

RTU on Gymnasium Roof. Refer to drawings for locations and dimensions.

Nov 30 2023

Performance Summary

Tag: RTU - 1	Model No: RKNL-H180CS35EAJA	AHRI Ref: 5385795
Project: Brewster	City: DETROIT/METROPOLITA	State: MI
Altitude: 663	Air Discharge: Downflow/Horizontal	

Cooling Performance

AHRI Rating - Capacity: 182,000	EER: 11.1	IEER: 14.6
Gross Cap @ AHRI Rating Conditions(btuh) - Capacity: 187,398		
Ambient Air (F) - Dry Bulb: 87.6	Wet Bulb: 72.6	
Airflow (CFM) - CFM: 6,000	SCFM: 6,000	
System Entering Air (F) - Dry Bulb: 80	Wet Bulb: 67	% RH: 51.1
System Leaving Air (F) - Dry Bulb: 58.8	Wet Bulb: 57.1	
Air Enthalpy (btu/lb) - Entering: 31.4	Leaving: 24.5	
Design Net Cooling Capacity (btuh) - Total: 187,400	Sensible: 137,100	Latent: 50,300
Design Gross Capacity (btuh) - Capacity: 189,600	Sensible: 139,300	
Total Power - Watts: 17,998.1	KW: 18	

Heating Performance

Gas Heating Values (btuh) - Input: 350,000	Output: 283,500	
Heating Airflow (CFM) - CFM: 6,000		
Air Dry Bulb (F) - Outdoor: 8	Entering Air: 70	Leaving Air: 113.8
Air Temperature Rise (F) - Rise: 43.8		

Air Moving System Characteristics

External Static Pressure (inches WG) - ESP: 1	
Blower Speed or Speed Tap - RPM: 776	Drive: Belt
Motor Characteristic (watts & BHP) - Power: 2,665.4	

Electrical Supply

Power Supply (Volt/Hz/Ph) - Volt/Hz/Ph: 208-230/60/3	
Minimum Ampacity (amps) - Ampacity: 81	
Max Overcurrent Protection (amps) - Fuse: 100	HACR Breaker: 100

Dimensions, Weight & Clearances

Dimensions - Length: 152 - 3/32	Width: 85 - 29/32	Height: 57 - 23/32
Weight (lb) - Weight: 2,005		
Clearances (inches) - Front: 48	Cond. Coil: 18	Duct Side: 12
Clearances (inches) - Evap End: 36	Top: 60	



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Product Submittal #: 8ee6c19d-734f-481d-b097-c8e7f9e9a70c

Submittal Printed on: 11/30/2023 7:36:04 PM

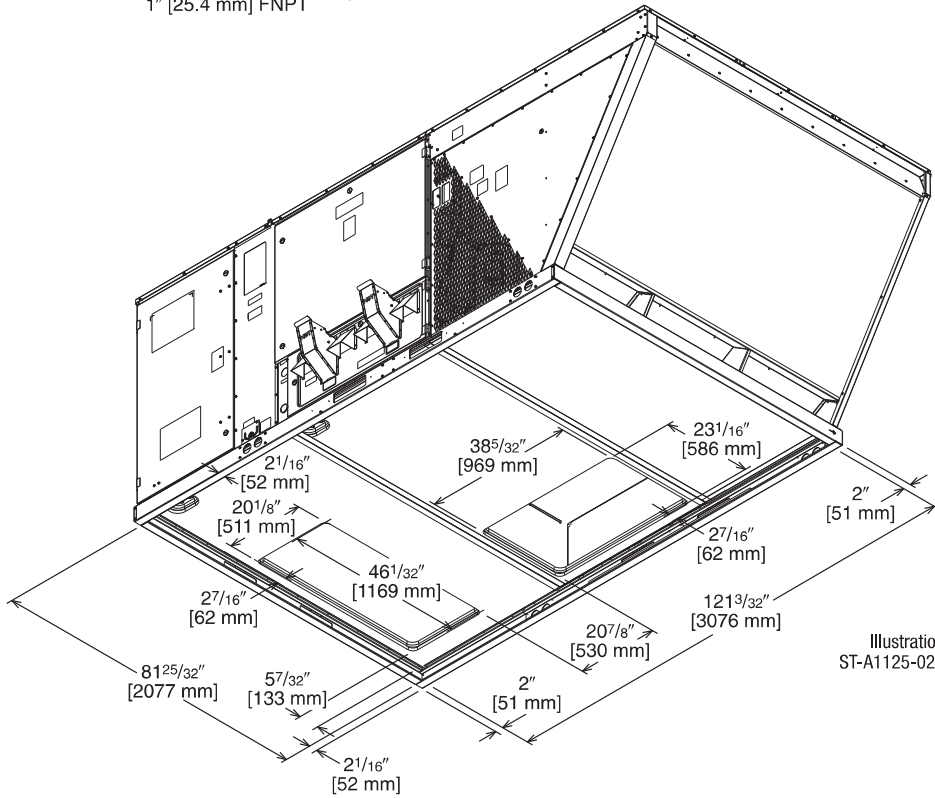
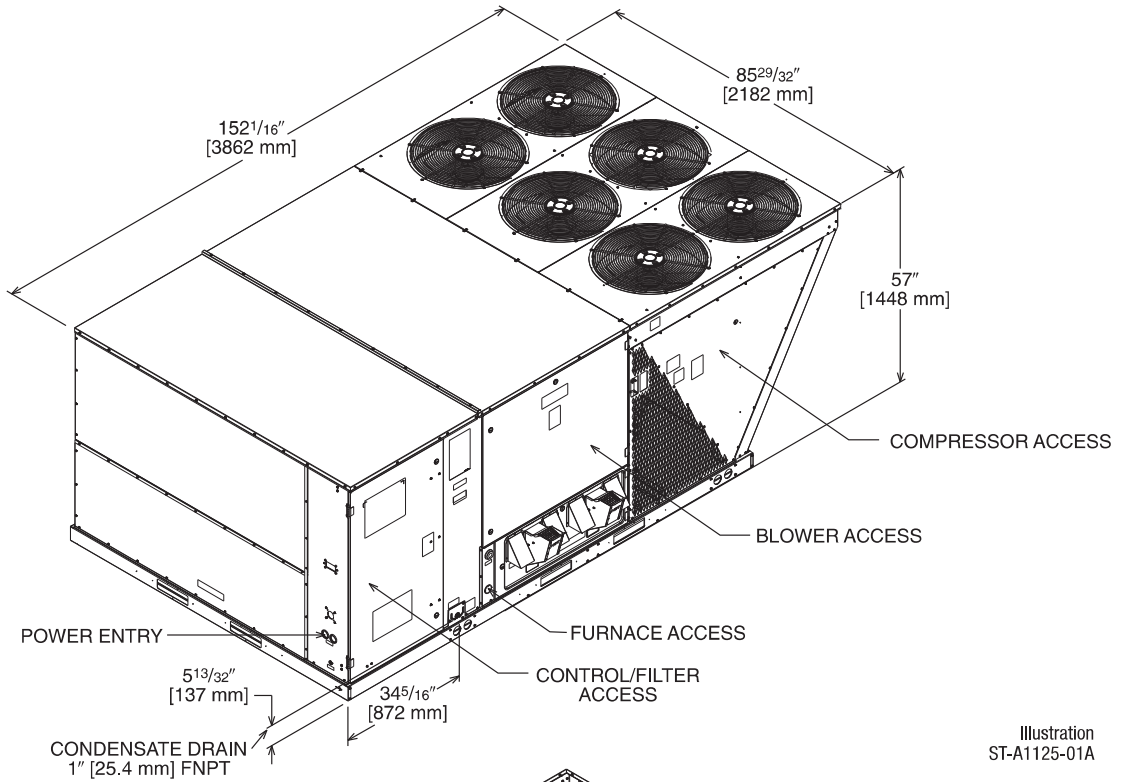
For Model: **RKNL-H180CS35EAJA**

In keeping with its policy of continuous progress and product improvement, reserves the right to make changes without notice.

