PACKAGED HEAT PUMP

QHA

Q-SERIES™

Standard Efficiency - Three-Phase - 60 Hz

ALLIED Commercial™

COMMERCIAL
PRODUCT SPECIFICATIONS

Bulletin No. 310940
November 2024

SEER2 - 13.4
HSPF2 - 6.7
3 to 5 Tons
Cooling Capacity - 34,000 to 57,000 Btuh
Heating Capacity - 34,000 to 57,500 Btuh
Optional Electric Heat - 5 to 23 kW

MODEL NUMBER IDENTIFICATION

Q H A 060 S 5 D N 1 Y - 1A

- **Model Family**
  Q = Light Commercial Packaged
- **Unit Type**
  H = Heat Pump
- **Major Design Sequence**
  A = 1st Generation
- **Nominal Cooling Capacity - Tons**
  036 = 3 Tons
  048 = 4 Tons
  060 = 5 Tons
- **Cooling Efficiency**
  S = 13.4 SEER2
- **Refrigerant Type**
  5 = R-454B
- **Blower Type**
  D = Direct Drive (ECM)
- **Heating Type**
  N = No Heat
- **Minor Design Sequence**
  1 = 1st Revision
- **Voltage**
  Y = 230V - 3 phase - 60Hz
  G = 460V - 3 phase - 60Hz
- **Minor Revision Sequence**
  1A = 1st Revision

CONTENTS

APPROVALS AND WARRANTY

APPROVALS

- AHRI Standard 210/240 certified
- Design Certified by ETL Intertek
- Unit and components ETL, NEC and CEC bonded for grounding to meet safety standards for servicing
- Optional electric heaters are ETL listed for the US and Canada and are rated and tested according to DOE test procedures and FTC labeling regulations
- All models are ASHRAE 90.1 compliant
- Seismic Certification (with Seismic Strapping Kit applied): Latest Edition of International Building Code, California Building Code, and ASCE 7-16

WARRANTY

- Compressors - Limited five years
- All other covered components - Limited one year

FEATURES

COOLING SYSTEM

R-454B Refrigerant
- Non-chlorine based
- Ozone-friendly
- Factory pre-charged

Indoor and Outdoor Coils
- Copper tube with aluminum fin coils
- Factory leak tested

Anti-Microbial Condensate Drain Pan
- Anti-Microbial additive resists growth of mold and mildew on drain pan which improves indoor air quality and reduces drain line blockage
- Insulated to reduce condensation
- Side drain connection

Drain Pan Overflow Switch
- Monitors condensate level in drain pan
- Shuts down unit if drain becomes clogged

Outdoor Coil Fan Motor
- Weather protected heavy duty condenser fan motor
- Coated steel fan blades for long life
- Corrosion-resistant coated steel fan guard
- Internally mounted
- Totally enclosed fan motor

Four-Way Reversing Valve
- Rapid changeover of refrigerant flow direction from cooling to heating and vice versa
- Operates on pressure differential between outdoor unit and indoor coil
- Factory installed

High Pressure Switch
- Protects the system from high pressure conditions
- Automatic reset.

Loss of Charge Switch
- Shuts off unit if suction pressure falls below setting
- Loss of charge and freeze-up protection

Service Valves
- Fully serviceable brass valves installed in discharge & liquid lines

COMPRESSOR

Scroll Compressor
- High volumetric efficiency
- Uniform suction flow
- Constant discharge flow
- Quiet operation
- Low gas pulses during compression reduces operational sound levels
- Compressor motor is internally protected from excessive current and temperature
- Compressor is installed in the unit on resilient rubber mounts for vibration free operation

Scroll Compressor Operation
- Two involute spiral scrolls matched together generate a series of crescent-shaped gas pockets between them
- During compression, one scroll remains stationary while the other scroll orbits around it
- Gas is drawn into the outer pocket, the pocket is sealed as the scroll rotates
- As the spiral movement continues, gas pockets are pushed to the center of the scrolls. Volume between the pockets is simultaneously reduced
- When the pocket reaches the center, gas is now at high pressure and is forced out of a port located in the center of the fixed scrolls
- During compression, several pockets are compressed simultaneously resulting in a smooth continuous compression cycle
- Continuous flank contact, maintained by centrifugal force, minimizes gas leakage and maximizes efficiency
- Compressor is tolerant to the effects of slugging and contaminants. If this occurs, scrolls separate, allowing liquid or contaminants to be worked toward the center and discharged
- Muffler in discharge line reduces operating sound levels

Optional Accessories

Field Installed

Compressor Crankcase Heater
- Protects against refrigerant migration that can occur during low ambient operation

Compressor Timed-Off Control
- Prevents compressor short-cycling
- Allows time for suction and discharge pressure to equalize
- Permits compressor start-up in an unloaded condition
- Automatic reset
- Five minute delay between compressor shut-off and start-up

Freezestat
- Senses suction line temperature
- Cycles compressor off when suction line temperature falls below its setpoint

Low Ambient Kit (40°F)
- Cycles the outdoor fan while allowing compressor operation in the cooling cycle
- This intermittent fan operation allows the system to operate without icing the evaporator coil and losing capacity
- Designed for use in ambient temperatures no lower than 40°F

NOTE - Crankcase heater and freezestat are recommended on compressor equipped with a low ambient kit.

