Trane Voyager Gas/Electric Packaged Rooftop

RTU-1

Unit Overview - YHD300G4RLD**0001000000000000000000000000

Application	Unit Size	Supply Fan		External Dimensions (in.)			Operating Weight		EER	IEER/SEER	Elevation
		Airflow	External Static Pressure	Height	Width	Length	Minimum	Maximum			
Gas/Electric	25 Ton	10000 cfm	0.400 in H2O	5.52 ft	7.02 ft	10.14 ft	2291.0 lb	2940.0 lb	10.6 EER	12.40	

Unit Features

Unit Electrical

Voltage/phase/hertz	460/60/3
MCA	56.00 A
MOP	70.00 A

Controls

Unit Controls	Reliatel

Cooling Section

Entering Dry Bulb	80.00 F
Entering Wet Bulb	67.00 F
Ambient Temp	95.00 F
Leaving Coil Dry Bulb	58.53 F
Leaving Coil Wet Bulb	57.61 F
Leaving Unit Dry Bulb	60.61 F
Leaving Unit Wet Bulb	58.40 F
Refrigeration System Options	
Leaving Dew Point	57.02 F

Capacity	
Gross Total	292.29 MBh
Gross Sensible	231.85 MBh
Net Total	273.26 MBh
Net Sensible	212.82 MBh
Fan Motor Heat	19.03 MBh
Refrig Charge-circuit 1	11.8 lb
Refrig Charge-circuit 2	11.3 lb

Heating Section

Heat Type	Gas
Heating Stages	2
Output Heating Capacity	200.00 MBh
Heating EAT	70.00 F
Heating LAT	88.43 F
Heating Temp Rise	18.43 F

Fan Section

Indoor Fan Data	
Type	FC Centrifugal
Drive Type	Belt
Evap Fan FLA	11.00 A
Indoor Fan Performance	
Airflow	10000 cfm
Design ESP	0.400 in H2O
Component SP	0.000 in H2O
Total SP	0.400 in H2O
Supply Motor Horsepower	7.500 hp
Indoor Motor Operating Power	6.04 bhp
Indoor Motor Power	4.50 kW
Indoor RPM	745 rpm

Outdoor Fan Data	
Type	Propeller
Fan Quantity	2
Drive Type	Direct
Outdoor Fan Performance	
Outdoor Motor Power	1.97 kW
Condenser Fan FLA	2.50 A
Exhaust Fan Data	
Type	FC Centrifugal
Drive Type	Direct
Exhaust Fan Performance	
Exhaust Fan Power	0.56 kW

Compressor Section

Power	21.21 kW
Circuit 1 RLA	8.20 A
Circuit 2 RLA	8.20 A

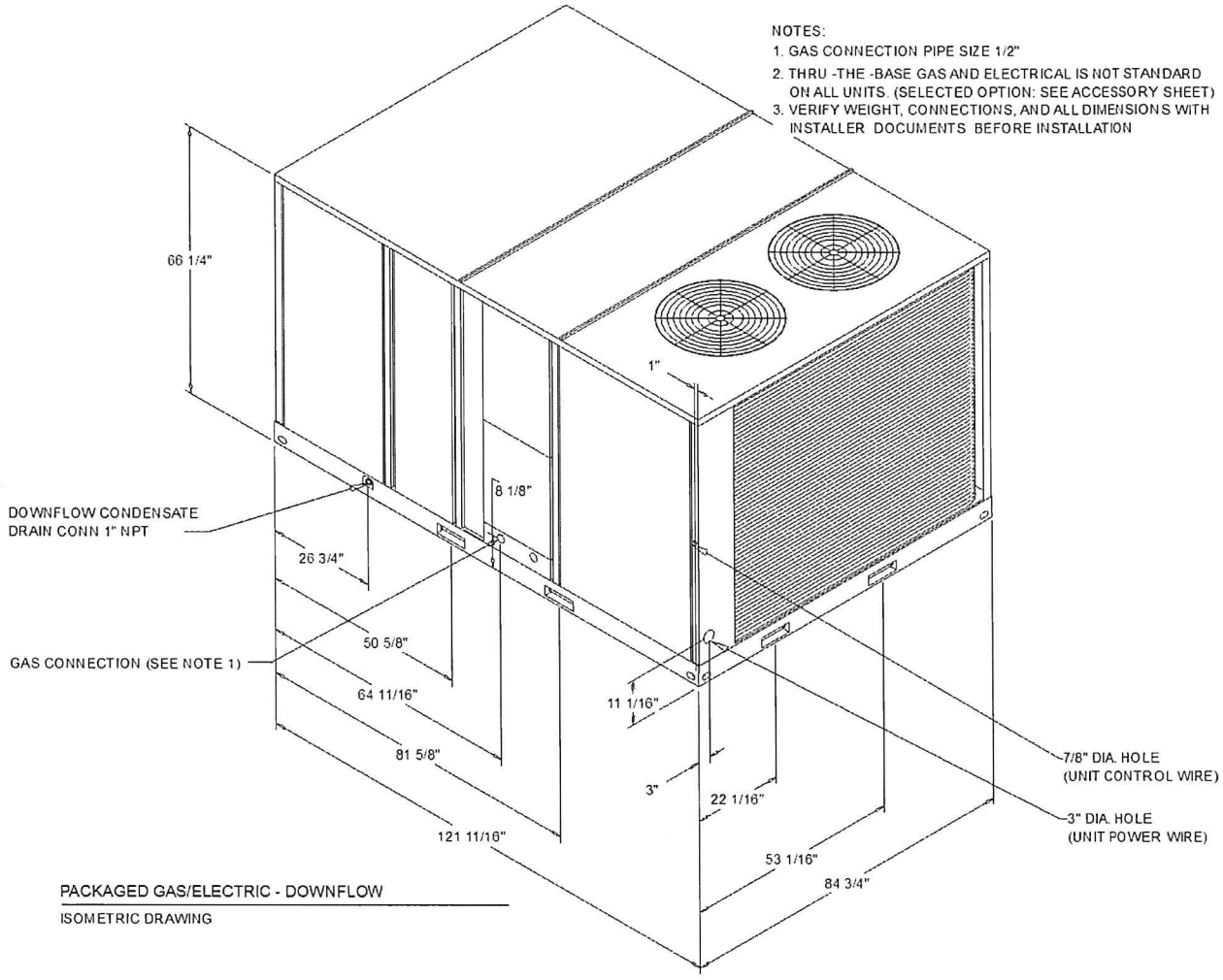
Accessories

Fresh air selection	Low Leak Econ, Dry Bulb
CO2 sensor kit	CO2 wall mounted, field sensor kit
Communications interface	BACnet communications interface
Ventilation module	yes

Acoustics

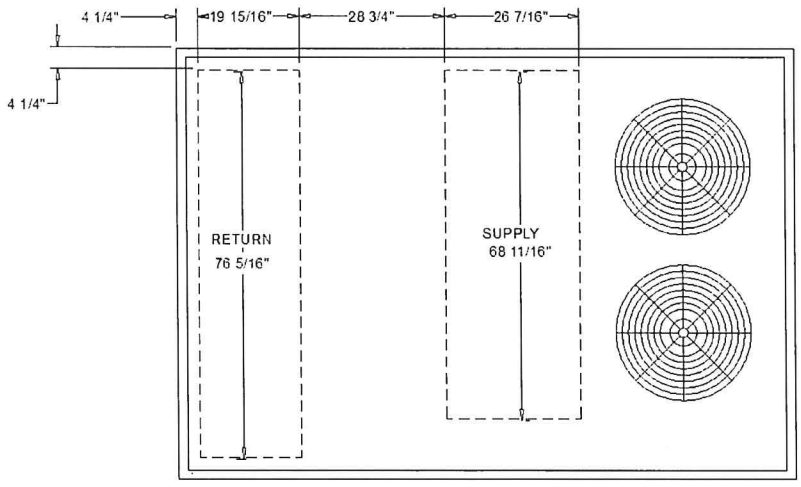
Sound Path	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Ducted Discharge	93 dB	91 dB	84 dB	86 dB	80 dB	77 dB	78 dB	73 dB
Ducted Inlet	92 dB	87 dB	78 dB	75 dB	71 dB	67 dB	67 dB	62 dB
Outdoor Noise	102 dB	89 dB	93 dB	94 dB	92 dB	87 dB	83 dB	75 dB

NOTES:
1. GAS CONNECTION PIPE SIZE 1/2"
2. THRU -THE -BASE GAS AND ELECTRICAL IS NOT STANDARD ON ALL UNITS. (SELECTED OPTION: SEE ACCESSORY SHEET)
3. VERIFY WEIGHT, CONNECTIONS, AND ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION



PACKAGED GAS/ELECTRIC - DOWNFLOW

ISOMETRIC DRAWING



PACKAGED GAS/ELECTRIC - DOWNFLOW

PLAN VIEW DRAWING

ELECTRICAL / GENERAL DATA

GENERAL PERFORMANCE

Model (Ton):	YHD300G (25.0)
Unit Operating Voltage Range:	414-506
Unit Primary Voltage:	460
Unit Secondary Voltage:	-
Unit Hertz:	60
Unit Phase:	3
EER: (5)	10.6

Standard Motor (1) (3)

Minimum Circuit Ampacity:	53.0
Maximum Fuse Size:	70.0
Maximum (HACR) Circuit Breaker:	70.0

Standard Oversized Motor (1) (4)

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

Accessory Oversized Motor (1) (4)

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

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 (in w.c):	2.5/14.0
Gas Connection Pipe Size:	1/2"

COMPRESSOR

	Circuit(s)
Number:	3
Horsepower:	12.8/6.9
Phase.	3
Rated Load Amps:	8.2/8.2/18.26
Locked Rotor Amps:	66.1/66.1/140.0

INDOOR MOTOR

Standard Motor

Number: (3)	1
Horsepower:	7.5
Motor Speed (RPM):	3,450
Phase:	3
Full Load Amps:	11.0
Locked Rotor Amps:	74.0

Standard Oversized Motor (4)

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

Accessory Oversized Motor (4)

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

OUTDOOR MOTOR

Number:	2
Horsepower:	1.0
Motor speed (RPM):	1,125
Phase:	3
Full Load Amps:	2.5
Locked Rotor Amps:	10.1

POWER EXHAUST

(Field Installed Power Exhaust)

Horsepower:	0.75
Motor Speed (RPM):	1,040
Phase:	1
Full Load Amps:	3.3
Locked Rotor Amps:	8.4

COMBUSTION BLOWER MOTOR

(Gas-Fired Heating only)

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

FILTER

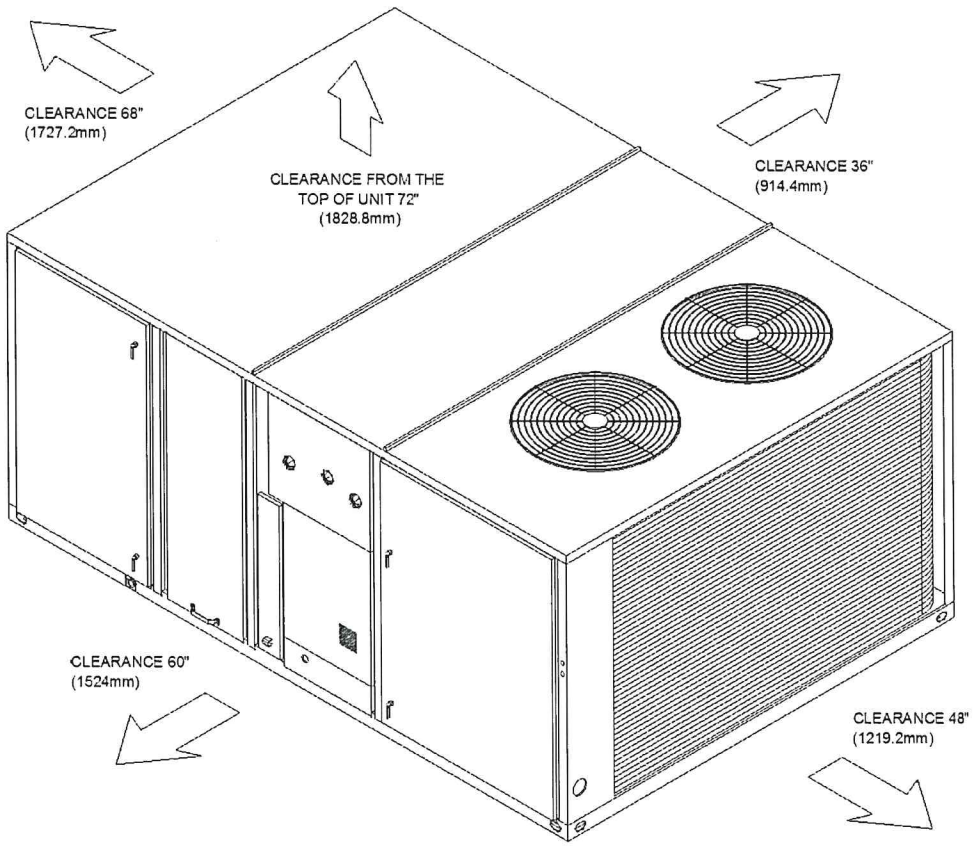
Type:	Throwaway
Furnished:	Yes
Number:	8 / 4
Recommended Size:	20"x20"x2" / 20"x16"x2"

REFRIGERANT (2)

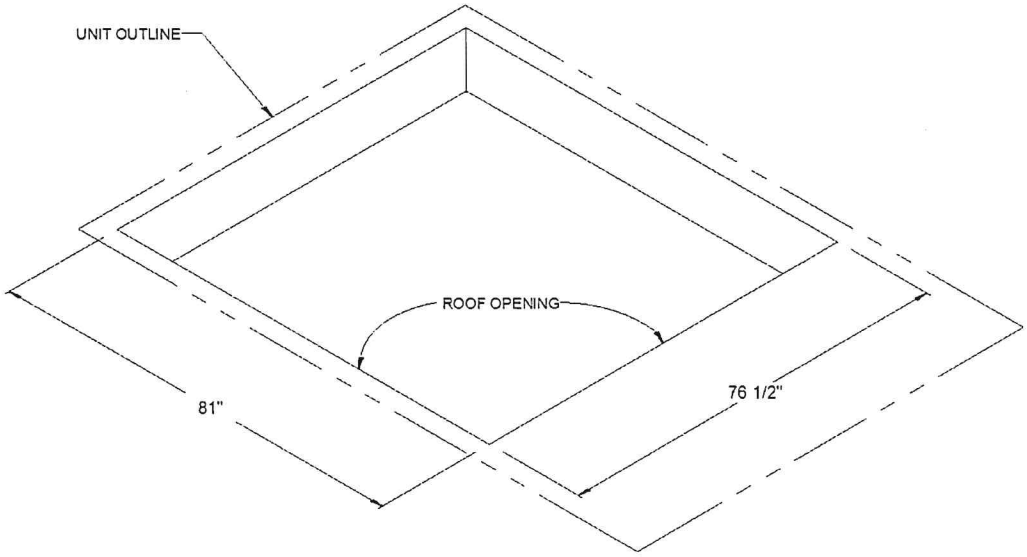
	Circuit #1 / 2
Type:	R-410
Factory Charge Circuit #1 / 2:	11.8 lb / 10.6 lb

NOTES:

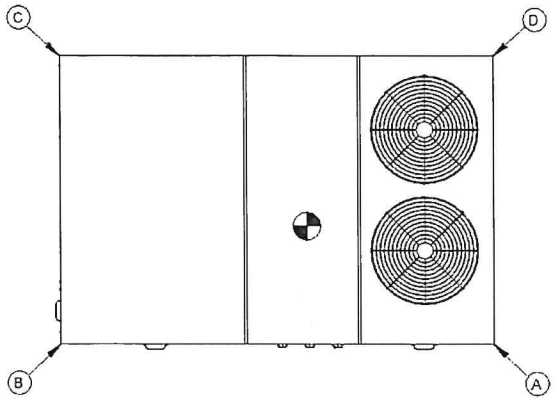
1. Maximum (HACR) Circuit Breaker sizing is for installations in the United States only.
2. Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.
3. Value include Standard Motor.
4. Value include Oversized Motor
5. EER is rated at AHRI conditions 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

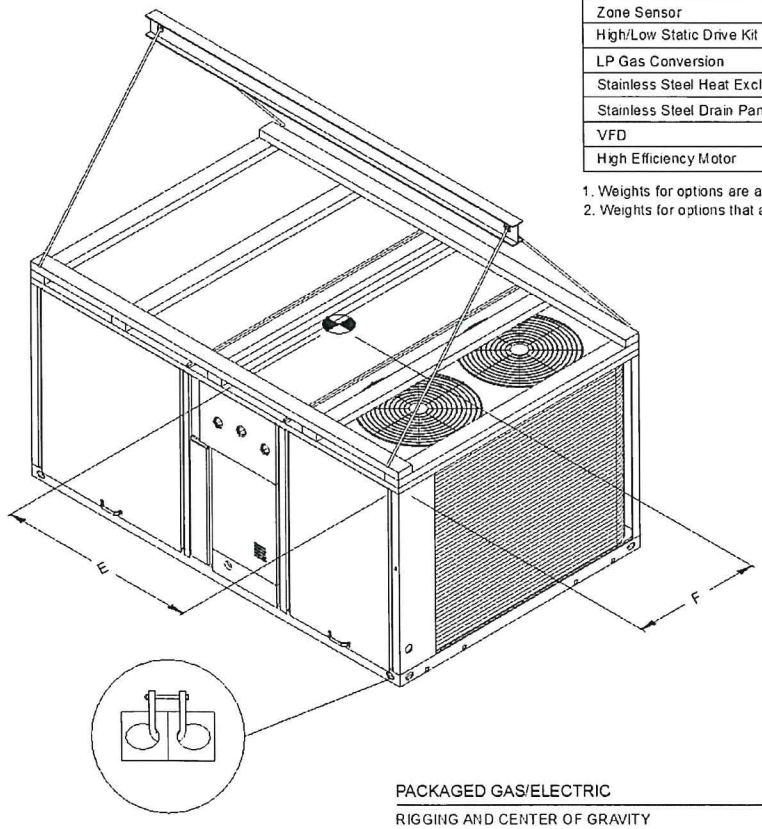
Base unit weights		Corner Weights				Center of Gravity	
SHIPPING	NET	(A)	(B)	(C)	(D)	E	F
2734.0 lb	2291.0 lb	734.0 lb	603.0 lb	432.0 lb	523.0 lb	55"	35"

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

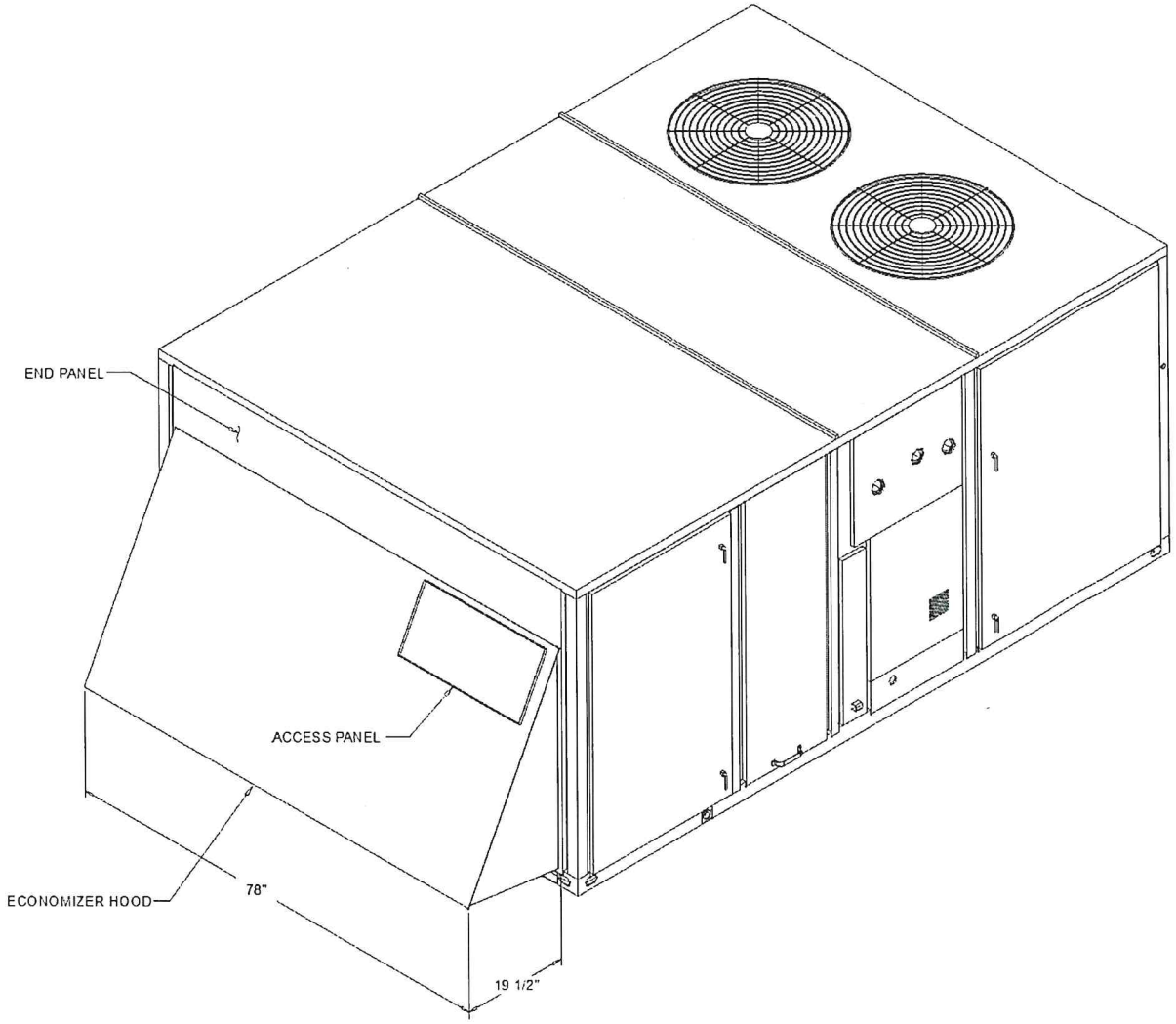
Accessory	Weight
Economizer, Manual and Motorized Outside Air Damper	250.0 lb
Power Exhaust	95.0 lb
Roof Curb	
Oversized Motor	
Hail Guard	51.0 lb
Hinged Access Doors	
Power Conv. Outlet	
Through the Base Electrical	
Circuit Breaker	
Disconnect	
Smoke Detector	
Novar	
Zone Sensor	
High/Low Static Drive 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.



