3-10 Ton R-410A PKGD Unitary Gas/Electric Rooftop

Job Information

Name	**Lees Summit Senior**	Tag	**RTU-AL1B**
Address		Quantity	**1**
Sales Team	**Kansas City Main Office**	Model Number	**YSC072H3RMA--D1C1A10000000000000000000000**
Comments			

General

Unit function	**DX cooling, gas heat**	Airflow	**Convertible configuration**
Airflow Application	**Downflow**	Design Airflow	**2370 cfm**
Fresh air selection	**Econ-dry bulb 0-100% w/ bar relief 3ph**	Tonnage	**6 Ton Single compressor**
Cooling Entering DB	**79.10 F**	Cooling Entering WB	**65.90 F**
Ent Air Relative Humidity	**49.91 %**	Ambient Temp	**105.00 F**
Heating capacity	**Medium gas heat 3ph**	Heating EAT	**60.00 F**
Voltage	**208-230/60/3**	Design ESP	**1.500 in H2O**
Supply fan/drive/type/motor	**Oversize motor**	Evaporator rows	**3.00 Each**
Evaporator fin spacing	**192 Per Foot**	Evaporator face area	**9.89 sq ft**
Evaporator face velocity	**240 ft/min**	Min. unit operating weight	**710.0 lb**
Max. unit operating weight	**1045.0 lb**	ASHRAE 90.1	**Yes**
Rated capacity (AHRI)	**71.00 MBh**		

Main Cooling

Evap Coil Leaving Air Temp (DB)	**58.99 F**	Evap Coil Leaving Air Temp (WB)	**56.30 F**
Cooling Leaving Unit DB	**59.30 F**	Cooling Leaving Unit WB	**56.42 F**
Gross Total Capacity	**69.10 MBh**	Gross Sensible Capacity	**51.46 MBh**
Gross Latent Capacity	**17.64 MBh**	Net Total Capacity	**69.10 MBh**
Net Sensible Capacity	**51.46 MBh**	Net Sensible Heat Ratio	**0.74 Number**
Fan motor heat	**0.00 MBh**	Dew Point	**54.50 F**
Refrig charge (HFC-410A) - ckt 1	**5.5 lb**	Saturated Discharge Temp Circuit 1	**124.42 F**
Saturated Suction Temp Circuit 1	**48.97 F**		

Main Heating

Input Heating Capacity	**120.00 MBh**	Output Heating Capacity	**97.20 MBh**
Output Heating Cap. w/Fan	**97.20 MBh**	Heating LAT	**98.20 F**
Heating Delta T	**38.20 F**		

Motor/Electrical

Component SP	**0.198 in H2O**	Total Static Pressure	**1.725 in H2O**
Field supplied drive kit required	**None**	Indoor mtr operating power	**1.93 bhp**
Indoor RPM	**1176 rpm**	Indoor Motor Power	**1.44 kW**
Outdoor Motor Power	**0.58 kW**	Compressor Power	**5.94 kW**
System Power	**7.96 kW**	EER @ AHRI Conditions	**11.2 EER**
MCA	**38.00 A**	MOP	**50.00 A**
Compressor 1 RLA	**22.40 A**	Compressor 2 RLA	**0.00 A**
Condenser fan FLA	**3.30 A**	Evaporator fan FLA	**6.30 A**
SEER/IEER	**12.70**		

Baseunit

Height	**3.41 ft**	Width	**4.44 ft**
Length	**7.39 ft**		

Fan

Indoor Fan Type	**FC Centrifugal**	Indoor Fan Drive Type	**Belt**
Outdoor Fan Type	**Propeller**	Outdoor Fan Drive Type	**Direct**
Outdoor Fan Quantity	**1**		

Heat

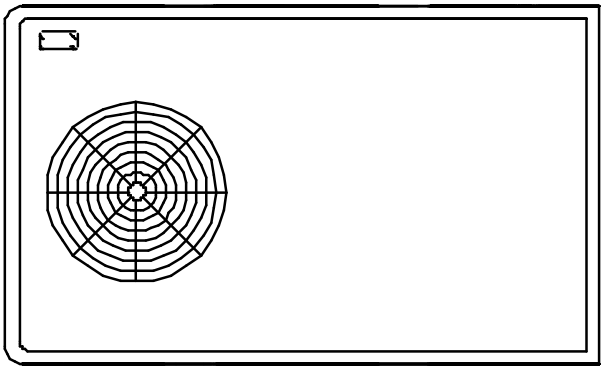
Heating Type	**Gas Heat**	Heating Stages	**1**

DX Cooling, Gas Heat 3-10 Ton

Unit controls	**Microprocessor controls 3ph**	Condenser coil protection	**Std condenser coil w/hail guard 3ph**
Through the base provisions	**Through the base electrical 3ph**	Disconnect sw/circuit breaker	**Non-fused disconnect**

Field installed accessories

Roof curb	**Roof curb**



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ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)

Model:	YSC072H	Oversized Motor
Unit Operating Voltage:	187-253	MCA:
Unit Primary Voltage:	208	MFS:
Unit Secondary Voltage	230	MCB:
Unit Hertz:	60	
Unit Phase:	3	
EER	11.2	
Standard Motor		Field Installed Oversized Motor
MCA:	35.0	MCA: N/A
MFS:	50.0	MFS: N/A
MCB:	50.0	MCB: N/A

HEATING PERFORMANCE

HEATING - GENERAL DATA

Heating Model:	Medium
Heating Input (BTU):	120,000
Heating Output (BTU):	96,000
No. Burners:	3
No. Stages	1

Gas Inlet Pressure

Natural Gas (Min/Mix):	4 1/2"/14"
LP (Min/Max)	11"/14"
Gas Pipe Connection Size:	1/2"

INDOOR MOTOR

Standard Motor		Oversized Motor		Field Installed Oversized Motor	
Number:		Number:	1	Number:	N/A
Horsepower:		Horsepower:	2.0	Horsepower:	N/A
Motor Speed (RPM):		Motor Speed (RPM):	–	Motor Speed (RPM):	N/A
Phase		Phase	3	Phase	N/A
Full Load Amps:		Full Load Amps:	6.30	Full Load Amps:	N/A
Locked Rotor Amps:		Locked Rotor Amps:	48.0	Locked Rotor Amps:	N/A

COMPRESSOR Circuit 1/2

Number:	
Horsepower:	
Phase:	
Rated Load Amps:	
Locked Rotor Amps:	

OUTDOOR MOTOR

Number:	1
Horsepower:	0.70
Motor Speed (RPM):	1100
Phase:	1
Full Load Amps:	3.3
Locked Rotor Amps:	12.3

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	5.5 lb
Circuit #2	N/A

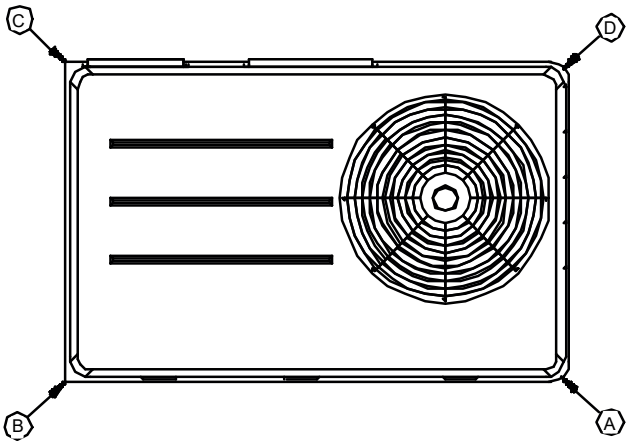
NOTES:

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.

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	
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)	12.0 lb
HAIL GUARD	20.0 lb
SMOKE DETECTOR, SUPPLY / RETURN	
NOVAR CONTROL	
STAINLESS STEEL HEAT EXCHANGER	
REHEAT	
ROOF CURB	78.0 lb

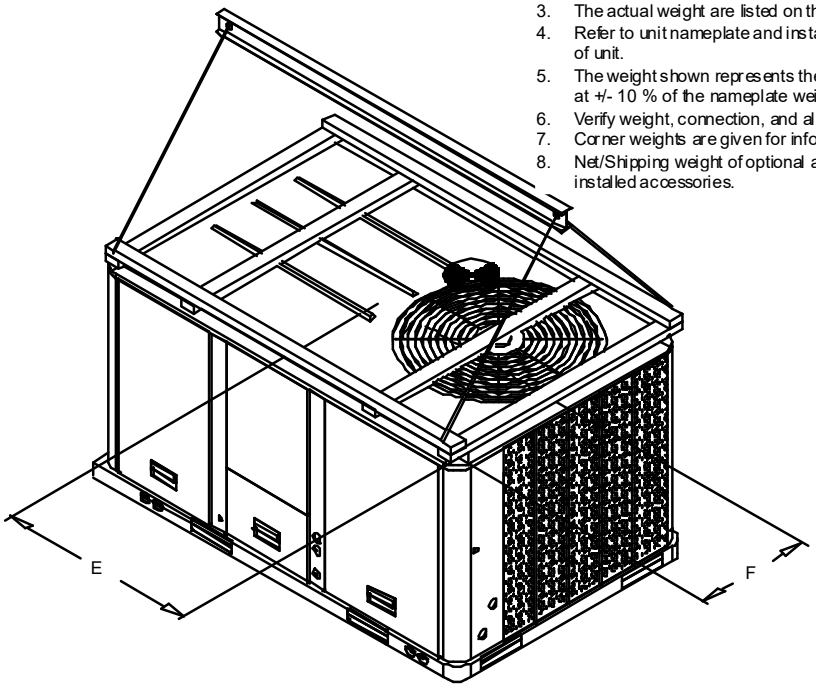
BASIC UNIT WEIGHTS		CORNER WEIGHTS				CENTER OF GRAVITY	
SHIPPING	NET	(A)	222.0 lb	(C)	121.0 lb	(E) LENGHT	(F) WIDTH
805.0 lb	710.0 lb	(B)	217.0 lb	(D)	150.0 lb	41"	22"



PACKAGED GAS / ELECTRICAL

CORNER WEIGHT

NOTE:
1. All weights are approximate.
2. Weights for options that are not list refer to Installation guide.
3. The actual weight are listed on the unit nameplate.
4. Refer to unit nameplate and installation guide for weights before scheduling transportation and installation of unit.
5. The weight shown represents the typical unit operating weight for the configuration selected. Estimated at +/- 10 % of the nameplate weight. .
6. Verify weight, connection, and all dimension with installer documents before installation.
7. Corner weights are given for information only.
8. Net/Shipping weight of optional accessories should be added to unit weight when ordering factory or field installed accessories.



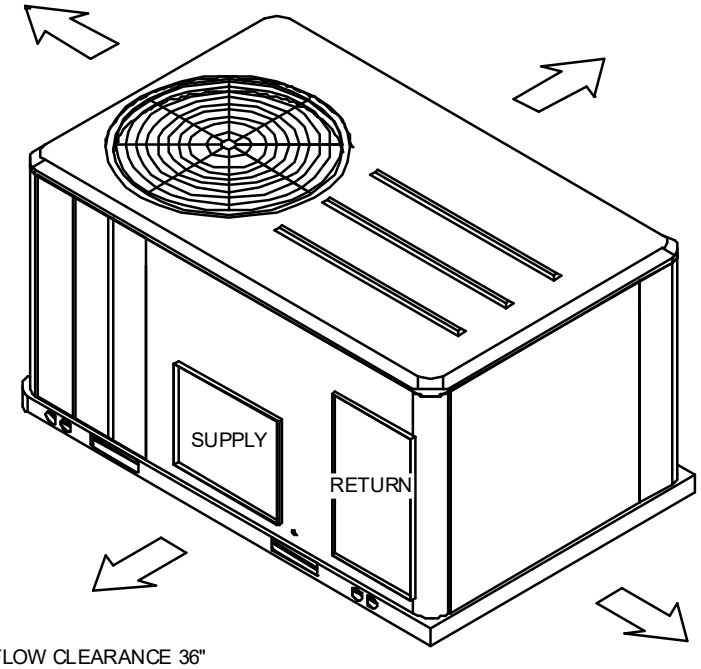
PACKAGED GAS / ELECTRICAL

RIGGING AND CENTER OF GRAVITY

CLEARANCE FROM TOP OF UNIT 72"

CLEARANCE 36"

CLEARANCE 48"



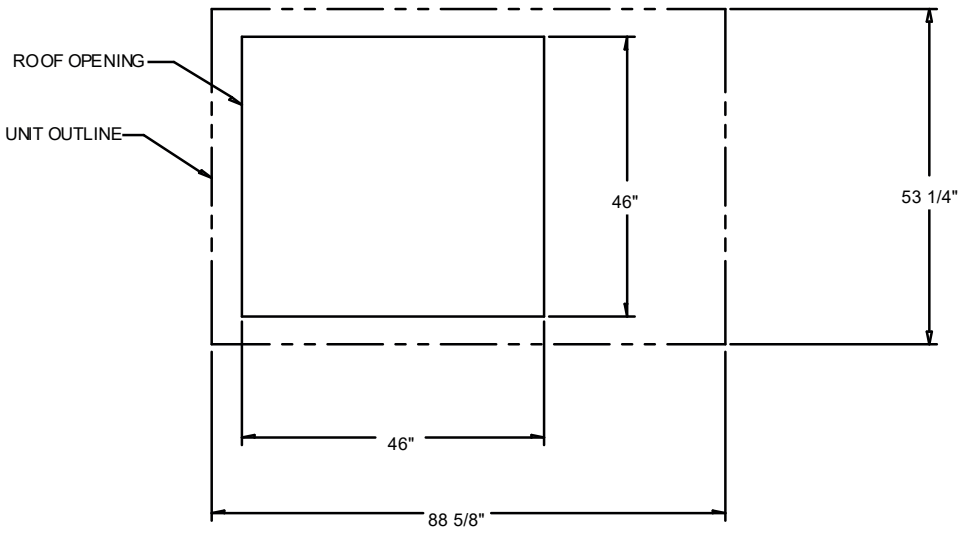
DOWNFLOW CLEARANCE 36"

HORIZONTAL CLEARANCE 18"

CLEARANCE 36"