FEATURES

CABINET

- Conditioned areas insulated with foil faced insulation to minimize heat loss and reduce operating sound levels
- Powder paint for maximum durability
- Full perimeter heavy-gauge galvanized steel base rails
- Base rails have rigging holes
- Two sides of the base rails have forklift slots
- Raised edges around duct and power entry openings in the bottom of the unit for water protection
- Easy service access
- Steel louvered panels provides complete coil protection

Airflow Choice

- Units are shipped with supply and return air duct covers installed for downflow or horizontal conversion

Electrical Inlets and Service Valves

- Field wiring inlets are located in one central area of the cabinet
- See dimension drawing
- Service valves with gauge ports are located inside the cabinet

Optional Accessories

Field Installed

Bottom Power Entry Kit

- Allows high and low voltage wiring connections through the unit base pan

Base Rail Openings Closure Kit

- Kit consists of panels and hardware to cover rigging holes and forklift slots in unit base rails

Square to Round Duct Adaptor Kits

- Downflow or horizontal kits available
- Converts square supply and return air openings on unit cabinet to round 14 in. diameter

Tool-Less Filter Access Kit

- Converts blower access panel to two-piece design
- One panel is equipped with tool-less latches for ease filter access without removing entire blower panel

NOTE - Not for seismic-rated applications.

CONTROLS

24 Volt Transformer

- 70VA transformer furnished and factory installed in control area

Field Installed

Smoke Detector

- Photoelectric type
- Installed in supply air and/or return air ducts
- Available with one sensor or two sensors

BLOWER

- Direct drive blower
- Blower wheel is statically and dynamically balanced
- Resiliently mounted
- Blower assembly easily removed for servicing

Constant Torque Blower Motor

- DC Brushless Motor
- High Efficiency Constant Torque
- ECM (Electronically Commutated Motor)
- Motor is programmed to provide constant torque at each of the selectable speeds
- Fixed blower “On” delay prevents cold air from entering system during gas heating demand
- See Blower Performance tables

INDOOR AIR QUALITY

Air Filters

- Filter rack furnished as standard
- See Specifications Table for sizes

NOTE - Filters must be field provided.

OPTIONS / ACCESSORIES

ELECTRIC HEAT (5-23 KW)

Optional Accessories

Field Installed

- Field installed internal to unit cabinet
- Available in several voltages and kW sizes
- Helix wound nichrome heating elements exposed directly in air stream
- Instant heat transfer
- Low element temperatures and long service life
- Cutoff limit control provides positive protection in case of excessive temperatures
- Factory assembled with controls installed and wired

NOTE - Field wiring for electric heat is separate from the unit power supply. A second, separate power source is required.

ECONOMIZER

Field Installed

Economizer
(Standard and High Performance Common Features)

- Convertible to downflow or horizontal
- Outdoor Air Hood is furnished
- Includes Barometric Relief Dampers with Exhaust Hood
- Barometric Relief Dampers allow relief of excess air,
- Aluminum blade dampers prevent blow back and outdoor air infiltration during off cycle
- Exhaust hood with bird screen furnished
- Single temperature control is furnished with Economizer
- Outdoor air sensor enables Economizer if the outdoor temperature is less than the setpoint of the control

Standard Economizer Features (Not for Title 24)

- Gear-driven action
- Return air and outdoor air dampers
- Plug-in connections to unit
- Nylon bearings
- Neoprene seals
- 24-volt
- Fully-modulating spring return motor

Standard Economizer Control Module
The Standard Economizer Control Module can be adjusted to operate based on outdoor air temperatures

Economizer Controls:

- Damper Minimum Position - Can be set lower than traditional minimum air requirements resulting in cost savings
- Free Cool LED - A steady green LED indicates outdoor air is suitable for free cooling

NOTE - Free Cooling runs when outdoor air temperature is lower than the set temperature on the economizer control.

NOTE: The Free Cooling default setting for outdoor air temperature sensor is 55°F.

High Performance Economizer Features

- Approved for California Title 24 building standards
- Low leakage dampers are Air Movement and Control Association International (AMCA) Class 1A Certified - Maximum 3 cfm per sq. ft. leakage at 1 in. w.g.
- ASHRAE 90.1-2010 compliant
- Gear-driven action
- High torque 24-volt fully-modulating spring return damper motor
- Return air and outdoor air dampers
- Plug-in connections to unit
- Stainless steel bearings
- Enhanced neoprene blade edge seals
- Flexible stainless steel jamb seals minimize air leakage

NOTE - High Performance Economizers are not approved for use with enthalpy controls in Title 24 applications.

NOTE - The Free Cooling setpoint for Title 24 applications must be set based on the Climate Zone where the system is installed. See Section 140.4 “Prescriptive Requirements for Space Conditioning Systems” of the California Energy Commission’s 2019 Building Energy Efficiency Standards. Refer to Installation Instructions for complete setup information and menu parameters available.