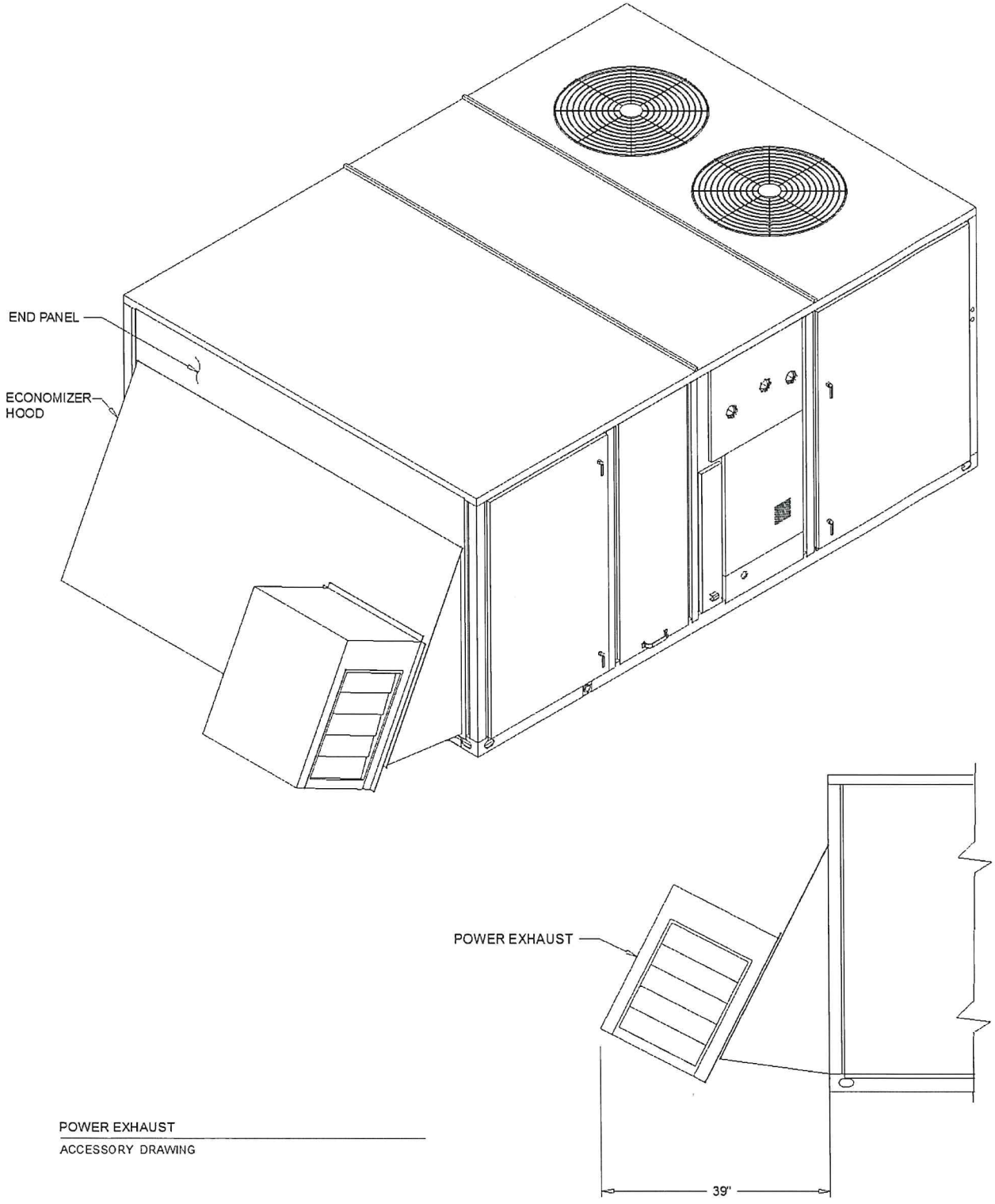
PACKAGED GAS/ELECTRIC

RIGGING AND CENTER OF GRAVITY



ECONOMIZER HOOD

PLAN VIEW DRAWING

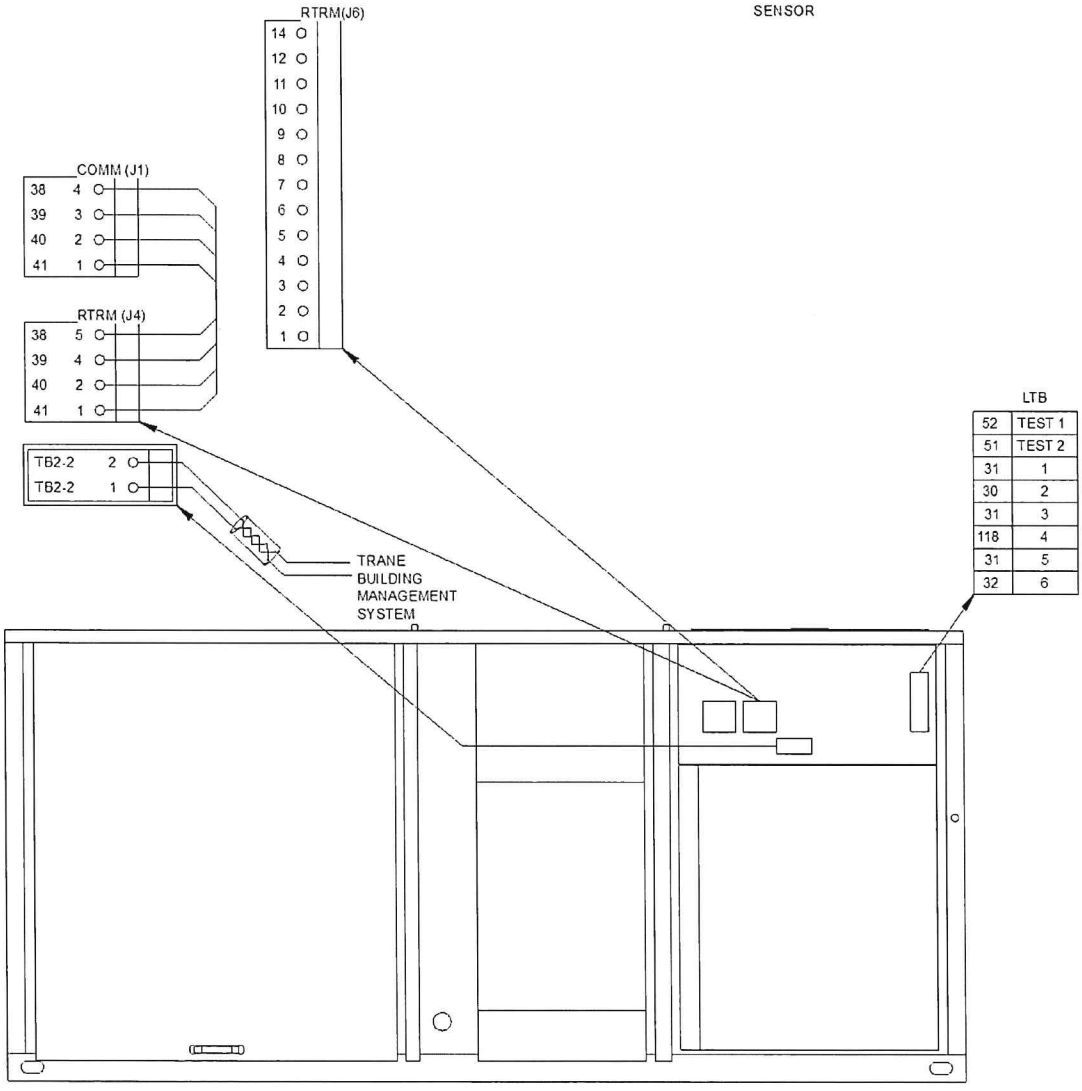


POWER EXHAUST

ACCESSORY DRAWING

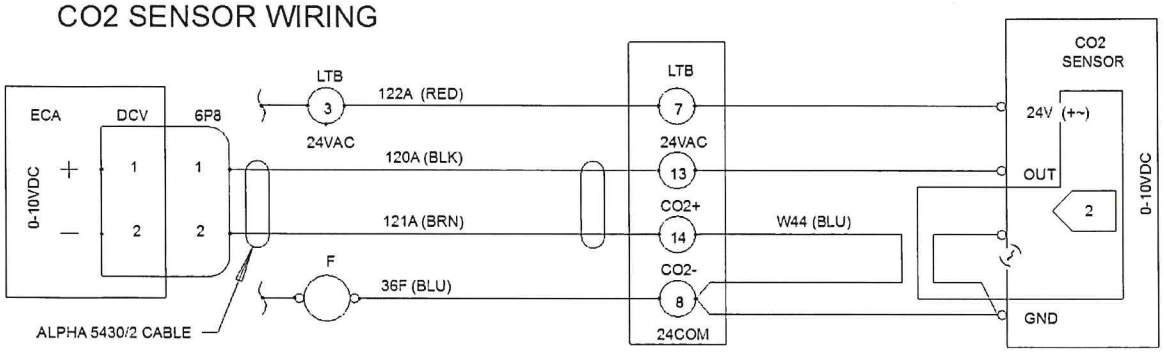
ZONE SENSOR WIRE TABLE	
WIRE SIZE	MAXIMUM WIRE LENGTH
22 GAUGE	1800"
20 GAUGE	3000"
18 GAUGE	4500"
16 GAUGE	7200"
14 GAUGE	11700"

NOTE:
1. ALL WIRING AND DEVICES SHOWN DASHED TO BE SUPPLIED AND INSTALLED BY THE CUSTOMER IN WITH NATIONAL AND LOCAL ELECTRICAL CODES.
2. LOW VOLTAGE CONTROL WIRING MUST NOT BE RUN IN CONDUIT WITH POWER WIRING
3. CUT WIRE JUMPER ADJACENT TO THE TERMINAL 1 ON ZONE SENSOR

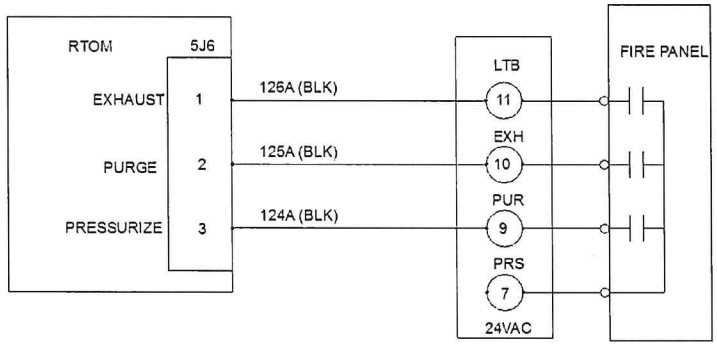


3.75"

CO2 SENSOR WIRING



VENTILATION OVERRIDE WIRING



REF	DESCRIPTION
ECA	ECONOMIZER ACTUATOR
F	FAN CONTACTOR
LTB	LOW VOLT TERM BLOCK
RTOM	OPTIONS MODULE
WN1	WIRE NUT
WN2	WIRE NUT

NOTE:

1. DASHED LINES REPRESENT RECOMMENDED FIELD WIRING.
2. APPLIES TO DUCT MOUNTED SENSOR ONLY.

3.50"

NOTES:

1. PRINT ON STRIP-TAC PLUS WITH BLACK LETTERS
2. REDUCE TRIMMED LABEL TO SIZE INDICATED.

General - 60 Hz Downflow Unit

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. 60 Hz 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.

Accessory - Low Leak Economizer
This accessory meets low leak requirements for ASHRAE90.1, IECC, and Title 24 standards; Allows 100 percent outdoor air supply from 0-100 percent modulating dampers; Comes standard with Barometric Relief; can be paired with Powered exhaust for additional building evacuation; Can be paired with Fault Detection (FDD) to meet current mandatory Title 24 requirements; Dry Bulb; And, available for down flow applications.

Accessory - Powered Exhaust
Power Exhaust shall be available on all units and shall be field installed. It shall provide exhaust of the return air, when using a downflow economizer, to maintain proper building pressurization.

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.

Accessory - 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.

Accessory - CO2 Sensing
The CO2 sensor has the ability to monitor space occupancy levels within the building by measuring the parts per million of CO2 (Carbon Dioxide) in the air. As the CO2 levels increase, the outside air damper modulates to meet the CO2 space ventilation requirements.

Field Selected BACnet Communication Interface 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.

F. 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.

G. REMOTE ACCESS/NETWORK SECURIT:
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 or a CHANGEOVER BYPASS SYSTEM)

A. SYSTEM OPERATING MODES: (Field Selected BACnet Communication Interface)
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.

D. CHANGEOVER BYPASS SYSTEM

1. 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.

2. 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.

3. 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.

Trane Voyager Gas/Electric Packaged Rooftop

RTU-2

Unit Overview - YHD180G4RLD**0001000000000000000000000000

Application	Unit Size	Supply Fan		External Dimensions (in.)			Operating Weight		EER	IEER/SEER	Elevation
		Airflow	External Static Pressure	Height	Width	Length	Minimum	Maximum			
Gas/Electric	15 Ton	6000 cfm	0.400 in H2O	5.52 ft	7.02 ft	10.14 ft	2222.0 lb	2663.0 lb	12.1 EER	14.00	

Unit Features

Unit Electrical

Voltage/phase/hertz	460/60/3
MCA	33.00 A
MOP	45.00 A

Controls

Unit Controls	Reliatel

Cooling Section

Entering Dry Bulb	80.00 F
Entering Wet Bulb	67.00 F
Ambient Temp	95.00 F
Leaving Coil Dry Bulb	58.06 F
Leaving Coil Wet Bulb	57.30 F
Leaving Unit Dry Bulb	59.24 F
Leaving Unit Wet Bulb	57.75 F
Refrigeration System Options	
Leaving Dew Point	56.82 F

Capacity	
Gross Total	180.52 MBh
Gross Sensible	142.17 MBh
Net Total	175.17 MBh
Net Sensible	136.82 MBh
Fan Motor Heat	5.35 MBh
Refrig Charge-circuit 1	13.0 lb
Refrig Charge-circuit 2	8.5 lb

Heating Section

Heat Type	Gas
Heating Stages	2
Output Heating Capacity	200.00 MBh
Heating EAT	70.00 F
Heating LAT	100.72 F
Heating Temp Rise	30.72 F

Fan Section

Indoor Fan Data	
Type	FC Centrifugal
Drive Type	Belt
Evap Fan FLA	4.80 A
Indoor Fan Performance	
Airflow	6000 cfm
Design ESP	0.400 in H2O
Component SP	0.000 in H2O
Total SP	0.400 in H2O
Supply Motor Horsepower	3.000 hp
Indoor Motor Operating Power	1.70 bhp
Indoor Motor Power	1.26 kW
Indoor RPM	550 rpm

Outdoor Fan Data	
Type	Propeller
Fan Quantity	2
Drive Type	Direct
Outdoor Fan Performance	
Outdoor Motor Power	0.89 kW
Condenser Fan FLA	1.30 A
Exhaust Fan Data	
Type	FC Centrifugal
Drive Type	Direct
Exhaust Fan Performance	
Exhaust Fan Power	0.56 kW