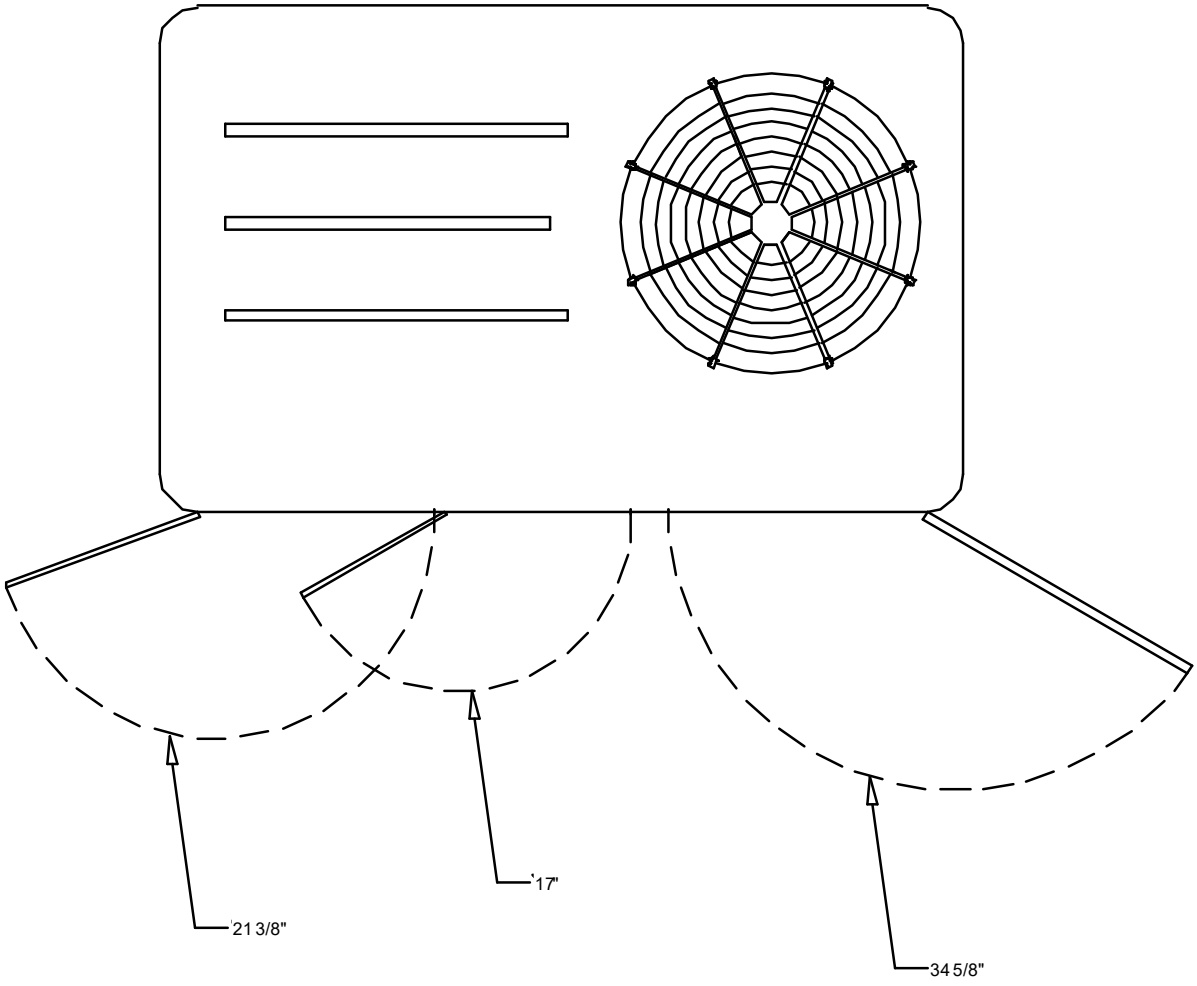
PACKAGED GAS / ELECTRIC

CLEARANCE



PACKAGED GAS / ELECTRIC

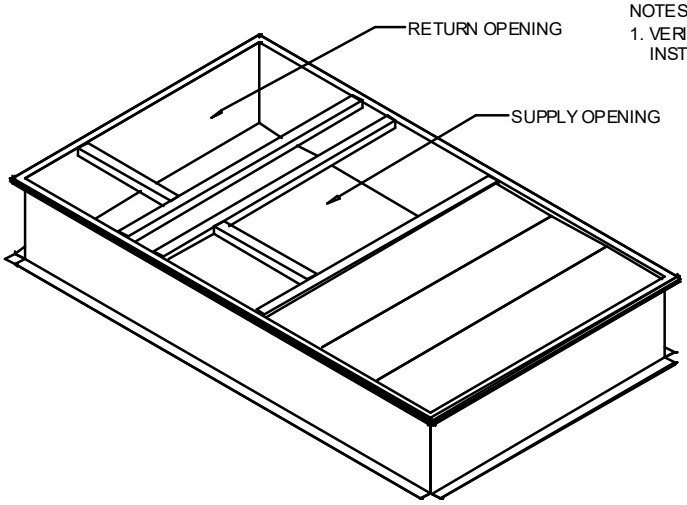
DOWNFLOW TYPICAL ROOF OPENING

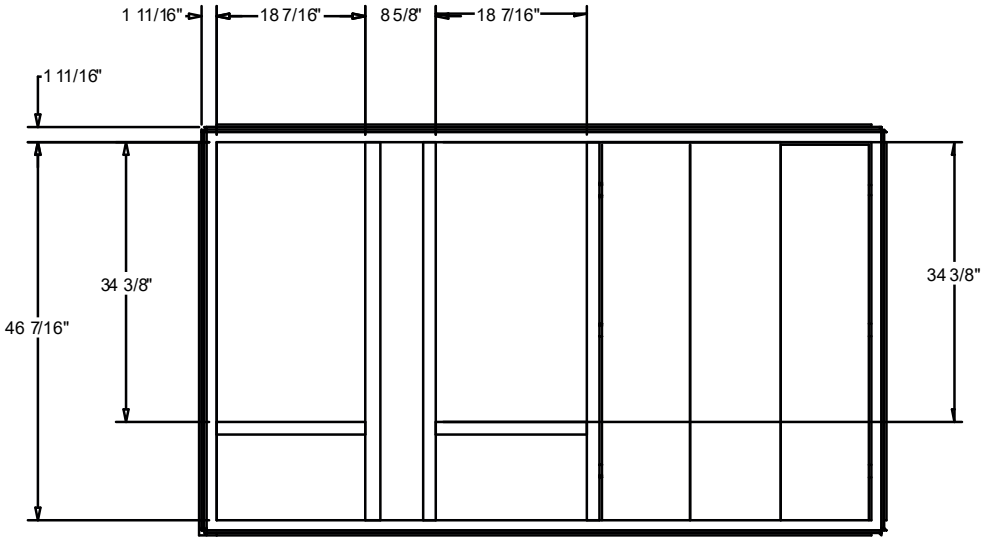


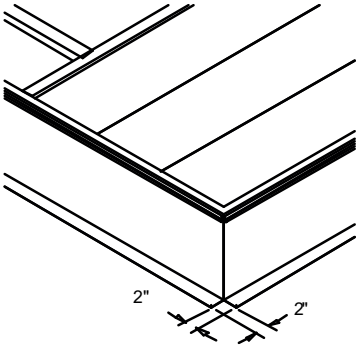
SWING DIAMETER - HINGED DOOR(S) OPTION

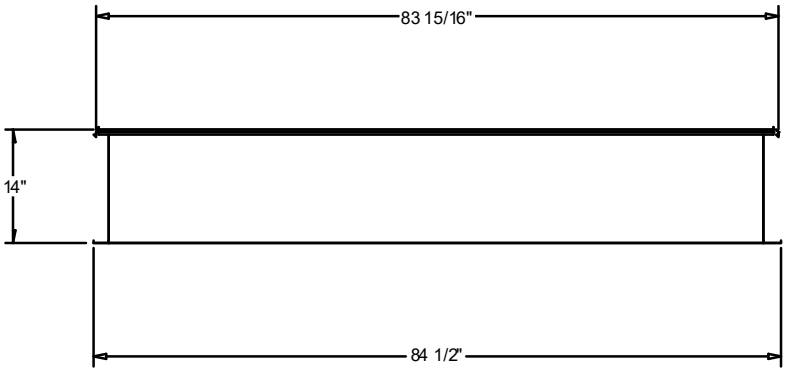
ACCESSORY

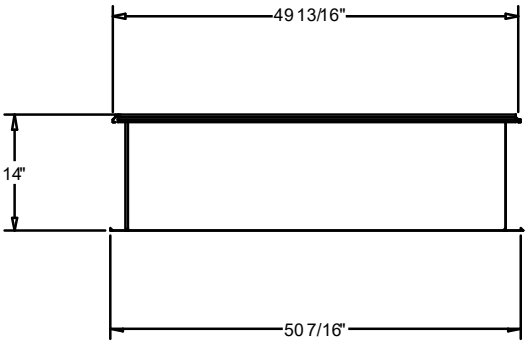
NOTES:
1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION







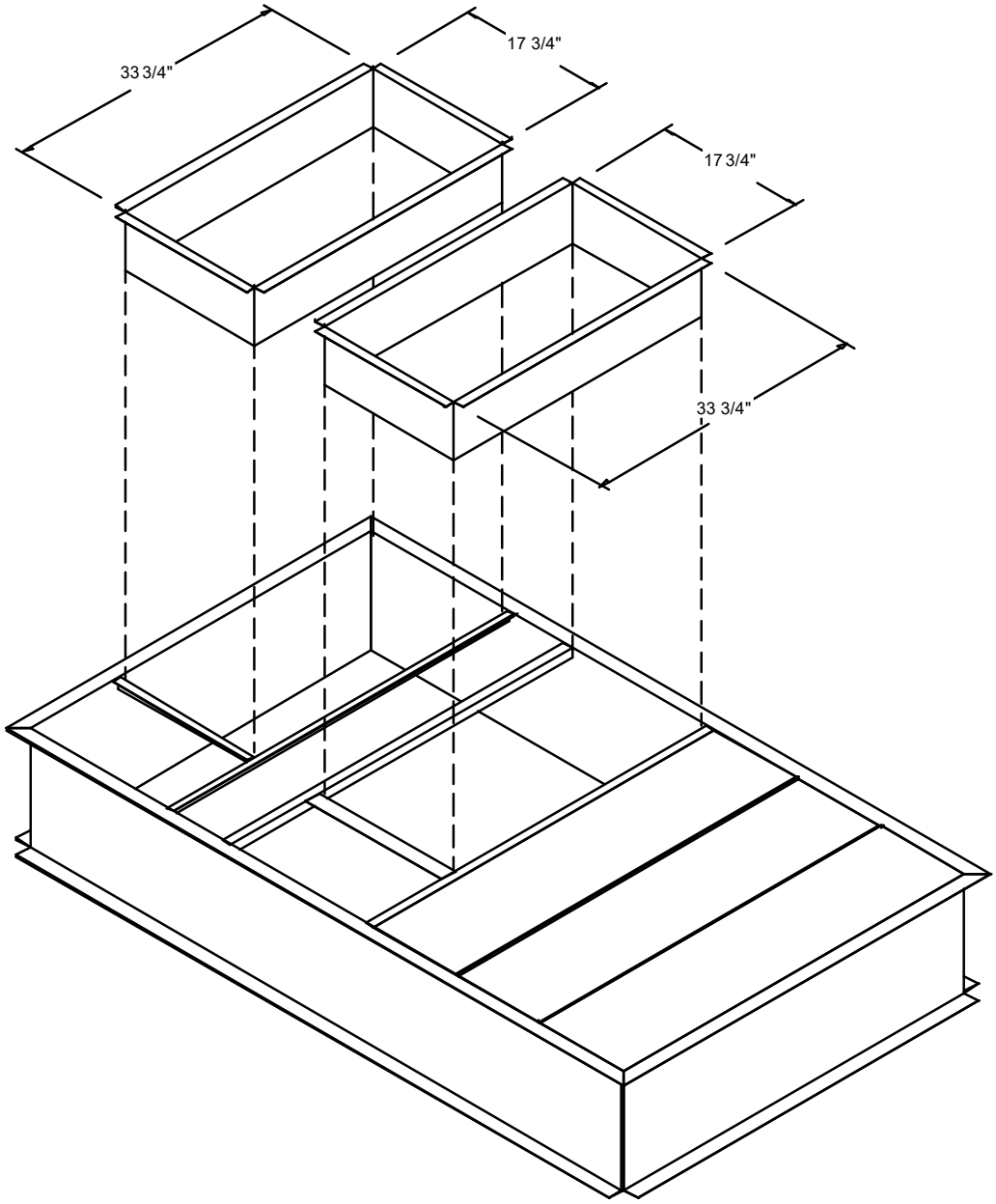


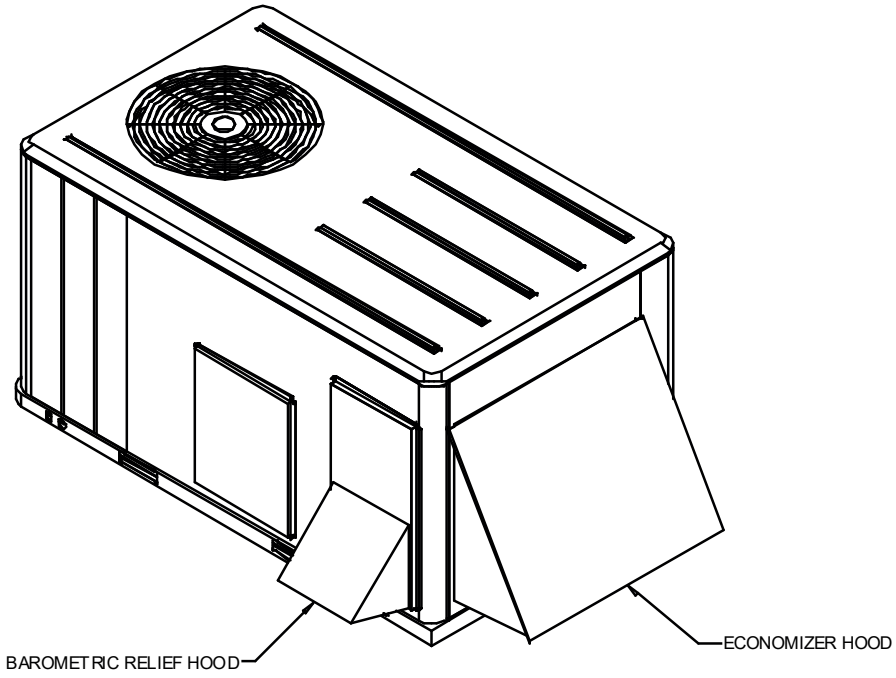


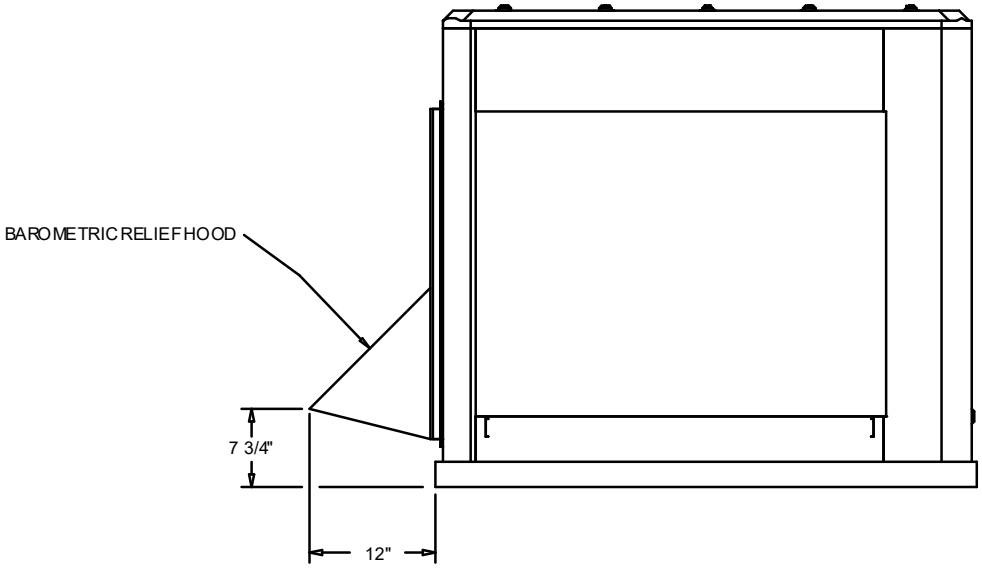
ROOF TOP CURB (BAYCURB043)

ACCESSORY

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







ACCESSORY - BAROMETRIC RELIEF DAMPER HOOD

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.

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/YSC120F,T/YHC074F, T/YHC092F,T/YHC102F, 120F). 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 to 5 ton units (high efficiency 3-phase with optional motor) are belt driven, FC centrifugal fans with adjustable motor sheaves. 3 to 5 ton units (standard and high efficiency 3-phase) have multispeed, direct drive motors. All 6 to 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, 6 ton (074), 7½ to 8½ (high efficiency) units 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. Evaporator coils are standard for all 3 to 10 ton standard efficiency models. Microchannel condenser coils are standard for all 3 to 10 ton standard efficiency models and 4, 5, 6, 7.5, 8.5 ton high efficiency models. The microchannel type condenser coil is not offered on the 4 and 5 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. These all aluminum coils are recyclable. 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 plastic, dual-sloped, removable and reversible 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.

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.

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.

Sequence of Operation
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.

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).

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.

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.

Sequence of Operation (Changeover Bypass System)
Occupied Heat/Cool:
Each VAV terminal shall use pressure-independent control, with airflow measurement, to vary primary airflow to maintain zone temperature at its occupied setpoint. The RTU shall modulate the bypass damper to maintain duct static pressure at setpoint and modulate (or cycle) compressors, modulate (or stage) heat, and/or enable airside economizing based on current zone cooling/heating demands. The OA damper shall open to bring in the required amount of ventilation.

Morning Warm-Up/Pre-Cool:
Each VAV terminal unit shall vary primary airflow to raise/lower zone temperature to its occupied setpoint. The RTU shall modulate the bypass damper to maintain duct static pressure at setpoint and modulate (or cycle) compressors or modulate (or stage) heat based on current zone cooling/heating demands. The OA damper shall remain closed, unless economizing.

Cooling/Heating Changeover Logic:
The System Controller shall determine the overall system cooling/heating mode based on "voting" from each zone. When the majority of zones require cooling, the RTU shall operate in cooling mode and any zone that requires heating shall reduce primary airflow to minimum. When the majority of zones require heating, the RTU shall operate in heating mode and any zone that requires cooling shall reduce primary airflow to minimum.