High Performance Economizer Control Module

- Module provides inputs and outputs to control economizer based on parameter settings
- Module automatically detects sensors by polling to determine which sensors are installed in system
- Module displays any alarm messages (fault detection and diagnostics) as an aid in troubleshooting
- Non-volatile memory retains parameter settings in case of power failure
- Keypad with four navigation buttons and LCD screen is furnished for setting economizer parameters
  - Menu Up/Exit ⓘ button returns to the main menu
  - Arrow Up ▲ button moves to the previous or next parameter within the selected menu
  - Arrow Down ▼ button moves to the next parameter within the selected menu
  - Select (enter) ↵ button confirms parameter selection

OPTIONS / ACCESSORIES

ECONOMIZER (continued)

High Performance Economizer Control Module (continued)
Main Menu Structure:

- STATUS (economizer and system operation status)
- SETPOINTS (settings for various setpoint parameters)
- SYSTEM SETUP (settings/information about the system)
- ADVANCED SETUP (freeze protection, CO_2 settings, stage 3 delay, and additional calibration settings)
- CHECKOUT (damper positions)
- ALARMS (output signal that can be configured for remote alarm monitoring)

NOTE - Refer to Installation Instructions for complete setup information and menu parameters available.

Field Installed

Single Enthalpy Temperature Control (Not for Title 24)

- Outdoor air enthalpy sensor enables Economizer if the outdoor enthalpy is less than the setpoint of the control

OUTDOOR AIR

Field Installed

Outdoor Air Dampers - Downflow

- Single blade damper
- 0 to 25% (fixed) outdoor air adjustable
- Installs in unit
- Outdoor air hood is furnished
- Automatic model features fully modulating spring return damper motor with plug-in connection
- Manual model features a slide damper

NOTE - Maximum mixed air temperature in cooling mode is 100°F.

ROOF CURBS

Field Installed

Clip Curb (Full Perimeter)

- Interlocking tabs fasten corners together
- No tools required
- Fully gasketed around curb perimeter and supply and return openings
- Available in 8, 14, 18 and 24 inch heights
- Shipped knocked down

Adjustable Pitch Roof Curb (Full Perimeter) Standard Curb

- Fully adjustable pitch curb provides a level platform for packaged units
- Allows flexible installations on roofs with sloped or uneven angles
- Adjustable from 2/12 to 6/12 pitch
- Fully gasketed around curb perimeter and supply and return openings
- Shipped knocked down

All Clip and Adjustable Pitch Curbs

- IBC 2018 compliant
- CBC 2019 compliant
- Seismic rating - SDS 2.0g, z/h=1, Ip=1.5
- Wind rating - 240 mph (Lateral), 214 mph (Uplift)
- Maximum load rating - 800 lbs.

Adaptor Curbs (not shown)

- Adaptor curbs are locally sourced

NOTE - Please contact your Allied representative for guidance in your area.

Strapping Kit - Hurricane

- Galvanized steel .07 in. thick minimum
- Attaches unit base rails to host structure

Strapping Kit - Seismic

- Heavy-gauge galvanized steel
- Kit contains 4 brackets and mounting hardware

OPTIONS / ACCESSORIES

Item			Catalog No.	Model No. QHA036	QHA048	QHA060
COOLING SYSTEM						
Compressor Crankcase Heater 230V 1-ph or 3-ph			**11X27**	X	X	X
Compressor Crankcase Heater 460V 3-ph			**21D21**	X	X	X
Compressor Timed-Off Control			**47J27**	X	X	X
Freezestat			**21D23**	X	X	X
Low Ambient Kit (40°F)			**21D20**	X	X	X
CABINET						
Base Rail Openings Closure Kit			**21J84**	X	X	X
Square to Round Duct Adaptor Kits	Downflow	14 in. dia.	**20X82**	X		
		14 in. dia.	**21D26**		X	X
	Horizontal	14 in. dia.	**21J92**	X		
		14 in. dia.	**21D24**		X	X
		16 in. dia.	**22U78**		X	X
		18 in. dia.	**22U79**		X	X
[1] Tool-Less Filter Access Kit			**21J80**	X	X	X
CONTROLS						
Smoke Detector - Supply or Return (one sensor)			**21U21**	X	X	X
Smoke Detector - Supply and Return (two sensors)			**21U22**	X	X	X
ELECTRICAL						
Bottom Power Entry Kit			**21J78**	X	X	X
[2] ELECTRIC HEAT						
5 kW		208/230V-3ph	**21J30**	X	X	X
		460V-3ph	**21J37**	X	X	X
10 kW		208/230V-3ph	**21J33**	X	X	X
		460V-3ph	**21J38**	X	X	X
15 kW		208/230V-3ph	**21J34**	X	X	X
		460V-3ph	**21J39**	X	X	X
20 kW		208/230V-3ph	**21J35**		X	X
		460V-3ph	**21J40**		X	X

[1] Not for seismic-rated applications.

[2] Field wiring for electric heat is separate from the unit power supply. A second, separate power source is required.