Gross capacity does not include the effect of motor heat. AHRI rating is net capacity and includes the effect of fan motor heat. All net capacities also accounts for the effect of motor heat.

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Model: RKNL-H180CS35EAJA



BOTTOM VIEW

[] Designates Metric Conversions

Model: RKNL-H180CS35EAJA

SUPPLY AND RETURN DIMENSIONS FOR HORIZONTAL APPLICATIONS

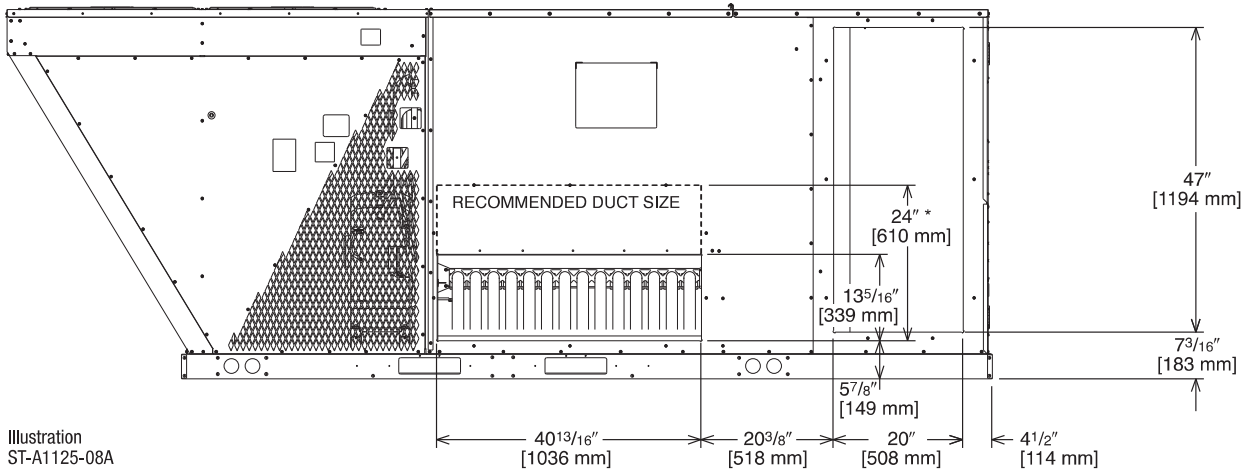


Illustration
ST-A1125-08A

* RECOMMENDED DUCT CONNECTION SIZE

DUCT SIDE VIEW (REAR)

SUPPLY AND RETURN DIMENSIONS FOR DOWNFLOW APPLICATIONS

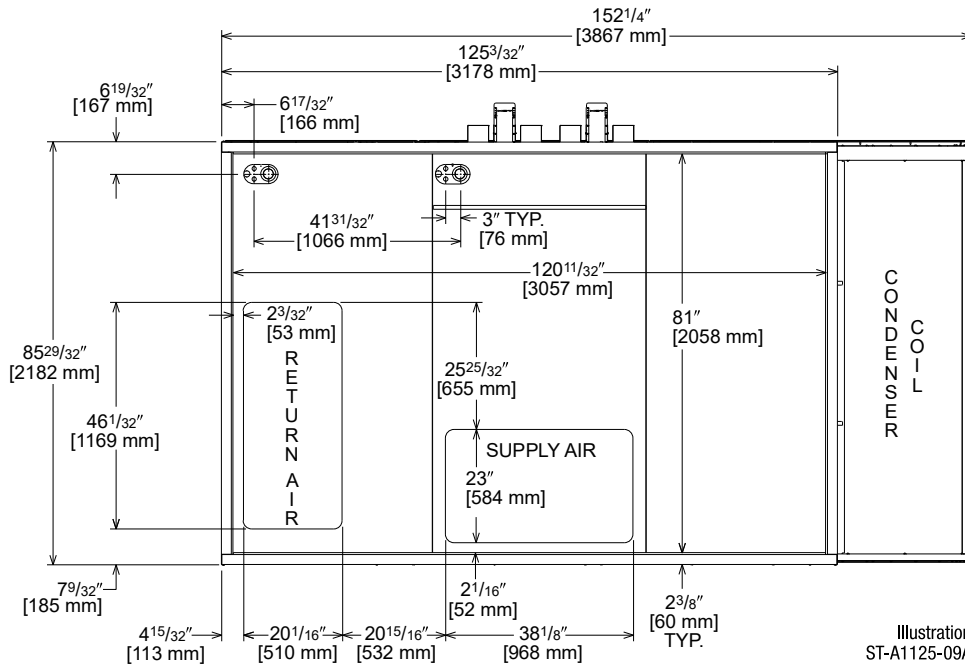


Illustration
ST-A1125-09A

BOTTOM VIEW

[] Designates Metric Conversions

Model: RKNL-H180CS35EAJA



RKNL-C/H STANDARD FEATURES INCLUDE:

- R-410A HFC refrigerant.
- Complete factory charged, wired and run tested.
- Scroll compressors with internal line break overload and high-pressure protection.
- Dual stage compressors.
- Convertible airflow – vertical downflow or horizontal sideflow.
- TXV refrigerant metering system on each circuit.
- High Pressure and Low Pressure/Loss of charge protection standard on all models.
- Solid Core liquid line filter drier on each circuit.
- Single slab, single pass designed evaporator and condenser coils facilitate easy cleaning for maintaining high efficiencies.
- Cooling operation up to 125 degree F ambient.
- Foil faced insulation encapsulated throughout entire unit minimizes airborne fibers from the air stream.
- Hinged major access door with heavy-duty gasketing, 1/4 turn latches and door retainers.
- Slide Out Indoor fan assembly for added service convenience.
- Powder Paint Finish meets ASTM B117 steel coated on each side for maximum protection. G90 galvanized.
- Base pan with drawn supply and return opening for superior water management.
- Forkable base rails for easy handling and lifting.
- Single point electrical connections.
- Internally sloped slide out condensate pan conforms to ASHRAE 62 standards.
- High performance belt drive motor with variable pitch pulleys and quick adjust belt system.
- Permanently lubricated evaporator, condenser and gas heat inducer motors.
- Condenser motors are internally protected, totally enclosed with shaft down design.
- 2 inch filter standard with slide out design.
- Two stage gas valve and direct spark ignition.
- Tubular heat exchange for long life and induced draft for efficiency and reliability.
- Solid state furnace control with on board diagnostics.
- 24 volt control system with resettable circuit breakers.
- Colored and labeled wiring.
- Copper tube/Aluminum Fin coils.
- Factory Installed Direct Digital Control (DDC) and sensors which can connect to LonWorks™ or BACnet® BAS systems for remote monitoring and control.
- (-H) Models with Variable Frequency Drive (VFD) meet ASHRAE 90.1-2010 and California Title 24