3-10 Ton R-410A PKGD Unitary Gas/Electric Rooftop

Job Information

Name	**Lees Summit Senior**	Tag	**RTU-IL1A**
Address		Quantity	**1**
Sales Team	**Kansas City Main Office**	Model Number	**YSC072H3RMA--D0C1A1000000000000000000000**
Comments			

General

Unit function	**DX cooling, gas heat**	Airflow	**Convertible configuration**
Airflow Application	**Downflow**	Design Airflow	**2280 cfm**
Fresh air selection	**Econ-dry bulb 0-100% w/ bar relief 3ph**	Tonnage	**6 Ton Single compressor**
Cooling Entering DB	**78.20 F**	Cooling Entering WB	**65.90 F**
Ent Air Relative Humidity	**52.40 %**	Ambient Temp	**105.00 F**
Heating capacity	**Medium gas heat 3ph**	Heating EAT	**60.00 F**
Voltage	**208-230/60/3**	Design ESP	**0.750 in H2O**
Evaporator rows	**3.00 Each**	Evaporator fin spacing	**192 Per Foot**
Evaporator face area	**9.89 sq ft**	Evaporator face velocity	**231 ft/min**
Min. unit operating weight	**710.0 lb**	Max. unit operating weight	**1045.0 lb**
ASHRAE 90.1	**Yes**	Rated capacity (AHRI)	**71.00 MBh**

Main Cooling

Evap Coil Leaving Air Temp (DB)	**58.42 F**	Evap Coil Leaving Air Temp (WB)	**56.02 F**
Cooling Leaving Unit DB	**60.14 F**	Cooling Leaving Unit WB	**56.69 F**
Gross Total Capacity	**68.30 MBh**	Gross Sensible Capacity	**48.71 MBh**
Gross Latent Capacity	**19.59 MBh**	Net Total Capacity	**64.80 MBh**
Net Sensible Capacity	**45.21 MBh**	Net Sensible Heat Ratio	**0.70 Number**
Fan motor heat	**3.51 MBh**	Dew Point	**54.40 F**
Refrig charge (HFC-410A) - ckt 1	**5.5 lb**	Saturated Discharge Temp Circuit 1	**124.42 F**
Saturated Suction Temp Circuit 1	**48.26 F**		

Main Heating

Input Heating Capacity	**120.00 MBh**	Output Heating Capacity	**97.20 MBh**
Output Heating Cap. w/Fan	**100.71 MBh**	Heating LAT	**99.70 F**
Heating Delta T	**39.70 F**		

Motor/Electrical

Component SP	**0.192 in H2O**	Total Static Pressure	**0.958 in H2O**
Field supplied drive kit required	**None**	Indoor mtr operating power	**1.10 bhp**
Indoor RPM	**926 rpm**	Indoor Motor Power	**0.82 kW**
Outdoor Motor Power	**0.58 kW**	Compressor Power	**5.95 kW**
System Power	**7.35 kW**	EER @ AHRI Conditions	**11.2 EER**
MCA	**35.00 A**	MOP	**50.00 A**
Compressor 1 RLA	**22.40 A**	Compressor 2 RLA	**0.00 A**
Condenser fan FLA	**3.30 A**	Evaporator fan FLA	**3.40 A**
SEER/IEER	**12.70**		

Baseunit

Height	**3.41 ft**	Width	**4.44 ft**

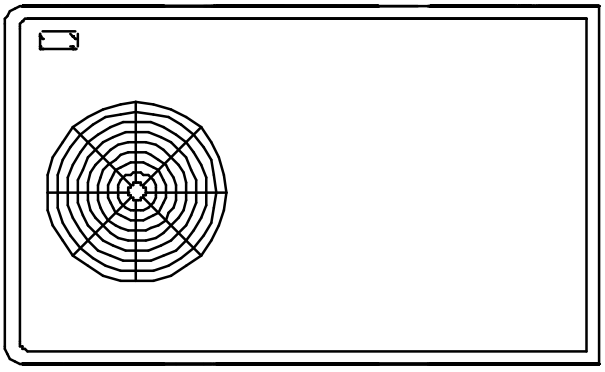
Length	**7.39 ft**

Fan			
Indoor Fan Type	**FC Centrifugal**	Indoor Fan Drive Type	**Belt**
Outdoor Fan Type	**Propeller**	Outdoor Fan Drive Type	**Direct**
Outdoor Fan Quantity	**1**		

Heat			
Heating Type	**Gas Heat**	Heating Stages	**1**

DX Cooling, Gas Heat 3-10 Ton			
Unit controls	**Microprocessor controls 3ph**	Condenser coil protection	**Std condenser coil w/hail guard 3ph**
Through the base provisions	**Through the base electrical 3ph**	Disconnect sw/circuit breaker	**Non-fused disconnect**

Field installed accessories	
Roof curb	**Roof curb**



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ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)

		Oversized Motor	
Model:	YSC072H		
Unit Operating Voltage:	187-253	MCA:	N/A
Unit Primary Voltage:	208	MFS:	N/A
Unit Secondary Voltage	230	MCB:	N/A
Unit Hertz:	60		
Unit Phase:	3		
EER	11.2		
Standard Motor		Field Installed Oversized Motor	
MCA:	35.0	MCA:	N/A
MFS:	50.0	MFS:	N/A
MCB:	50.0	MCB:	N/A

HEATING PERFORMANCE

HEATING - GENERAL DATA

Heating Model:	Medium
Heating Input (BTU):	120,000
Heating Output (BTU):	96,000
No. Burners:	3
No. Stages	1

Gas Inlet Pressure

Natural Gas (Min/Mix):	4 1/2"/14"
LP (Min/Max)	11"/14"
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	3	Phase	N/A	Phase	N/A
Full Load Amps:	3.4	Full Load Amps:	N/A	Full Load Amps:	N/A
Locked Rotor Amps:	32.2	Locked Rotor Amps:	N/A	Locked Rotor Amps:	N/A

COMPRESSOR Circuit 1/2

Number:	
Horsepower:	
Phase:	
Rated Load Amps:	
Locked Rotor Amps:	

OUTDOOR MOTOR

Number:	1
Horsepower:	0.70
Motor Speed (RPM):	1100
Phase:	1
Full Load Amps:	3.3
Locked Rotor Amps:	12.3

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	5.5 lb
Circuit #2	N/A

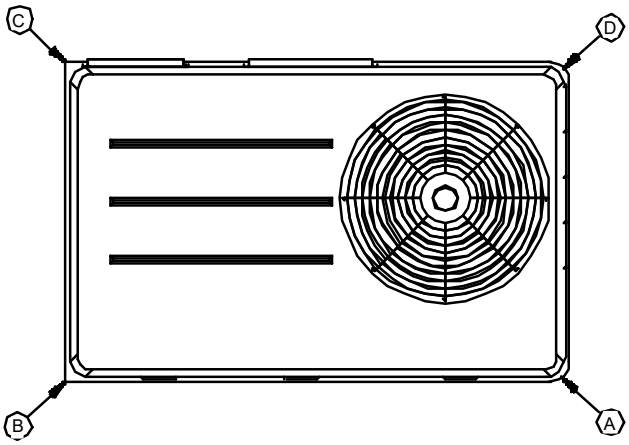
NOTES:

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.

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	
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)	12.0 lb
HAIL GUARD	20.0 lb
SMOKE DETECTOR, SUPPLY / RETURN	
NOVAR CONTROL	
STAINLESS STEEL HEAT EXCHANGER	
REHEAT	
ROOF CURB	78.0 lb

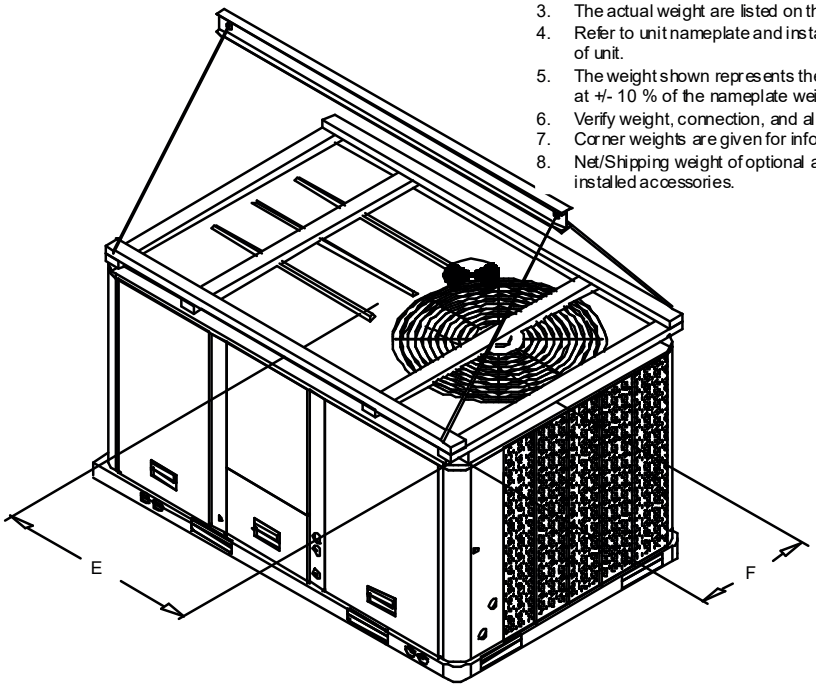
BASIC UNIT WEIGHTS		CORNER WEIGHTS				CENTER OF GRAVITY	
SHIPPING	NET	(A)	222.0 lb	(C)	121.0 lb	(E) LENGHT	(F) WIDTH
805.0 lb	710.0 lb	(B)	217.0 lb	(D)	150.0 lb	41"	22"



PACKAGED GAS / ELECTRICAL

CORNER WEIGHT

NOTE:
1. All weights are approximate.
2. Weights for options that are not list refer to Installation guide.
3. The actual weight are listed on the unit nameplate.
4. Refer to unit nameplate and installation guide for weights before scheduling transportation and installation of unit.
5. The weight shown represents the typical unit operating weight for the configuration selected. Estimated at +/- 10 % of the nameplate weight. .
6. Verify weight, connection, and all dimension with installer documents before installation.
7. Corner weights are given for information only.
8. Net/Shipping weight of optional accessories should be added to unit weight when ordering factory or field installed accessories.



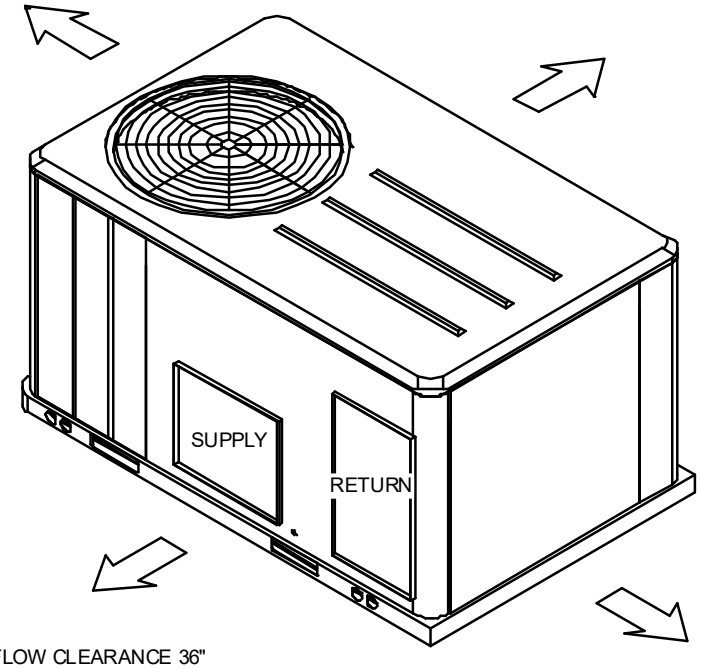
PACKAGED GAS / ELECTRICAL

RIGGING AND CENTER OF GRAVITY

CLEARANCE FROM TOP OF UNIT 72"

CLEARANCE 36"

CLEARANCE 48"



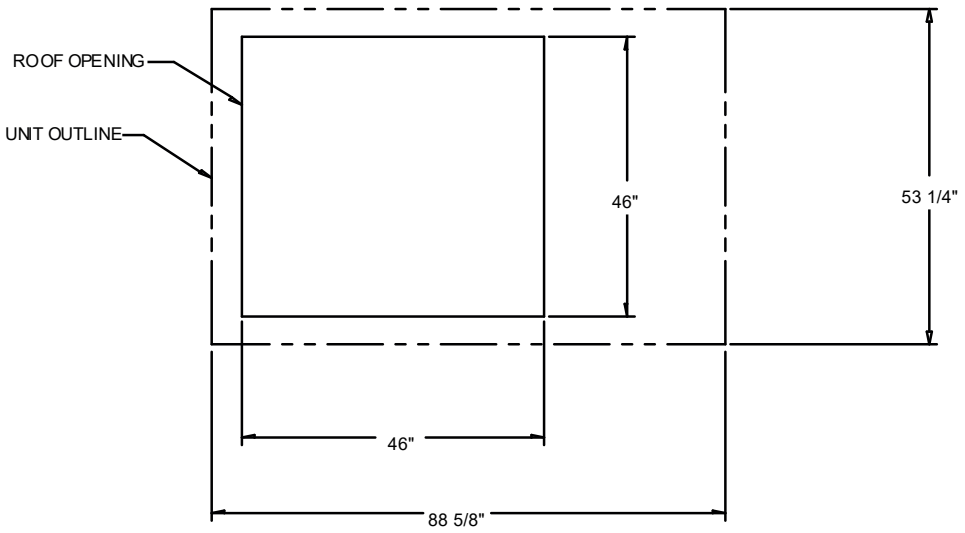
DOWNFLOW CLEARANCE 36"

HORIZONTAL CLEARANCE 18"

CLEARANCE 36"