X = Field Installed

OPTIONS / ACCESSORIES

Item		Catalog No.	Model No.		
			QHA036	QHA048	QHA060
23 kW	208/230V-3ph	**21J36**			X
	460V-3ph	**21J41**			X
ECONOMIZER					
Standard Economizer With Outdoor Air Hood (Not for Title 24)					
Downflow or Horizontal (Includes Barometric Relief Dampers and Exhaust Hood)		**21U15**	X	X	X
High Performance Economizer With Outdoor Air Hood (Approved for California Title 24 Building Standards / AMCA Class 1A Certified)					
Downflow or Horizontal (Includes Barometric Relief Dampers and Exhaust Hood)		**21U17**	X	X	X
Economizer Controls					
Single Enthalpy Control (Standard)		**21Z09**	X	X	X
Single Enthalpy Control (High Performance)		**11G21**	X	X	X
OUTDOOR AIR					
Outdoor Air Dampers With Outdoor Air Hood					
Motorized		**21U19**	X	X	X
Manual		**21U20**	X	X	X
ROOF CURBS					
Clip Curbs					
8 in height		**21J17**	X	X	X
14 in height		**21J19**	X	X	X
18 in height		**21J20**	X	X	X
24 in height		**21J25**	X	X	X
Adjustable Pitch Roof Curb (Knock-Down Style)					
14 in height		**21U04**	X	X	X
Adjustable Pitch Roof Curb (Welded Style)					
14 in height		**22V55**	X	X	X
Strapping Kits for Roof Curbs					
Strapping Kit - Hurricane (Slab Mount)		**21J74**	X	X	X
Strapping Kit - Hurricane (Rail Mount)		**22G53**	X	X	X
Strapping Kit - Seismic		**21J75**	X	X	X

[1] Not for seismic-rated applications.

[2] Field wiring for electric heat is separate from the unit power supply. A second, separate power source is required.

X = Field Installed

SPECIFICATIONS

		3 Ton	4 Ton	5 Ton
General Data	Nominal Tonnage	**3 Ton**	**4 Ton**	**5 Ton**
	Model Number	**QHA036S5D**	**QHA048S5D**	**QHA060S5D**
	Efficiency Type	**Standard**	**Standard**	**Standard**
	Blower Type	Direct Drive (ECM)	Direct Drive (ECM)	Direct Drive (ECM)
Cooling Performance	Gross Cooling Capacity - Btuh	35,000	48,000	59,000
	[1] Net Cooling Capacity - Btuh	34,000	45,500	55,500
	AHRI Rated Air Flow - cfm	1200	1600	1750
	Total Unit Power - kW	3.13	3.76	4.85
	[1] SEER2	13.4	14.00	14.00
	[1] EER2	10.6	11.50	11.50
Heating Performance	[1] Total High Heating Capacity - Btuh	35,000	47,000	57,000
	Total Unit Power - kW	3.12	3.75	4.83
	[1] COP	3.68	3.75	3.58
	[1] HSPF2 - Region IV (Region V)	6.7 / 6.3	6.7 / 5.59	6.7 / 5.9
	[1] Total Low Heating Capacity - Btuh	21,000	25,000	30,000
	Total Unit Power - kW	2.84	3.52	4.31
	[1] COP	2.2	2.1	2.08
Refrigerant Charge	Refrigerant Type	R-454B	R-454B	R-454B
		8 lbs. 8 oz.	8 lbs. 15 oz.	9 lbs. 6 oz.
Electric Heat Available		5, 10, and 15 kW	5, 10, 15, and 20 kW	5, 10, 15, 20, and 23 kW
Compressor Type		Scroll (1)	Scroll (1)	Scroll (1)
Outdoor Coil	Net face area (total) - sq. ft.	33.57	33.57	37.66
	Tube diameter - in.	5/16	5/16	5/16
	Number of rows	2	2	2
	Fins per inch	22	22	22
Outdoor Coil Fan	Motor - (No.) horsepower	(1) 1/3	(1) 1/3	(1) 1/3
	Motor rpm	825	825	825
	Total Motor Input - watts	280	280	280
	Diameter - (No.) in.	(1) 24	(1) 24	(1) 24
	Number of blades	3	3	3
Indoor Coil	Net face area (total) - sq. ft.	6.75	6.75	6.75
	Tube diameter - in.	3/8	3/8	3/8
	Number of rows	3	3	3
	Fins per inch	15	15	15
	Drain connection (Number) and size - in.	(1) 3/4 in. NPT coupling		
	Expansion device type	Refrigerant Metering Orifice		Balanced Port TXV
Indoor Blower	Nominal motor HP	0.75 HP (ECM)	1.0 HP (ECM)	1.0 HP (ECM)
	Blower wheel nominal diameter x width - in.	(1) 12 x 9	(1) 12 x 9	(1) 12 x 10
[2] Filters	Type of filter	Disposable		
	Number and size - in.	(2) 20 x 20 x 1	(2) 20 x 20 x 1	(2) 20 x 20 x 1
Electrical characteristics		208/230V or 460V-60Hz -3ph		

NOTE - Net capacity includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.

[1] AHRI Certified to AHRI Standard 210/240:
Cooling Ratings - 95°F outdoor air temperature and 80°F db/67°F wb entering indoor coil air.
High Temperature Heating Ratings - 47°F db/43°F wb outdoor air temperature and 70°F entering indoor coil air.
Low Temperature Heating Ratings - 17°F db/15°F wb outdoor air temperature and 70°F entering indoor coil air.

[2] Filters are not furnished and must be field provided.

COOLING / HEATING RATINGS

NOTE − For Temperatures and Capacities not shown in tables, see bulletin − Cooling Unit Rating Table Correction Factor Data in Miscellaneous Engineering Data section.