Compressor Section

Power	12.28 kW
Circuit 1 RLA	14.70 A
Circuit 2 RLA	7.00 A

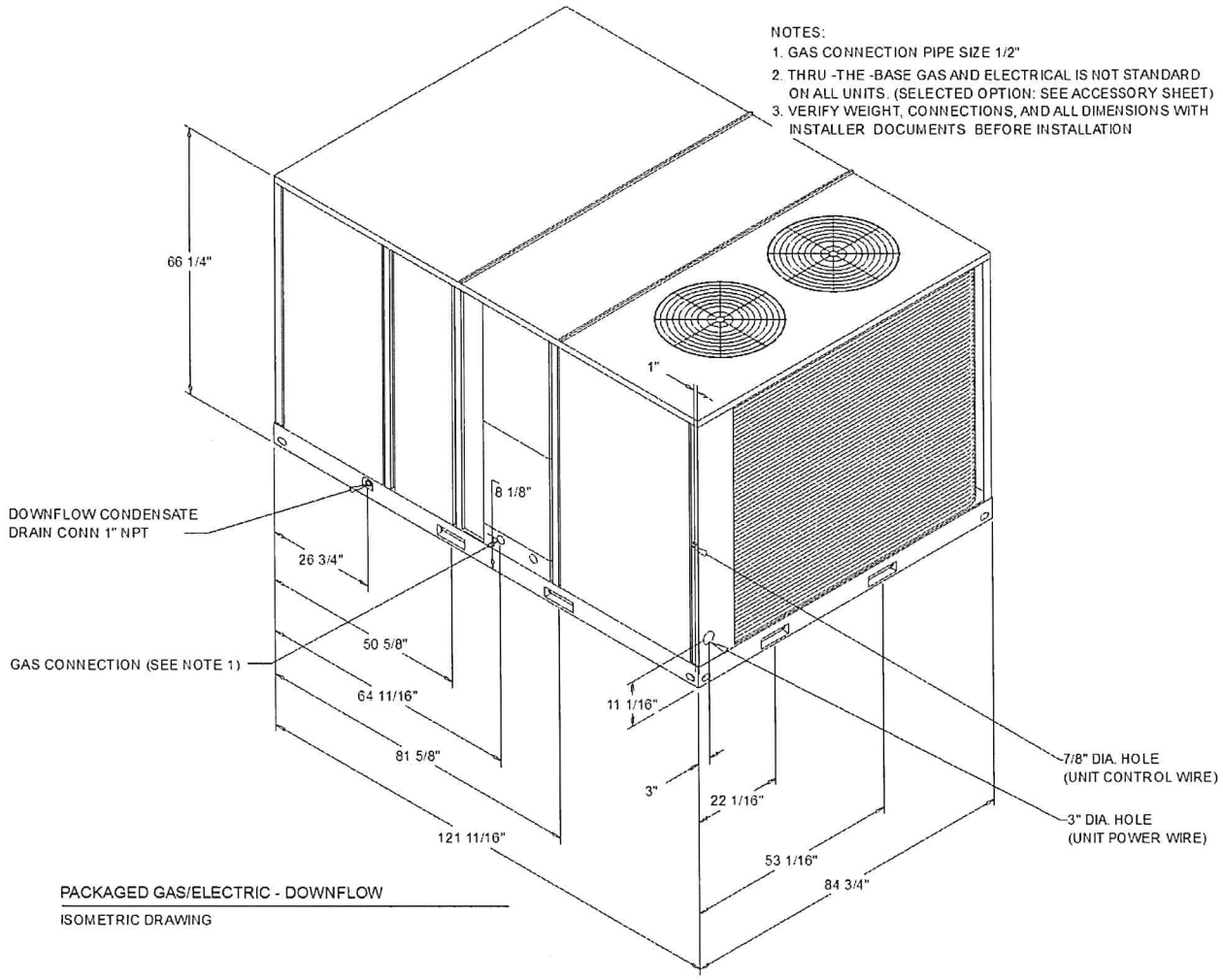
Accessories

Fresh air selection	Low Leak Econ, Dry Bulb
CO2 sensor kit	CO2 wall mounted, field sensor kit
Communications interface	BACnet communications interface
Ventilation module	yes

Acoustics

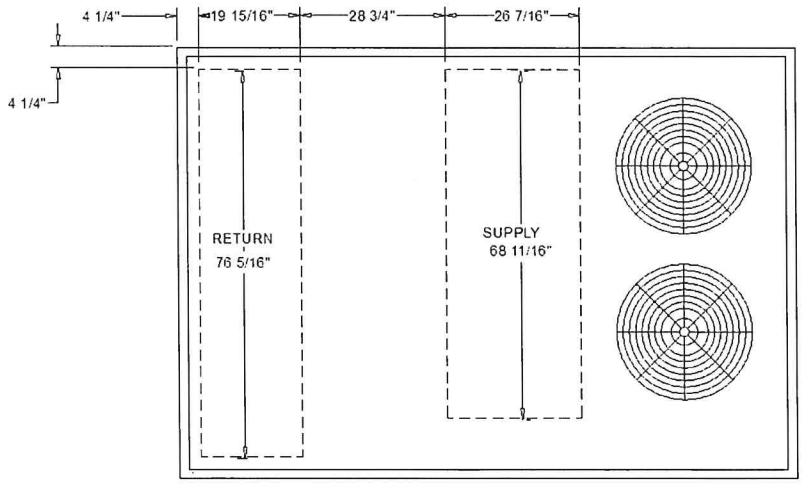
Sound Path	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Ducted Discharge	84 dB	80 dB	74 dB	76 dB	69 dB	66 dB	66 dB	59 dB
Ducted Inlet	91 dB	79 dB	70 dB	67 dB	61 dB	57 dB	55 dB	48 dB
Outdoor Noise	88 dB	97 dB	94 dB	92 dB	89 dB	83 dB	79 dB	75 dB

NOTES:
1. GAS CONNECTION PIPE SIZE 1/2"
2. THRU -THE -BASE GAS AND ELECTRICAL IS NOT STANDARD ON ALL UNITS. (SELECTED OPTION: SEE ACCESSORY SHEET)
3. VERIFY WEIGHT, CONNECTIONS, AND ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION



PACKAGED GAS/ELECTRIC - DOWNFLOW

ISOMETRIC DRAWING



PACKAGED GAS/ELECTRIC - DOWNFLOW

PLAN VIEW DRAWING

ELECTRICAL / GENERAL DATA

GENERAL PERFORMANCE

Model (Ton):	YHD180G (15.0)
Unit Operating Voltage Range:	414-506
Unit Primary Voltage:	460
Unit Secondary Voltage:	-
Unit Hertz:	60
Unit Phase:	3
EER: (5)	12.0

Standard Motor (1) (3)

Minimum Circuit Ampacity:	33.0
Maximum Fuse Size:	45.0
Maximum (HACR) Circuit Breaker:	45.0

Standard Oversized Motor (1) (4)

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

Accessory Oversized Motor (1) (4)

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

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 (in w.c):	2.5 / 14.0
Gas Connection Pipe Size:	1/2"

COMPRESSOR

	Circuit(s)
Number:	2
Horsepower:	7.5/4.75
Phase:	3
Rated Load Amps:	14.7/7.0
Locked Rotor Amps:	130.0/52.0

INDOOR MOTOR

Standard Motor

Number: (3)	1
Horsepower:	3.0
Motor Speed (RPM):	1,740
Phase:	1
Full Load Amps:	4.8
Locked Rotor Amps:	40.5

Standard Oversized Motor (4)

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

Accessory Oversized Motor (4)

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

OUTDOOR MOTOR

Number:	2
Horsepower:	0.5
Motor speed (RPM):	1,100
Phase:	3
Full Load Amps:	1.3
Locked Rotor Amps:	4.2

POWER EXHAUST

(Field Installed Power Exhaust)

Horsepower:	0.75
Motor Speed (RPM):	1,040
Phase:	1
Full Load Amps:	3.3
Locked Rotor Amps:	8.4

COMBUSTION BLOWER MOTOR

(Gas-Fired Heating only)

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

FILTER

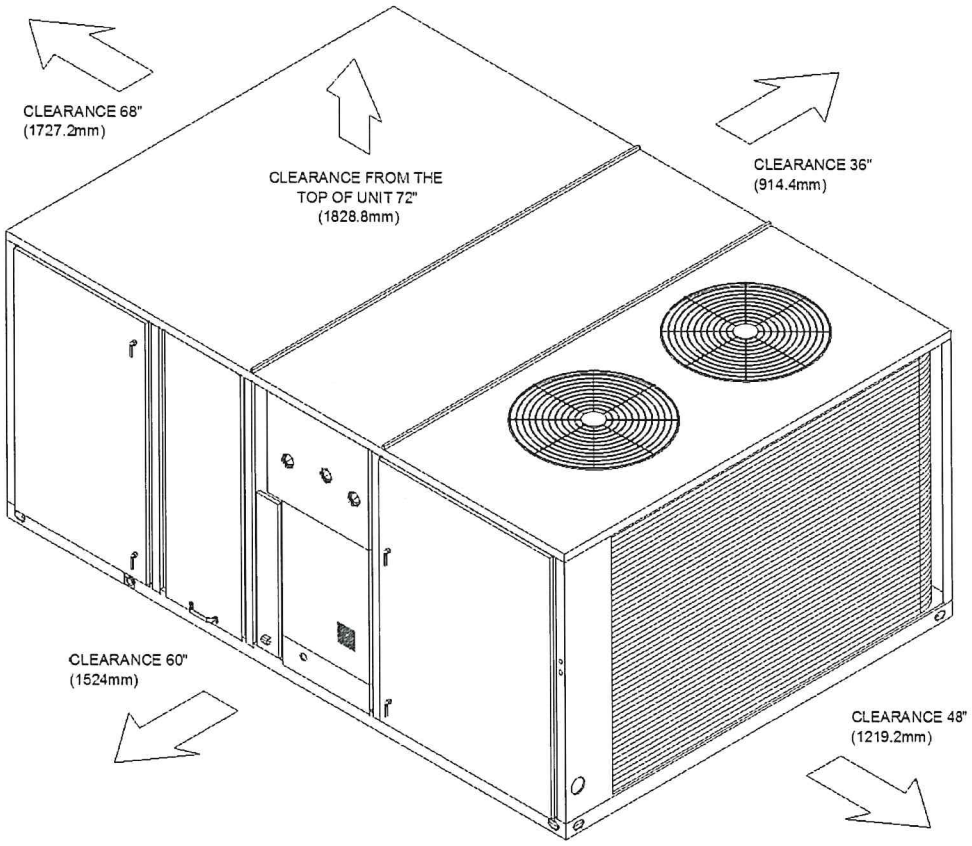
Type:	Throwaway
Furnished:	Yes
Number:	8/4
Recommended Size:	20"x20"x2" / 20"x16"x2"

REFRIGERANT (2)

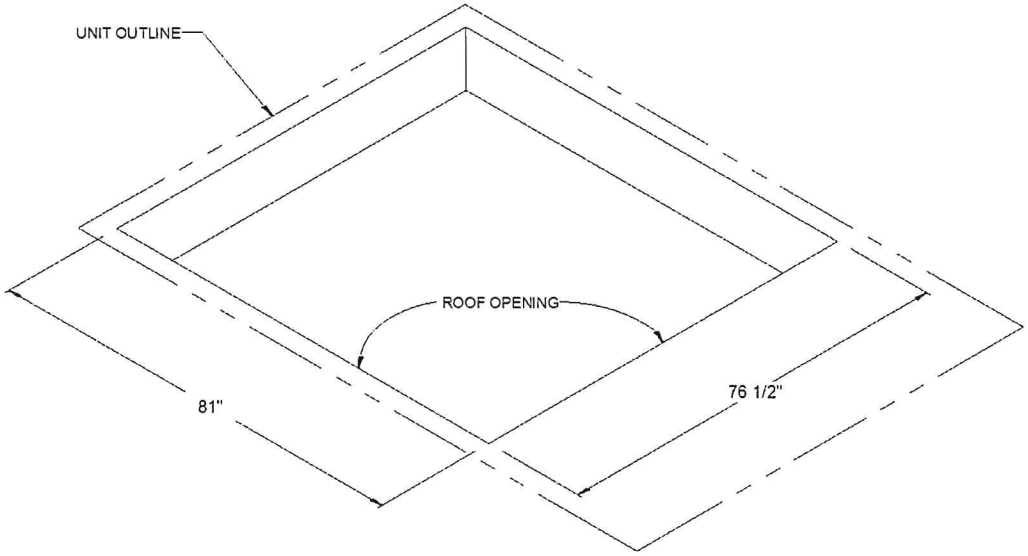
	Circuit #1 / 2
Type:	R-410
Factory Charge Circuit #1 / 2:	13.0 lb / 8.5 lb

NOTES:

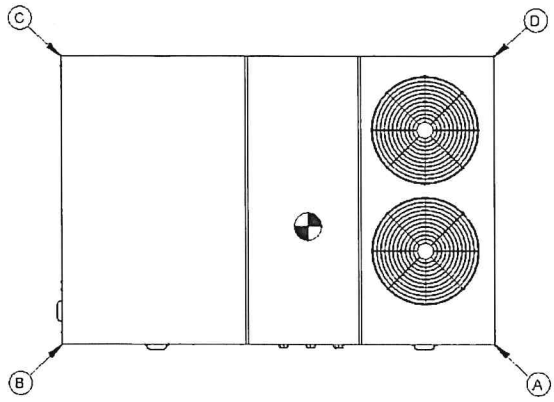
1. Maximum (HACR) Circuit Breaker sizing is for installations in the United States only.
2. Refrigerant charge is an approximate value. For a more precise value, see unit nameplate and service instructions.
3. Value include Standard Motor.
4. Value include Oversized Motor
5. EER is rated at AHRI conditions 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

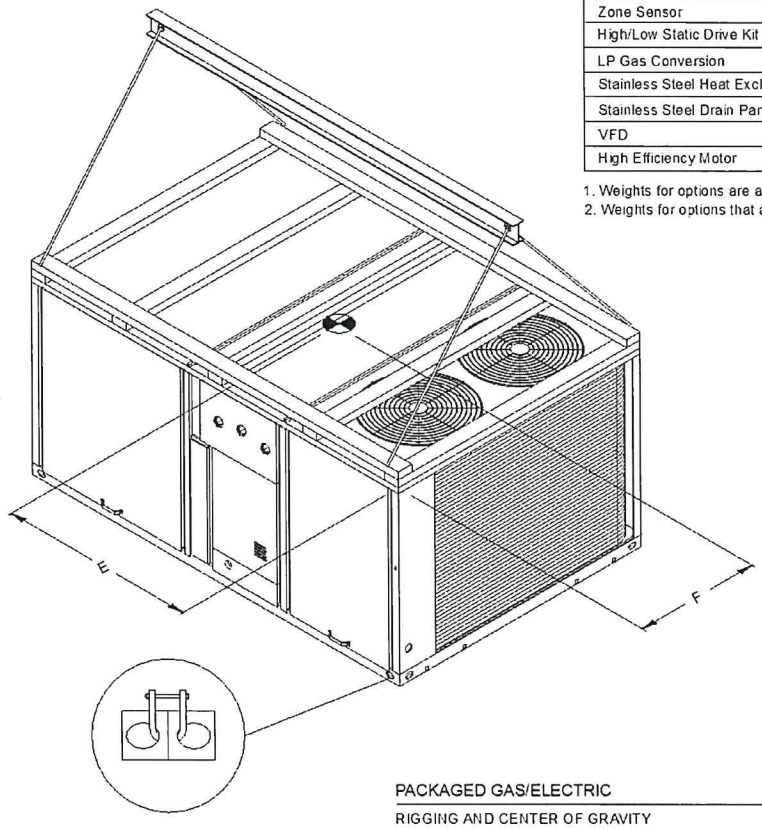
Base unit weights		Corner Weights				Center of Gravity	
SHIPPING	NET	(A)	(B)	(C)	(D)	E	F
2665.0 lb	2222.0 lb	665.0 lb	602.0 lb	453.0 lb	503.0 lb	51"	36"

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

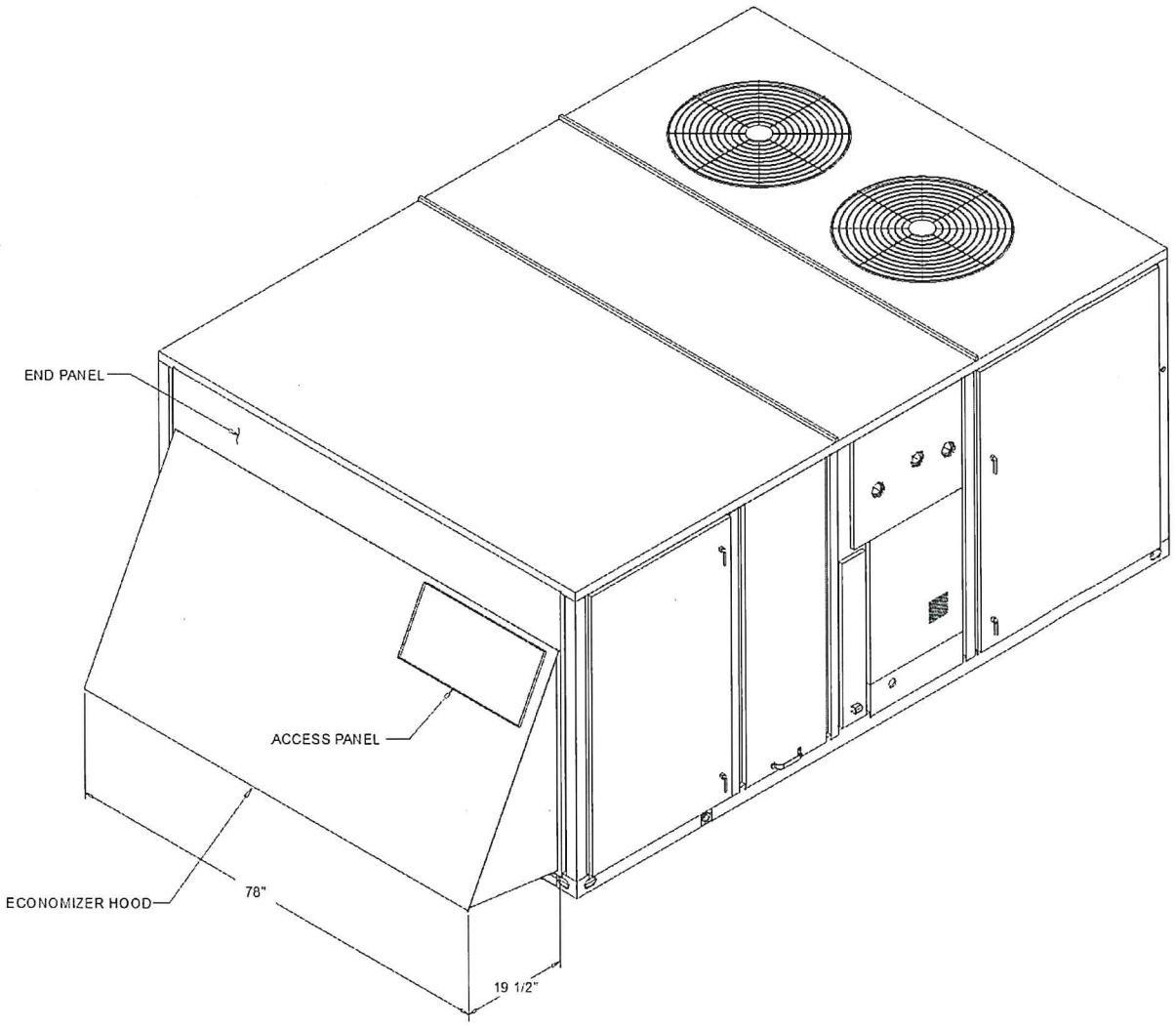
Accessory	Weight
Economizer, Manual and Motorized Outside Air Damper	250.0 lb
Power Exhaust	95.0 lb
Roof Curb	
Oversized Motor	
Hail Guard	51.0 lb
Hinged Access Doors	
Power Conv. Outlet	
Through the Base Electrical	
Circuit Breaker	
Disconnect	
Smoke Detector	
Novar	
Zone Sensor	
High/Low Static Drive 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.