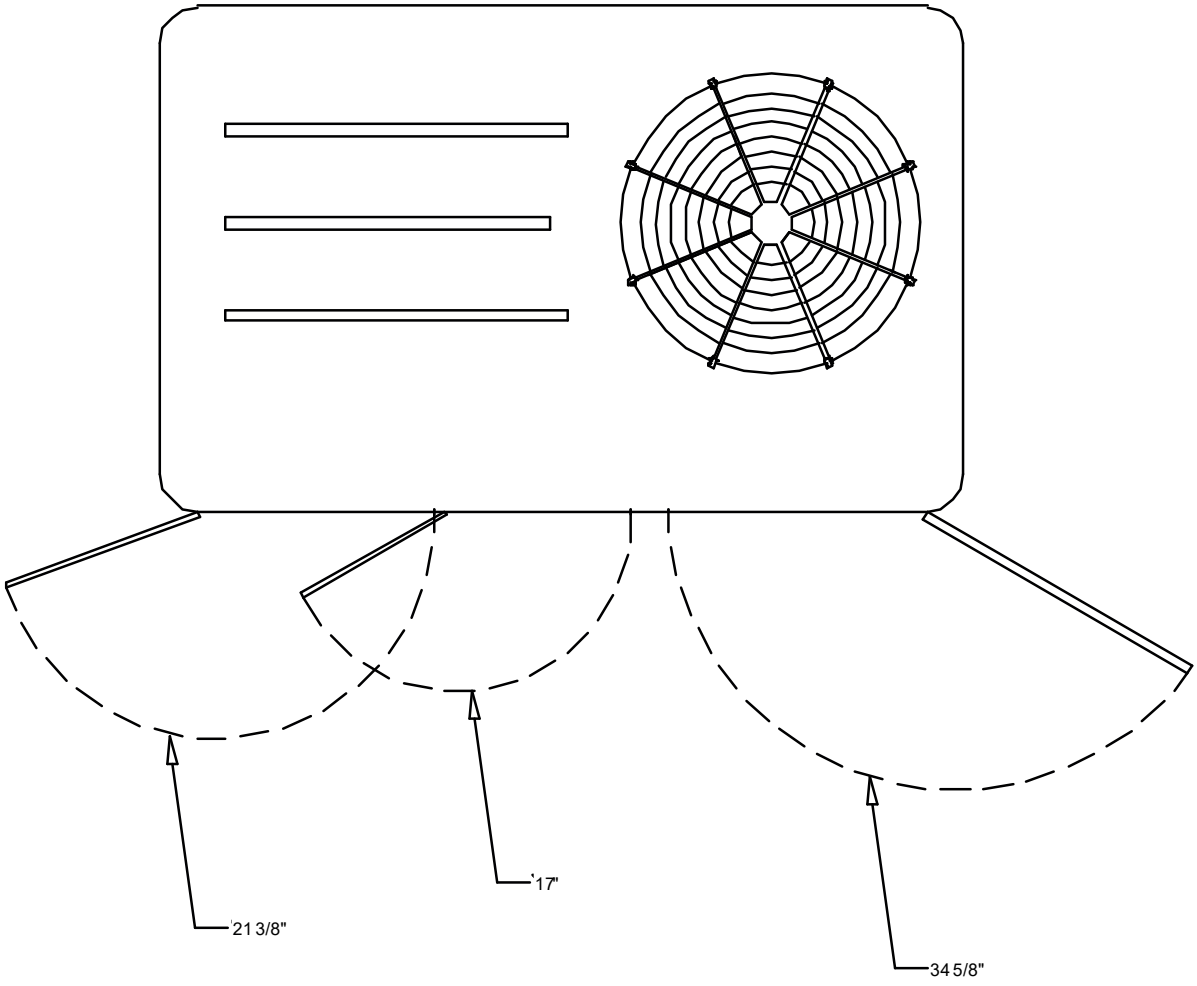
PACKAGED GAS / ELECTRIC

CLEARANCE



PACKAGED GAS / ELECTRIC

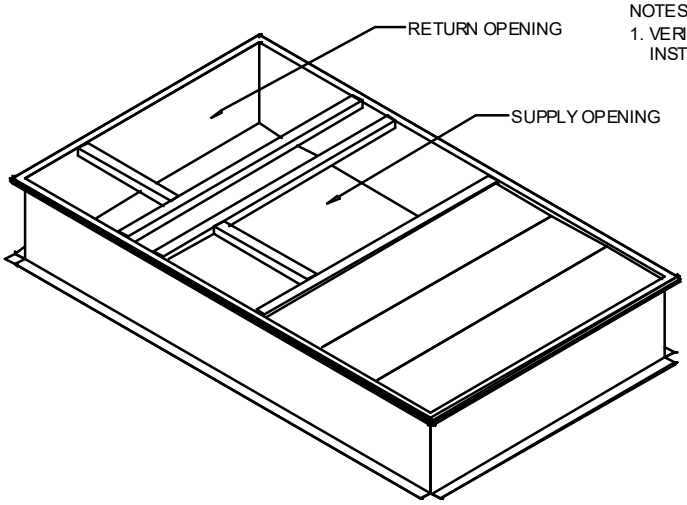
DOWNFLOW TYPICAL ROOF OPENING

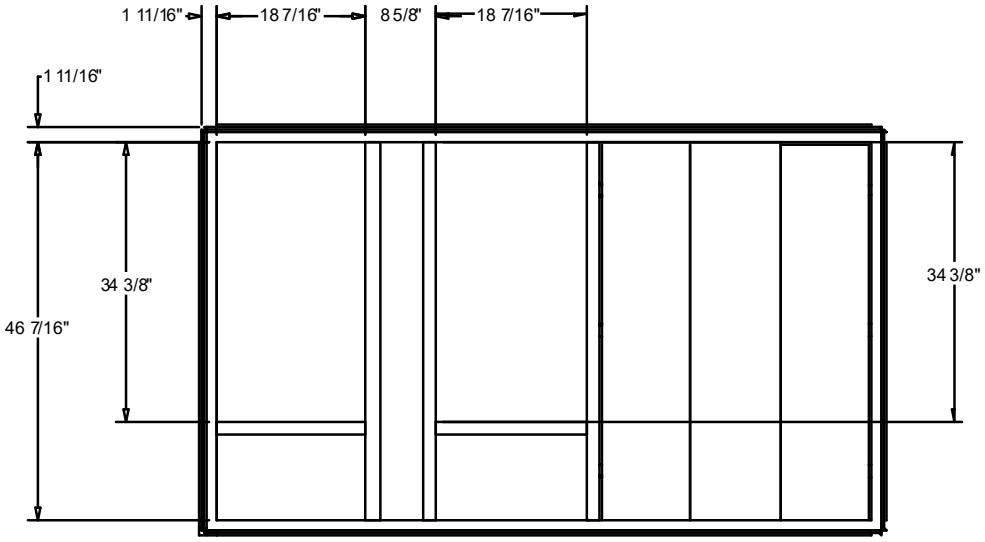


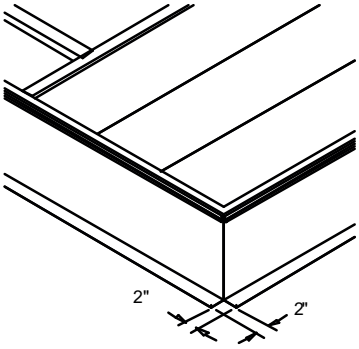
SWING DIAMETER - HINGED DOOR(S) OPTION

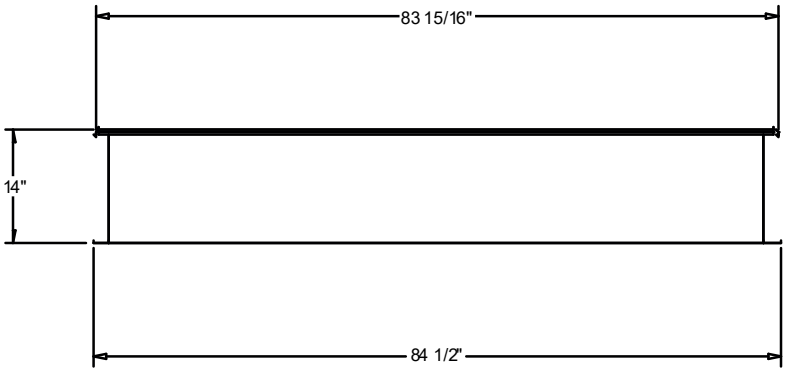
ACCESSORY

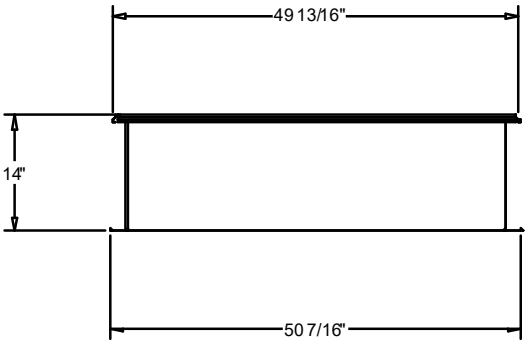
NOTES:
1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION







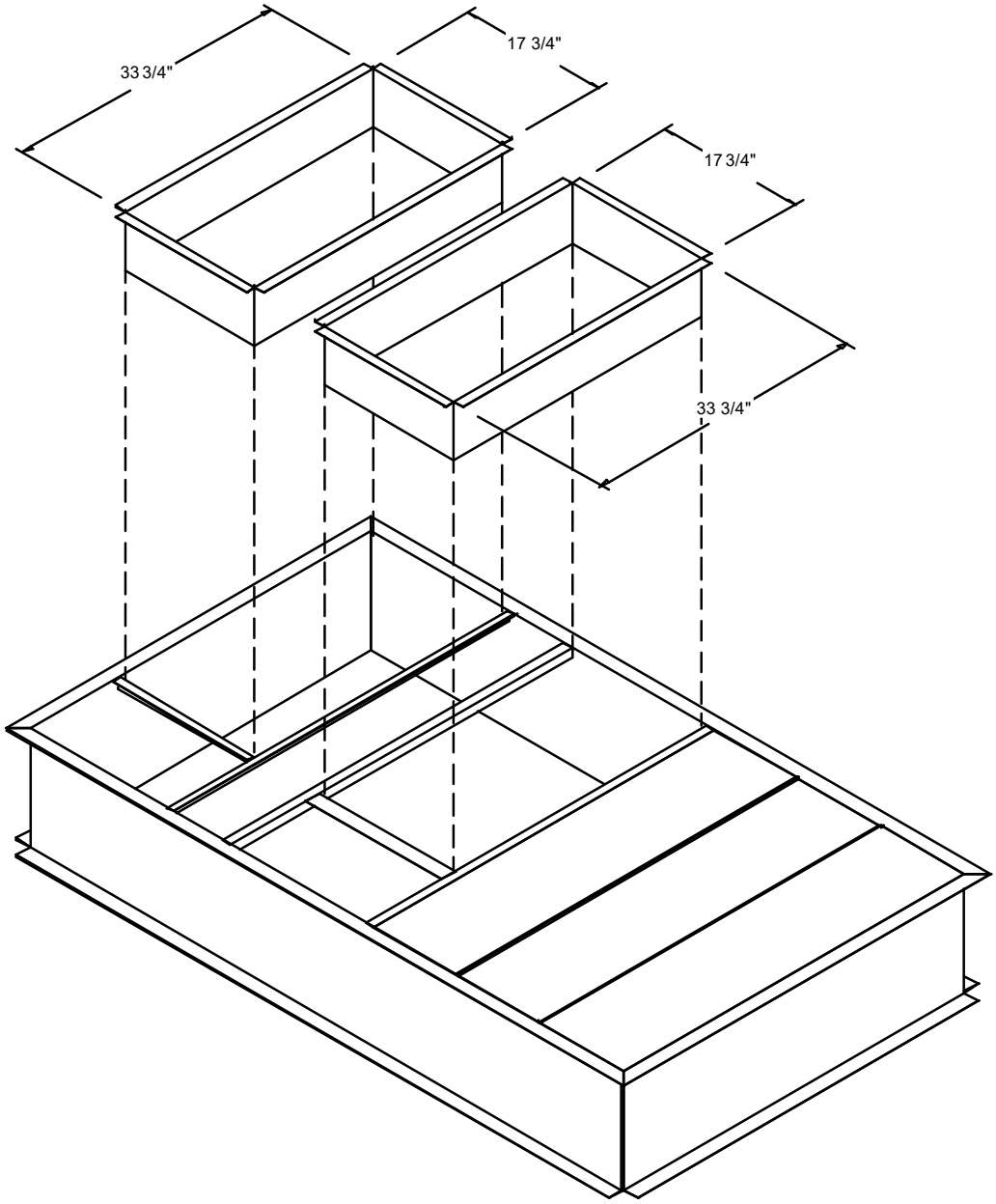


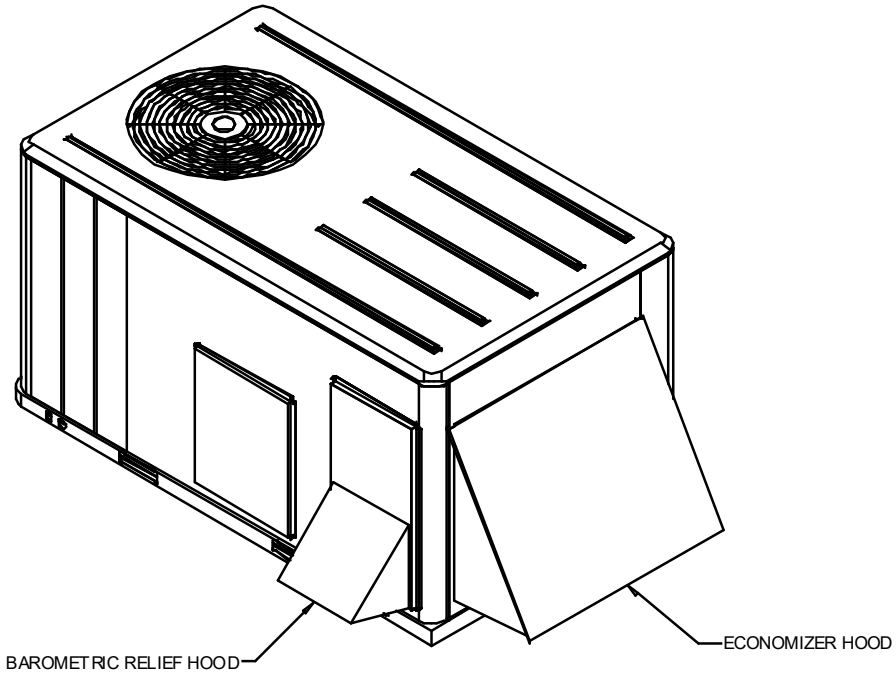


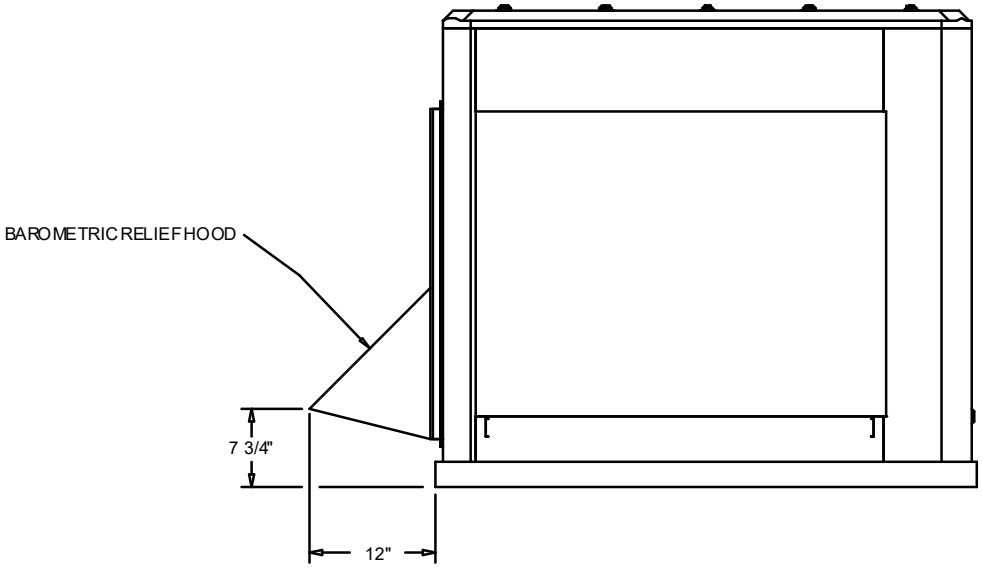
ROOF TOP CURB (BAYCURB043)

ACCESSORY

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







ACCESSORY - BAROMETRIC RELIEF DAMPER HOOD

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.

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/YSC120F,T/YHC074F, T/YHC092F,T/YHC102F, 120F). 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 to 5 ton units (high efficiency 3-phase with optional motor) are belt driven, FC centrifugal fans with adjustable motor sheaves. 3 to 5 ton units (standard and high efficiency 3-phase) have multispeed, direct drive motors. All 6 to 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, 6 ton (074), 7½ to 8½ (high efficiency) units 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. Evaporator coils are standard for all 3 to 10 ton standard efficiency models. Microchannel condenser coils are standard for all 3 to 10 ton standard efficiency models and 4, 5, 6, 7.5, 8.5 ton high efficiency models. The microchannel type condenser coil is not offered on the 4 and 5 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. These all aluminum coils are recyclable. 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 plastic, dual-sloped, removable and reversible 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.

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.

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.

Sequence of Operation
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.

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).

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.

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.

Sequence of Operation (Changeover Bypass System)
Occupied Heat/Cool:
Each VAV terminal shall use pressure-independent control, with airflow measurement, to vary primary airflow to maintain zone temperature at its occupied setpoint. The RTU shall modulate the bypass damper to maintain duct static pressure at setpoint and modulate (or cycle) compressors, modulate (or stage) heat, and/or enable airside economizing based on current zone cooling/heating demands. The OA damper shall open to bring in the required amount of ventilation.

Morning Warm-Up/Pre-Cool:
Each VAV terminal unit shall vary primary airflow to raise/lower zone temperature to its occupied setpoint. The RTU shall modulate the bypass damper to maintain duct static pressure at setpoint and modulate (or cycle) compressors or modulate (or stage) heat based on current zone cooling/heating demands. The OA damper shall remain closed, unless economizing.

Cooling/Heating Changeover Logic:
The System Controller shall determine the overall system cooling/heating mode based on "voting" from each zone. When the majority of zones require cooling, the RTU shall operate in cooling mode and any zone that requires heating shall reduce primary airflow to minimum. When the majority of zones require heating, the RTU shall operate in heating mode and any zone that requires cooling shall reduce primary airflow to minimum.

3-10 Ton R-410A PKGD Unitary Gas/Electric Rooftop

Job Information

Name	**Lees Summit Senior**	Tag	**RTU-ILA**
Address		Quantity	**1**
Sales Team	**Kansas City Main Office**	Model Number	**YSC090H3RMA--D1C1A10000000000000000000**
Comments			

General

Unit function	**DX cooling, gas heat**	Airflow	**Convertible configuration**
Airflow Application	**Downflow**	Design Airflow	**2640 cfm**
Fresh air selection	**Econ-dry bulb 0-100% w/ bar relief 3ph**	Tonnage	**7.5 Ton Single compressor**
Cooling Entering DB	**79.10 F**	Cooling Entering WB	**65.50 F**
Ent Air Relative Humidity	**48.59 %**	Ambient Temp	**105.00 F**
Heating capacity	**Medium gas heat 3ph**	Heating EAT	**60.00 F**
Voltage	**208-230/60/3**	Design ESP	**1.500 in H2O**
Supply fan/drive/type/motor	**Oversize motor**	Evaporator rows	**4.00 Each**
Evaporator fin spacing	**192 Per Foot**	Evaporator face area	**9.89 sq ft**
Evaporator face velocity	**267 ft/min**	Min. unit operating weight	**832.0 lb**
Max. unit operating weight	**1167.0 lb**	ASHRAE 90.1	**Yes**
Rated capacity (AHRI)	**87.00 MBh**		

Main Cooling

Evap Coil Leaving Air Temp (DB)	**56.12 F**	Evap Coil Leaving Air Temp (WB)	**54.83 F**
Cooling Leaving Unit DB	**58.90 F**	Cooling Leaving Unit WB	**55.94 F**
Gross Total Capacity	**83.97 MBh**	Gross Sensible Capacity	**65.51 MBh**
Gross Latent Capacity	**18.46 MBh**	Net Total Capacity	**77.22 MBh**
Net Sensible Capacity	**58.76 MBh**	Net Sensible Heat Ratio	**0.76 Number**
Fan motor heat	**6.75 MBh**	Dew Point	**53.93 F**
Refrig charge (HFC-410A) - ckt 1	**7.5 lb**	Saturated Discharge Temp Circuit 1	**124.33 F**
Saturated Suction Temp Circuit 1	**47.49 F**		

Main Heating

Input Heating Capacity	**150.00 MBh**	Output Heating Capacity	**120.00 MBh**
Output Heating Cap. w/Fan	**126.75 MBh**	Heating LAT	**102.30 F**
Heating Delta T	**42.30 F**		

Motor/Electrical

Component SP	**0.194 in H2O**	Total Static Pressure	**1.728 in H2O**
Field supplied drive kit required	**None**	Indoor mtr operating power	**2.16 bhp**
Indoor RPM	**1273 rpm**	Indoor Motor Power	**1.61 kW**
Outdoor Motor Power	**0.68 kW**	Compressor Power	**7.20 kW**
System Power	**9.49 kW**	EER @ AHRI Conditions	**11.2 EER**
MCA	**44.00 A**	MOP	**60.00 A**
Compressor 1 RLA	**25.00 A**	Compressor 2 RLA	**0.00 A**
Condenser fan FLA	**3.30 A**	Evaporator fan FLA	**9.40 A**
SEER/IEER	**12.70**		