RXRX-AR02 - Carbon Dioxide Sensor

ECONOMIZERS

AXRD-01RKCCM3—3-5 Ton [10.6-17.6 kW] Models

AXRD-01RKCDM3—3-5 Ton [10.6-17.6 kW] Models

RXRX-AV03—3-5 Ton [10.6-17.6 kW] Models

RXRX-AR02—3-5 Ton [10.6-17.6 kW] Models

Single Enthalpy

Single Enthalpy and smoke detector

Dual Enthalpy Kit

Optional CO₂ Sensor

- Features **Honeywell** Controls
- Available factory installed or field accessory
- Gear Driven Direct Drive Actuator
- Fully Modulating (0-100%)
- Extra Low Leakage Dampers California Title 24 Compliant
- Horizontal or Downflow Applications
- Slip-In Design for Easy Installations
- Plug-In Polarized 12-pin Electrical Connections
- Pre-configuring—No Field Adjustments Necessary
- Standard Barometric Relief Damper Provided
- Single Enthalpy with Dual Enthalpy upgrade kit
- CO₂ Input Sensor Available (field installed)
- Economizer ships in complete for downflow or horizontal duct applications
- Field assembled hood ships with Economizer
- Optional Remote minimum position (Honeywell #S963B1128) is available from ProStock.
- Field installed power exhaust available
- If connected to a Building Automation System (BAS), all economizer functions can be viewed on the (BAS), or 16 x 2 LCD screen
- If connected to thermostat, all economizer functions can be viewed on 16 x 2 LCD screen

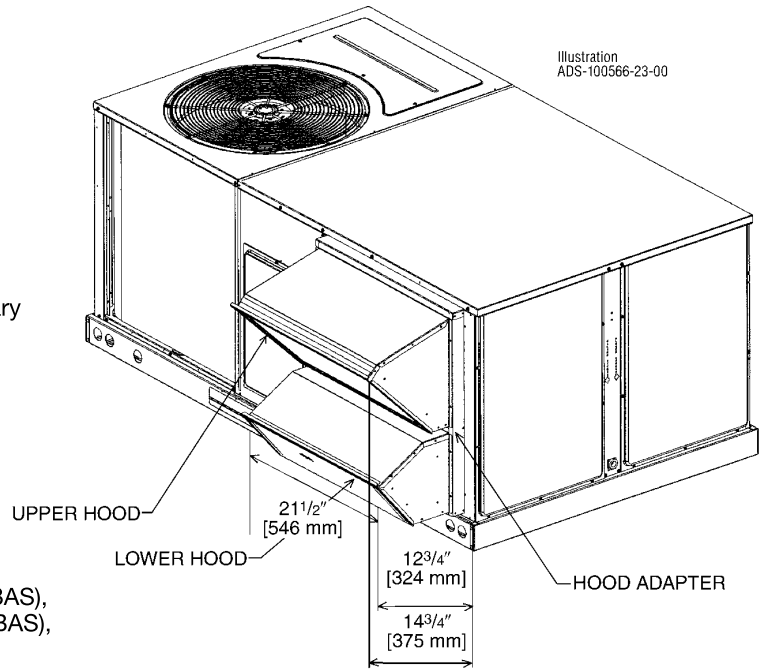
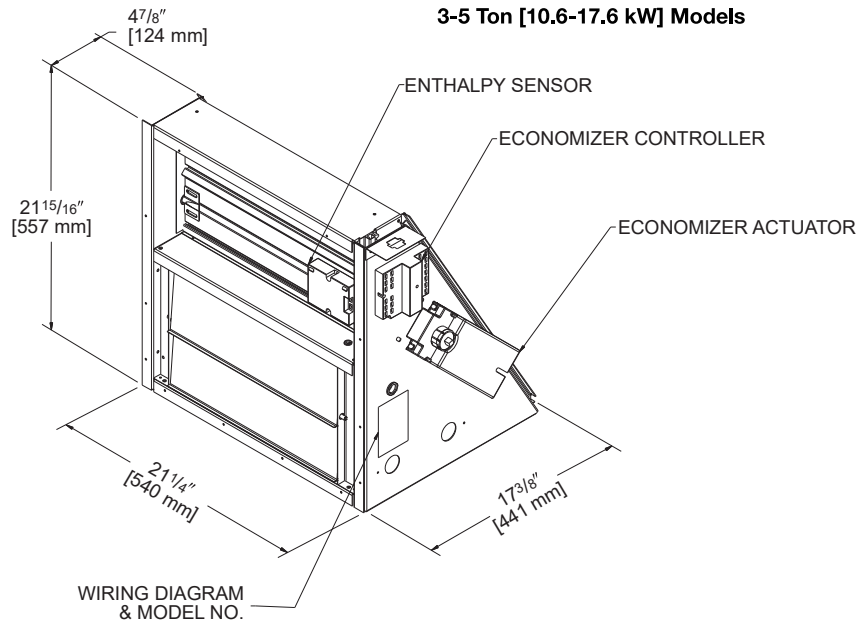


Illustration
ADS-100566-23-00

[] Designates Metric Conversions



3-5 Ton [10.6-17.6 kW] Models

AXRD-01RMDDM3 - Economizer-Single Enth/ Smoke Detector

ECONOMIZERS—DOWNFLOW ONLY

Use to Select Field Installed Options Only

AXRD-01RMDCM3—Single Enthalpy (Outdoor) with DDC

AXRD-01RMDDM3—Single Enthalpy (Outdoor) w/Smoke Detector and DDC

RXXR-AR03—Optional Wall-Mounted CO₂ Sensor

RXXR-AV02—Dual Enthalpy Upgrade Kit

- Features **Honeywell** Controls
- Available Factory Installed or Field Accessory
- Gear Driven Direct Drive Actuator
- Fully Modulating (0-100%)
- Ultra Low Leak Dampers meet California Title 24 requirements
- Slip-In Design for Easy Installation
- Plug-In Polarized 12-pin & 4-pin Electrical Connections
- Pre-Configured—No Field Adjustments Necessary
- Standard Barometric Relief Damper
- Single Enthalpy with Dual Enthalpy Upgrade Kit Available
- CO₂ Input Sensor Available
- Field Assembled Hood Ships with Economizer
- Economizer Ships Complete for Downflow Duct Application.
- Optional Remote Minimum Position Potentiometer (270 ohm) (Honeywell #S963B1136) is Available from Prostock.
- Field Installed Power Exhaust Available
- If connected to a Building Automation System (BAS), all economizer functions can be viewed on the (BAS).

