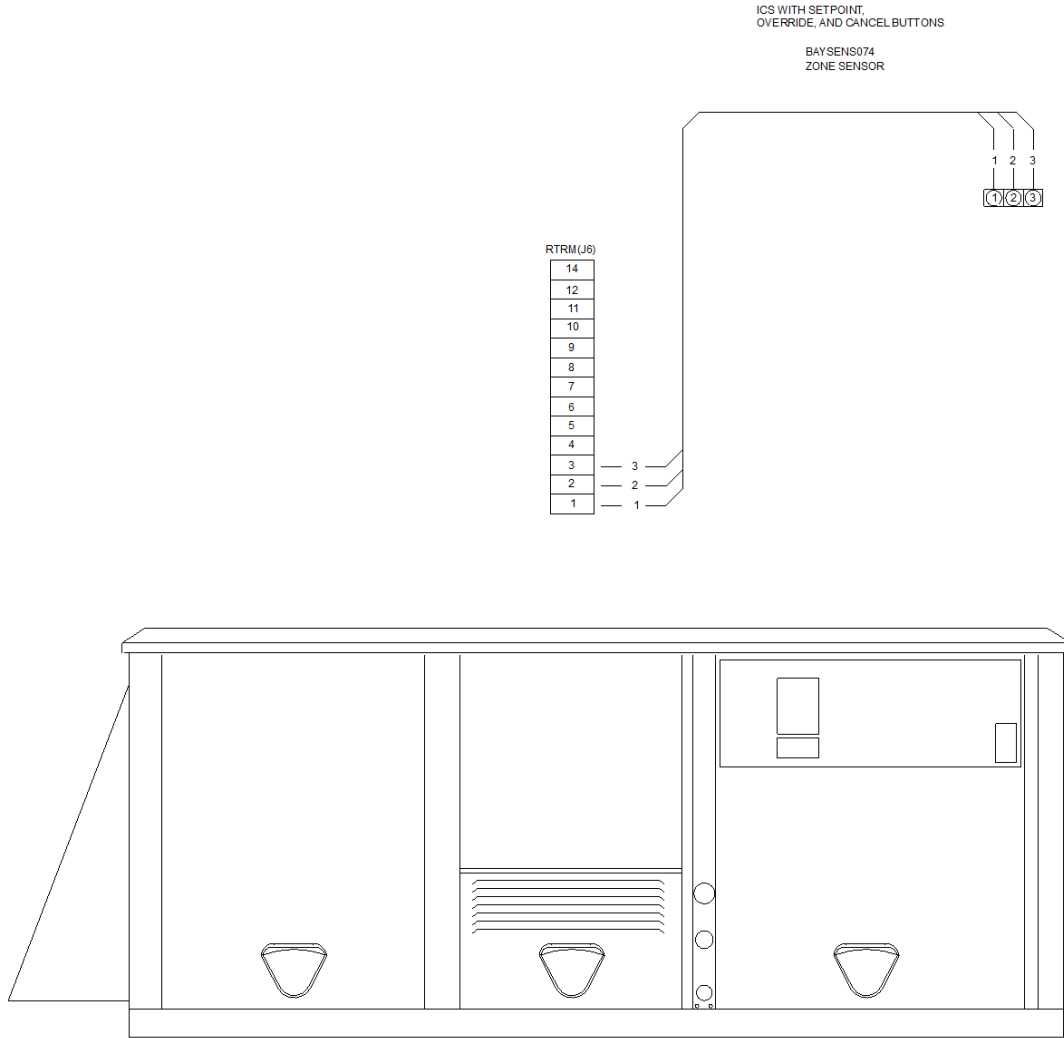
WIRE SIZE	MAXIMUM WIRE LENGTH
22 GAUGE	1800"
20 GAUGE	3000"
18 GAUGE	4500"
16 GAUGE	7200"
14 GAUGE	11700"

NOTE:

1. All wiring and devices shown dashed to be supplied and installed by the customer in accordance with national and local electrical codes.
2. Low voltage control wiring must not be run in conduit with power wiring.

Field Wiring - 3-10 Ton R-410 Packaged Heat Pumps

Item: B1 - B3 Qty: 5 Tag(s): RTU-1, RTU-5, RTU-3, RTU-4, RTU-6



ZONE SENSOR WIRE TABLE

WIRE SIZE	MAXIMUM WIRE LENGTH
22 GAUGE	1800"
20 GAUGE	3000"
18 GAUGE	4500"
16 GAUGE	7200"
14 GAUGE	11700"

NOTE:

1. All wiring and devices shown dashed to be supplied and installed by the customer in accordance with national and local electrical codes.
2. Low voltage control wiring must not be run in conduit with power wiring.

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 - 6- 25 Ton PKGD Precedent Unitary Rooftops

Item	Tag(s)	Qty	Description	Model Number
A1	RTU-2	1	15-Ton Heat Pump Precedent	WSJ180A4S0N**D0C0A2A1A002

Field Installed Option Description	Part/Ordering Number
CO2 wall mounted sensor	FIACO2K001A
Room sensor with temperature adjustment with override	BAYSENS074A
Humidity wall mounted sensor	BAYSENS036A
Low Ambient Kit	FIALOAM002A

Product Family - 3-10Ton R-410 Packaged Heat Pump

Item	Tag(s)	Qty	Description	Model Number
B1	RTU-1, RTU-5	2	4-Ton Heat Pump Precedent	WSC048H4REA**D0C1A2A6000A
B3	RTU-4, RTU-6	2	3-Ton Heat Pump Precedent	WSC036H4RBA**D0C1A2A6000A

Field Installed Option Description	Part/Ordering Number
Humidity wall mounted sensor	BAYSENS036A
Room sensor with temperature adjustment with override	BAYSENS074A

Item	Tag(s)	Qty	Description	Model Number
B2	RTU-3	1	10-Ton Heat Pump Precedent	WSC120H4RKB**D0C1A2A6000AA

Field Installed Option Description	Part/Ordering Number
CO2 wall mounted sensor	BAYSENS251A
Humidity wall mounted sensor	BAYSENS036A
Room sensor with temperature adjustment with override	BAYSENS074A