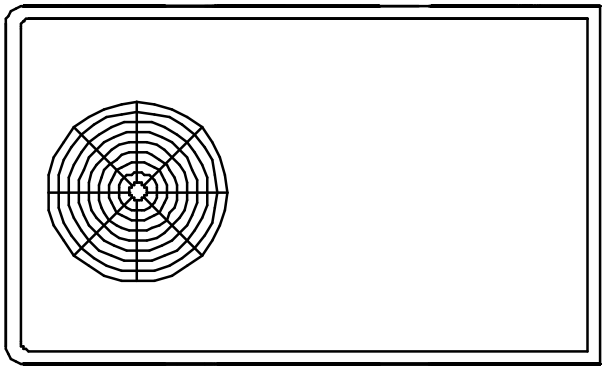
Baseunit			
Height	**3.41 ft**	Width	**4.44 ft**
Length	**7.39 ft**		

Fan			
Indoor Fan Type	**FC Centrifugal**	Indoor Fan Drive Type	**Belt**
Outdoor Fan Type	**Propeller**	Outdoor Fan Drive Type	**Direct**
Outdoor Fan Quantity	**1**		

Heat			
Heating Type	**Gas Heat**	Heating Stages	**2**

DX Cooling, Gas Heat 3-10 Ton			
Unit controls	**Microprocessor controls 3ph**	Condenser coil protection	**Std condenser coil w/hail guard 3ph**
Through the base provisions	**Through the base electrical 3ph**	Disconnect sw/circuit breaker	**Non-fused disconnect**

Field installed accessories	
Roof curb	**Roof curb**



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ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)

		Oversized Motor	
Model:	YSC090H		
Unit Operating Voltage:	187-253	MCA:	44.0
Unit Primary Voltage:	208	MFS:	60.0
Unit Secondary Voltage	230	MCB:	60.0
Unit Hertz:	60		
Unit Phase:	3		
EER	11.2		
Standard Motor		Field Installed Oversized Motor	
MCA:	38.0	MCA:	N/A
MFS:	60.0	MFS:	N/A
MCB:	60.0	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/Mix):	4 1/2"/14"
LP (Min/Max)	11"/14"
Gas Pipe Connection Size:	3/4"

INDOOR MOTOR

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

COMPRESSOR Circuit 1/2

Number:	1
Horsepower:	6.7
Phase:	3
Rated Load Amps:	25.0
Locked Rotor Amps:	164.0

OUTDOOR MOTOR

Number:	1
Horsepower:	0.7
Motor Speed (RPM):	1100
Phase:	1
Full Load Amps:	3.3
Locked Rotor Amps:	12.3

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)

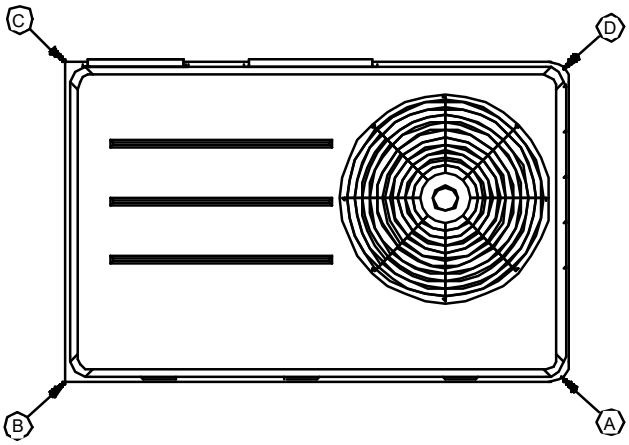
Type

Factory Charge

Circuit #1	7.5 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.



PACKAGED GAS / ELECTRICAL

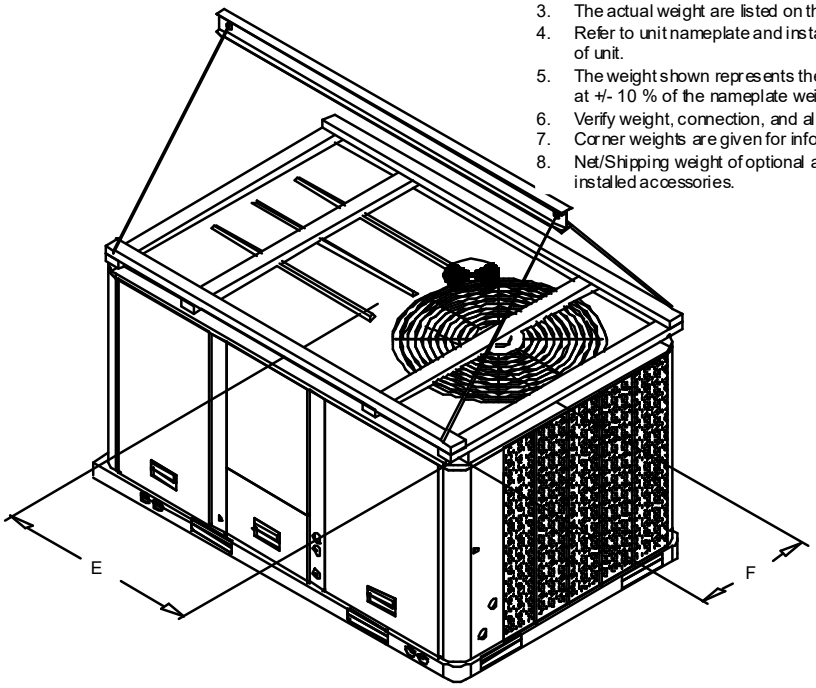
CORNER WEIGHT

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	
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)	12.0 lb
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 GRAVITY	
SHIPPING	NET	(A)	206.0 lb	(C)	127.0 lb	(E) LENGHT	(F) WIDTH
853.0 lb	760.0 lb	(B)	237.0 lb	(D)	190.0 lb	36"	22"

NOTE:
1. All weights are approximate.
2. Weights for options that are not list refer to Installation guide.
3. The actual weight are listed on the unit nameplate.
4. Refer to unit nameplate and installation guide for weights before scheduling transportation and installation of unit.
5. The weight shown represents the typical unit operating weight for the configuration selected. Estimated at +/- 10 % of the nameplate weight. .
6. Verify weight, connection, and all dimension with installer documents before installation.
7. Corner weights are given for information only.
8. Net/Shipping weight of optional accessories should be added to unit weight when ordering factory or field installed accessories.



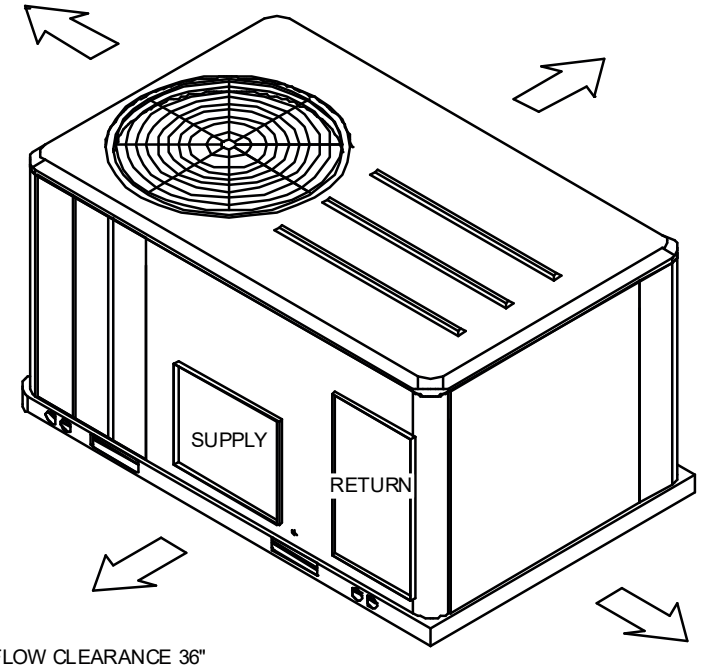
PACKAGED GAS / ELECTRICAL

RIGGING AND CENTER OF GRAVITY

CLEARANCE FROM TOP OF UNIT 72"

CLEARANCE 36"

CLEARANCE 48"



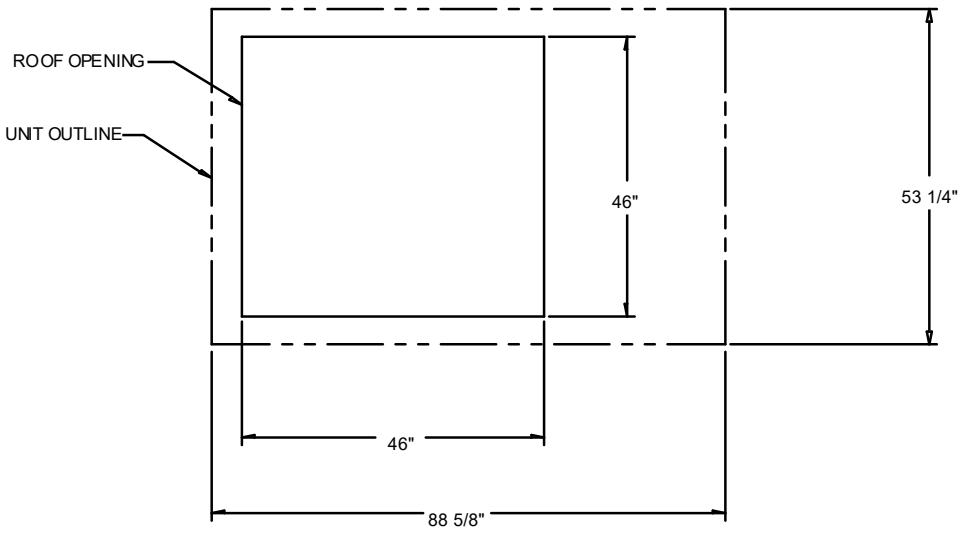
DOWNFLOW CLEARANCE 36"

HORIZONTAL CLEARANCE 18"

CLEARANCE 36"

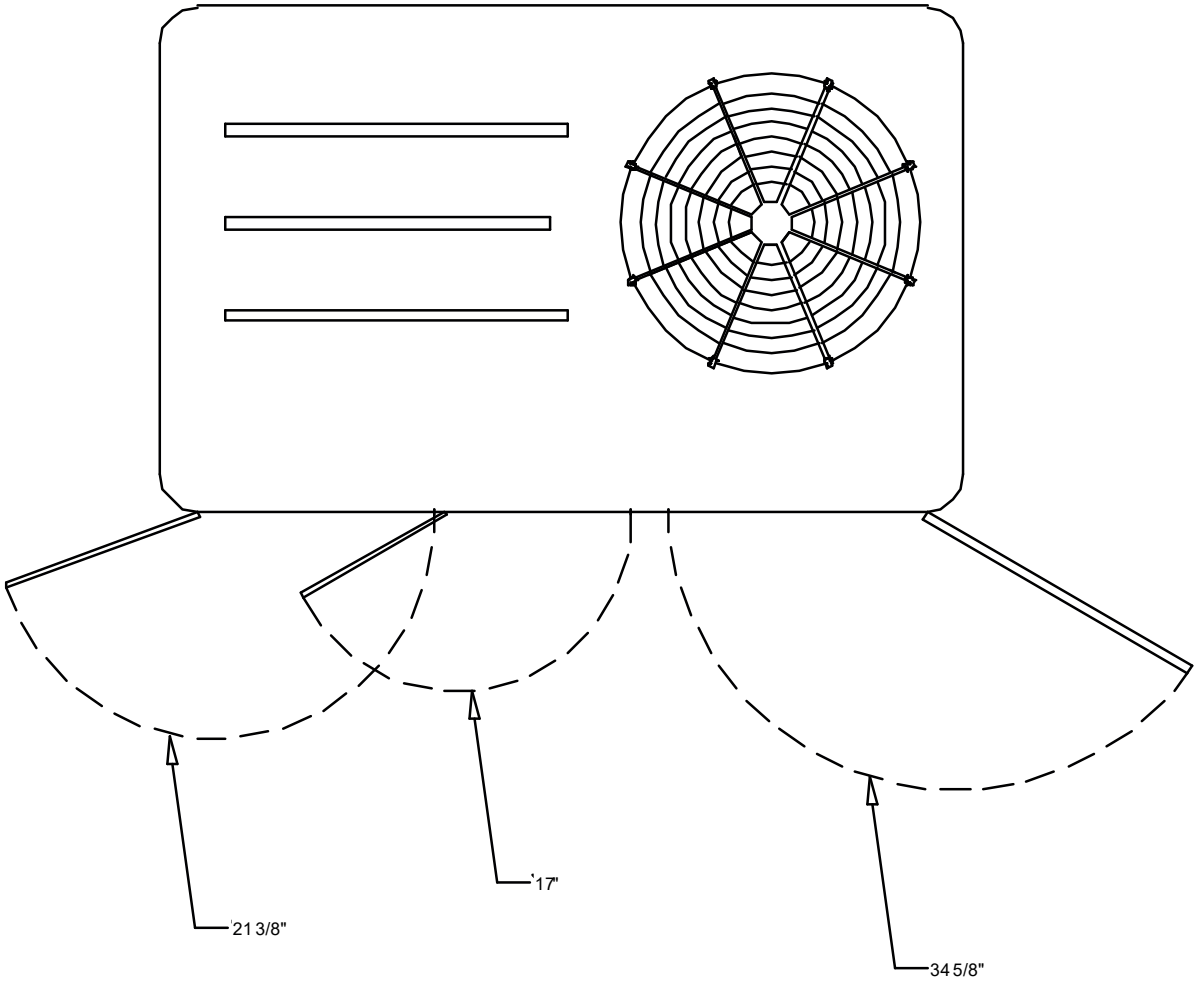
PACKAGED GAS / ELECTRIC

CLEARANCE



PACKAGED GAS / ELECTRIC

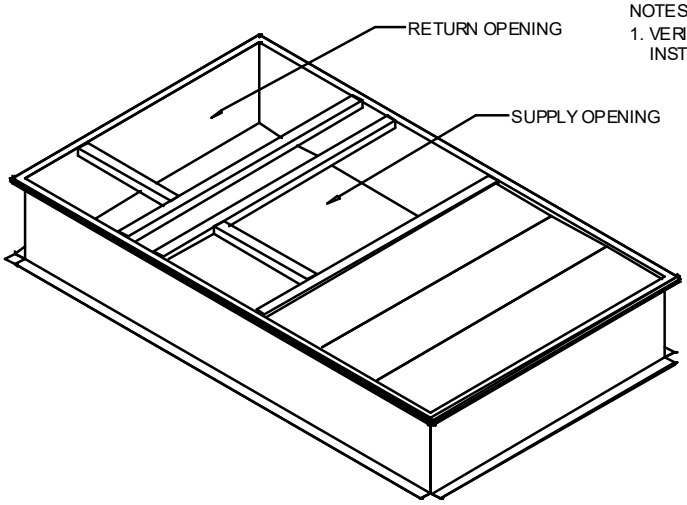
DOWNFLOW TYPICAL ROOF OPENING

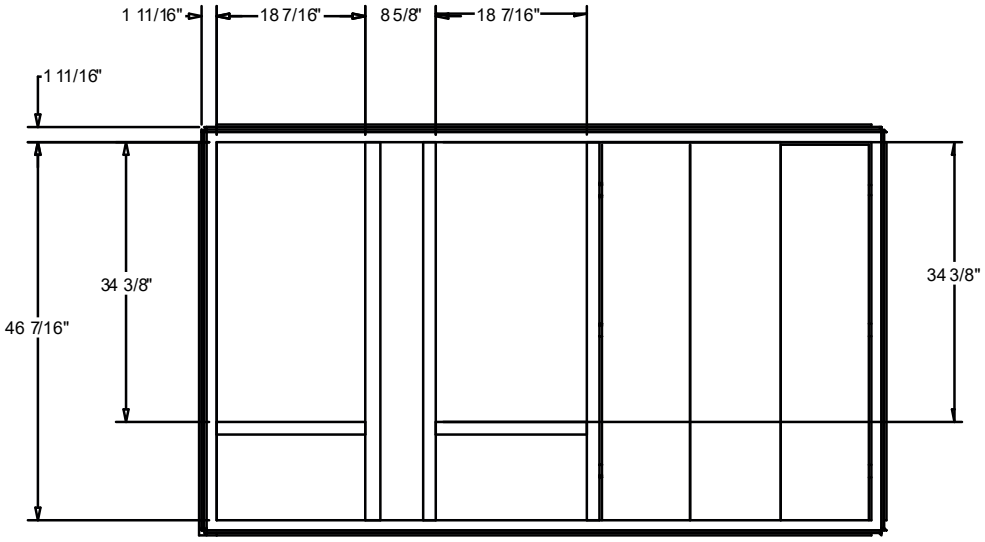


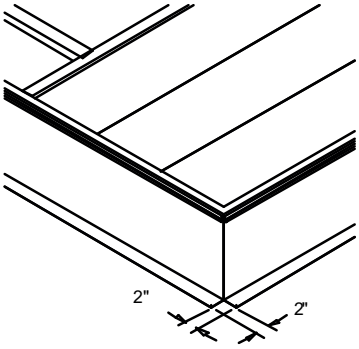
SWING DIAMETER - HINGED DOOR(S) OPTION

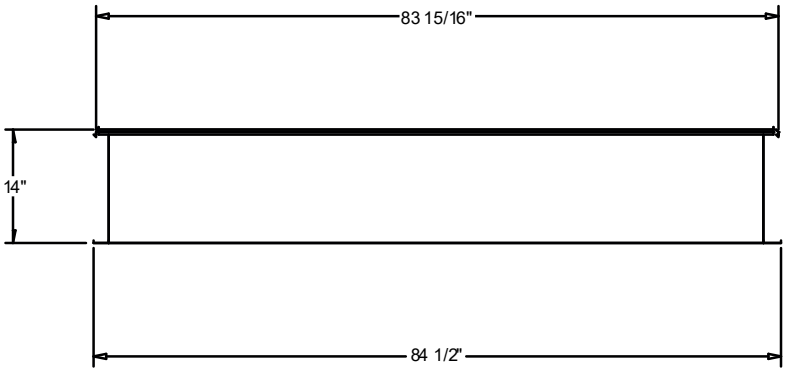
ACCESSORY

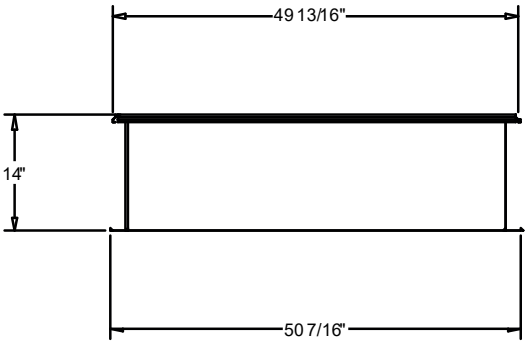
NOTES:
1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION