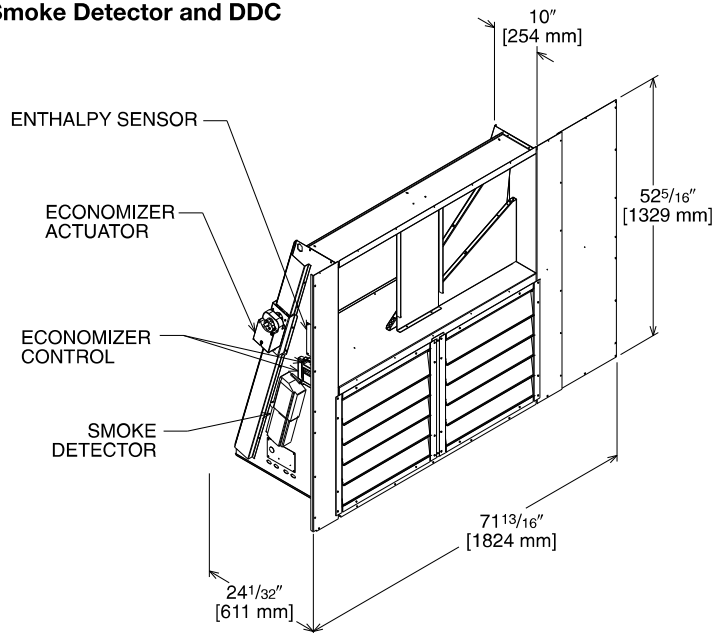


Illustration
ST-A00566-58

TOLERANCE ±.125

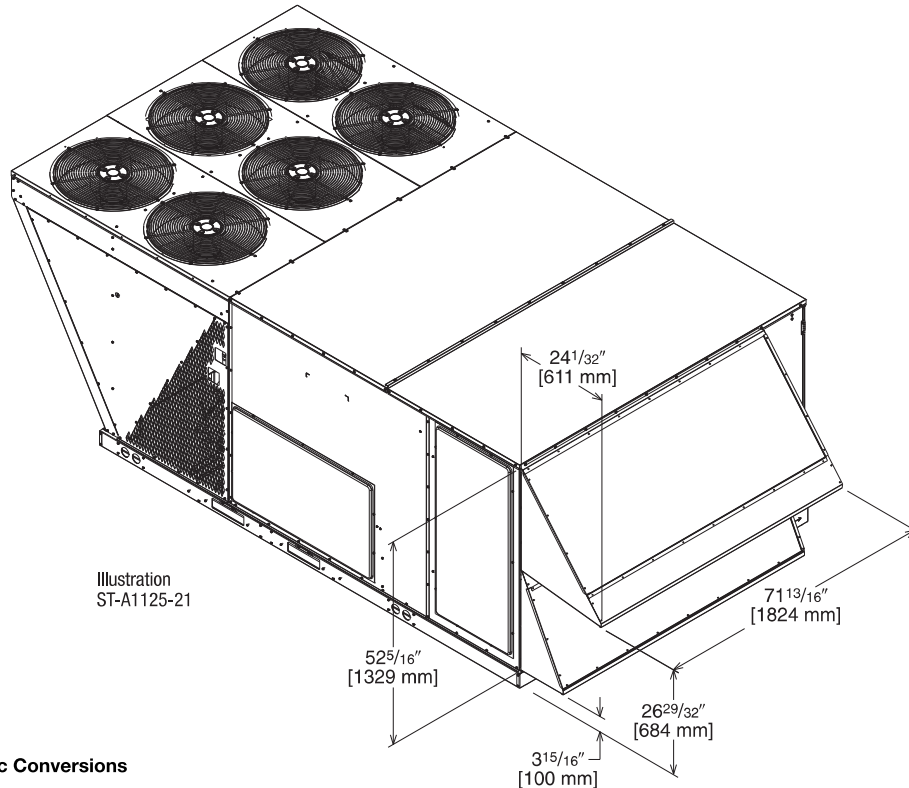


Illustration
ST-A1125-21

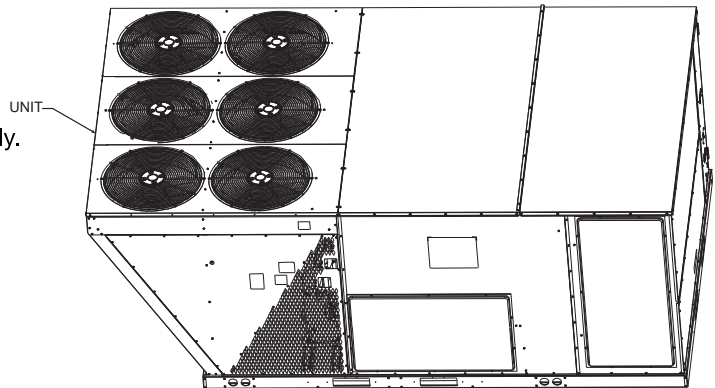
[] Designates Metric Conversions

RXKG-CBH14 - Roofcurb, 14"

ROOFCURBS (Full Perimeter)

- Rheem's roofcurb design can be utilized on 15, 20 and 25 ton [52.8, 70.3 and 87.9 kW] models.
- One available height (14" [356 mm]).
- Quick assembly corners for simple and fast assembly.
- 1" [25.4 mm] x 4" [102 mm] Nailers provided.
- Insulating panels not required because of insulated outdoor base pan.
- Sealing gasket (28" [711 mm]) provided with Roofcurb.
- Packaged for easy field assembly.

TYPICAL INSTALLATION



ROOFCURB ASSEMBLY

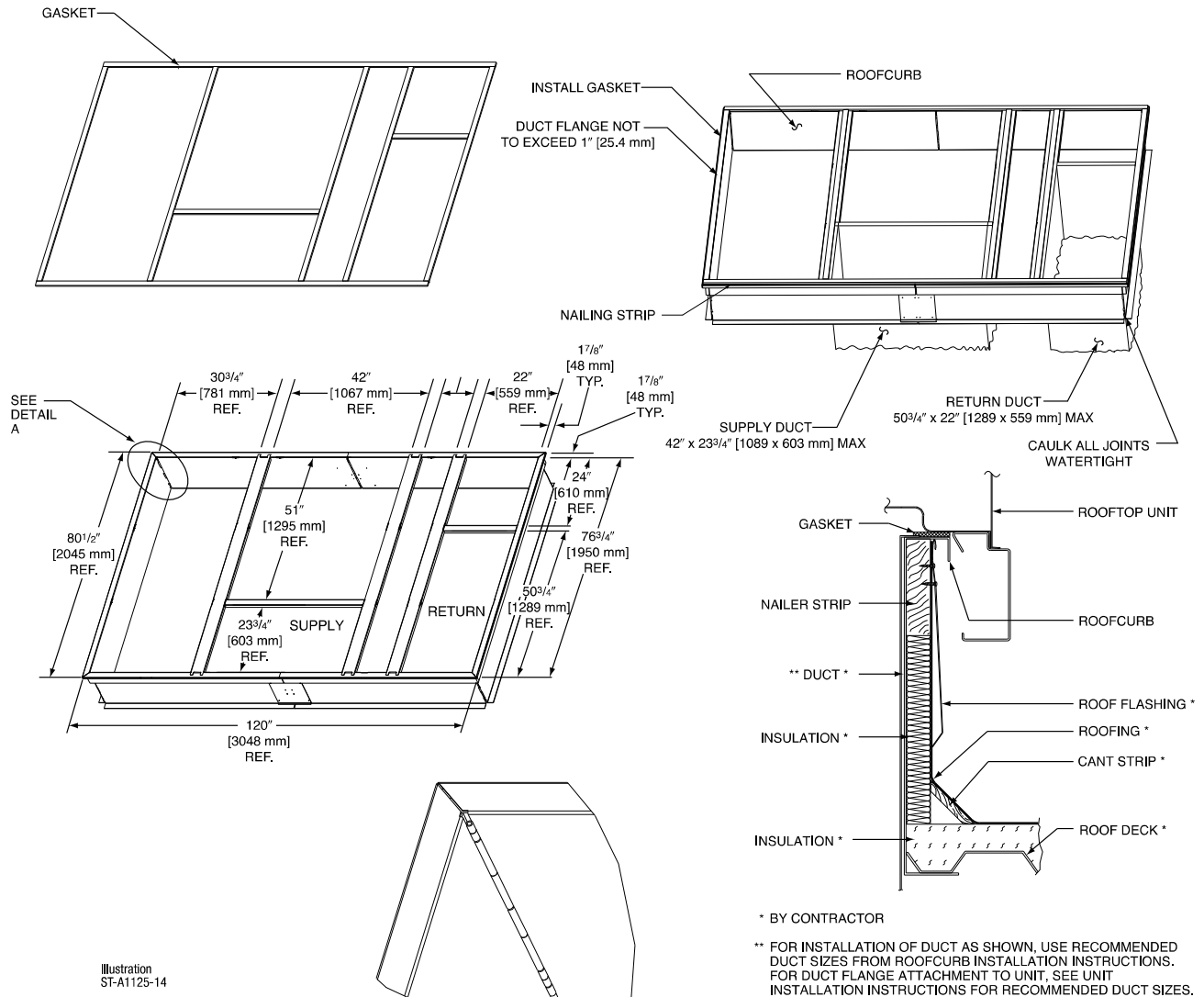


Illustration
SF-A1125-14

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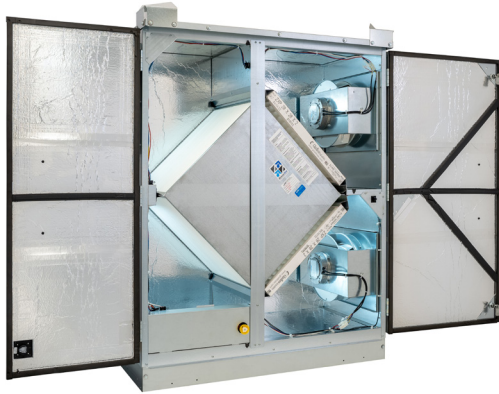
DETAIL A