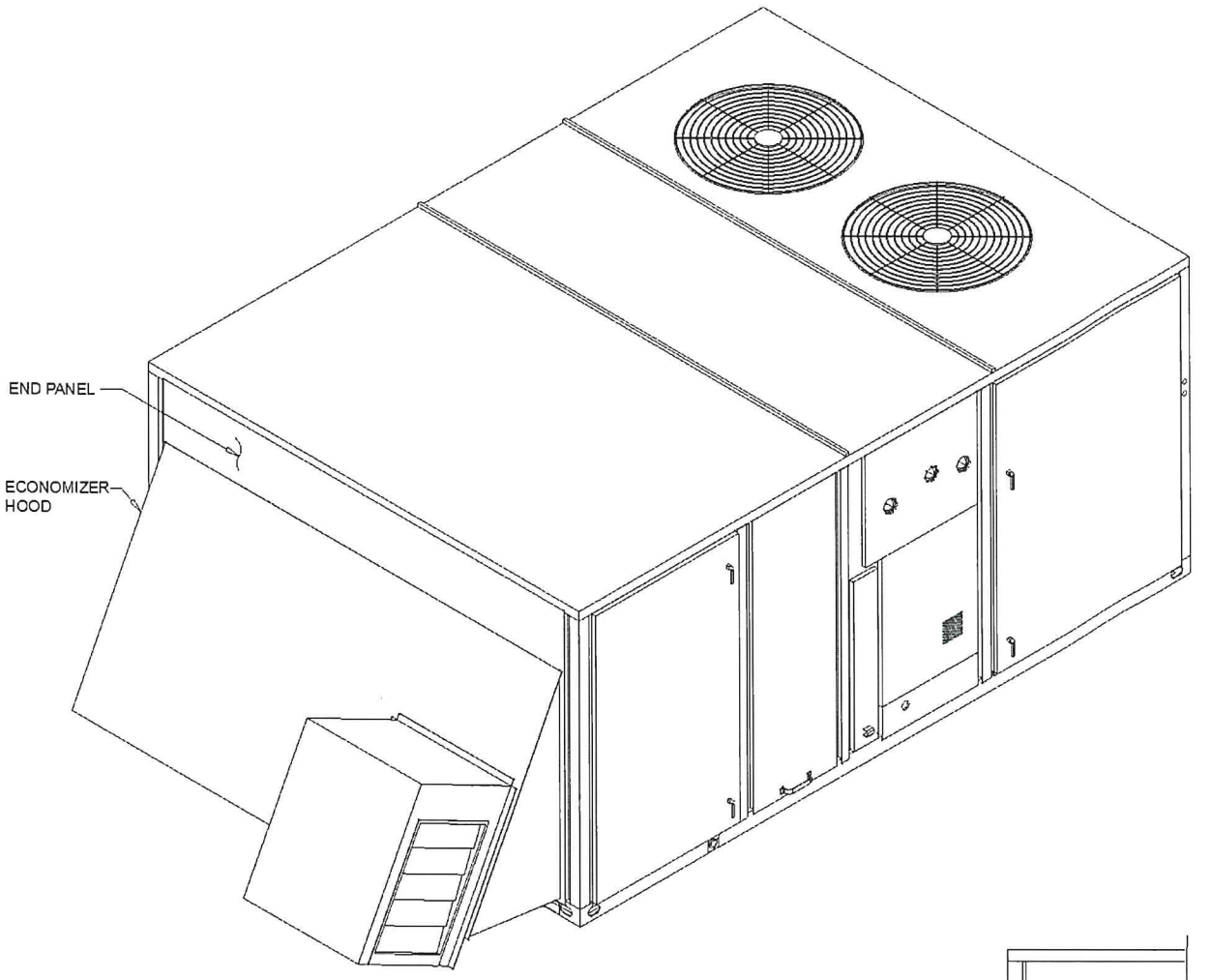
PACKAGED GAS/ELECTRIC

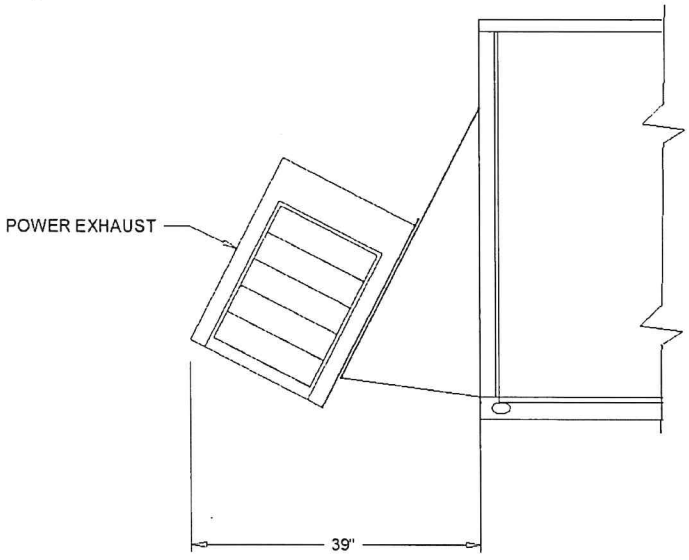
RIGGING AND CENTER OF GRAVITY



ECONOMIZER HOOD

PLAN VIEW DRAWING



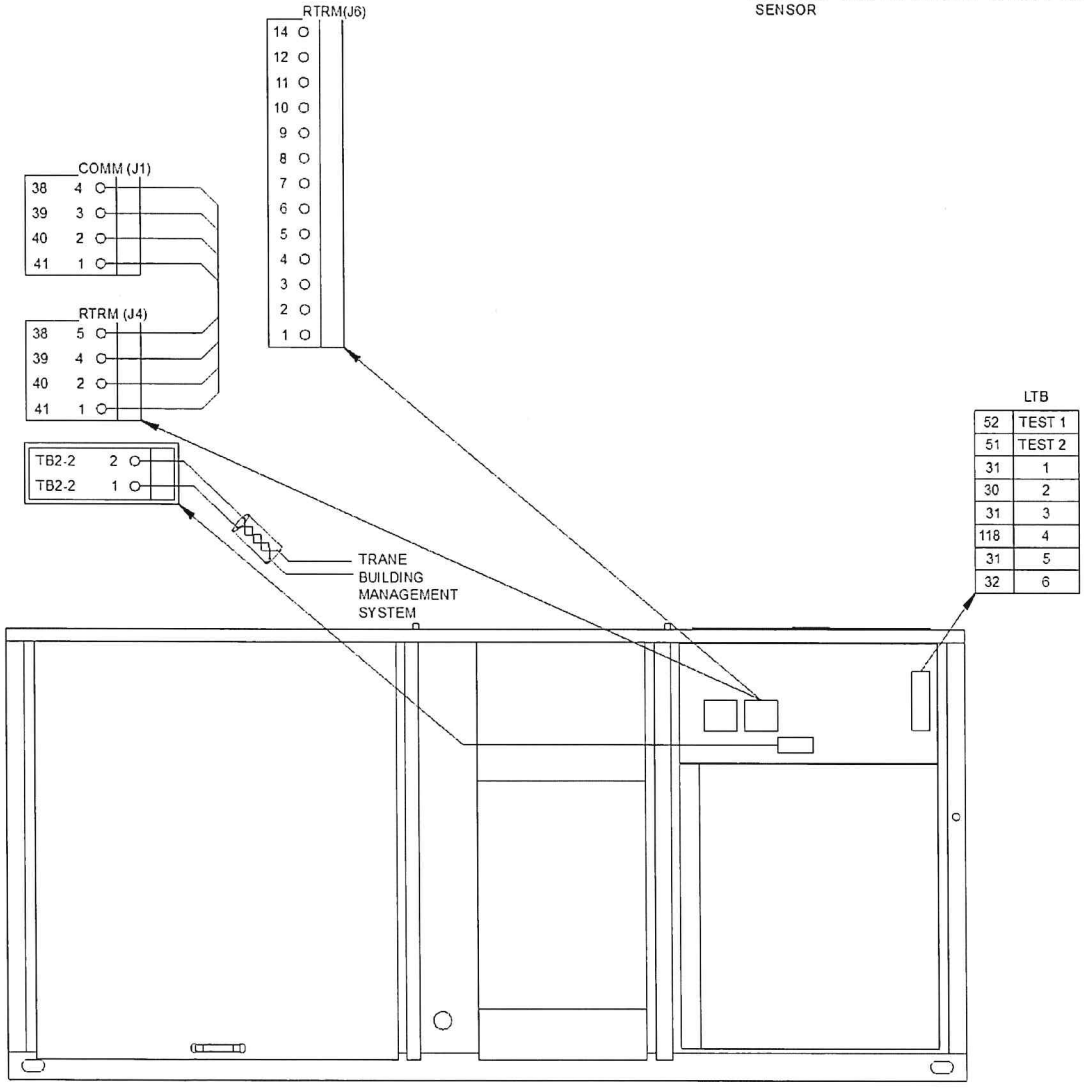


POWER EXHAUST

ACCESSORY DRAWING

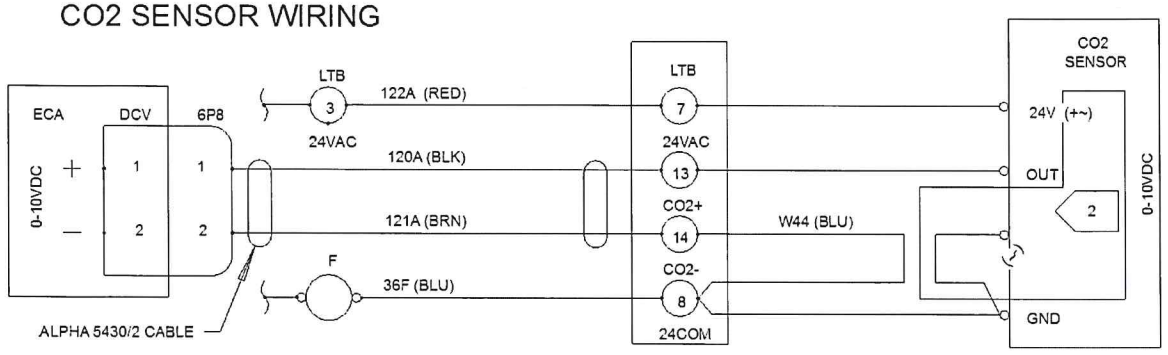
ZONE SENSOR WIRE TABLE	
WIRE SIZE	MAXIMUM WIRE LENGTH
22 GAUGE	1800"
20 GAUGE	3000"
18 GAUGE	4500"
16 GAUGE	7200"
14 GAUGE	11700"

NOTE:
1. ALL WIRING AND DEVICES SHOWN DASHED TO BE SUPPLIED AND INSTALLED BY THE CUSTOMER IN WITH NATIONAL AND LOCAL ELECTRICAL CODES.
2. LOW VOLTAGE CONTROL WIRING MUST NOT BE RUN IN CONDUIT WITH POWER WIRING
3. CUT WIRE JUMPER ADJACENT TO THE TERMINAL 1 ON ZONE SENSOR

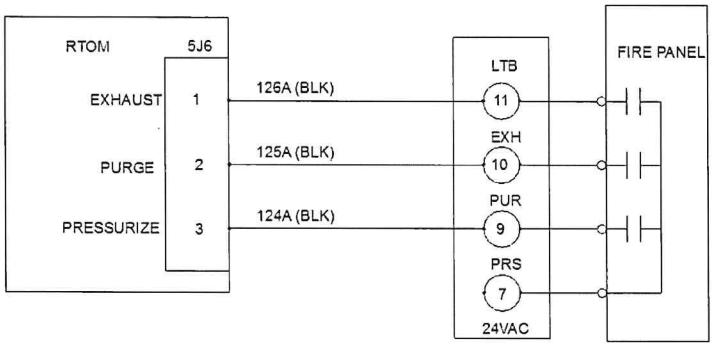


3.75"

CO2 SENSOR WIRING



VENTILATION OVERRIDE WIRING



REF	DESCRIPTION
ECA	ECONOMIZERACTUATOR
F	FAN CONTACTOR
LTB	LOW VOLT TERM BLOCK
RTOM	OPTIONS MODULE
WN1	WIRE NUT
WN2	WIRE NUT

NOTE:

1. DASHED LINES REPRESENT RECOMMENDED FIELD WIRING.
2. APPLIES TO DUCT MOUNTED SENSOR ONLY.

3.50"

NOTES:

1. PRINT ON STRIP-TAC PLUS WITH BLACK LETTERS
2. REDUCE TRIMMED LABEL TO SIZE INDICATED.

General - 60 Hz Downflow Unit

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. 60 Hz 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.

Accessory - Low Leak Economizer
This accessory meets low leak requirements for ASHRAE90.1, IECC, and Title 24 standards; Allows 100 percent outdoor air supply from 0-100 percent modulating dampers; Comes standard with Barometric Relief; can be paired with Powered exhaust for additional building evacuation; Can be paired with Fault Detection (FDD) to meet current mandatory Title 24 requirements; Dry Bulb; And, available for down flow applications.

Accessory - Powered Exhaust
Power Exhaust shall be available on all units and shall be field installed. It shall provide exhaust of the return air, when using a downflow economizer, to maintain proper building pressurization.

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.

Accessory - 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.

Accessory - CO2 Sensing
The CO2 sensor has the ability to monitor space occupancy levels within the building by measuring the parts per million of CO2 (Carbon Dioxide) in the air. As the CO2 levels increase, the outside air damper modulates to meet the CO2 space ventilation requirements.

Field Selected BACnet Communication Interface 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.

F. 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.

G. REMOTE ACCESS/NETWORK SECURIT:
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 or a CHANGEOVER BYPASS SYSTEM)

A. SYSTEM OPERATING MODES: (Field Selected BACnet Communication Interface)
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.

D. CHANGEOVER BYPASS SYSTEM

1. 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.

2. 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.

3. 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.

Trane Foundation Gas/Electric Rooftop

RTU - 3, 6

Unit Overview - GBC048A4ELB**0000000000000000000000000000

Application	Unit Size	Supply Fan		External Dimensions (in.)			Operating Weight		EER	IEER/SEER	Elevation
		Airflow	External Static Pressure	Height	Width	Length	Minimum	Maximum			
Gas/Electric	4 Ton	1600 cfm	0.750 in H2O	3.55 ft	3.99 ft	6.40 ft	566.0 lb	765.0 lb	12.0 EER	14.00	

Unit Features

Unit Electrical

Voltage/phase/hertz	460/60/3
MCA	11.00 A
MOP	15.00 A

Controls

Unit Controls	Electro-mechanical

Cooling Section

Entering Dry Bulb	80.00 F	Capacity	
Entering Wet Bulb	67.00 F	Gross Total	51.13 MBh
Ambient Temp	95.00 F	Gross Sensible	38.83 MBh
Leaving Coil Dry Bulb	57.45 F	Net Total	47.98 MBh
Leaving Coil Wet Bulb	56.59 F	Net Sensible	35.68 MBh
Leaving Unit Dry Bulb	59.72 F	Refrig Charge-circuit 1	4.6 lb
Leaving Unit Wet Bulb	57.47 F		

Heating Section

Output Heating Capacity	57.60 MBh
Output Heating Capacity with Fan	57.60 MBh
Heating EAT	70.00 F
Heating LAT	103.18 F
Heating Temp Rise	33.18 F

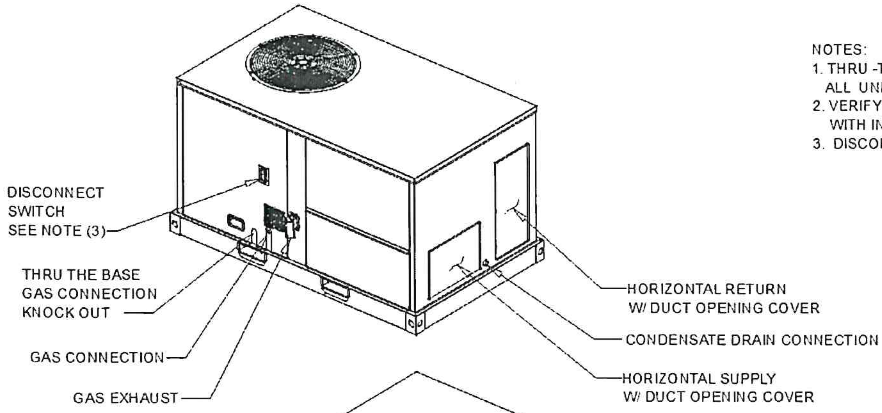
Fan Section

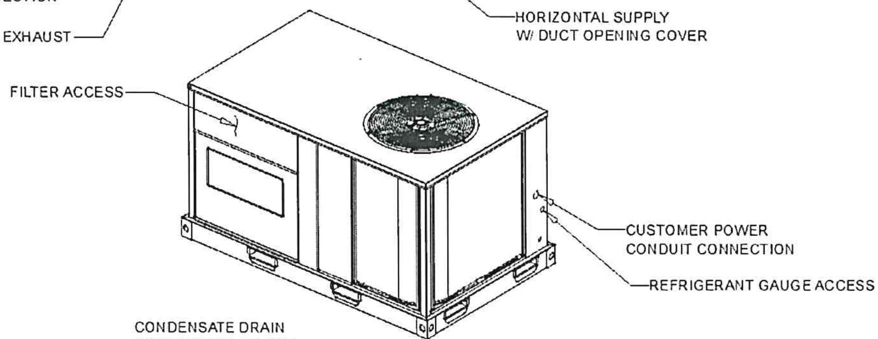
Indoor Fan Data		Outdoor Fan Data	
Type	FC Centrifugal	Type	Propeller
Drive Type	Belt	Fan Quantity	1
Indoor Fan Performance		Drive Type	Direct
Airflow	1600 cfm	Outdoor Fan Performance	
Design ESP	0.750 in H2O	Condenser Fan FLA	0.70 A
Component SP	0.000 in H2O	Exhaust Fan Data	
Total SP	0.750 in H2O	Type	FC Centrifugal
Indoor Motor Operating Power	0.00 bhp	Drive Type	Direct
Indoor Motor Power	0.00 kW	Exhaust Fan Performance	
Indoor RPM	956 rpm	Exhaust Fan FLA	2.50 A

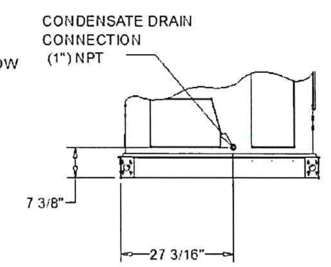
Compressor Section

Circuit 1 RLA	6.20 A
Circuit 2 RLA	0.00 A

NOTES:
1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
2. VERIFY WEIGHT, CONNECTIONS, AND ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION
3. DISCONNECT SWITCH IS NOT STANDARD ON ALL UNITS.