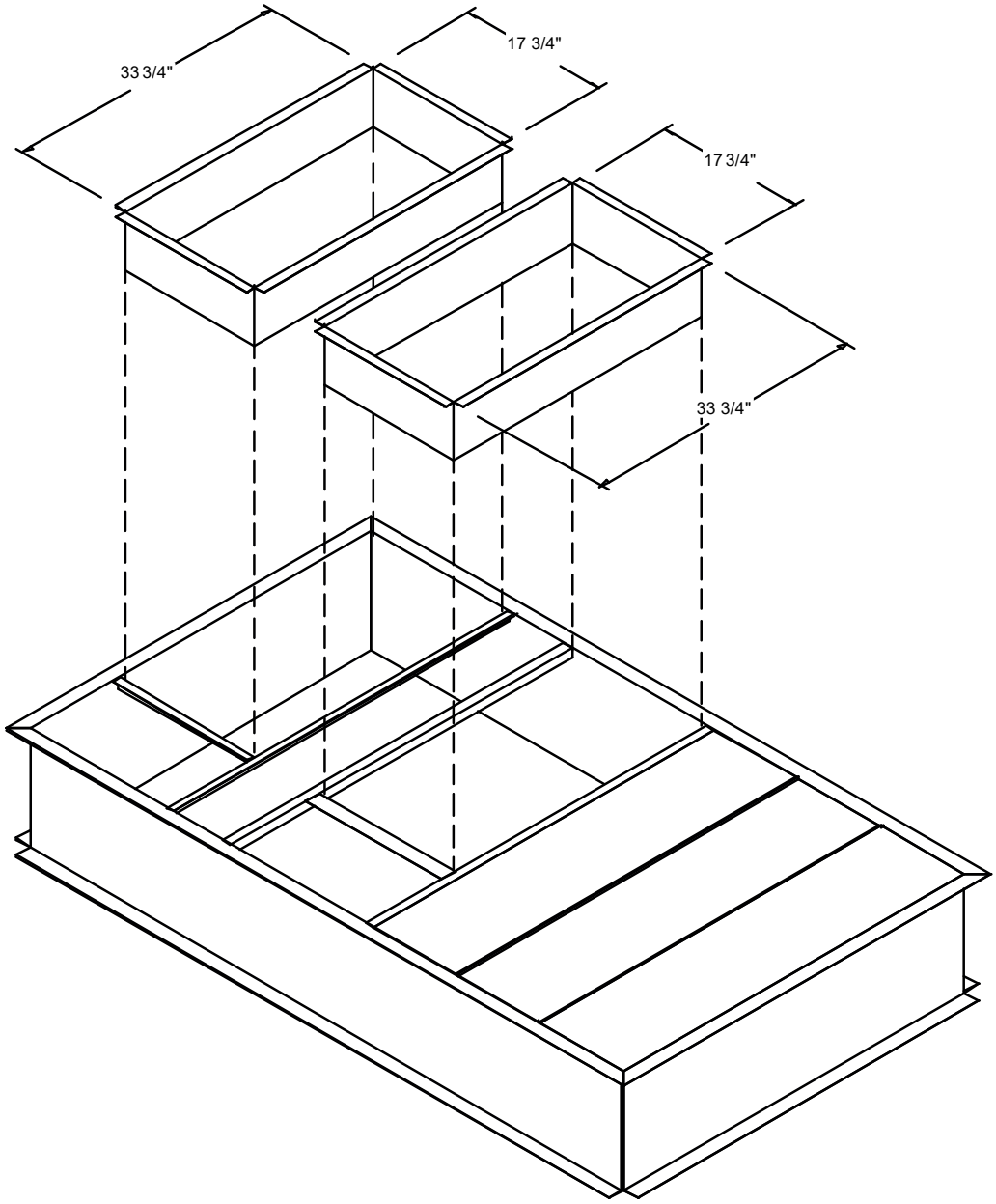


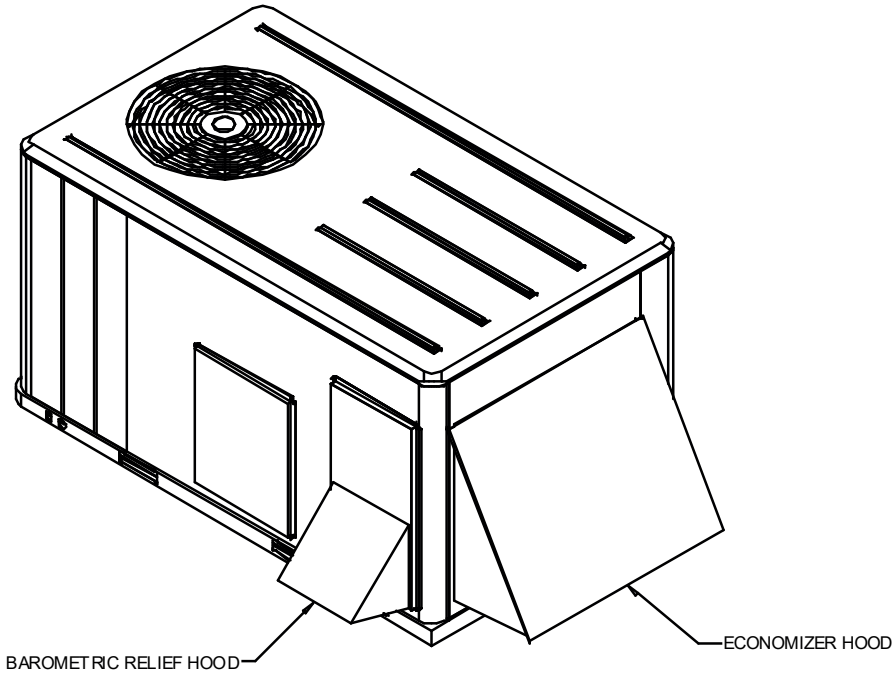


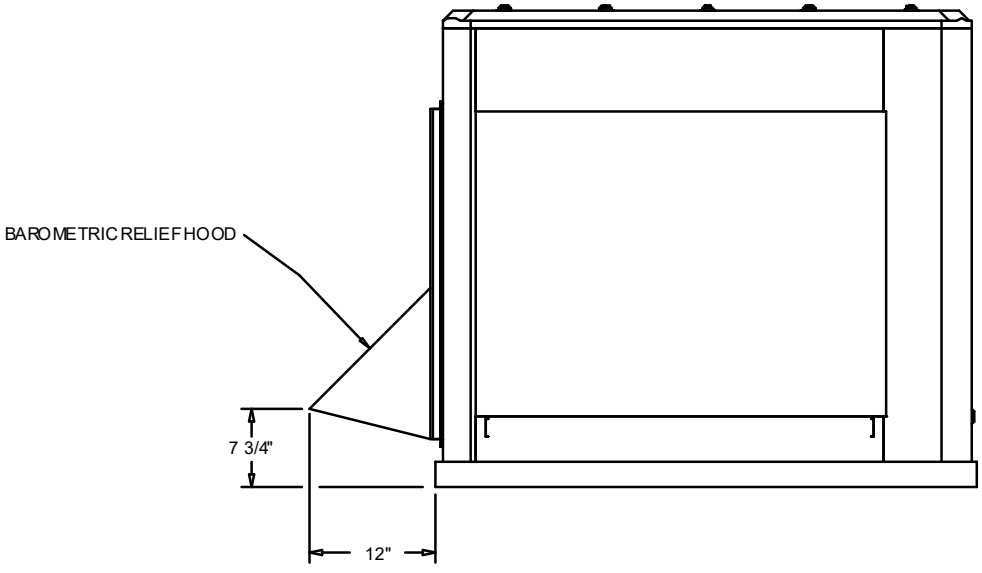
ROOF TOP CURB (BAYCURB043)

ACCESSORY

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







ACCESSORY - BAROMETRIC RELIEF DAMPER HOOD

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.

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/YSC120F,T/YHC074F, T/YHC092F,T/YHC102F, 120F). 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 to 5 ton units (high efficiency 3-phase with optional motor) are belt driven, FC centrifugal fans with adjustable motor sheaves. 3 to 5 ton units (standard and high efficiency 3-phase) have multispeed, direct drive motors. All 6 to 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, 6 ton (074), 7½ to 8½ (high efficiency) units 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. Evaporator coils are standard for all 3 to 10 ton standard efficiency models. Microchannel condenser coils are standard for all 3 to 10 ton standard efficiency models and 4, 5, 6, 7.5, 8.5 ton high efficiency models. The microchannel type condenser coil is not offered on the 4 and 5 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. These all aluminum coils are recyclable. 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 plastic, dual-sloped, removable and reversible 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.

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.

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.

Sequence of Operation
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.

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).

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.

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.

Sequence of Operation (Changeover Bypass System)
Occupied Heat/Cool:
Each VAV terminal shall use pressure-independent control, with airflow measurement, to vary primary airflow to maintain zone temperature at its occupied setpoint. The RTU shall modulate the bypass damper to maintain duct static pressure at setpoint and modulate (or cycle) compressors, modulate (or stage) heat, and/or enable airside economizing based on current zone cooling/heating demands. The OA damper shall open to bring in the required amount of ventilation.

Morning Warm-Up/Pre-Cool:
Each VAV terminal unit shall vary primary airflow to raise/lower zone temperature to its occupied setpoint. The RTU shall modulate the bypass damper to maintain duct static pressure at setpoint and modulate (or cycle) compressors or modulate (or stage) heat based on current zone cooling/heating demands. The OA damper shall remain closed, unless economizing.

Cooling/Heating Changeover Logic:
The System Controller shall determine the overall system cooling/heating mode based on "voting" from each zone. When the majority of zones require cooling, the RTU shall operate in cooling mode and any zone that requires heating shall reduce primary airflow to minimum. When the majority of zones require heating, the RTU shall operate in heating mode and any zone that requires cooling shall reduce primary airflow to minimum.

12 1/2 -25 Ton Packaged Unitary Gas/Elec Rooftop - CTO

Job Information

Name	**Lees Summit Senior**	Tag	**RTU-AL1A**
Address		Quantity	**1**
Sales Team	**Kansas City Main Office**	Model Number	**YSD210G3RL---D0C1A100000000-000000000000**
Comments			

General

Unit function	**Gas/Electric**	Unit controls	**Reliatel**
Design Airflow	**6680 cfm**	Fresh air selection	**Econ-Dry Bulb 0-100% w/ bar ref**
Tonnage	**17.5 Ton**	Cooling Entering Dry Bulb	**76.60 F**
Cooling Entering Wet Bulb	**62.20 F**	Ent Air Rel Humidity	**44.35 %**
Ambient Temp	**105.00 F**	Heating capacity	**Gas Heat - Low**
Heating EAT	**60.00 F**	Voltage	**208-230/60/3**
Design ESP	**1.500 in H2O**	Evaporator Rows	**2**
Evaporator Face Area	**23.00 sq ft**	Evaporator Fin Spacing	**192 Per Foot**
Evaporator Face Velocity	**290 ft/min**	Min. Unit Operating Weight	**1915.0 lb**
Max Unit Operating Weight	**2276.0 lb**	Rated capacity (AHRI)	**196.00 MBh**
ASHRAE 90.1	**Yes**		

Main Cooling

Evap Coil Leav Air Temp (DB)	**53.95 F**	Evap Coil Leav Air Temp (WB)	**52.86 F**
Cooling Leaving Unit DB	**56.79 F**	Cooling Leaving Unit WB	**54.04 F**
Gross Total Capacity	**175.96 MBh**	Gross Sensible Capacity	**163.41 MBh**
Gross Latent Capacity	**12.55 MBh**	Net Total Capacity	**158.88 MBh**
Net Sensible Capacity	**146.33 MBh**	Net Sensible Heat Ratio	**0.92 Number**
Fan Motor Heat	**17.08 MBh**	Dew Point Temp	**52.06 F**
Refrig charge (HFC-410A) - ckt 1	**12.6 lb**	Refrig charge (HFC-410A) - ckt 2	**6.8 lb**
Saturated Discharge Temp Circuit 1	**130.30 F**	Saturated Suction Temp Circuit 1	**47.34 F**
Saturated Discharge Temp Circuit 2	**125.50 F**	Saturated Suction Temp Circuit 2	**47.03 F**

Main Heating

Output Htg Capacity	**200.00 MBh**	Output Htg Capacity w/Fan	**217.08 MBh**
Heating LAT	**87.59 F**	Heating Temp Rise	**27.59 F**

Motor/Electrical

Field Supplied Drive Kit Required	**High Static Drive Kit**	Component SP Add	**0.262 in H2O**
Total Static Pressure	**1.803 in H2O**	Indoor Mtr. Operating Power	**5.42 bhp**
Indoor RPM	**866 rpm**	Indoor Motor Power	**4.04 kW**
Outdoor Motor Power	**1.48 kW**	Compressor Power	**15.10 kW**
System Power	**20.62 kW**	EER @ AHRI Conditions	**11.0 EER**
MCA	**77.00 A**	MOP	**100.00 A**
Compressor 1 RLA	**29.44 A**	Compressor 2 RLA	**15.61 A**
Condenser Fan FLA	**3.80 A**	Evaprator Fan FLA	**16.70 A**
IEER Rating	**12.20**		

Acoustics

Ducted Discharge - 63 Hz	**92 dB**	Ducted Discharge - 125 Hz	**88 dB**
Ducted Discharge - 250 Hz	**83 dB**	Ducted Discharge - 500 Hz	**86 dB**
Ducted Discharge - 1k Hz	**79 dB**	Ducted Discharge - 2k Hz	**76 dB**
Ducted Discharge - 4k Hz	**76 dB**	Ducted Discharge - 8k Hz	**70 dB**
Ducted Inlet - 63 Hz	**94 dB**	Ducted Inlet - 125Hz	**88 dB**
Ducted Inlet - 500 Hz	**77 dB**	Ducted Inlet - 1k Hz	**72 dB**
Ducted Inlet - 2k Hz	**67 dB**	Ducted Inlet - 4k Hz	**66 dB**
Ducted Inlet - 8k Hz	**61 dB**	Outdoor Noise - 63 Hz	**93 dB**
Outdoor Noise - 125 Hz	**98 dB**	Outdoor Noise - 250 Hz	**95 dB**
Outdoor Noise - 500 Hz	**92 dB**	Outdoor Noise - 1k Hz	**89 dB**
Outdoor Noise - 2k Hz	**85 dB**	Outdoor Noise - 4k Hz	**82 dB**
Outdoor Noise - 8k Hz	**79 dB**	Ducted Inlet - 250 Hz	**80 dB**

Baseunit

Width	**7.02 ft**	Length	**10.14 ft**
Height	**4.68 ft**		

Fan

T24_SZVZV	**NA**	Indoor Fan Type	**FC Centrifugal**
Indoor Fan Drive Type	**Belt**	Outdoor Fan Type	**Propeller**
Outdoor Fan Quantity	**2**	Outdoor Fan Drive Type	**Direct**