ERV on Roof (Fully Concealed by Existing Parapet)

ENERGY RECOVERY VENTILATOR
EC MOTOR



SPECIFICATIONS



Ventilation Type:
Static plate, heat and humidity transfer

Airflow Range: 250–1100 CFM

AHRI 1060 Certified Core:
One L125-G5

Standard Features:
Non-fused disconnect
24VAC transformer/relay package
Cross-core differential pressure ports
Independent blower control

Filters:
Total Qty. 2, MERV 8: 20" x 20" x 2"

Unit Weight:
261-415 lbs., varies by option(s)

Max. Shipping Dimensions & Weight (on pallet):
60" L x 30" W x 82 1/4" H
455 lbs.

Motor(s):
Qty. 2, 370W ea., Direct drive EC motorized impeller packages (208–230V/1Ph/60Hz)

Options:
Qty. 2, Direct drive EC motorized impeller packages:
480W 120V/1Ph/60Hz (Advanced),
680W 208–230V/1Ph/60Hz (Advanced),
860W 460V/3Ph/60Hz (Advanced)

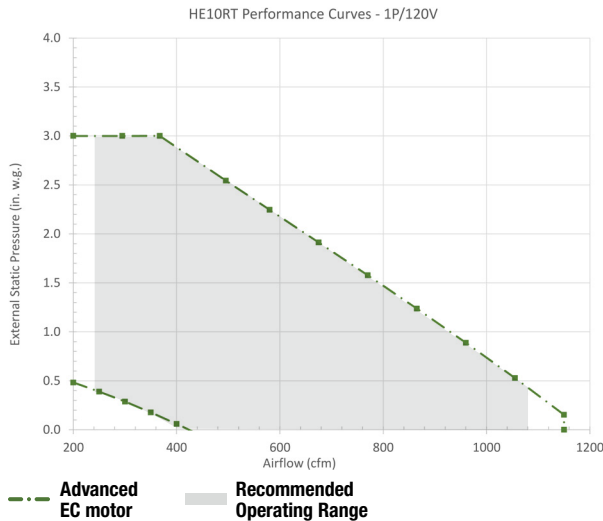
Fused disconnect
Integrated programmable controls: enhanced, premium
Class 1 low leakage motorized isolation dampers:
FA, EA or both airstreams
Factory mounted filter alarms: both airstreams
Double wall construction
Exterior paint: white, custom colors

Accessories:
Filters: MERV 13, 2" (shipped loose)
Backdraft damper: 12"
Automatic balancing damper: 4", 5", 6"
Potentiometer speed control: remote installed
Roof curb: standard 14"
Curb wind clip
Engineered combo curb for Trane or Carrier RTUS
Digital time clock: wall mount (TC7D-W),
in exterior enclosure (TC7D-E)
Carbon dioxide sensor/control:
wall mount (CO2-W), duct mount (CO2-D)
IAQ sensor: wall mount (IAQ-W), duct mount (IAQ-D)
Motion occupancy sensor/control:
ceiling mount (MC-C), wall mount (MC-W)
Smoke detector: duct mount (SD-D)
Indoor electric duct heater: RH series (1–11.5 kW),
EK series (1–175 kW)
Indirect gas-fired duct furnace: GH series (50–400 MBH);
Installed downstream of any fans
Duct flange kit: square 14" x 14", 2 flanges

Energy recovery core is AHRI Certified®



EC MOTOR OPERATING RANGE AND FAN PERFORMANCE



HE10RT MOTOR 1P/120V Options		
Airflow (CFM)	Advanced EC	
	External Static Pressure (Inches Water Column)	Unit Power Consumption (Watts)
200	3.00	567
295	3.00	739
367	3.00	870
495	2.54	978
580	2.25	1033
675	1.91	1080
770	1.58	1113
865	1.24	1133
960	0.89	1142
1055	0.53	1140
1150	0.15	1129
1150	0.00	1017

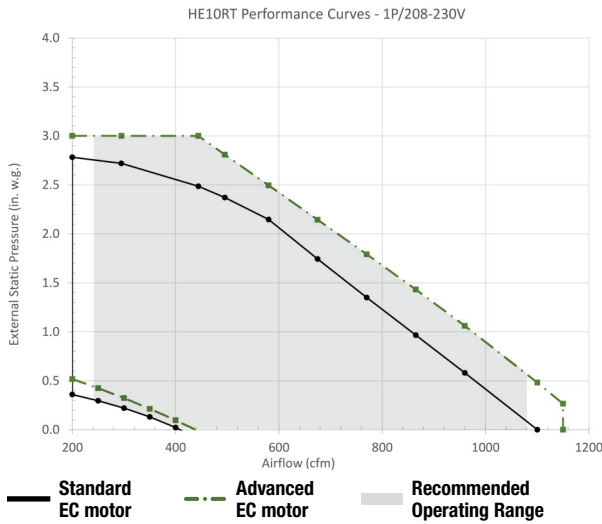
Note: Airflow performance includes effect of clean, standard filter supplied with unit.



ENERGY RECOVERY VENTILATOR
EC MOTOR

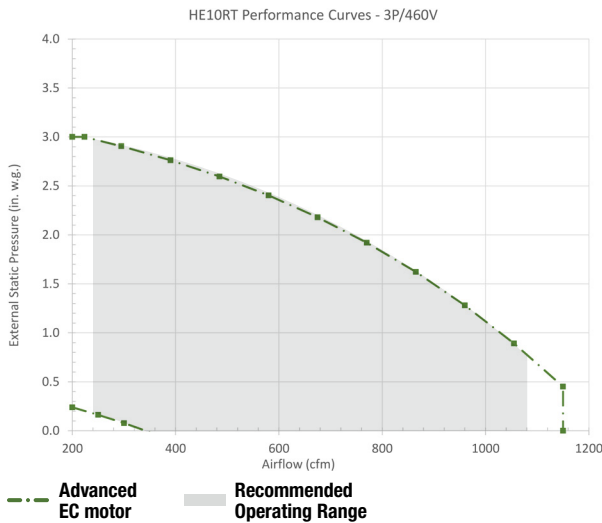


EC MOTOR OPERATING RANGE AND FAN PERFORMANCE



HE10RT MOTOR 1P/208-230V Options				
Airflow (CFM)	Standard EC		Advanced EC	
	External Static Pressure (Inches Water Column)	Unit Power Consumption (Watts)	External Static Pressure (Inches Water Column)	Unit Power Consumption (Watts)
200	2.78	566	3.00	650
295	2.72	658	3.00	795
444	2.48	791	3.00	1051
495	2.37	832	2.81	1079
580	2.15	894	2.49	1120
675	1.74	900	2.14	1160
770	1.35	900	1.79	1190
865	0.97	900	1.43	1211
960	0.58	900	1.06	1222
1100	0.00	900	0.48	1217
1150			0.27	1209
1150			0.00	919

Note: Airflow performance includes effect of clean, standard filter supplied with unit.