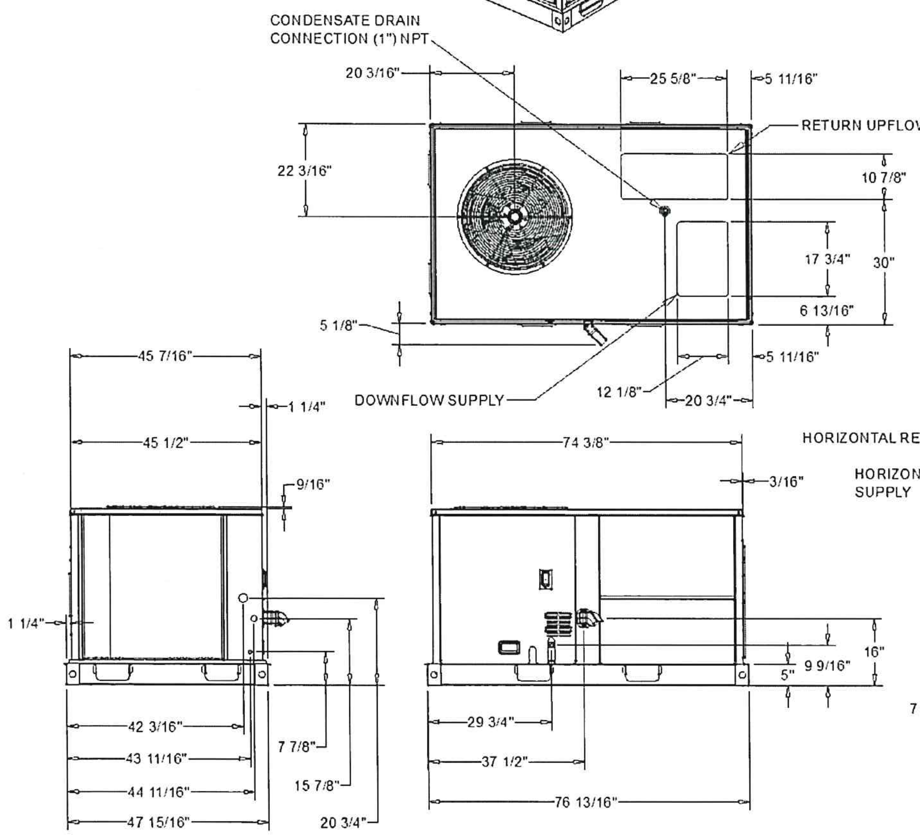


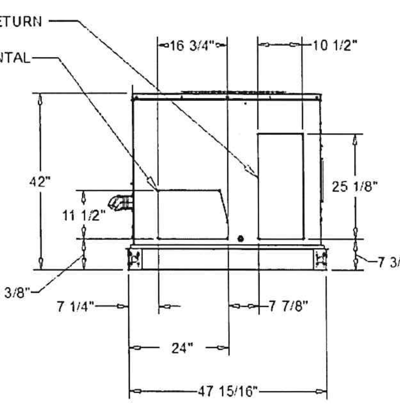




CONDENSATE DRAIN

DIMENSION DRAWING





3 - 5 PACKAGED COOLING

DIMENSION DRAWING

ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)(7)(10)

Model:	GBC048	Oversized Motor
Unit Operating Voltage:	-	MCA:
Unit Primary Voltage:	460	MFS:
Unit Secondary Voltage	-	MCB:
Unit Hertz:	60	
Unit Phase:	3	
EER:	12 / 14	
IEER One Speed Fan:	-	
IEER Multi Speed Fan:	-	
Standard Motor		Field Installed Oversized Motor
MCA:	11.0	MCA:
MFS:	15.0	MFS:
MCB:	15.0	MCB:

HEATING PERFORMANCE

HEATING - GENERAL DATA

Heating Model:	Low
Heating Input (BTU):	72000
Heating Output (BTU):	57600
No. Burners:	2
No. Stages	1
Gas Inlet Pressure	
Natural Gas (Min/Max):	4.5 / 14.0 in. wc
LP (Min/Max)	11.0 / 14.0 in. wc
Gas Pipe Connection Size:	1/2"

INDOOR MOTOR

Standard Motor		Oversized Motor	Field Installed Oversized Motor
Number:	1	Number:	Number:
Horsepower:	1.0	Horsepower:	Horsepower:
Motor Speed (RPM):	-	Motor Speed (RPM):	Motor Speed (RPM):
Phase	3	Phase	Phase
Full Load Amps:	2.0	Full Load Amps:	Full Load Amps:
Locked Rotor Amps:	15.0	Locked Rotor Amps:	Locked Rotor Amps:

COMPRESSOR

Circuit 1/2

Number:	1
Horsepower:	5.4
Phase:	3
Rated Load Amps:	6.2/6.9
Locked Rotor Amps:	41.0

OUTDOOR MOTOR

Number:	1
Horsepower:	0.33
Motor Speed (RPM):	-
Phase:	3
Full Load Amps:	0.7
Locked Rotor Amps:	2.3

POWER EXHAUST ACCESSORY (3)

(Field Installed Power Exhaust)

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

FILTERS

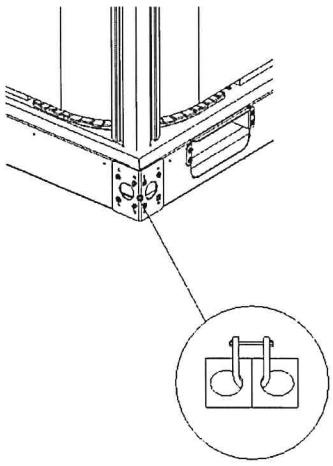
Type:	Throwaway
Furnished:	Yes
Number	4
Recommended	16"x16"x2"

REFRIGERANT (2)

Type:	R-410A
Factory Charge:	
Circuit #1	4.6 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 does not include Heater.
5. Value include Standard Motor.
6. Value include Oversized Motor
7. EER is rated at AHRI conditions and in accordance with DOE test procedures.
8. For Compressor Motors and Condenser Fan Motors: Amp draw for each motor; multiply value by number of motors to determine total amps.
9. HP for each compressor.
10. Integrated Energy Efficiency Ratio (IEER) is rated in accordance with AHRI standard 210/240 or 360.
11. Full Load Amps (FLA) are the combined amps for outdoor motors.



PACKAGED COOLING PLAN VIEW

RIGGING DRAWING

Base Unit and Corner Weights only

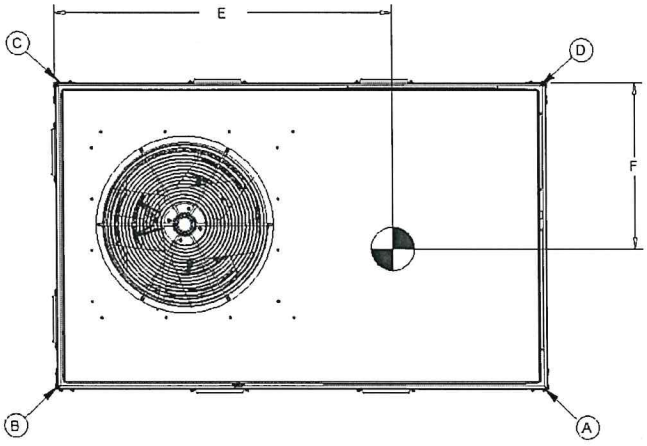
Base unit weights		Corner Weights				Center of Gravity	
SHIPPING	NET	(A)	(B)	(C)	(D)	E	F
616.0 lb	566.0 lb	110.0 lb	119.0 lb	175.0 lb	162.0 lb	40"	29"

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	26.0 lb
Barometric Relief	-
Power Exhaust	-
Roof Curb	-
Oversized Motor	-
Disconnect	-
Hail Guard	-
Through the Base	-
Through the Gas	-
	-

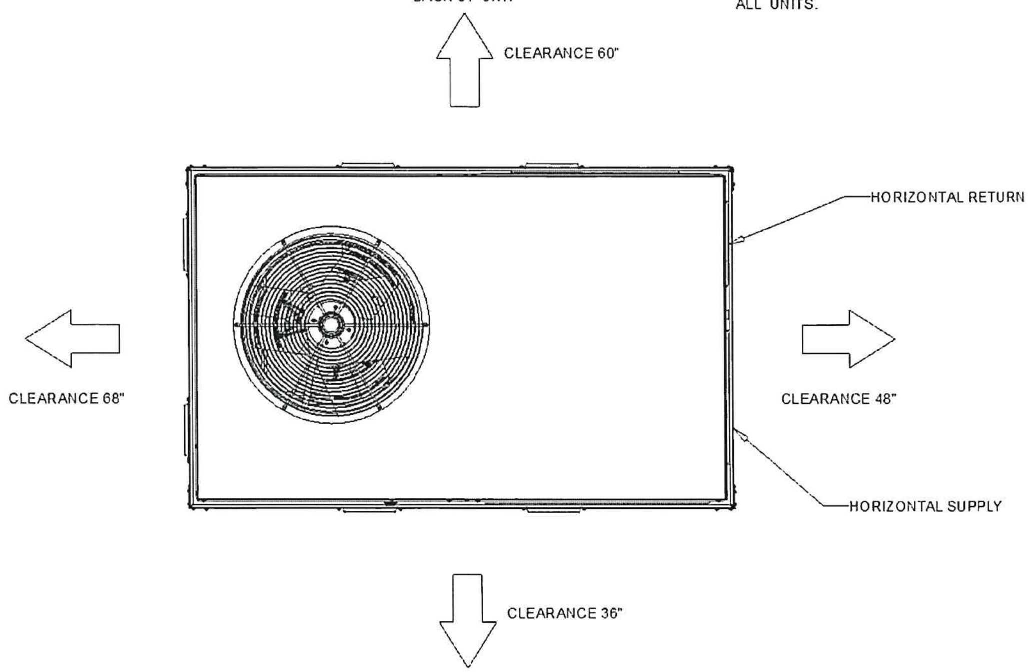
1. Weights for options are approximate.
2. Weights for options that are not list refer to Installation guide.



PACKAGED GAS/ELECTRIC PLAN VIEW

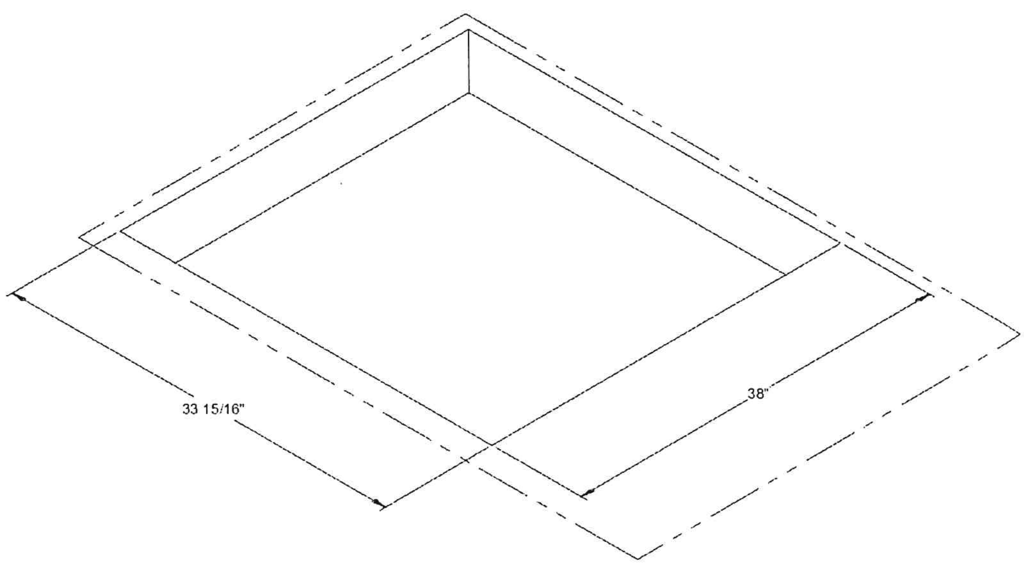
CENTER OF GRAVITY DRAWING

NOTES:
1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.



PACKAGED GAS / ELECTRIC PLAN VIEW

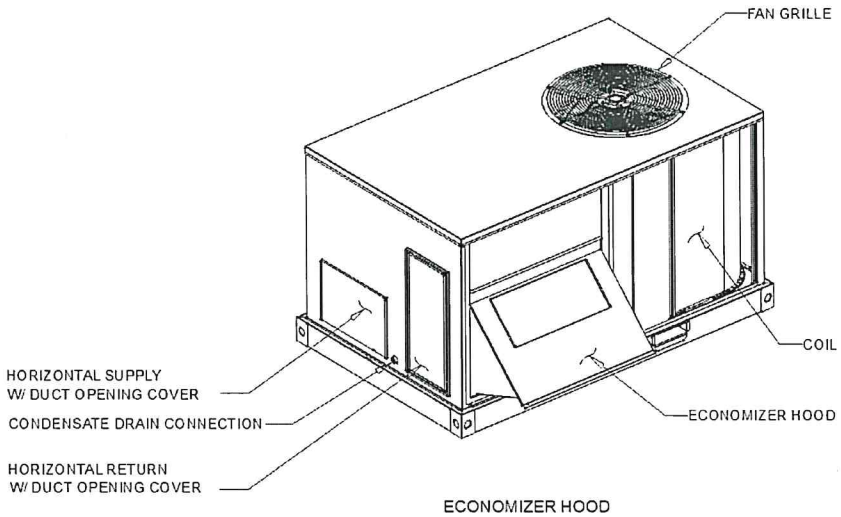
CLEARANCE DRAWING



PACKAGED GAS / ELECTRIC PLAN VIEW

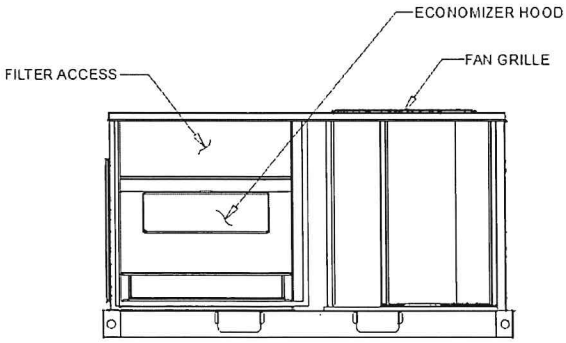
DOWNFLOW CLEARANCE DRAWING

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



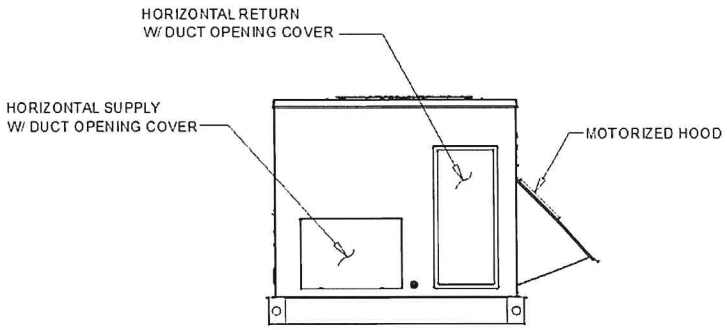
ECONOMIZER HOOD

DIMENSION DRAWING



BACK VIEW OF UNIT

DIMENSION DRAWING



RIGHT VIEW OF UNIT

DIMENSION DRAWING

3 thru 5 Ton General

The units shall be convertible from downflow or horizontal airflow. The operating range shall be between 125.0 F and 40.0 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 5rd Edition.

3 thru 5 Ton Casing

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. Unit's surface shall be tested 672 hours in a salt spray test in compliance with ASTM B117. Cabinet construction shall allow for all maintenance on one side of the unit. In order to ensure a water and air tight seal, service panels shall have lifting handles and no more than four screws to remove. All exposed vertical panels and top covers in the indoor air section shall be insulated with a 1/2", 1.0 lb density foil-faced, fire-resistant, permanent,dorless, glass fiber material. The base of the downflow unit shall be insulated with 1/2", 1.0 lb 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 1 1/8" 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.

3 thru 5 Ton 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 phase monitors and low and high pressure control as standard.

3 thru 5 Ton 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.

3 thru 5 Ton 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.

3 thru 5 Ton Evaporator and Condenser Coils

Microchannel coils will be burst tested by the manufacturer. Microchannel condenser coils shall be standard on all units. Coils shall be leak tested to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 225 psig and pressure tested to 450 psig. Sloped condensate drain pans are standard.

3 thru 5 Ton Filters

Two inch standard filters shall be factory supplied on all units.

3 thru 5 Ton Gas Heating Section

The heating section shall have a tubular heat exchanger design. 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. 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 Heat Only).

3 thru 5 Ton High Pressure Control

All units include High Pressure Cutout as standard.

3 thru 5 Ton Indoor Fan
Units above shall have belt driven, FC centrifugal fans with adjustable motor sheaves. All motors shall be thermally protected. Oversized motors shall be available for high static application. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

3 thru 5 Ton Low Pressure Control
All units include low pressure cutout as standard.

3 thru 5 Ton 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.

3 thru 5 Ton Phase Monitor
The Phase Monitor is a three-phase line monitor module that protects against phase loss, phase reversal and phase unbalance. It is intended to protect compressors from reverse rotation. It has an operating input voltage range of 190-600 Vac, and LED indicators for ON and FAULT. There are no field adjustments and the module will automatically reset from a fault condition.

3 thru 5 Ton Refrigerant Circuits
Each refrigerant circuit shall have independent thermal expansion valve, service pressure ports, and refrigerant line filter driers factory installed as standard. An area shall be provided for replacement suction line driers.

3 thru 5 Ton Unit Top
The top cover shall be double hemmed and gasket sealed to prevent water leakage.

Job Name: BLUE OAKS CHURCH
Prepared By:
Unit Tag: RTU-1 (3)
Quantity: 1

RTU-4

Trane Foundation Gas/Electric Rooftop

Unit Overview - GBC036A4ELB**0000000000000000000000000000

Application	Unit Size	Supply Fan		External Dimensions (in.)			Operating Weight		EER	IEER/SEER	Elevation
		Airflow	External Static Pressure	Height	Width	Length	Minimum	Maximum			
Gas/Electric	3 Ton	1200 cfm	0.750 in H2O	3.55 ft	3.99 ft	6.40 ft	524.0 lb	723.0 lb	12.0 EER	14.00	

Unit Features

Unit Electrical

Voltage/phase/hertz	460/60/3
MCA	11.00 A
MOP	15.00 A

Controls

Unit Controls	Electro-mechanical

Cooling Section

Entering Dry Bulb	80.00 F
Entering Wet Bulb	67.00 F
Ambient Temp	95.00 F
Leaving Coil Dry Bulb	57.62 F
Leaving Coil Wet Bulb	56.80 F
Leaving Unit Dry Bulb	60.20 F
Leaving Unit Wet Bulb	57.80 F

Capacity	
Gross Total	36.99 MBh
Gross Sensible	28.39 MBh
Net Total	34.36 MBh
Net Sensible	25.75 MBh
Refrig Charge-circuit 1	3.5 lb

Heating Section

Output Heating Capacity	57.60 MBh
Output Heating Capacity with Fan	57.60 MBh
Heating EAT	70.00 F
Heating LAT	114.24 F
Heating Temp Rise	44.24 F

Fan Section

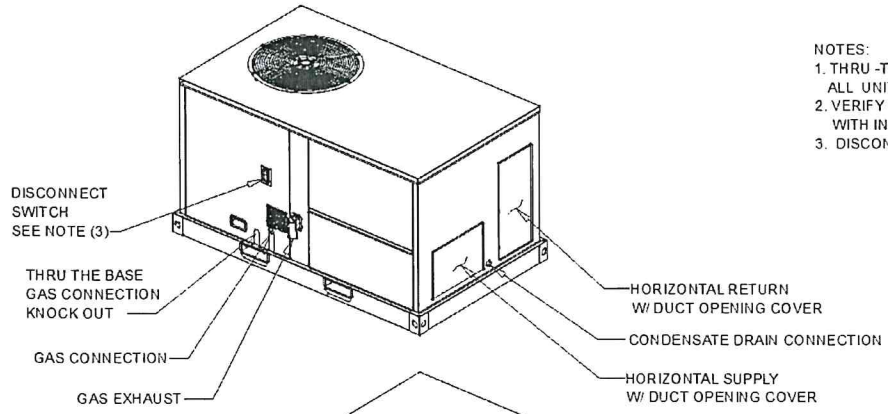
Indoor Fan Data	
Type	FC Centrifugal
Drive Type	Belt
Indoor Fan Performance	
Airflow	1200 cfm
Design ESP	0.750 in H2O
Component SP	0.000 in H2O
Total SP	0.750 in H2O
Indoor Motor Operating Power	0.00 bhp
Indoor Motor Power	0.00 kW
Indoor RPM	886 rpm

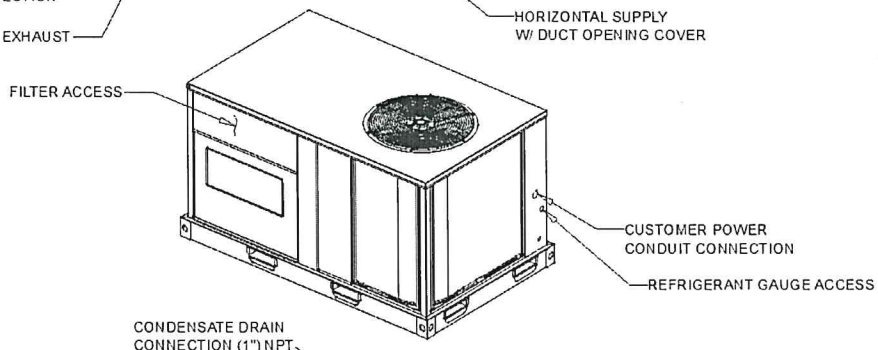
Outdoor Fan Data	
Type	Propeller
Fan Quantity	1
Drive Type	Direct
Outdoor Fan Performance	
Condenser Fan FLA	0.70 A
Exhaust Fan Data	
Type	FC Centrifugal
Drive Type	Direct
Exhaust Fan Performance	
Exhaust Fan FLA	2.50 A

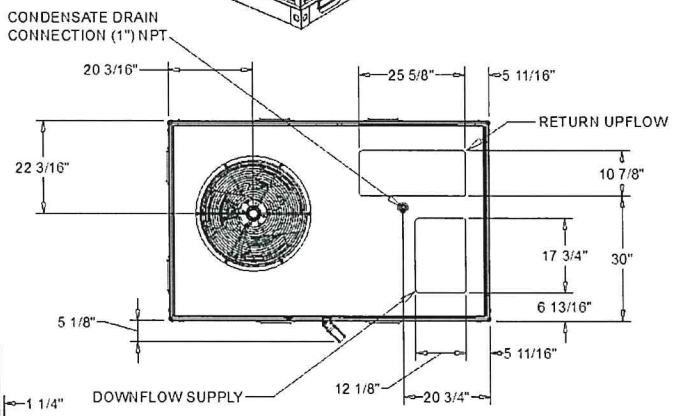
Compressor Section

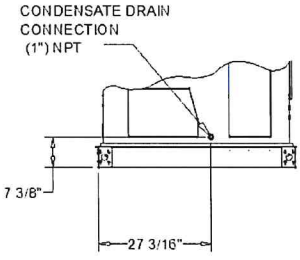
Circuit 1 RLA	5.80 A
Circuit 2 RLA	0.00 A

NOTES:
1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
2. VERIFY WEIGHT, CONNECTIONS, AND ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION
3. DISCONNECT SWITCH IS NOT STANDARD ON ALL UNITS.