3 Ton Cooling - QHA036S5D

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			85° F (29.4° C)						95° F (35° C)						105° F (40.6° C)						115° F (46.1° C)					
			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb		
	cfm	L/s	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C
59°F (15°C)	1000	470	35.4	10.4	2250	.90	1.00	1.00	34.2	10.0	2550	.92	1.00	1.00	33.0	9.7	2880	.94	1.00	1.00	31.6	9.3	3260	.96	1.00	1.00
	1200	565	37.8	11.1	2250	.96	1.00	1.00	36.6	10.7	2550	.97	1.00	1.00	35.0	10.3	2890	1.00	1.00	1.00	33.6	9.8	3270	1.00	1.00	1.00
	1400	660	39.5	11.6	2250	1.00	1.00	1.00	38.5	11.3	2560	1.00	1.00	1.00	36.6	10.7	2900	1.00	1.00	1.00	35.2	10.3	3270	1.00	1.00	1.00
63°F (17.2°C)	1000	470	37.4	11.0	2250	.74	.87	.98	35.8	10.5	2550	.76	.89	1.00	34.0	10.0	2890	.77	.91	1.00	32.6	9.6	3260	.79	.93	1.00
	1200	565	39.0	11.4	2250	.78	.93	1.00	37.4	11.0	2550	.80	.95	1.00	35.6	10.4	2890	.82	.97	1.00	33.6	9.8	3270	.84	1.00	1.00
	1400	660	40.5	11.9	2250	.83	.98	1.00	38.5	11.3	2560	.84	1.00	1.00	36.6	10.7	2900	.87	1.00	1.00	35.2	10.3	3270	.89	1.00	1.00
67°F (19.4°C)	1000	470	39.5	11.6	2250	.60	.72	.84	38.0	11.1	2560	.60	.73	.86	36.2	10.6	2900	.62	.75	.88	34.6	10.1	3270	.63	.77	.91
	1200	565	41.5	12.2	2250	.63	.76	.89	39.5	11.6	2560	.64	.78	.92	38.0	11.1	2900	.65	.80	.94	35.8	10.5	3270	.67	.83	.97
	1400	660	42.5	12.5	2250	.66	.81	.95	41.0	12.0	2560	.67	.83	.97	39.0	11.4	2900	.68	.85	1.00	36.8	10.8	3280	.70	.88	1.00
71°F (21.7°C)	1000	470	42.0	12.3	2250	.46	.58	.70	40.0	11.7	2560	.46	.59	.71	38.5	11.3	2900	.47	.61	.73	36.4	10.7	3270	.48	.62	.75
	1200	565	44.0	12.9	2260	.49	.62	.74	42.0	12.3	2560	.49	.63	.76	40.0	11.7	2900	.48	.64	.78	37.8	11.1	3280	.49	.66	.81
	1400	660	45.5	13.3	2260	.50	.65	.78	43.5	12.7	2560	.50	.66	.81	41.0	12.0	2900	.51	.68	.83	39.0	11.4	3280	.51	.69	.86

3 Ton Heating - QHA036S5D

Indoor Coil Air Volume 65°F db (28°C db)		Air Temperature Entering Outdoor Coil											
		65°F (18°C)			45°F (7°C)			25°F (-4°C)			5°F (-15°C)		
		Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input
CFM	L/s	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW	
1050	495	49.7	14.6	2680	37.8	11.1	2480	25.9	7.6	2270	15.9	4.7	2015
1200	565	50.2	14.7	2580	38.4	11.3	2380	26.4	7.7	2170	16.4	4.8	1915
1350	635	50.7	14.9	2510	38.8	11.4	2305	26.9	7.9	2100	16.9	5.0	1845

QHA036S5 - Heating Performance

Outdoor Temperature		Compressor Motor kW Input	Total Output		COP
°F	°C		kBtuh	kw	
65	18	2.58	50.2	14.7	4.63
60	16	2.53	47.3	13.9	4.41
55	13	2.49	44.4	13.0	4.21
50	10	2.44	41.5	12.2	4
47	8	2.41	39.8	11.7	3.86
45	7	2.38	38.4	11.3	3.76
40	4	2.32	34.9	10.2	3.49
35	2	2.25	31.4	9.2	3.21
30	-1	2.21	28.9	8.5	2.98
25	-4	2.17	26.4	7.7	2.76
20	-7	2.14	23.9	7.0	2.54
17	-8	2.12	22.4	6.6	2.4
15	-9	2.1	21.3	6.2	2.29
10	-12	2.05	18.4	5.4	2.01
5	-15	1.92	16.4	4.8	1.91
0	-18	1.79	14.5	4.2	1.82
-5	-21	1.66	12.5	3.7	1.7
-10	-23	1.53	10.6	3.1	1.56
-15	-26	1.4	8.7	2.5	1.4
-20	-29	1.27	6.7	2.0	1.19

	Inputs					
	Cap	Watts	Cap	Watts	Cap	Watts
	Low		Med		High	
CFM	1050		1200		1350	
47	39248.8	2505.32	39778.91	2405.432	40245.87	2333.72
35	---	---	31367.99	2246.986	---	---
17	---	---	22411.57	2112.793	---	---