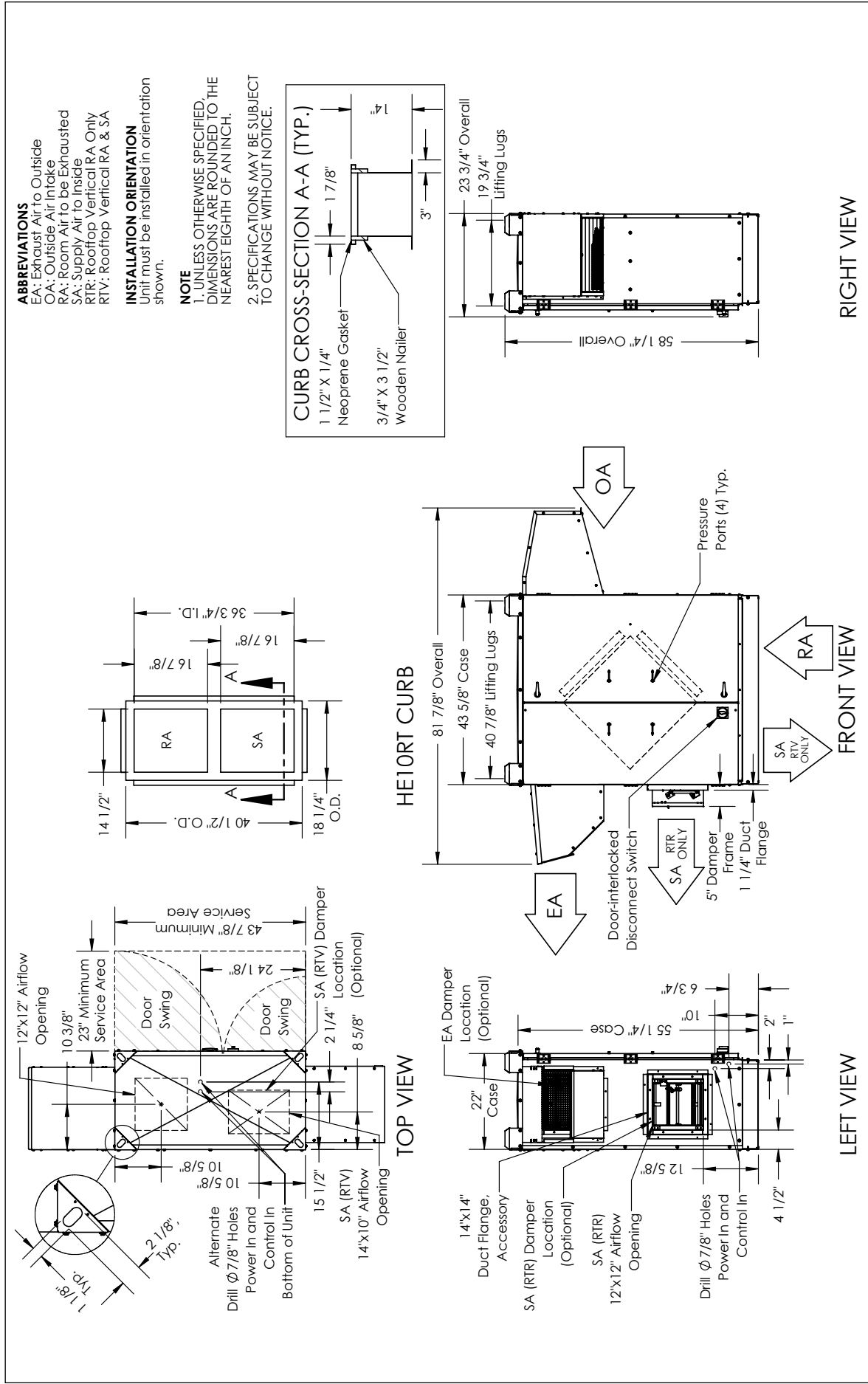
HE10RT MOTOR 3P/460V Options		
Airflow (CFM)	Advanced EC	
	External Static Pressure (Inches Water Column)	Unit Power Consumption (Watts)
200	3.00	829
224	3.00	860
295	2.91	925
390	2.76	1015
485	2.60	1105
580	2.40	1191
675	2.18	1273
770	1.92	1346
865	1.62	1408
960	1.28	1456
1055	0.89	1488
1150	0.45	1501
1150	0.00	1267

Note: Airflow performance includes effect of clean, standard filter supplied with unit.

ELECTRICAL DATA

Option	Watts	Volts	Hz	Phase	FLA per motor	Min. Cir. Amps	Max. Overcurrent Protection Device
[EE] Standard	370	208-230	60	Single	1.73	3.9	20
	480	120	60	Single	6.5	14.6	15
[AA] Advanced	680	208-230	60	Single	5	11.3	15
	860	460	60	Three	1.22	2.7	15

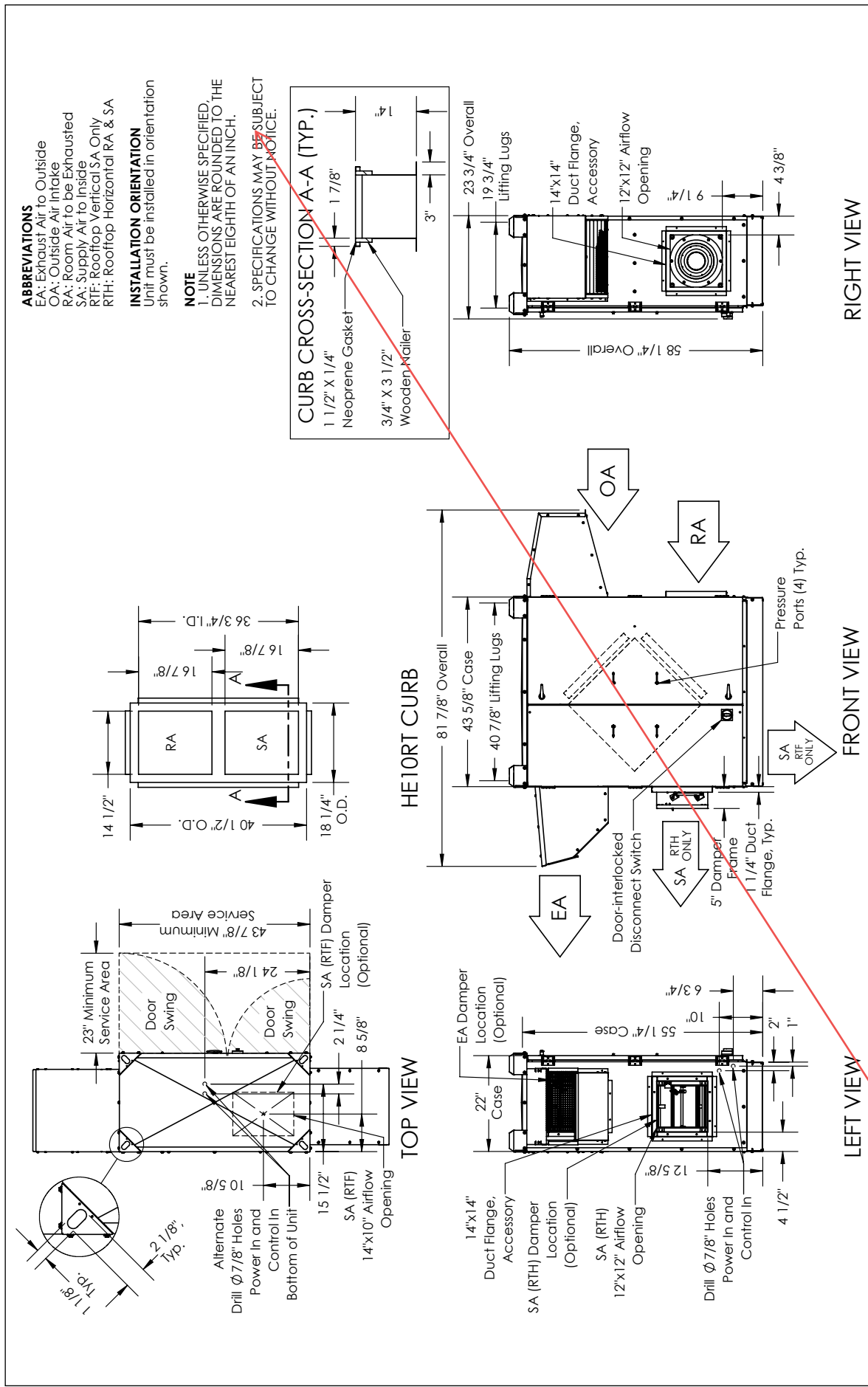
HE10RT (RTV/RTR) ENERGY RECOVERY VENTILATOR EC MOTOR



UNIT MOUNTING & APPLICATION
 Must be mounted as shown. Airstreams cannot be switched.