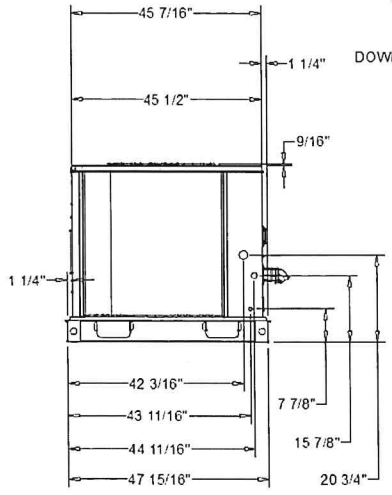


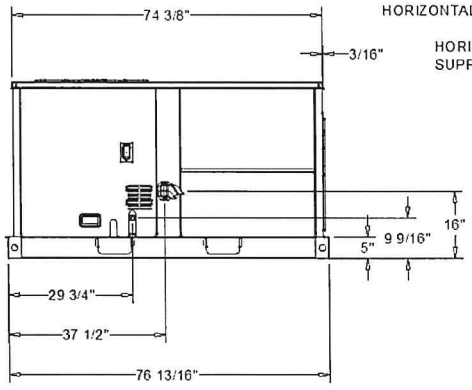


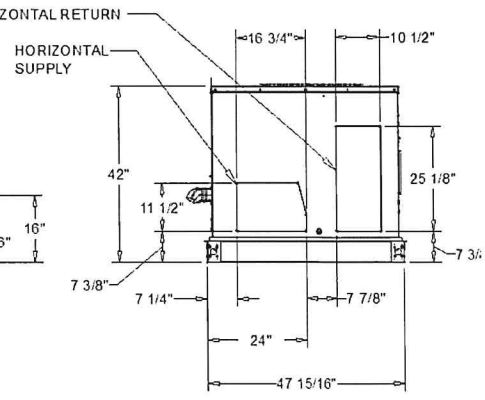


CONDENSATE DRAIN

DIMENSION DRAWING







3 - 5 PACKAGED COOLING

DIMENSION DRAWING

ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)(7)(10)

Model:	GBC036	Oversized Motor
Unit Operating Voltage:	-	MCA:
Unit Primary Voltage:	460	MFS:
Unit Secondary Voltage	-	MCB:
Unit Hertz:	60	
Unit Phase:	3	
EER:	12 / 14	
IEER One Speed Fan:	-	
IEER Multi Speed Fan:	-	
Standard Motor		Field Installed Oversized Motor
MCA:	10.5	MCA:
MFS:	15.0	MFS:
MCB:	15.0	MCB:

HEATING PERFORMANCE

HEATING - GENERAL DATA

Heating Model:	Low
Heating Input (BTU):	72000
Heating Output (BTU):	57600
No. Burners:	2
No. Stages	1
Gas Inlet Pressure	
Natural Gas (Min/Max):	4.5 / 14.0 in. wc
LP (Min/Max)	11.0 / 14.0 in. wc
Gas Pipe Connection Size:	1/2"

INDOOR MOTOR

Standard Motor		Oversized Motor	Field Installed Oversized Motor
Number:	1	Number:	Number:
Horsepower:	1.0	Horsepower:	Horsepower:
Motor Speed (RPM):	-	Motor Speed (RPM):	Motor Speed (RPM):
Phase	3	Phase	Phase
Full Load Amps:	2.0	Full Load Amps:	Full Load Amps:
Locked Rotor Amps:	15.0	Locked Rotor Amps:	Locked Rotor Amps:

COMPRESSOR

Circuit 1/2

Number:	1
Horsepower:	4.10
Phase:	3
Rated Load Amps:	5.8/6.3
Locked Rotor Amps:	38.0

OUTDOOR MOTOR

Number:	1
Horsepower:	0.33
Motor Speed (RPM):	-
Phase:	3
Full Load Amps:	0.7
Locked Rotor Amps:	2.3

POWER EXHAUST ACCESSORY (3)

(Field Installed Power Exhaust)

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

FILTERS

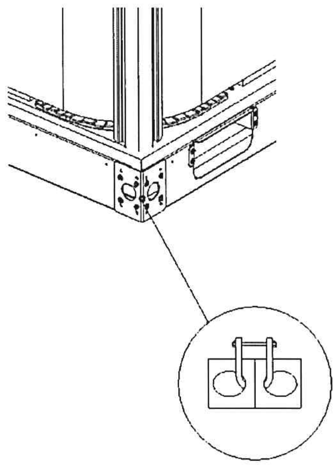
Type:	Throwaway
Furnished:	Yes
Number	4
Recommended	16"x16"x2"

REFRIGERANT (2)

Type:	R-410A
Factory Charge:	
Circuit #1	3.5 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 does not include Heater.
5. Value include Standard Motor.
6. Value include Oversized Motor
7. EER is rated at AHRI conditions and in accordance with DOE test procedures.
8. For Compressor Motors and Condenser Fan Motors: Amp draw for each motor; multiply value by number of motors to determine total amps.
9. HP for each compressor.
10. Integrated Energy Efficiency Ratio (IEER) is rated in accordance with AHRI standard 210/240 or 360.
11. Full Load Amps (FLA) are the combined amps for outdoor motors.



PACKAGED COOLING PLAN VIEW

RIGGING DRAWING

Base Unit and Corner Weights only

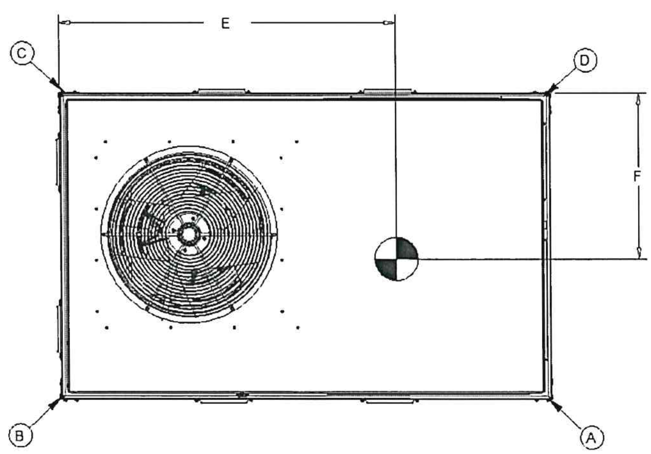
Base unit weights		Corner Weights				Center of Gravity	
SHIPPING	NET	Ⓐ	Ⓑ	Ⓒ	Ⓓ	E	F
574.0 lb	524.0 lb	95.0 lb	111.0 lb	172.0 lb	146.0 lb	42"	29"

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	26.0 lb
Barometric Relief	-
Power Exhaust	-
Roof Curb	-
Oversized Motor	-
Disconnect	-
Hail Guard	-
Through the Base	-
Through the Gas	-
	-

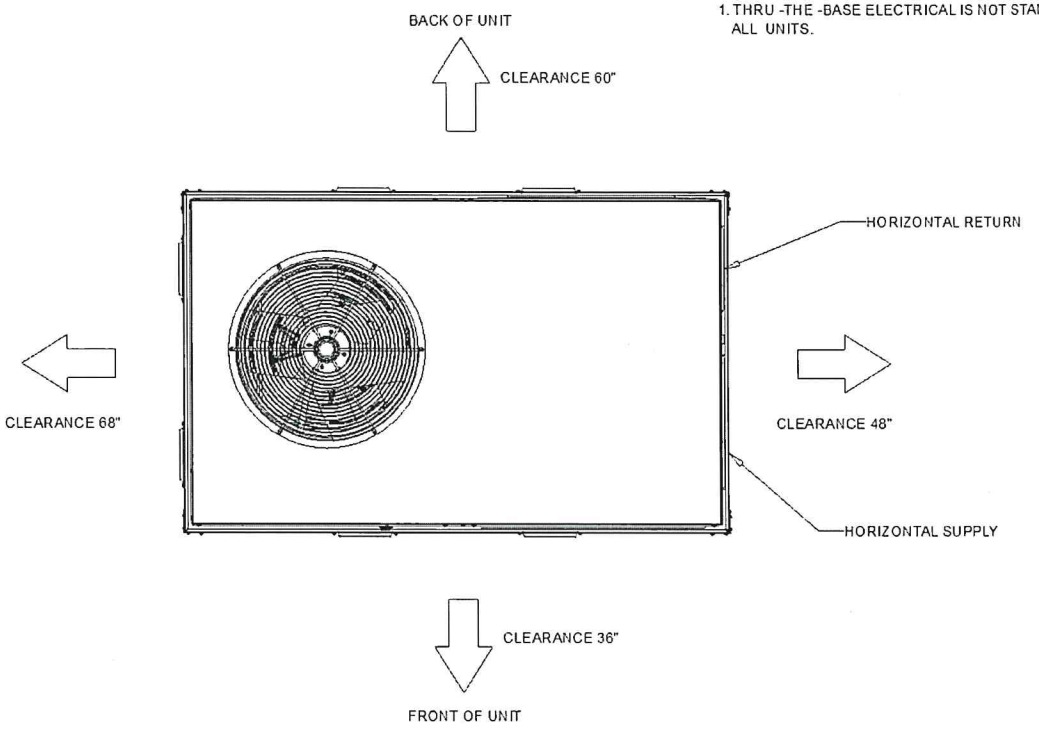
1. Weights for options are approximate.
2. Weights for options that are not list refer to Installation guide.



PACKAGED GAS/ELECTRIC PLAN VIEW

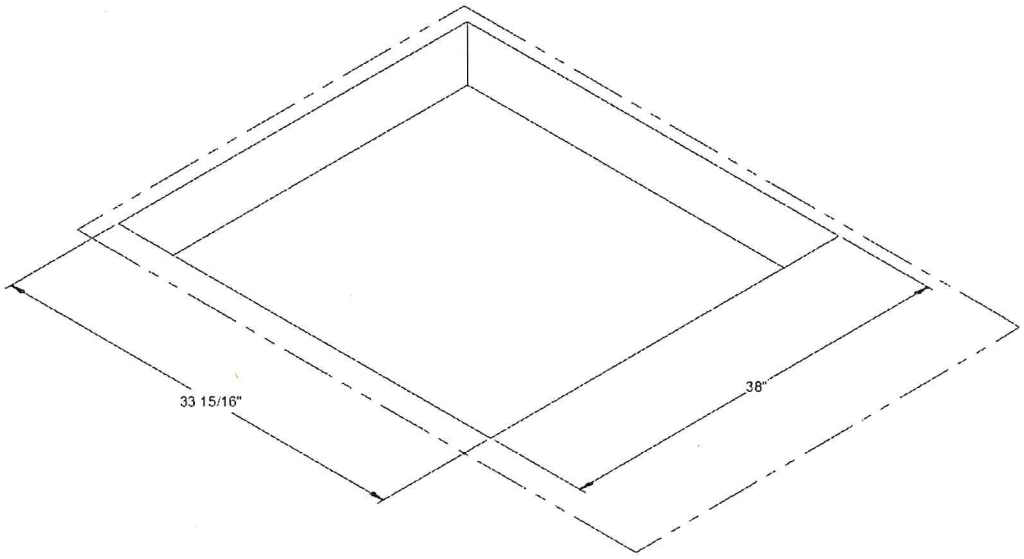
CENTER OF GRAVITY DRAWING

NOTES:
1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.



PACKAGED GAS / ELECTRIC PLAN VIEW

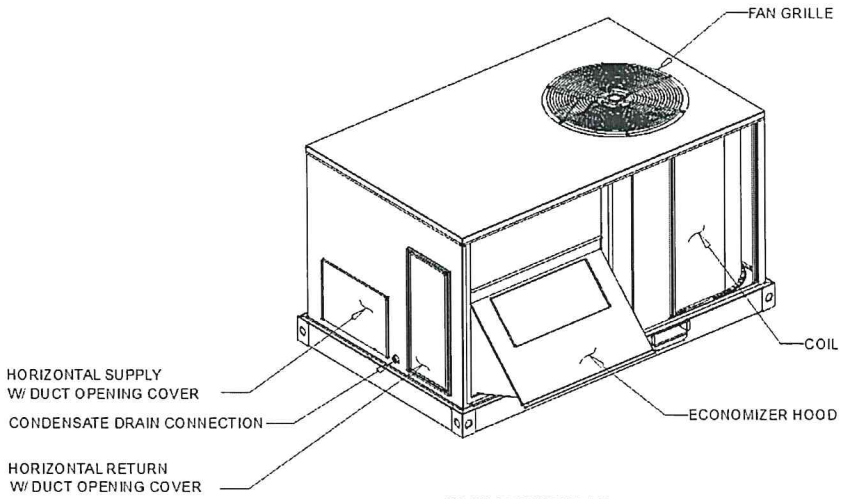
CLEARANCE DRAWING



PACKAGED GAS / ELECTRIC PLAN VIEW

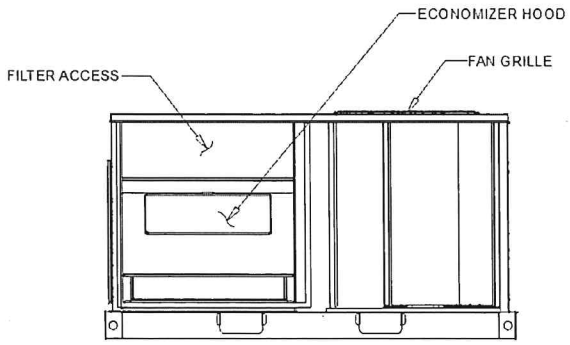
DOWNFLOW CLEARANCE DRAWING

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



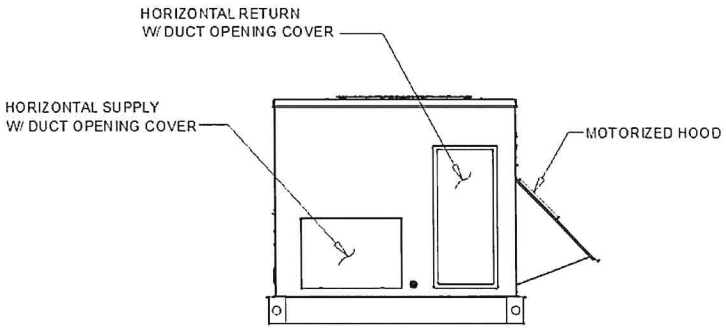
ECONOMIZER HOOD

DIMENSION DRAWING



BACK VIEW OF UNIT

DIMENSION DRAWING



RIGHT VIEW OF UNIT

DIMENSION DRAWING

3 thru 5 Ton General
The units shall be convertible from downflow or horizontal airflow. The operating range shall be between 125.0 F and 40.0 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 5rd Edition.

3 thru 5 Ton Casing
Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. Unit's surface shall be tested 672 hours in a salt spray test in compliance with ASTM B117. Cabinet construction shall allow for all maintenance on one side of the unit. In order to ensure a water and air tight seal, service panels shall have lifting handles and no more than four screws to remove. All exposed vertical panels and top covers in the indoor air section shall be insulated with a 1/2", 1.0 lb density foil-faced, fire-resistant, permanent,dorless, glass fiber material. The base of the downflow unit shall be insulated with 1/2", 1.0 lb 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 1 1/8" 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.

3 thru 5 Ton 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 phase monitors and low and high pressure control as standard.

3 thru 5 Ton 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.

3 thru 5 Ton 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.

3 thru 5 Ton Evaporator and Condenser Coils
Microchannel coils will be burst tested by the manufacturer. Microchannel condenser coils shall be standard on all units. Coils shall be leak tested to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 225 psig and pressure tested to 450 psig. Sloped condensate drain pans are standard.

3 thru 5 Ton Filters
Two inch standard filters shall be factory supplied on all units.

3 thru 5 Ton Gas Heating Section
The heating section shall have a tubular heat exchanger design. 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. 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 Heat Only).

3 thru 5 Ton High Pressure Control
All units include High Pressure Cutout as standard.

3 thru 5 Ton Indoor Fan
Units above shall have belt driven, FC centrifugal fans with adjustable motor sheaves. All motors shall be thermally protected. Oversized motors shall be available for high static application. All indoor fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

3 thru 5 Ton Low Pressure Control
All units include low pressure cutout as standard.

3 thru 5 Ton 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.

3 thru 5 Ton Phase Monitor
The Phase Monitor is a three-phase line monitor module that protects against phase loss, phase reversal and phase unbalance. It is intended to protect compressors from reverse rotation. It has an operating input voltage range of 190-600 Vac, and LED indicators for ON and FAULT. There are no field adjustments and the module will automatically reset from a fault condition.

3 thru 5 Ton Refrigerant Circuits
Each refrigerant circuit shall have independent thermal expansion valve, service pressure ports, and refrigerant line filter driers factory installed as standard. An area shall be provided for replacement suction line driers.

3 thru 5 Ton Unit Top
The top cover shall be double hemmed and gasket sealed to prevent water leakage.