Indoor Coil Air Volume 70°F db (28°C db)		Air Temperature Entering Outdoor Coil											
		65°F (18°C)			45°F (7°C)			25°F (-4°C)			5°F (-15°C)		
		Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input
CFM	L/s	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW	
1050	495	49.1	14.4	2850	37.5	11.0	2630	25.7	7.5	2410	15.8	4.6	2135
1200	565	49.7	14.6	2745	38.0	11.1	2530	26.2	7.7	2310	16.4	4.8	2035
1350	635	50.1	14.7	2670	38.4	11.3	2455	26.6	7.8	2235	16.8	4.9	1960

QHA036S5 - Heating Performance

Outdoor Temperature		Compressor Motor kW Input	Total Output		COP
°F	°C		kBtuh	kw	
65	18	2.75	49.7	14.6	4.35
60	16	2.7	46.8	13.7	4.16
55	13	2.64	44	12.9	3.97
50	10	2.59	41.1	12.0	3.76
47	8	2.56	39.4	11.5	3.64
45	7	2.53	38	11.1	3.55
40	4	2.46	34.6	10.1	3.29
35	2	2.39	31.1	9.1	3.03
30	-1	2.35	28.7	8.4	2.83
25	-4	2.31	26.2	7.7	2.61
20	-7	2.27	23.8	7.0	2.4
17	-8	2.25	22.3	6.5	2.28
15	-9	2.23	21.1	6.2	2.17
10	-12	2.17	18.3	5.4	1.91
5	-15	2.04	16.4	4.8	1.83
0	-18	1.9	14.4	4.2	1.73
-5	-21	1.76	12.5	3.7	1.62
-10	-23	1.62	10.6	3.1	1.49
-15	-26	1.49	8.6	2.5	1.33
-20	-29	1.35	6.7	2.0	1.14

	Inputs					
	Cap	Watts	Cap	Watts	Cap	Watts
	Low		Med		High	
CFM	1050		1200		1350	
47	38847.26	2659.991	39392.45	2557.47	39810.89	2482.295
35	---	---	31133.36	2389.15	---	---
17	---	---	22288.56	2244.56	---	---

Indoor Coil Air Volume 75°F db (28°C db)		Air Temperature Entering Outdoor Coil											
		65°F (18°C)			45°F (7°C)			25°F (-4°C)			5°F (-15°C)		
		Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input
CFM	L/s	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW	
1050	495	48.5	14.2	3025	37.1	10.9	2795	25.5	7.5	2560	15.8	4.6	2265
1200	565	49.1	14.4	2920	37.6	11.0	2690	26.0	7.6	2455	16.3	4.8	2160
1350	635	49.5	14.5	2840	38.1	11.2	2610	26.5	7.8	2375	16.7	4.9	2085

QHA036S5 - Heating Performance

Outdoor Temperature		Compressor Motor kW Input	Total Output		COP
°F	°C		kBtuh	kw	
65	18	2.92	49.1	14.4	4.09
60	16	2.86	46.3	13.6	3.91
55	13	2.81	43.5	12.7	3.74
50	10	2.75	40.7	11.9	3.55
47	8	2.72	39	11.4	3.43
45	7	2.69	37.6	11.0	3.34
40	4	2.62	34.2	10.0	3.1
35	2	2.54	30.9	9.1	2.87
30	-1	2.5	28.4	8.3	2.67
25	-4	2.46	26	7.6	2.47
20	-7	2.41	23.6	6.9	2.27
17	-8	2.39	22.2	6.5	2.16
15	-9	2.36	21	6.2	2.06
10	-12	2.31	18.2	5.3	1.81
5	-15	2.16	16.3	4.8	1.74
0	-18	2.02	14.4	4.2	1.65
-5	-21	1.87	12.4	3.6	1.53
-10	-23	1.73	10.5	3.1	1.4
-15	-26	1.58	8.6	2.5	1.26
-20	-29	1.43	6.6	1.9	1.07

	Inputs					
	Cap	Watts	Cap	Watts	Cap	Watts
	Low		Med		High	
CFM	1050		1200		1350	
47	38450.67	2824.289	38975.43	2717.78	39403.32	2640.393
35	---	---	30858.2	2538.58	---	---
17	---	---	22154.79	2384.355	---	---

COOLING / HEATING RATINGS

NOTE − For Temperatures and Capacities not shown in tables, see bulletin − Cooling Unit Rating Table Correction Factor Data in Miscellaneous Engineering Data section.