HE10RT (RTH/RTF) ENERGY RECOVERY VENTILATOR EC MOTOR



Job Name/Location:

Tag No:

Date:

For:	File	Resubmit
	Approval	Other

PO No.:

Architect: GC:

Engr: Mech:

Rep: (Company) (Project Manager)



LMU480HHV
Multi F MAX with LGRED° Outdoor Unit
4.0 Ton Heat Pump

Performance:

Cooling Capacity (Min.-Rated-Max., Btu/h)	10,800-48,000-58,000
Heating Capacity (Min.-Rated-Max., Btu/h)	12,420-52,500-59,000
Max. Heating Capacity at 17°F (Btu/h)	56,740
Max. Heating Capacity at 5°F (Btu/h)	52,840
Max. Heating Capacity at -4°F (Btu/h)	46,010
Max. Heating Capacity at -13°F (Btu/h)	39,870
Cooling COP @95°F (Rated)	3.84
Heating COP @47°F (Rated)	3.62

Cooling Nominal Test Conditions: Indoor: 80°F DB / 67°F WB
Outdoor: 95°F DB / 75°F WB

Heating Nominal Test Conditions: Indoor: 70°F DB / 60°F WB
Outdoor: 47°F DB / 43°F WB

Operating Range:

Cooling (°F DB)	
Heating (°F WB)	

Heat Pump on Roof (Fully Concealed by Existing Parapet)

Unit Data:

Refrigerant Type	R410A
Refrigerant Control	EEV
Sound Pressure (Cool / Heat) ±1 dB(A) ⁶	54 / 56
Net / Shipping Weight (lbs.)	218 / 243
Heat Exchanger Coating	Gold Fin™
Minimum No. of Indoor Units	2
Maximum No. of Indoor Units	8

Electrical:

Power Supply (V/Hz/Ø) ¹	208-230V, 60, 1
MOP (A)	40
MCA (A)	32.7
Cooling Rated Amps (A)	29.2
Heating Rated Amps (A)	29.2
Compressor (A)	22.0
Fan Motor (A)	1.6 x 2
Locked Rotor Amps (A)	22

MOP - Maximum Overcurrent Protection MCA - Minimum Circuit Ampacity

Compressor:

Type	R1 Scroll
Quantity	1
Oil / Type	FVC68D

Fan:

Type	Propeller
Quantity	2
Motor / Drive	Brushless Digitally Controlled/Direct
Max. Airflow Rate (CFM)	2,119 x 2

Piping:

Refrigerant Charge (lbs.)	11.46
Liquid Line Connection (in., O.D.)	Ø3/8 x 1
Vapor Line Connection (in., O.D.)	Ø3/4 x 1
Maximum Total Piping ² (ft.)	475.7
Min. / Max. ODU to IDU Piping ³ (ft.)	32.8 / 229.6
Piping Length ⁴ (no add'l refrigerant, ft.)	180.4
Maximum Elevation between ODU and IDU (ft.)	98.4
Maximum Elevation between IDU and IDU (ft.)	49.2

ODU = Outdoor Unit IDU = Indoor Unit

Features:

- R1 Scroll (Variable Speed) Compressor
- Auto operation
- Auto restart
- Self diagnosis
- Defrost / Deicing
- Low ambient cooling down to 14°F
- Soft start
- Restart delay (three [3] minutes)
- Factory installed Drain Pan Heater

Optional Accessories:

- PI-485 - PMNFP14A1
- AC Smart 5 - PACS5A000
- ACP 5 - PACP5A000
- MultiSITE™ Comm. Mgr. - PBACNBTR0A
- Power Distribution Indicator (PDI) Premium - PQNUD1S41
- Mobile LGMV - PLGMVW100
- Low Ambient Wind Baffle (Cooling Operation Down to -4°F) - ZLABGP04A x2

Required⁵ Accessories:

- 2 Port BD Unit - PMBD3620
- 3 Port BD Unit - PMBD3630
- 4 Port BD Unit - PMBD3640
- 4 Port BD Unit - PMBD3641

Notes:

1. Acceptable operating voltage: 187V - 253V.
2. Piping lengths are equivalent.
3. 180.4 ft. of Main Piping + 49.2 ft. of Branch Piping.
4. 49.2 ft. of Main Piping + 131.2 of Branch Piping.
5. At least one branch distribution (BD) unit is required for system operation; a maximum of two can be installed per ODU with the use of a Y-branch accessory (PMBL5620).
6. Sound pressure levels are tested in an anechoic chamber under ISO Std. 3745.
7. All power / communication cable to be minimum 14 AWG from the ODU to the BD unit, and 14 AWG from the BD unit to the IDU.
8. All power / communication cable to be 4-conductor, stranded, shielded or unshielded, and must comply with applicable local and national codes. If shielded, the wire must be grounded to the chassis at the ODU only.
9. Power wiring size must comply with the applicable local and national codes.
10. See the Engineering Manual Capacity Tables for ODU sensible and latent capacities.
11. See the Engineering Manual Combination Tables for allocation of ODU rated capacity to each connected IDU when all are calling for full capacity. Allocation percentages should be applied to ODU capacity at design conditions.
12. This data is rated 0 ft. above sea level, with 0 ft. level difference between ODU and IDUs, and the following refrigerant pipe lengths:
LMU361HHV: 16.4 ft. Main + (16.4 ft. Branch x 5) = 98.4 ft.
LMU421HHV: 16.4 ft. Main + (16.4 ft. Branch x 6) = 114.8 ft.
LMU480HHV: 16.4 ft. Main + (16.4 ft. Branch x 8) = 147.6 ft.
All capacities are net with a combination ratio between 95 - 105%.
13. Must follow installation instructions in the applicable LG installation manual.
14. See the Engineering Manual Capacity Tables for ODU capacity at design conditions.



For a complete list of available accessories, contact your LG representative.

For continual product development, LG reserves the right to change specifications without notice.