Trane Foundation Gas/Electric Rooftop

RTU - 5

Unit Overview - GBC060A4ELB**0000000000000000000000000000

Application	Unit Size	Supply Fan		External Dimensions (in.)			Operating Weight		EER	IEER/SEER	Elevation
		Airflow	External Static Pressure	Height	Width	Length	Minimum	Maximum			
Gas/Electric	5 Ton	2000 cfm	0.750 in H2O	3.55 ft	3.99 ft	6.40 ft	586.0 lb	785.0 lb	12.0 EER	14.00	

Unit Features

Unit Electrical

Voltage/phase/hertz	460/60/3
MCA	13.00 A
MOP	20.00 A

Controls

Unit Controls	Electro-mechanical

Cooling Section

Entering Dry Bulb	80.00 F	Capacity	
Entering Wet Bulb	67.00 F	Gross Total	60.85 MBh
Ambient Temp	95.00 F	Gross Sensible	46.61 MBh
Leaving Coil Dry Bulb	58.28 F	Net Total	56.77 MBh
Leaving Coil Wet Bulb	57.10 F	Net Sensible	42.52 MBh
Leaving Unit Dry Bulb	60.66 F	Refrig Charge-circuit 1	5.0 lb
Leaving Unit Wet Bulb	58.03 F		

Heating Section

Output Heating Capacity	57.60 MBh
Output Heating Capacity with Fan	57.60 MBh
Heating EAT	70.00 F
Heating LAT	96.54 F
Heating Temp Rise	26.54 F

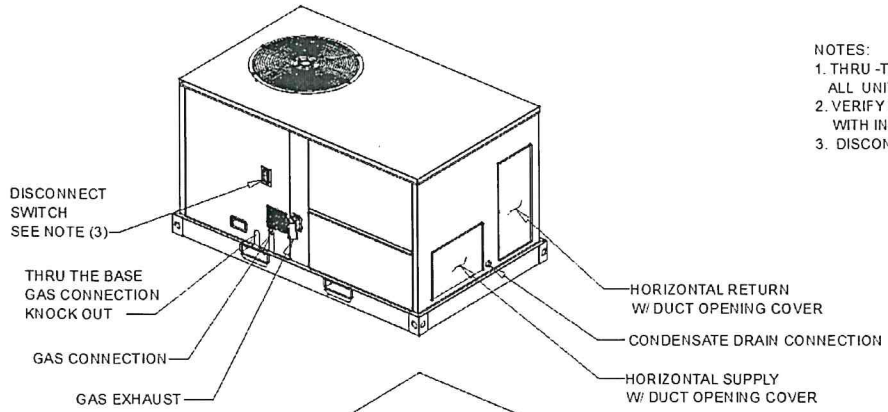
Fan Section

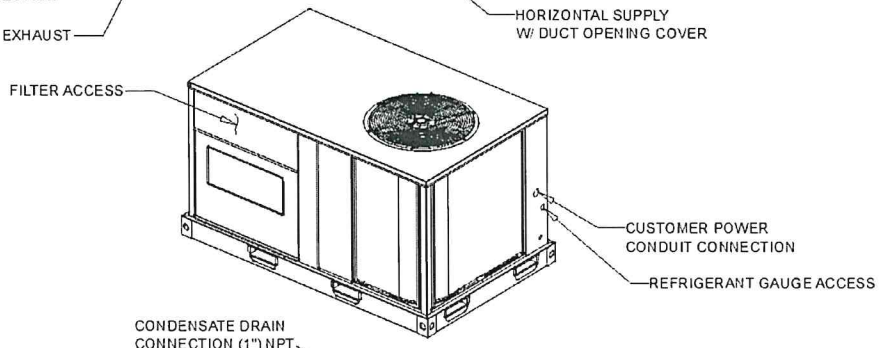
Indoor Fan Data		Outdoor Fan Data	
Type	FC Centrifugal	Type	Propeller
Drive Type	Belt	Fan Quantity	1
Indoor Fan Performance		Drive Type	Direct
Airflow	2000 cfm	Outdoor Fan Performance	
Design ESP	0.750 in H2O	Condenser Fan FLA	0.70 A
Component SP	0.000 in H2O	Exhaust Fan Data	
Total SP	0.750 in H2O	Type	FC Centrifugal
Indoor Motor Operating Power	0.00 bhp	Drive Type	Direct
Indoor Motor Power	0.00 kW	Exhaust Fan Performance	
Indoor RPM	1058 rpm	Exhaust Fan FLA	2.50 A

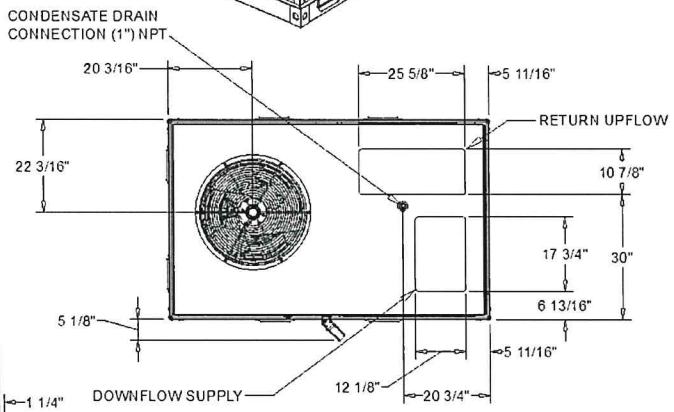
Compressor Section

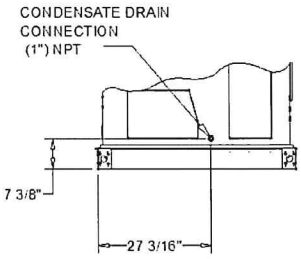
Circuit 1 RLA	7.80 A
Circuit 2 RLA	0.00 A

NOTES:
1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
2. VERIFY WEIGHT, CONNECTIONS, AND ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION
3. DISCONNECT SWITCH IS NOT STANDARD ON ALL UNITS.



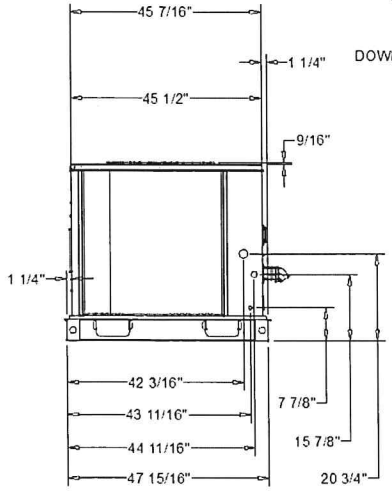


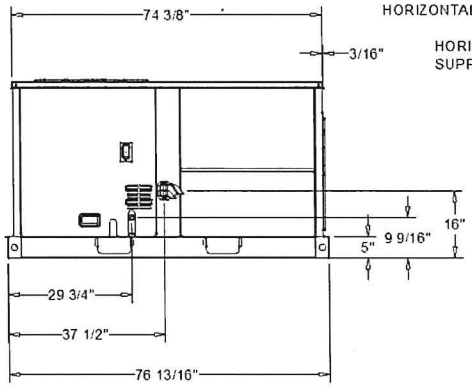


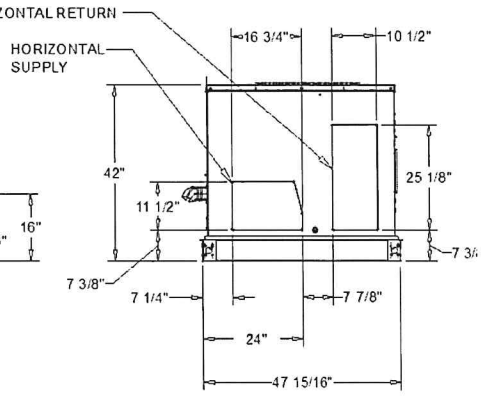


CONDENSATE DRAIN

DIMENSION DRAWING







3 - 5 PACKAGED COOLING

DIMENSION DRAWING

ELECTRICAL / GENERAL DATA

GENERAL (2)(4)(6)(7)(10)

Model:	GBC060	Oversized Motor
Unit Operating Voltage:	-	MCA:
Unit Primary Voltage:	460	MFS:
Unit Secondary Voltage	-	MCB:
Unit Hertz:	60	
Unit Phase:	3	
EER:	12 / 14	
IEER One Speed Fan:	-	
IEER Multi Speed Fan:	-	
Standard Motor		Field Installed Oversized Motor
MCA:	12.9	MCA:
MFS:	20.0	MFS:
MCB:	20.0	MCB:

HEATING PERFORMANCE

HEATING - GENERAL DATA

Heating Model:	Low
Heating Input (BTU):	72000
Heating Output (BTU):	57600
No. Burners:	2
No. Stages	1
Gas Inlet Pressure	
Natural Gas (Min/Max):	4.5 / 14.0 in. wc
LP (Min/Max)	11.0 / 14.0 in. wc
Gas Pipe Connection Size:	1/2"

INDOOR MOTOR

Standard Motor		Oversized Motor	Field Installed Oversized Motor
Number:	1	Number:	Number:
Horsepower:	1.0	Horsepower:	Horsepower:
Motor Speed (RPM):	-	Motor Speed (RPM):	Motor Speed (RPM):
Phase	3	Phase	Phase
Full Load Amps:	2.0	Full Load Amps:	Full Load Amps:
Locked Rotor Amps:	15.0	Locked Rotor Amps:	Locked Rotor Amps:

COMPRESSOR

Circuit 1/2

Number:	1
Horsepower:	6.50
Phase:	3
Rated Load Amps:	7.8/8.6
Locked Rotor Amps:	52.0

OUTDOOR MOTOR

Number:	1
Horsepower:	0.33
Motor Speed (RPM):	-
Phase:	3
Full Load Amps:	0.7
Locked Rotor Amps:	2.3

POWER EXHAUST ACCESSORY (3)

(Field Installed Power Exhaust)

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

FILTERS

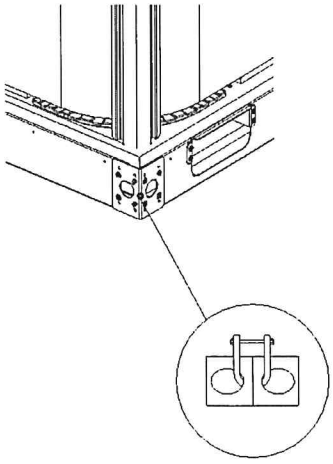
Type:	Throwaway
Furnished:	Yes
Number	4
Recommended	16"x16"x2"

REFRIGERANT (2)

Type:	R-410A
Factory Charge:	
Circuit #1	5.0 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 does not include Heater.
5. Value include Standard Motor.
6. Value include Oversized Motor
7. EER is rated at AHRI conditions and in accordance with DOE test procedures.
8. For Compressor Motors and Condenser Fan Motors: Amp draw for each motor; multiply value by number of motors to determine total amps.
9. HP for each compressor.
10. Integrated Energy Efficiency Ratio (IEER) is rated in accordance with AHRI standard 210/240 or 360.
11. Full Load Amps (FLA) are the combined amps for outdoor motors.



PACKAGED COOLING PLAN VIEW

RIGGING DRAWING

Base Unit and Corner Weights only

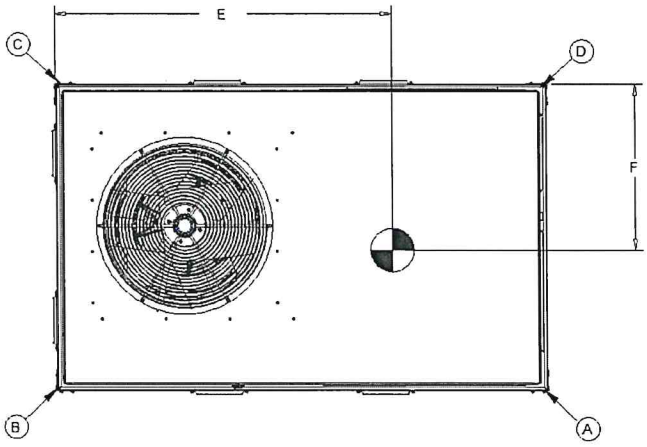
Base unit weights		Corner Weights				Center of Gravity	
SHIPPING	NET	(A)	(B)	(C)	(D)	E	F
636.0 lb	586.0 lb	120.0 lb	125.0 lb	174.0 lb	168.0 lb	40"	29"

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	68"
Barometric Relief	"
Power Exhaust	"
Roof Curb	"
Oversized Motor	"
Disconnect	"
Hail Guard	"
Through the Base	"
Through the Gas	"
	"

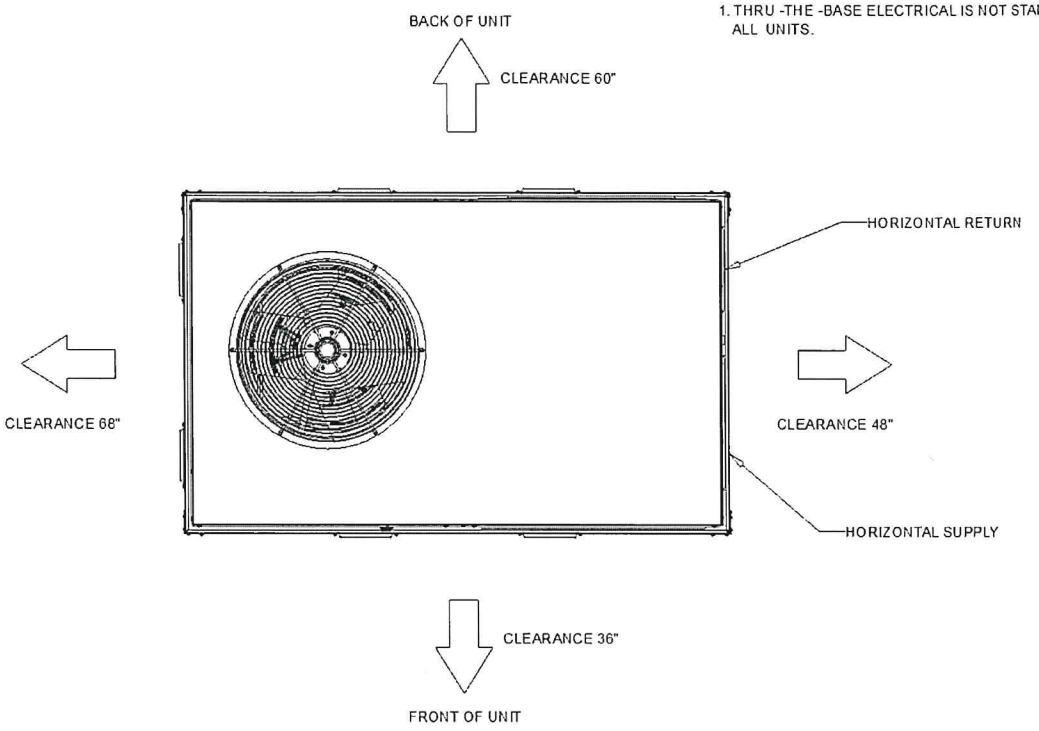
1. Weights for options are approximate.
2. Weights for options that are not list refer to Installation guide.



PACKAGED GAS/ELECTRIC PLAN VIEW

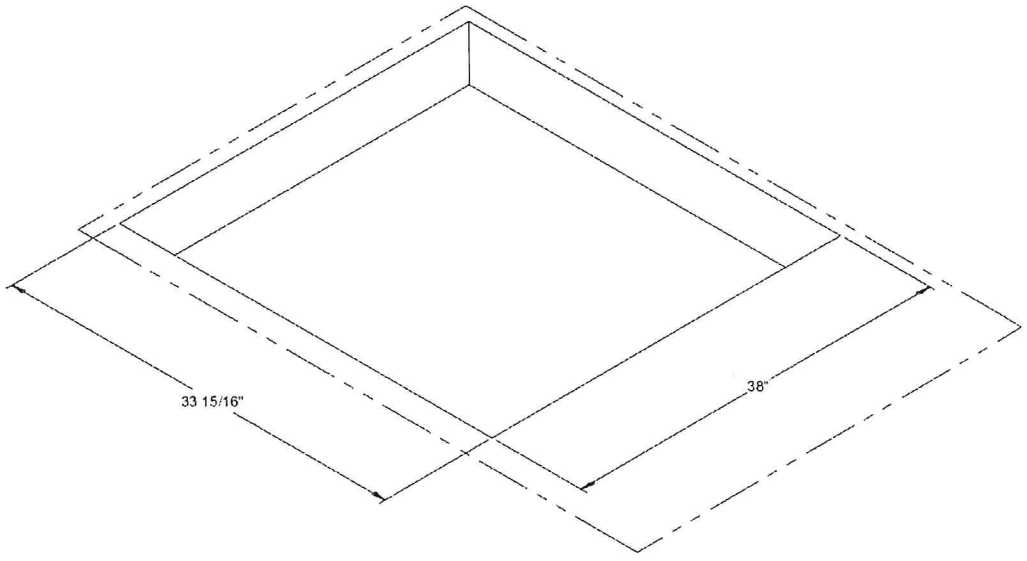
CENTER OF GRAVITY DRAWING

NOTES:
1. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.



PACKAGED GAS / ELECTRIC PLAN VIEW

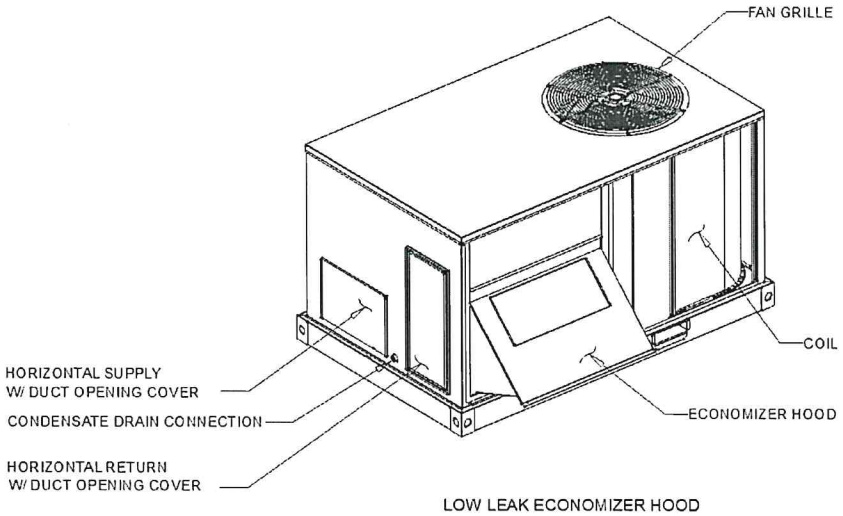
CLEARANCE DRAWING



PACKAGED GAS / ELECTRIC PLAN VIEW

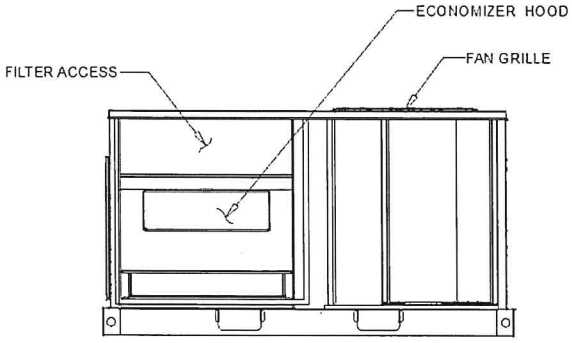
DOWNFLOW CLEARANCE DRAWING

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



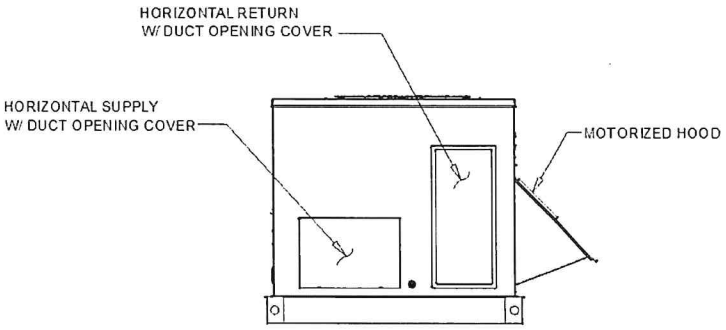
LOW LEAK ECONOMIZER HOOD

DIMENSION DRAWING



BACK VIEW OF UNIT

DIMENSION DRAWING



RIGHT VIEW OF UNIT

DIMENSION DRAWING

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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 four screws to remove. All exposed vertical panels and top covers in the indoor air section shall be insulated with a 1/2", 1.0 lb density foil-faced, fire-resistant, permanent,dorless, glass fiber material. The base of the downflow unit shall be insulated with 1/2", 1.0 lb 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 1 1/8" 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.

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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.

3 thru 5 Ton 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.

3 thru 5 Ton Evaporator and Condenser Coils
Microchannel coils will be burst tested by the manufacturer. Microchannel condenser coils shall be standard on all units. Coils shall be leak tested to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 225 psig and pressure tested to 450 psig. Sloped condensate drain pans are standard.

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The heating section shall have a tubular heat exchanger design. 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. 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 Heat Only).

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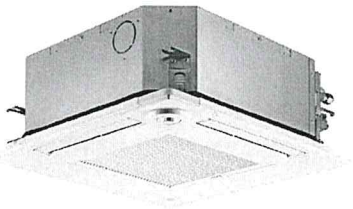
3 thru 5 Ton Refrigerant Circuits
Each refrigerant circuit shall have independent thermal expansion valve, service pressure ports, and refrigerant line filter driers factory installed as standard. An area shall be provided for replacement suction line driers.

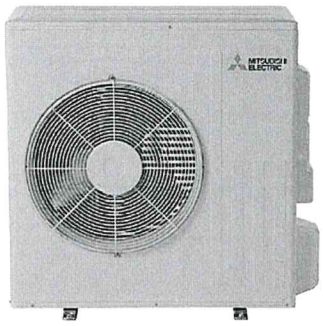
3 thru 5 Ton Unit Top
The top cover shall be double hemmed and gasket sealed to prevent water leakage.