4 Ton Cooling - QHA048S5D

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			85° F (29.4° C)						95° F (35° C)						105° F (40.6° C)						115° F (46.1° C)					
			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb		
	cfm	L/s	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C
59°F (15°C)	1300	615	44	12.9	2720	0.95	1	1	42	12.3	3090	0.97	1	1	40.5	11.9	3510	1	1	1	38.5	11.3	3980	1	1	1
	1650	780	47.5	13.9	2730	1	1	1	45.5	13.3	3100	1	1	1	43.5	12.7	3520	1	1	1	41.5	12.2	3990	1	1	1
	2000	945	50	14.7	2730	1	1	1	48	14.1	3110	1	1	1	46	13.5	3530	1	1	1	43.5	12.7	4000	1	1	1
63°F (17.2°C)	1300	615	45	13.2	2720	0.78	0.92	1	43.5	12.7	3090	0.8	0.94	1	41.5	12.2	3510	0.82	0.97	1	39	11.4	3980	0.84	1	1
	1650	780	47.5	13.9	2730	0.85	1	1	45.5	13.3	3100	0.87	1	1	43.5	12.7	3520	0.89	1	1	41.5	12.2	3990	0.93	1	1
	2000	945	50	14.7	2730	0.92	1	1	48	14.1	3110	0.94	1	1	46	13.5	3530	0.97	1	1	43.5	12.7	4000	1	1	1
67°F (19.4°C)	1300	615	48	14.1	2730	0.62	0.76	0.89	46	13.5	3100	0.64	0.78	0.91	43.5	12.7	3520	0.65	0.8	0.94	41	12	3990	0.66	0.82	0.97
	1650	780	50.5	14.8	2730	0.67	0.83	0.98	48	14.1	3110	0.69	0.85	1	45.5	13.3	3530	0.7	0.88	1	43	12.6	4000	0.72	0.91	1
	2000	945	52	15.2	2740	0.72	0.9	1	49.5	14.5	3110	0.74	0.93	1	47	13.8	3540	0.76	0.96	1	44.5	13	4010	0.78	0.99	1
71°F (21.7°C)	1300	615	50.5	14.8	2730	0.48	0.61	0.74	48.5	14.2	3110	0.48	0.63	0.76	46	13.5	3530	0.49	0.64	0.77	43.5	12.7	4000	0.51	0.66	0.8
	1650	780	53.5	15.7	2740	0.5	0.66	0.81	51	14.9	3110	0.51	0.68	0.83	48	14.1	3540	0.52	0.7	0.86	45.5	13.3	4010	0.54	0.72	0.89
	2000	945	55	16.1	2740	0.53	0.72	0.88	52.5	15.4	3120	0.54	0.73	0.91	49.5	14.5	3550	0.56	0.75	0.95	47	13.8	4020	0.57	0.78	0.98

4 Ton Heating - QHA048S5D

Indoor Coil Air Volume 65°F db (28°C db)		Air Temperature Entering Outdoor Coil											
		65°F (18°C)			45°F (7°C)			25°F (-4°C)			5°F (-15°C)		
		Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input
CFM	L/s	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW	
1500	710	59.7	17.5	2885	45	13.2	2700	30	8.8	2515	18.4	5.4	2255
1650	780	60.1	17.6	2825	45.5	13.3	2640	30.5	8.9	2455	18.9	5.5	2190
1800	850	60.6	17.8	2775	45.9	13.5	2590	30.9	9.1	2405	19.4	5.7	2145

QHA048S5 - Heating Performance

Outdoor Temperature		Compressor Motor kW Input	Total Output		COP
°F	°C		kBtuh	kw	
65	18	2.83	60.1	17.6	4.84
60	16	2.78	56.6	16.6	4.61
55	13	2.74	53.1	15.6	4.38
50	10	2.69	49.5	14.5	4.13
47	8	2.67	47.4	13.9	3.98
45	7	2.64	45.5	13.3	3.85
40	4	2.58	40.7	11.9	3.51
35	2	2.52	35.9	10.5	3.15
30	-1	2.49	33.2	9.7	2.94
25	-4	2.46	30.5	8.9	2.72
20	-7	2.42	27.7	8.1	2.49
17	-8	2.4	26.1	7.6	2.36
15	-9	2.39	24.7	7.2	2.25
10	-12	2.34	21.1	6.2	1.94
5	-15	2.19	18.9	5.5	1.86
0	-18	2.04	16.7	4.9	1.77
-5	-21	1.89	14.5	4.2	1.66
-10	-23	1.74	12.3	3.6	1.53
-15	-26	1.59	10	2.9	1.36
-20	-29	1.44	7.8	2.3	1.18

	Inputs					
	Cap	Watts	Cap	Watts	Cap	Watts
	Low		Med		High	
CFM	1500		1650		1800	
47	46907.38	2726.685	47378.42	2665.059	47821.84	2617.269
35	---	---	35913.71	2516.105	---	---
17	---	---	26095.58	2402.265	---	---

4 Ton Heating - QHA048S5D

Indoor Coil Air Volume 70°F db (28°C db)		Air Temperature Entering Outdoor Coil											
		65°F (18°C)			45°F (7°C)			25°F (-4°C)			5°F (-15°C)		
		Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input
CFM	L/s	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW	
1500	710	59.1	17.3	3075	44.6	13.1	2880	29.8	8.7	2675	18.3	5.4	2400
1650	780	59.5	17.4	3005	45.1	13.2	2810	30.3	8.9	2610	18.8	5.5	2335
1800	850	60	17.6	2955	45.5	13.3	2760	30.7	9	2560	19.3	5.7	2280