Heat

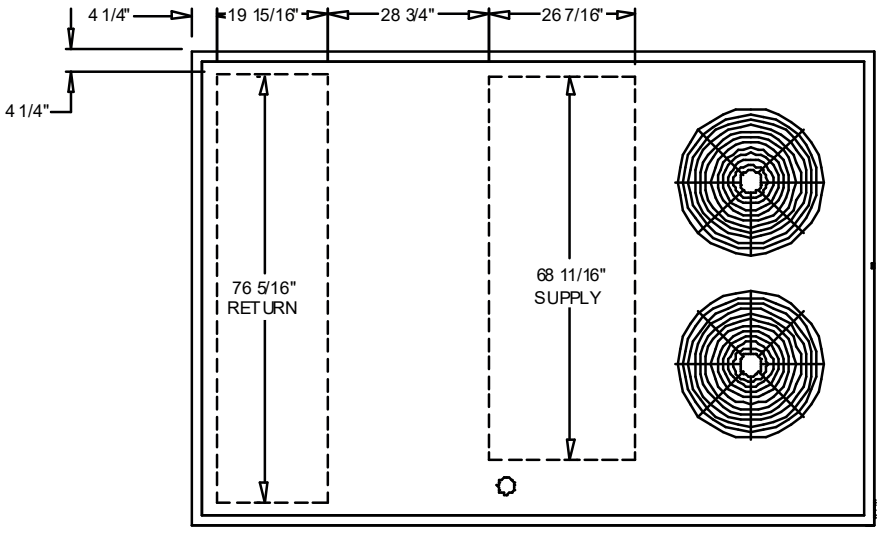
Heating Type	**Gas**	Heating Stages	**2**

DX cooling

Condenser coil protection	**Std cond coil w/hail guard**	Through the base provisions	**Through the base electric**
Disconnect sw/circuit breaker	**Unit mounted non-fused disconnect**		

Field installed accessories

Roof curb	**Roof curb**



PACKAGED GAS/ELECTRIC - DOWNFLOW

PLAN VIEW DRAWING

ELECTRICAL / GENERAL DATA

GENERAL PERFORMANCE

Model (Ton):	YSD210G (17.5)
Unit Operating Voltage Range:	187-253
Unit Primary Voltage:	208
Unit Secondary Voltage:	230
Unit Hertz:	60
Unit Phase:	3
EER: (5)	11.0

Standard Motor (1) (3)

Minimum Circuit Ampacity:	77.0/77.0
Maximum Fuse Size:	100.0/100.0
Maximum (HACR) Circuit Breaker:	100.0/100.0

Oversized Motor (1) (4)

MCA:	N/A
MFS:	N/A
MCB (HACR):	N/A

Field Installed Oversized Motor (1) (4)

MCA:	N/A
MFS:	N/A
MCB (HACR):	N/A

GAS HEATING

Heating Models:	Low
Heating and 1 Stage Input (Btu/h)	250000/175000
Heating and 1 Stage Output (Btu/h):	200000/140000
Min./Max. Gas Input - Pressure Natural or LP:	2.5 / 14.0
Gas Connection Pipe Size:	1/2"

COMPRESSOR

	Circuit(s)
Number:	2
Horsepower:	9.2/4.5
Phase:	3
Rated Load Amps:	29.4/15.6
Locked Rotor Amps:	267.0/110.0

INDOOR MOTOR

Number: (3)	1
Horsepower:	5.00
Motor Speed (RPM):	3,450
Phase:	3
Full Load Amps:	16.7
Locked Rotor Amps:	109.0

Oversized Motor (4)

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 (4)

Number:	N/A
Hp:	N/A
Motor Speed (RPM):	N/A
Phase:	N/A
FLA:	N/A
LRA:	N/A

OUTDOOR MOTOR

Number:	2
Horsepower:	1.00
Motor speed (RPM):	1,125
Phase:	3
Full Load Amps:	3.8
Locked Rotor Amps:	16.42

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):	3,500/2,800
Phase:	1
Full Load Amps:	0.8
Locked Rotor Amps:	2.00

FILTER

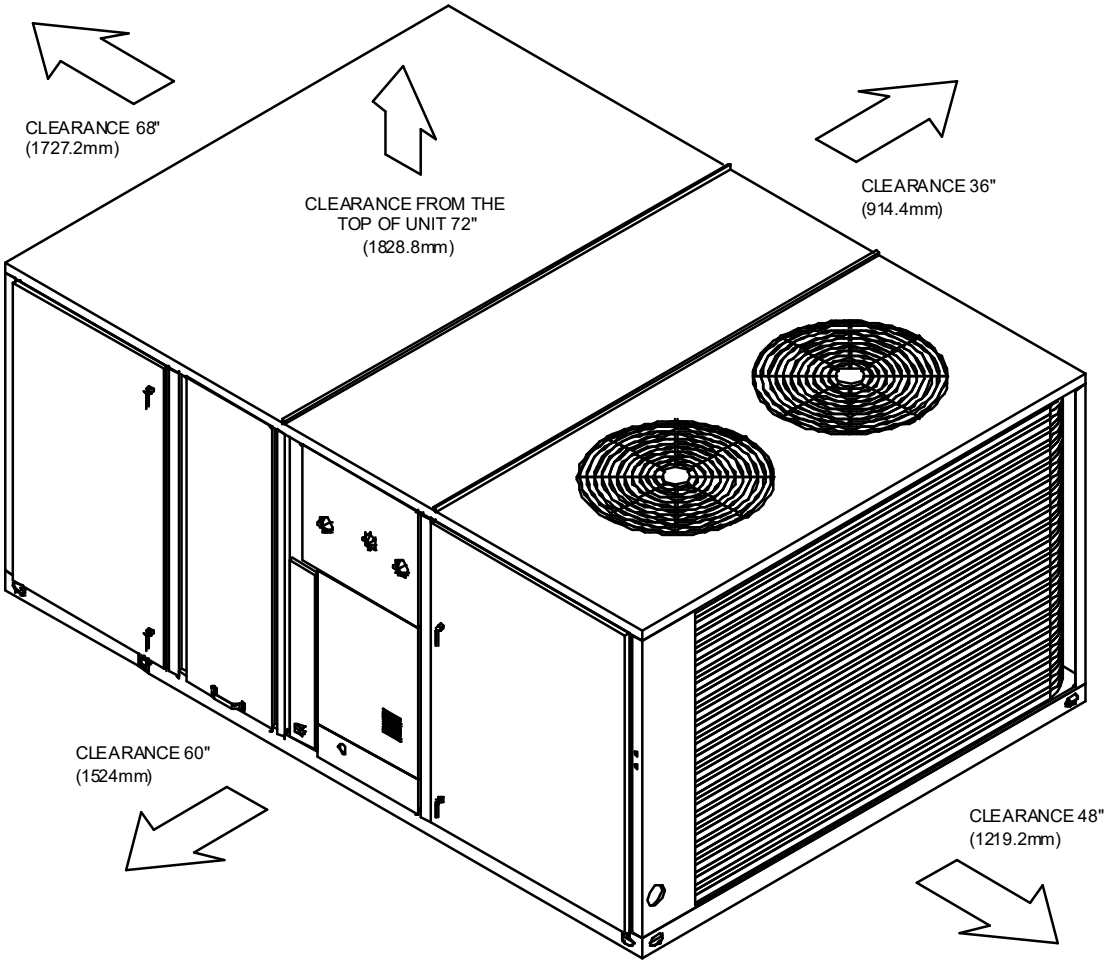
Type:	Throwaway
Furnished:	Yes
Number:	4 / 4
Recommended Size:	20"x20"x2" / 20"x25"x2"

REFRIGERANT (2)

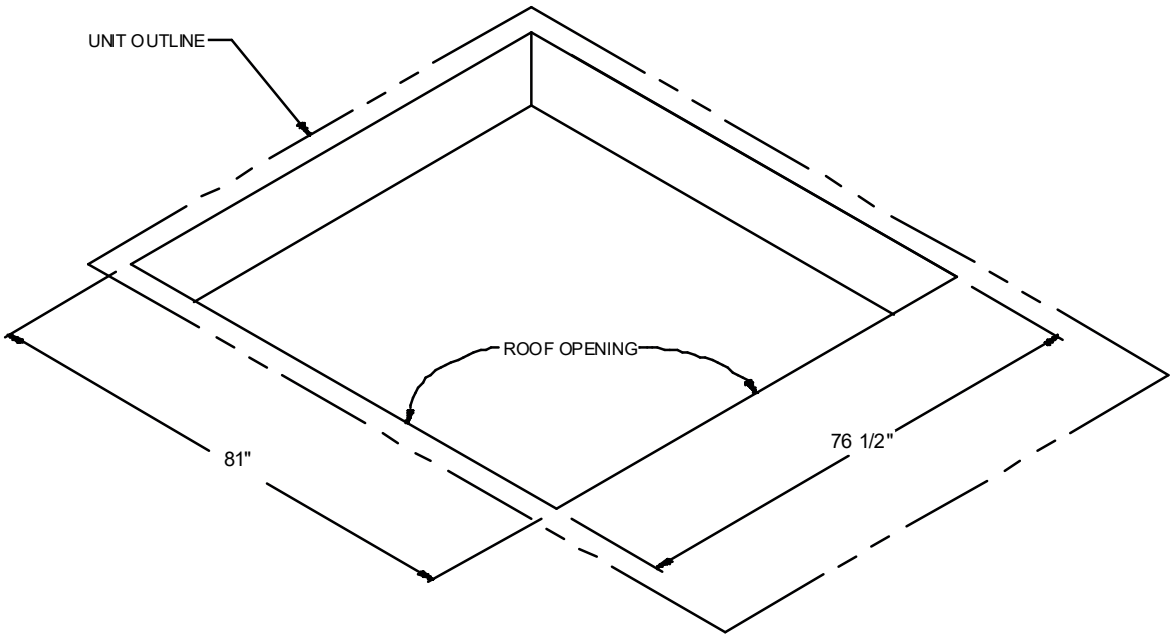
	Circuit #1 / 2
Type:	R410
Factory Charge Circuit #1 / 2:	12.6 lb / 6.8 lb

NOTES:

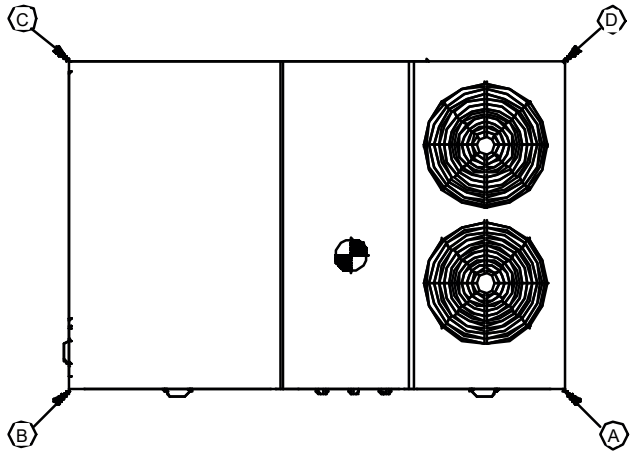
1. Maximum (HACR) Circuit Breaker sizing is for installations in the United States only.
2. Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.
3. Value includes oversized motor.
4. Value does not include Power Exhaust Accessory.
5. EER is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



DOWNFLOW-PACKAGED GAS/ELECTRIC CLEARANCE



DOWNFLOW-PACKAGED GAS/ELECTRIC ROOF OPENING CLEARANCE



CORNER WEIGHT

Base Unit and Corner Weights only

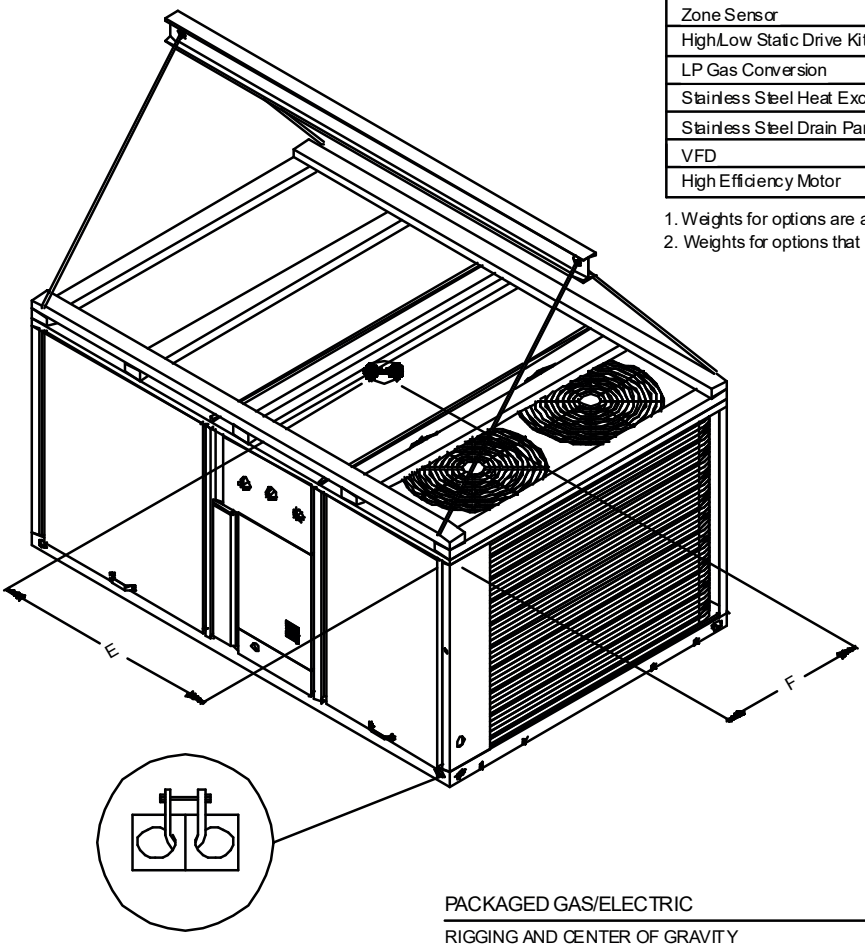
Base unit weights		Corner Weights				Center of Gravity	
SHIPPING	NET	(A)	(B)	(C)	(D)	E	F
2326.0 lb	1894.0 lb	604.0 lb	511.0 lb	371.0 lb	409.0 lb	57"	35"

1. All weights are approximate.
2. The actual weight are listed on the unit nameplate.
3. Refer to unit nameplate and installation guide for weights before scheduling transportation and installation of unit.
4. The weight shown represents the typical unit operating weight for the configuration selected. Estimated at +/- 10 % of the nameplate weight. .
5. Verify weight, connection, and all dimension with installer documents before installation.
6. Corner weights are given for information only.
7. Net/Shipping weight of optional accessories should be added to unit weight when ordering factory or field installed accessories.

Installed Options Net Weight Data

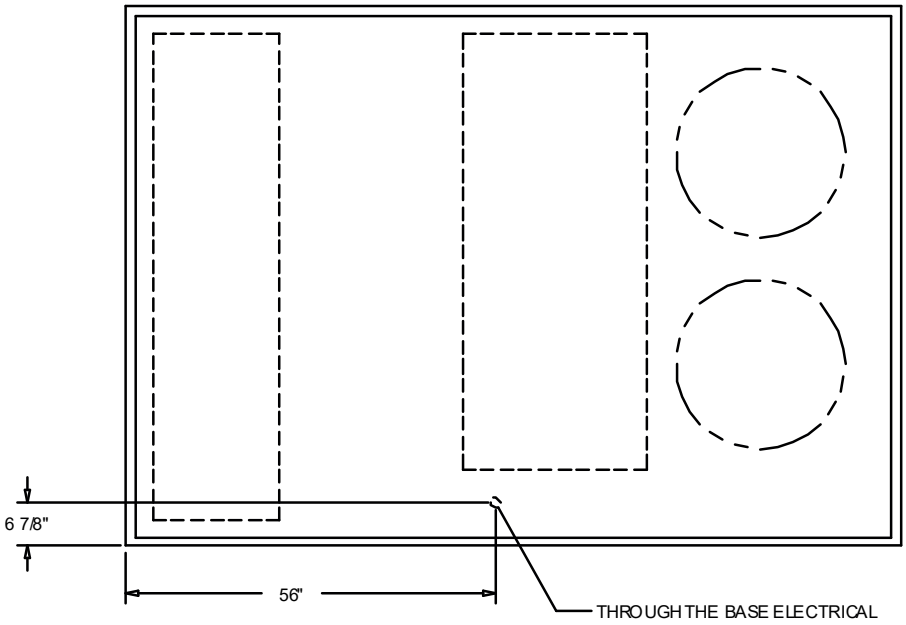
Accessory	Weight
Economizer, Manual and Motorized Outside Air Damper	80.0 lb
Power Exhaust	
Roof Curb	235.0 lb
Oversized Motor	
Hail Guard	43.0 lb
Hinged Access Doors	27.0 lb
Power Conv. Outlet	
Through the Base Electrical	23.0 lb
Circuit Breaker	
Disconnect	10.0 lb
Smoke Detector	
Novar	
Zone Sensor	
High/Low Static Drive Kit	
LP Gas Conversion	
Stainless Steel Heat Exchanger	
Stainless Steel Drain Pan	
VFD	
High Efficiency Motor	