SLZ-KF18NA & SUZ-KA18NA2
18,000 BTU/H 2' X 2' 4-WAY CEILING CASSETTE
18,000 BTU/H HEAT PUMP UNIVERSAL OUTDOOR UNIT

MITSUBISHI ELECTRIC

Job Name:
System Reference: HPFC-1 – HPFC 5 Date:





Indoor Unit SLZ-KF18NA

Outdoor Unit SUZ-KA18NA2

INDOOR UNIT FEATURES

- Ceiling-recessed cassette (24"x24") ductless heat pump
- Install Konnect Series in a drywalled ceiling (with an access panel for servicing) or in a 2'x2' drop ceiling
- Wide airflow pattern for excellent air distribution
- Optional 3D i-see Sensor®
- Fresh air intake provided in the main body
- Built-in drain condensate lift mechanism (lifts to 33")
- Multiple control options available:
  - kumo cloud® smart device app for remote access
  - Third-party interface options
  - Wired or wireless controllers
- Long-life air filter included
- Individual vane control

OUTDOOR UNIT FEATURES

- Variable speed INVERTER-driven compressor
- Innovative Joint Lap DC Motor leads to high efficiency and reliability
- Pulse Amplitude Modulation technology
- High-performance grooved piping for increased heat exchange efficiency

SPECIFICATIONS: SLZ-KF18NA & SUZ-KA18NA2

Cooling at 95°F[1]	Maximum Capacity	BTU/H	17,700
	Rated Capacity	BTU/H	17,700
	Minimum Capacity	BTU/H	6,100
	Maximum Power Input	W	1,410
	Rated Power Input	W	1,410
	Moisture Removal	Pints/h	4.7
	Sensible Heat Factor		0.71
	Power Factor	%	98.0/98.0
Heating at 47°F[2]	Maximum Capacity	BTU/H	20,900
	Rated Capacity	BTU/H	19,700
	Minimum Capacity	BTU/H	8,400
	Maximum Power Input	W	2,100
	Rated Power Input	W	8,400
	Power Factor	%	98.0/98.0
Heating at 17°F[3]	Maximum Capacity	BTU/H	12,900
	Rated Capacity	BTU/H	12,900
	Maximum Power Input	W	1,410
	Rated Power Input	W	1,410
Heating at 5°F[4]	Maximum Capacity	BTU/H	9,800
	Maximum Power Input	W	1,210
Heating at -4°F[5]	Maximum Capacity	BTU/H	7,500
Efficiency	SEER		20.7
	EER[1]		12.5
	HSPF [IV]		11.6
	COP at 47°F[2]		3.1
	COP at 17°F at Maximum Capacity[3]		2.68
	COP at 5°F at Maximum Capacity[4]		2.37
	ENERGY STAR® Certified		Yes
Electrical	Voltage, Phase, Frequency		208/230, 1, 60
	Guaranteed Voltage Range	V AC	187 - 253
	Voltage: Indoor - Outdoor, S1-S2	V AC	208/230
	Voltage: Indoor - Outdoor, S2-S3	V DC	24
	Short-circuit Current Rating [SCCR]	kA	5
	Recommended Fuse/Breaker Size (Oudoor)	A	15
	Recommended Wire Size [Indoor - Outdoor]	AWG	14
	Power Supply		Indoor unit is powered by the outdoor unit
Indoor Unit	MCA	A	0.54
	Fan Motor Full Load Amperage	A	0.43
	Fan Motor Output	W	50
	Fan Motor Type		DC Motor
	Airflow Rate at Cooling, Dry	CFM	300–420–475
	Airflow Rate at Cooling, Wet	CFM	270–378–429
	Airflow Rate at Heating, Dry	CFM	300–420–475
	Sound Pressure Level [Cooling]	dB[A]	32–40–43
	Sound Pressure Level [Heating]	dB[A]	32–40–43
	Drain Pipe Size	In. [mm]	1-1/4 [32]
	Condensate Lift Mechanism, Maximum Distance	In. [mm]	33 [850]
	Coating on Heat Exchanger		—
	External Finish Color		Munsell 1.0Y 9.2/0.2
	Unit Dimensions	W x D x H: In. [mm]	22-7/16 x 22-7/16 x 9-21/32 [570 x 570 x 245]
	Package Dimensions	W x D x H: In. [mm]	24-13/32 x 27-15/16 x 9-7/16 [620 x 710 x 240]
	Unit Weight	Lbs. [kg]	31 [13.9]
	Package Weight	Lbs. [kg]	37 [17]
Indoor Unit Operating Temperature Range	Cooling Intake Air Temp [Maximum / Minimum]*	°F	90 DB, 72 WB / 68 DB, 61 WB
	Heating Intake Air Temp [Maximum / Minimum]	°F	77 DB / 59 DB

NOTES:

AHRI Rated Conditions
(Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Applications should be restricted to comfort cooling only; equipment cooling applications are not recommended for low ambient temperature conditions.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

Specifications are subject to change without notice.

SPECIFICATIONS: SLZ-KF18NA & SUZ-KA18NA2

Outdoor Unit	MCA	A	14.0
	MOCP	A	24
	Fan Motor Full Load Amperage	A	0.67
	Fan Motor Output	W	77
	Airflow Rate	CFM	1691/1691
	Refrigerant Control		LEV
	Defrost Method		Reverse Cycle
	Coating on Heat Exchanger		Blue Fin Coating
	Sound Pressure Level, Cooling[1]	dB(A)	54
	Sound Pressure Level, Heating[2]	dB(A)	55
	Compressor Type		DC INVERTER-driven Twin Rotary
	Compressor Model		SNB130FQBMT
	Compressor Rated Load Amps	A	10.0
	Compressor Locked Rotor Amps	A	12.5
	Compressor Oil Type // Charge	oz.	FV50S//11.8
	External Finish Color		Ivory Munsell 3Y 7.8/1.1
	Base Pan Heater		Optional
	Unit Dimensions	W x D x H: In. [mm]	33-1/16 x 13 x 34-5/8 [840 x 330 x 880]
	Package Dimensions	W x D x H: In. [mm]	38-9/16 x 16-9/16 x 39 [980 x 420 x 990]
	Unit Weight	Lbs. [kg]	127 [58]
	Package Weight	Lbs. [kg]	145 [66]
Outdoor Unit Operating Temperature Range	Cooling Air Temp [Maximum / Minimum]*	°F	115 DB / 14 DB
	Cooling Thermal Lock-out / Re-start Temperatures**	°F	-1 / 3
	Heating Thermal Lock-out / Re-start Temperatures**	°F	-9 / -4
Refrigerant	Type		R410A
	Charge	Lbs, oz	3, 9.0
	Chargeless Piping Length	Ft. [m]	25.0 [7.5]
	Additional Refrigerant Charge Per Additional Piping Length	oz./Ft. [g/m]	0.216 [20]
Piping	Gas Pipe Size O.D. [Flared]	In.[mm]	1/2 [12.7]
	Liquid Pipe Size O.D. [Flared]	In.[mm]	1/4 [6.35]
	Maximum Piping Length	Ft. [m]	100 [30]
	Maximum Height Difference	Ft. [m]	50 [15]
	Maximum Number of Bends		10

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

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INDOOR UNIT ACCESSORIES: SLZ-KF18NA

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	Connector cable for remote display	☐ PAC-SA88HA-EP
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ PAC-WHS01HC-E
	Remote Operation Adapter‡	☐ PAC-SF40RM-E
	Thermostat Interface	☐ PAC-US444CN-1
	USNAP Adapter	☐ PAC-WHS01UP-E
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☐ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ PAR-40MAAU
	Simple MA Remote Controller†	☐ PAC-YT53CRAU-J
	Touch MA Controller†	☐ PAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Receiver	☐ PAR-FA32MA-W
	Wireless Receiver	☐ PAR-SF9FA-E
	Wireless Remote Contoller	☐ PAR-SL100A-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MicroBlue) Mini Condensate Pump (110/208/230V) up to 18,000 BTU/H	☐ X85-003
	Blue Diamond Alarm Extension Cable—6.5 Ft.	☐ C13-192
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Disconnect Switch	(30A/600V/UL) [fits 2" X 4" utility box] - Black	☐ TAZ-MS303
	(30A/600V/UL) [fits 2" X 4" utility box] - White	☐ TAZ-MS303W
Grille	Grille	☐ SLP-18FAU
i-see Sensor® Panel	3D i-see Sensor® Corner Panel	☐ PAC-SF1ME-E
	Grille with 3D i-see Sensor®	☐ SLP-18FAEU
Lineset	100' x 1/4" x 100' / 1/2" Lineset (Twin-Tube Insulation)	☐ MLS141212T-100
	15' x 1/4" x 15' / 1/2" Lineset (Twin-Tube Insulation)	☐ MLS141212T-15
	30' x 1/4" x 30' / 1/2" Lineset (Twin-Tube Insulation)	☐ MLS141212T-30
	50' x 1/4" x 50' / 1/2" Lineset (Twin-Tube Insulation)	☐ MLS141212T-50
	65' x 1/4" x 65' / 1/2" Lineset (Twin-Tube Insulation)	☐ MLS141212T-65

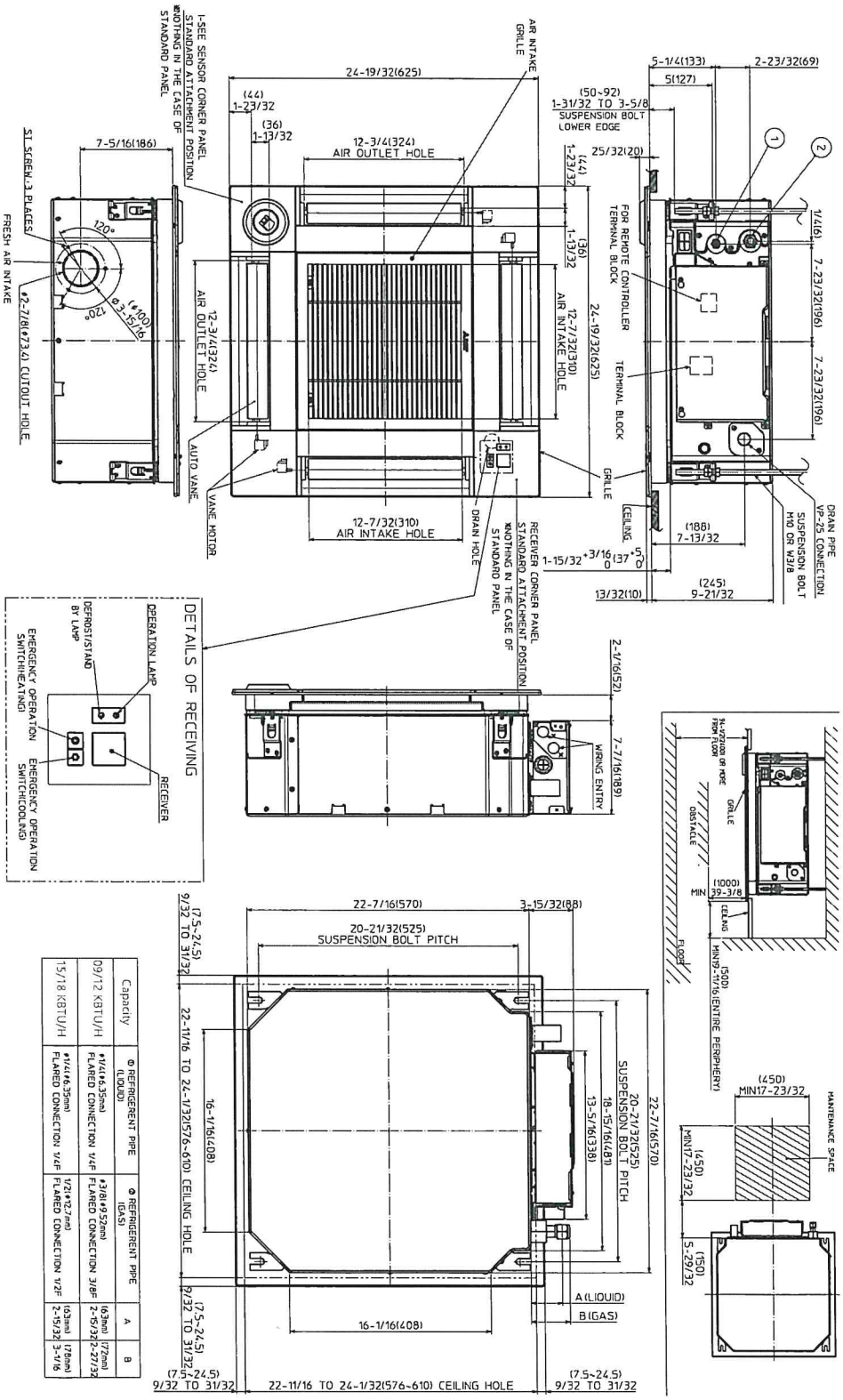
NOTES:
‡PAC-SF40RM-E (Unable to use with wireless remote controller)

OUTDOOR UNIT ACCESSORIES: SUZ-KA18NA2

Air Outlet Guide	Air Outlet Guide	☐ MAC-886SG-E
Control/Service Tool	M- & P-Series Maintenance Tool Cable Set	☐ M21EC0397
	USB/UART Conversion Cable (Required for all laptop connection)	☐ M21EC1397
Mini-Split Wire	14 Gauge, 4 wire MiniSplit Cable—250 ft. roll	☐ S144-250
	14 Gauge, 4 wire MiniSplit Cable—250 ft. roll	☐ SW144-250
	14 Gauge, 4 wire MiniSplit Cable—50 ft. roll	☐ S144-50
	14 Gauge, 4 wire MiniSplit Cable—50 ft. roll	☐ SW144-50
	16 Gauge, 4 wire MiniSplit Cable—250 ft. roll	☐ S164-250
	16 Gauge, 4 wire MiniSplit Cable—250 ft. roll	☐ SW164-250
	16 Gauge, 4 wire MiniSplit Cable—50 ft. roll	☐ S164-50
	16 Gauge, 4 wire MiniSplit Cable—50 ft. roll	☐ SW164-50
Mounting Pad	Condensing Unit Mounting Pad: 16" x 36" x 3"	☐ ULTRILITE1
	Outdoor Unit 3-1/4 inch Mounting Base (Pair) - Plastic	☐ DSD-400P
Optional Defrost Heater	Base Heater	☐ MAC-642BH-U1
Stand	18" Single Fan Stand	☐ QSMS1801M
	24" Single Fan Stand	☐ QSMS2401M
	Condenser Wall Bracket	☐ QSWB2000M-1
	Outdoor Unit Stand — 12" High	☐ QSMS1201M

INDOOR UNIT DIMENSIONS: SLZ-KF18NA

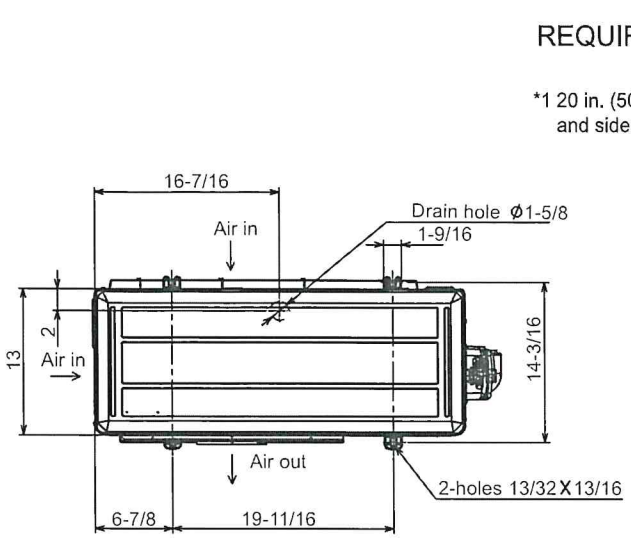
Unit: inch (mm)

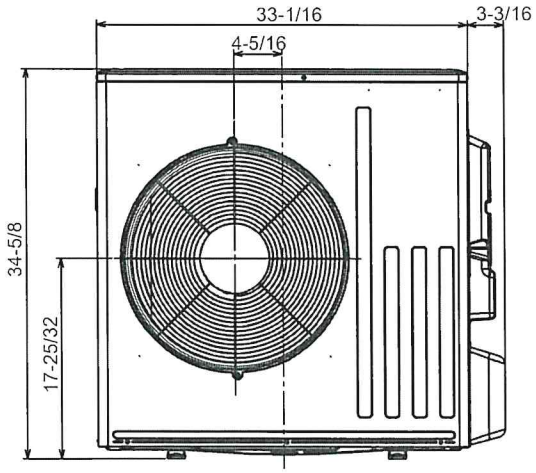


Capacity	Ø REFRIGERENT PIPE (LIQUID)	Ø REFRIGERENT PIPE (GAS)	A	B
09/12 KBTU/H	ø1/4(ø6.35mm) FLARED CONNECTION 1/4F	ø3/8(ø9.52mm) FLARED CONNECTION 3/8F	(63mm) 2-5/32	(72mm) 2-27/32
15/18 KBTU/H	ø1/4(ø6.35mm) FLARED CONNECTION 1/4F	1/2(ø12.7mm) FLARED CONNECTION 1/2F	(83mm) 2-15/32	(78mm) 3-1/16

OUTDOOR UNIT DIMENSIONS: SUZ-KA18NA2

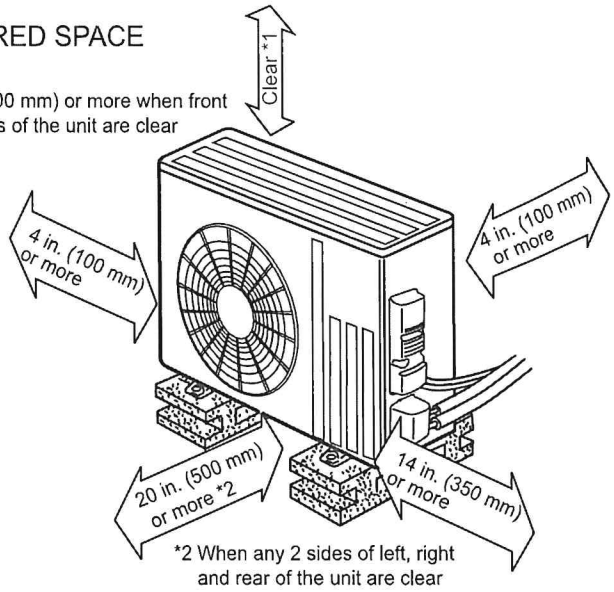
Unit: inch



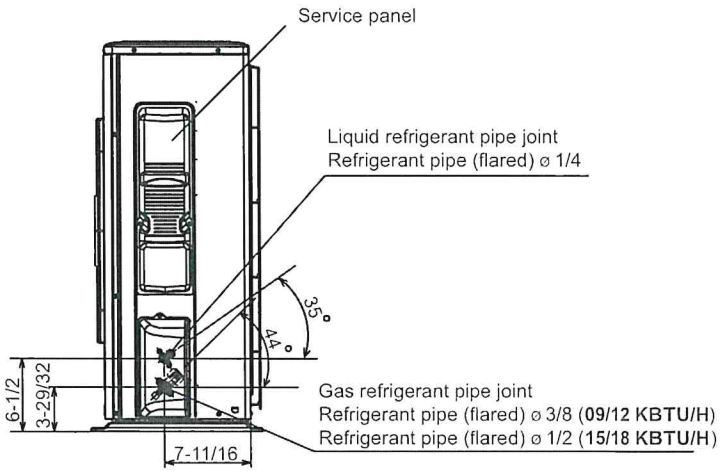


REQUIRED SPACE

*1 20 in. (500 mm) or more when front and sides of the unit are clear



*2 When any 2 sides of left, right and rear of the unit are clear



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