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SB_MultiF_MAX_LGRED_LMU480HHV_2021_10_18_113447

LMU480HHV
Multi F MAX with LGRED® Outdoor Unit
4.0 Ton Heat Pump



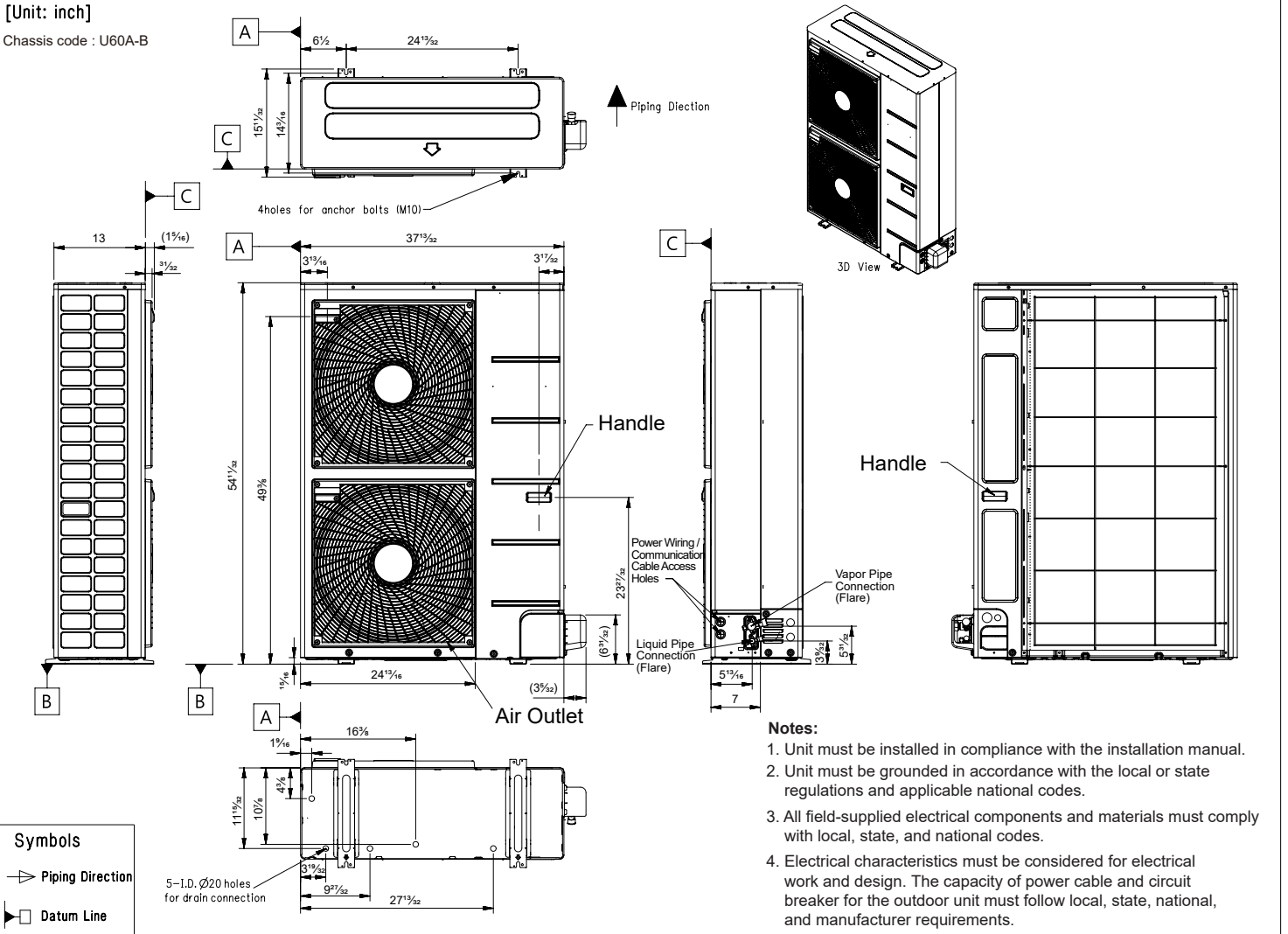
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PO No.: _____

[Unit: inch]

Chassis code : U60A-B



Job Name/Location: _____

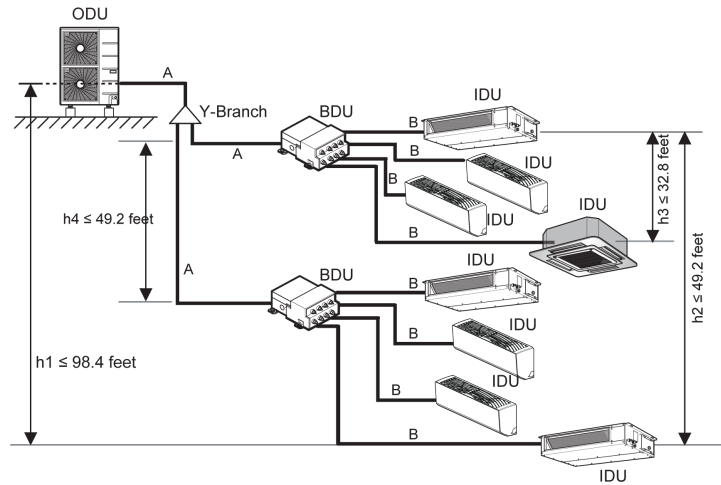
LMU480HHV
Multi F MAX with LGRED® Outdoor Unit
4.0 Ton Heat Pump



Tag No.: _____

Date: _____

PO No.: _____

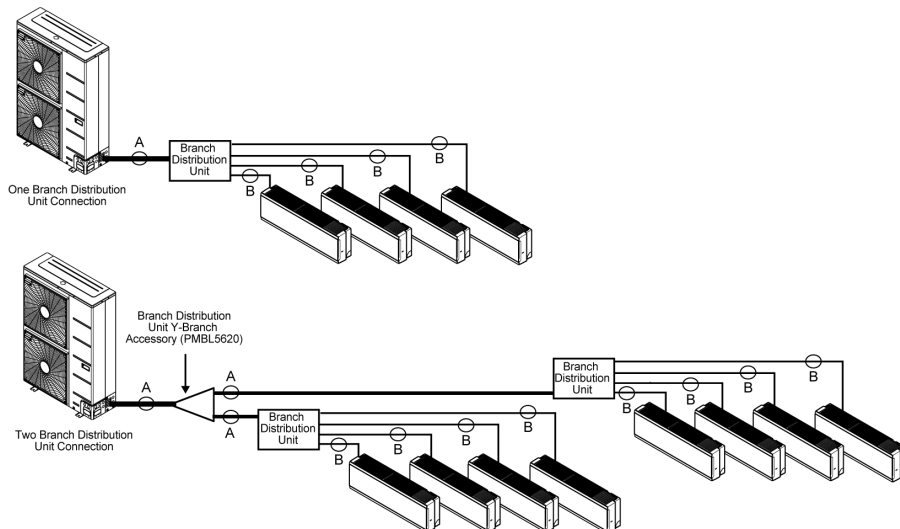


Example: LMU480HHV outdoor unit with eight (8) indoor units and two (2) branch distribution units connected.
 ODU: Outdoor Unit.
 IDU: Indoor Unit.
 BDU: Branch Distribution Unit(s).
 A: Main Pipe.
 B: Branch Pipe (Branch Distribution Unit[s] to Indoor Unit[s]).

Multi F MAX with LGRED Outdoor Unit Refrigerant Piping System Limitations.

Pipe Length (ELF = Equivalent Length of pipe in Feet)	Total piping length ($\Sigma A + \Sigma B$)	≤475.7 feet	
	Main pipe (Outdoor Unit to Branch Distribution Units: A)	Minimum for Each (A) Piping Segment	16.4 feet
		Maximum (ΣA)	≤180.4 feet
	Total branch piping length (ΣB)	≤295.3 feet	
Elevation Differential (All Elevation Limitations are Measured in Actual Feet)	Branch pipe (Branch Distribution Units to Indoor Units: B)	Minimum	16.4 feet
		Maximum	≤49.2 feet
	If outdoor unit is above or below indoor unit (h1)		≤98.4 feet
	Between the farthest two indoor units (h2)		≤49.2 feet
Between branch distribution unit and farthest connected indoor unit(s) (h3)		≤32.8 feet	
Between branch distribution units (h4)		≤49.2 feet	

Installing the Unit



Multi F MAX with LGRED Piping Sizes.

Piping	Main Pipe A (inch)	Branch Pipe B
Liquid	Ø3/8	Depends on the size of the indoor unit piping.
Vapor	Ø3/4	