1. Weights for options are approximate.
2. Weights for options that are not list refer to Installation guide.



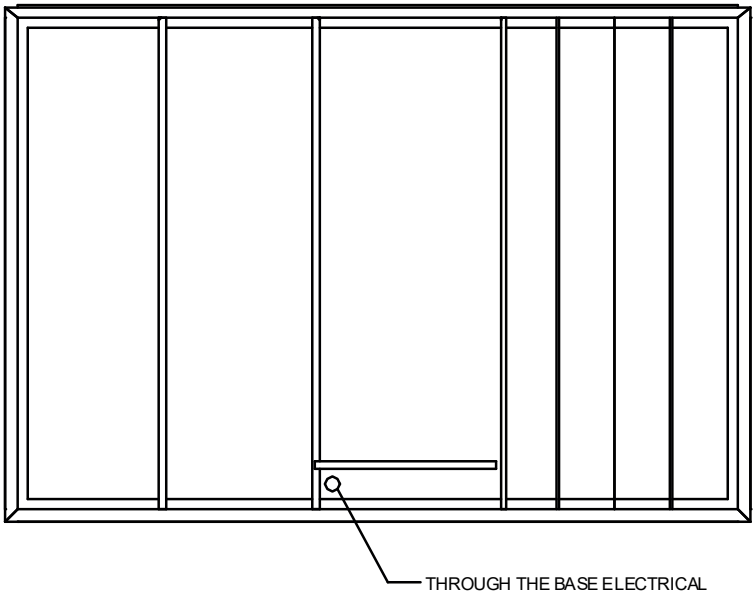
PACKAGED GAS/ELECTRIC

RIGGING AND CENTER OF GRAVITY



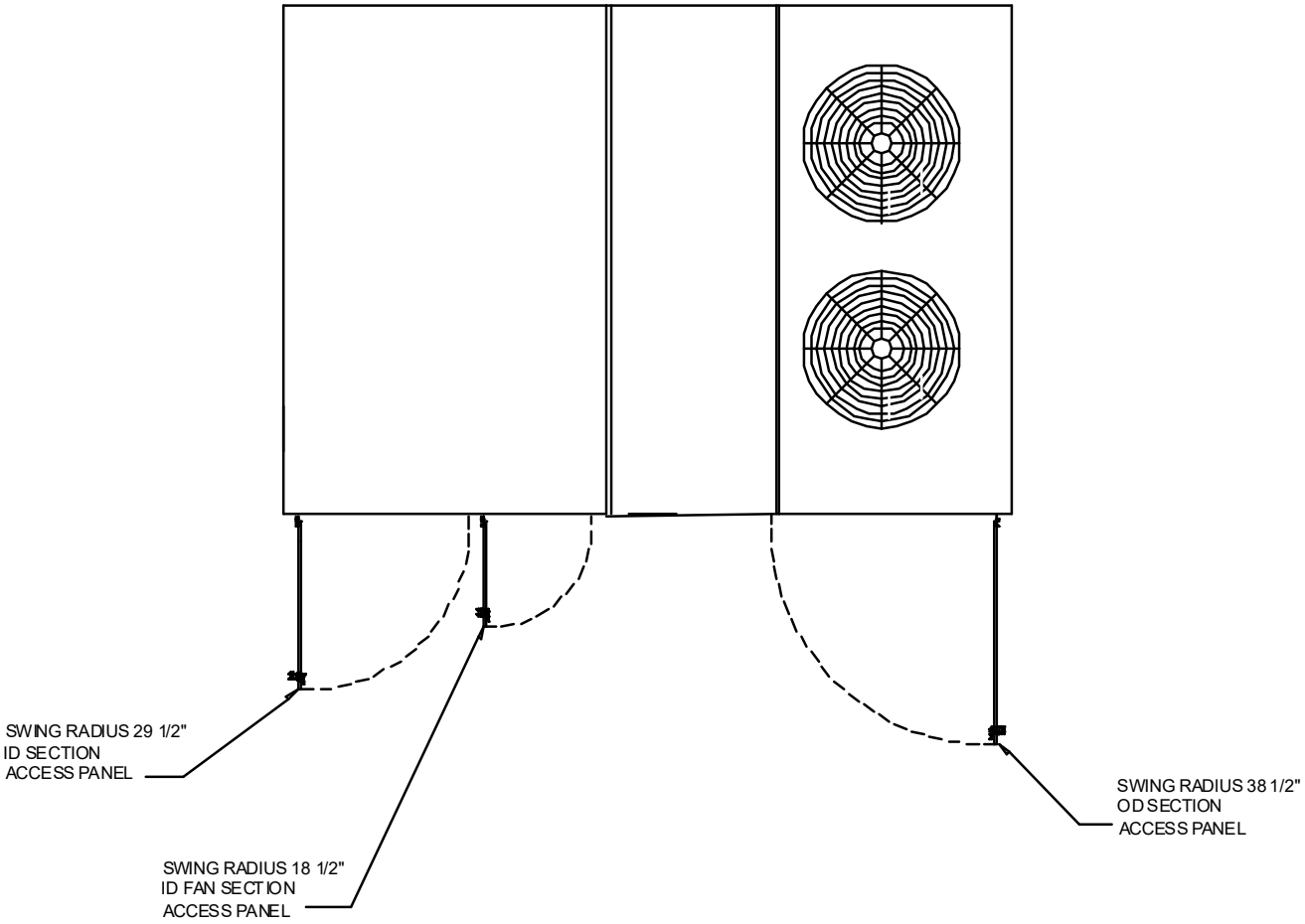
THROUGH THE BASE ELECTRICAL

ACCESSORY-PLAN VIEW



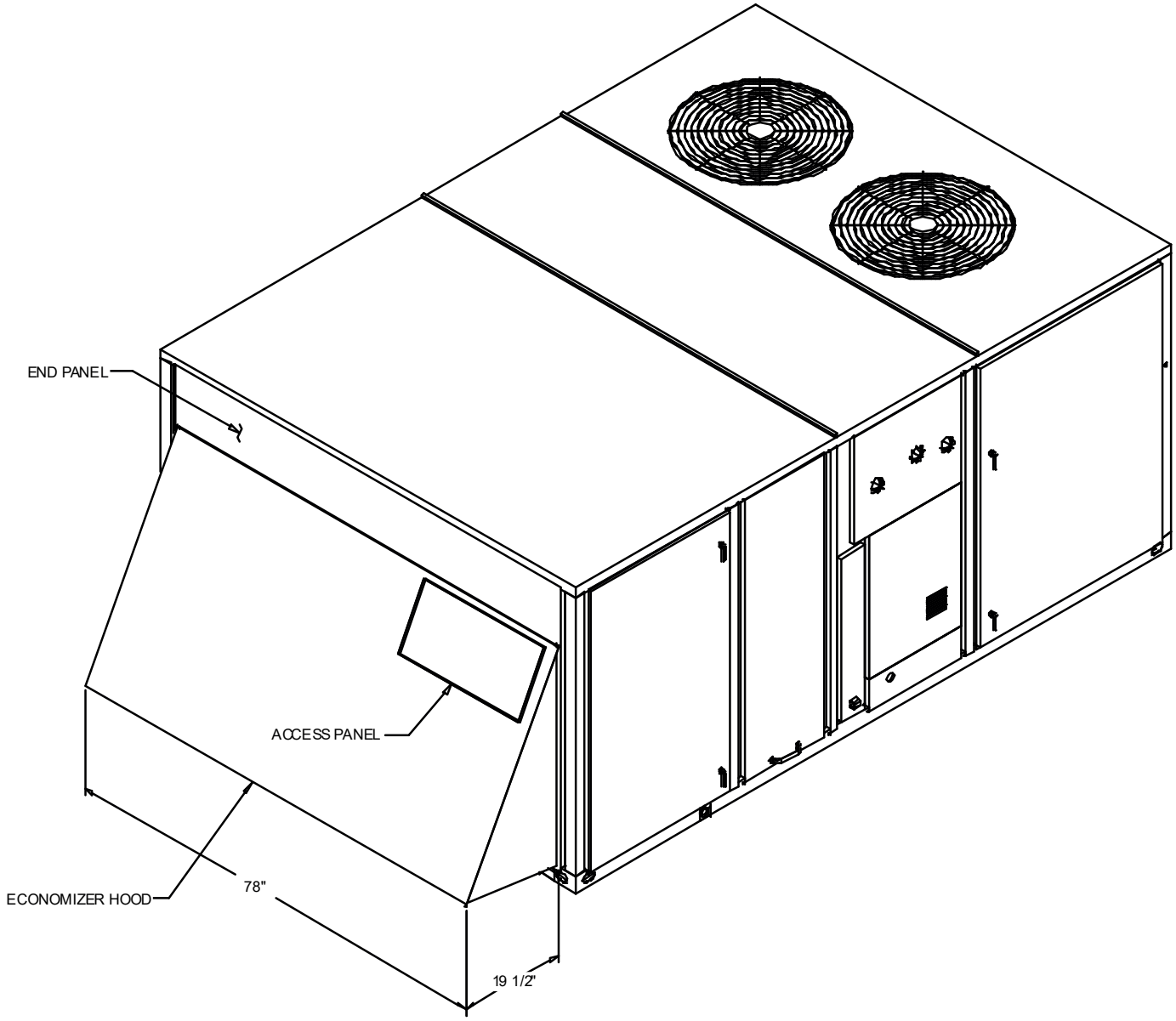
THROUGH THE BASE ELECTRICAL ROOF CURB

ACCESSORY-PLAN VIEW



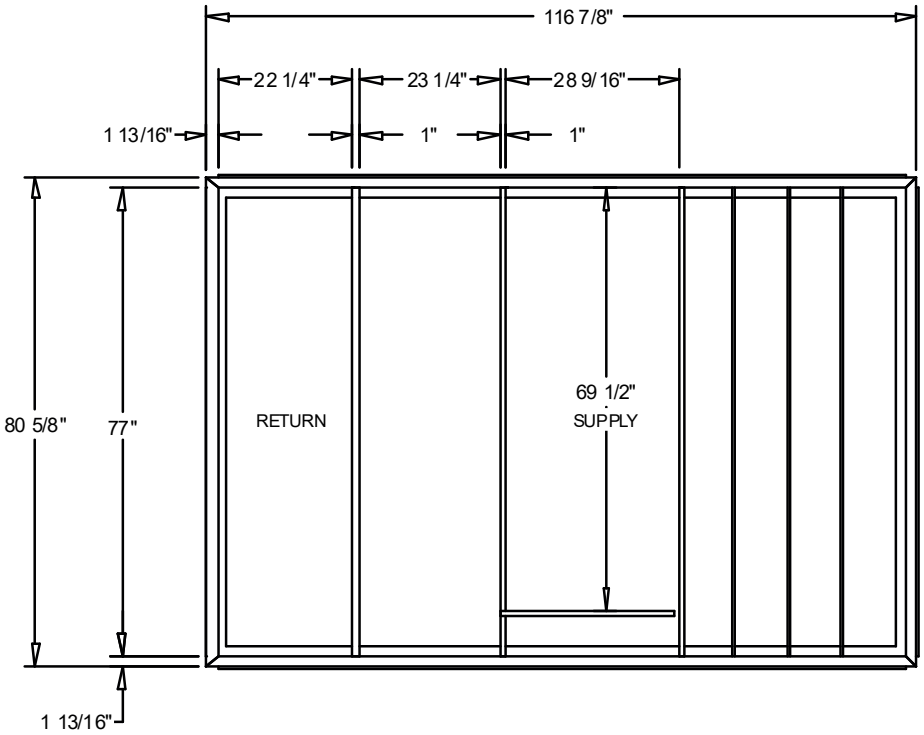
HINGGING ACCESS DOORS

ACCESSORY

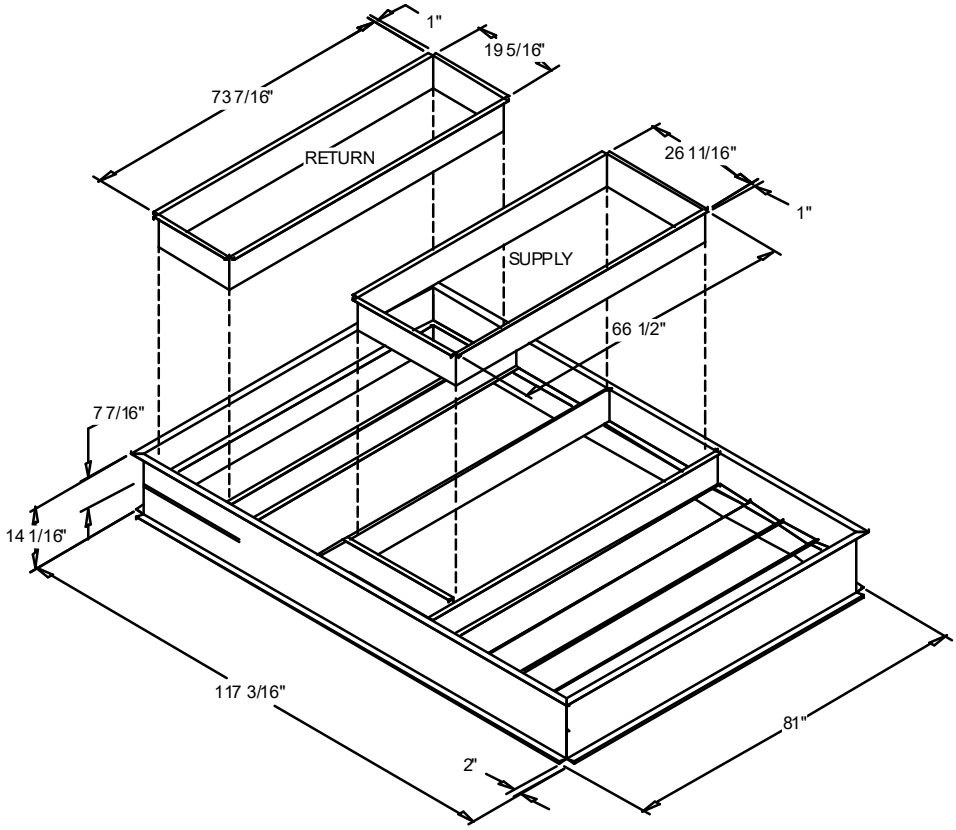


ECONOMIZER HOOD

PLAN VIEW DRAWING



ACCESSORY-ROOF CURB



ACCESSORY-DOWNFLOW DUCT CONNECTIONS

General - Downflow
The units shall be dedicated downflow 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 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 UL listed and labeled, classified in accordance to UL 1995/C 22.2, 236-05 3rd Edition.

Packaged Rooftop units cooling, heating capacities, and efficiencies are AHRI certified within scope of AHRI Standard 340/360 (I-P) and ANSIZ21.47 and 10 CFR Part 431 pertaining to Commercial Warm
Air Furnaces (gas heating units).

Casing - Downflow
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

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. Dual compressors are available on all standard efficiency models and 12.5 to 20 tons high efficiency models and allow for efficient cooling utilizing 3 stages of compressor operation (high efficiency models only). 25 tons high efficiency units have 3 compressors for up to 4 stages of compressor operation.

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

Refrigerant Circuits
Each refrigerant circuit shall have 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
Evaporator Coils (only on T/YS*150, 180, 210, 240, 300G models)-
Microchannel evaporator 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.
Coils shall be leak tested to ensure the pressure integrity. The evaporator coil shall be leak tested to 225 psig and pressure tested to 450 psig.

Condenser Coils (available on T/Y**150, 180, 210, 240, 300G models) - Microchannel condenser coils shall be standard on all units. Coils shall be leak tested to ensure the pressure integrity. The condenser coil shall be leak tested to 225 psig and pressure tested to 450 psig.

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 shall also comply with California requirements for low NOx emissions.

Condenser Coil
The microchannel type condenser coil is standard for the standard efficiency models.
Due to flat streamlined tubes with small ports, and metallurgical tube-tofin 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.

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. 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. 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.

Hinged Access Doors
Sheet metal hinges are available on the Filter/Evaporator Access Door and the Compressor/Control Access Door. This option is available on all downflow models.

Two-Inch Pleated Filters (MERV 8 & 13)
Two inch pleated media filters shall be available on all models.

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.

Sequence of Operation
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.
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).

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.

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.

Sequence of Operation (Changeover Bypass System)
Occupied Heat/Cool:
Each VAV terminal shall use pressure-independent control, with airflow measurement, to vary primary airflow to maintain zone temperature at its occupied setpoint. The RTU shall modulate the bypass damper to maintain duct static pressure at setpoint and modulate (or cycle) compressors, modulate (or stage) heat, and/or enable airside economizing based on current zone cooling/heating demands. The OA damper shall open to bring in the required amount of ventilation.

Morning Warm-Up/Pre-Cool:
Each VAV terminal unit shall vary primary airflow to raise/lower zone temperature to its occupied setpoint. The RTU shall modulate the bypass damper to maintain duct static pressure at setpoint and modulate (or cycle) compressors or modulate (or stage) heat based on current zone cooling/heating demands. The OA damper shall remain closed, unless economizing.

Cooling/Heating Changeover Logic:
The System Controller shall determine the overall system cooling/heating mode based on ?voting? from each zone. When the majority of zones require cooling, the RTU shall operate in cooling mode and any zone that requires heating shall reduce primary airflow to minimum. When the majority of zones require heating, the RTU shall operate in heating mode and any zone that requires cooling shall reduce primary airflow to minimum.