QHA048S5 - Heating Performance

Outdoor Temperature		Compressor Motor kW Input	Total Output		COP
°F	°C		kBtuh	kw	
65	18	3.01	59.5	17.4	4.56
60	16	2.96	56	16.4	4.34
55	13	2.92	52.5	15.4	4.12
50	10	2.87	49	14.4	3.89
47	8	2.84	46.9	13.7	3.75
45	7	2.81	45.1	13.2	3.63
40	4	2.75	40.4	11.8	3.32
35	2	2.68	35.7	10.5	2.98
30	-1	2.65	33	9.7	2.79
25	-4	2.61	30.3	8.9	2.58
20	-7	2.58	27.5	8.1	2.36
17	-8	2.56	25.9	7.6	2.23
15	-9	2.54	24.5	7.2	2.12
10	-12	2.49	21	6.2	1.85
5	-15	2.34	18.8	5.5	1.77
0	-18	2.18	16.6	4.9	1.68
-5	-21	2.02	14.4	4.2	1.57
-10	-23	1.86	12.2	3.6	1.45
-15	-26	1.7	10	2.9	1.3
-20	-29	1.54	7.8	2.3	1.12

	Inputs					
	Cap	Watts	Cap	Watts	Cap	Watts
	Low		Med		High	
CFM	1500		1650		1800	
47	46468.03	2904.286	46925.49	2838.889	47386.16	2787.868
35	---	---	35705.88	2679.738	---	---
17	---	---	25913.7	2557.874	---	---

4 Ton Heating - QHA048S5D

Indoor Coil Air Volume 75°F db (28°C db)		Air Temperature Entering Outdoor Coil											
		65°F (18°C)			45°F (7°C)			25°F (-4°C)			5°F (-15°C)		
		Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input
CFM	L/s	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW	
1500	710	58.6	17.2	3275	44.2	13	3065	29.5	8.6	2850	18.1	5.3	2555
1650	780	59	17.3	3205	44.7	13.1	3000	30	8.8	2785	18.6	5.5	2485
1800	850	59.5	17.4	3150	45.1	13.2	2945	30.4	8.9	2730	19	5.6	2430

QHA048S5 - Heating Performance

Outdoor Temperature		Compressor Motor kW Input	Total Output		COP
°F	°C		kBtuh	kw	
65	18	3.21	59	17.3	4.3
60	16	3.16	55.6	16.3	4.1
55	13	3.11	52.1	15.3	3.88
50	10	3.06	48.6	14.2	3.67
47	8	3.03	46.5	13.6	3.54
45	7	3	44.7	13.1	3.43
40	4	2.93	40	11.7	3.13
35	2	2.86	35.4	10.4	2.82
30	-1	2.82	32.7	9.6	2.62
25	-4	2.79	30	8.8	2.43
20	-7	2.75	27.2	8	2.23
17	-8	2.73	25.6	7.5	2.11
15	-9	2.71	24.2	7.1	2
10	-12	2.66	20.7	6.1	1.73
5	-15	2.49	18.6	5.5	1.67
0	-18	2.32	16.4	4.8	1.58
-5	-21	2.15	14.2	4.2	1.48
-10	-23	1.98	12	3.5	1.36
-15	-26	1.81	9.9	2.9	1.23
-20	-29	1.64	7.7	2.3	1.05

	Inputs					
	Cap	Watts	Cap	Watts	Cap	Watts
	Low		Med		High	
CFM	1500		1650		1800	
47	46020.06	3093.981	46499.4	3026.077	46926.04	2971.73
35	---	---	35423.79	2855.386	---	---
17	---	---	25612.56	2725.421	---	---

COOLING / HEATING RATINGS

NOTE − For Temperatures and Capacities not shown in tables, see bulletin − Cooling Unit Rating Table Correction Factor Data in Miscellaneous Engineering Data section.

5 Ton Cooling - QHA060S5D

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																					
			85° F (29.4° C)						95° F (35° C)						105° F (40.6° C)						115° F (46.1° C)					
			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb			Total Cool Cap.		Comp. Motor Watts Input	Sensible/Total Ratio (S/T) Dry Bulb		
	cfm	L/s	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C	kBtuh	kW		75°F 23.9°C	80°F 26.7°C	85°F 29.4°C
59°F (15°C)	1450	685	53	15.5	3470	0.91	1	1	51	14.9	3970	0.93	1	1	49	14.4	4540	0.95	1	1	46.5	13.6	5180	0.98	1	1
	1830	865	57	16.7	3490	0.99	1	1	55	16.1	4000	1	1	1	53	15.5	4570	1	1	1	50	14.7	5220	1	1	1
	2200	1040	60.5	17.7	3520	1	1	1	58	17	4020	1	1	1	55.5	16.3	4600	1	1	1	53	15.5	5240	1	1	1
63°F (17.2°C)	1450	685	55.5	16.3	3480	0.75	0.88	1	53	15.5	3980	0.76	0.9	1	50.5	14.8	4550	0.78	0.92	1	48	14.1	5200	0.81	0.95	1
	1830	865	58.5	17.1	3510	0.81	0.96	1	56	16.4	4010	0.83	0.98	1	53	15.5	4570	0.85	1	1	50	14.7	5220	0.88	1	1
	2200	1040	60.5	17.7	3520	0.87	1	1	58	17	4020	0.89	1	1	55.5	16.3	4600	0.92	1	1	53	15.5	5240	0.95	1	1
67°F (19.4°C)	1450	685	59	17.3	3510	0.6	0.73	0.85	56	16.4	4010	0.62	0.75	0.87	53.5	15.7	4580	0.63	0.76	0.9	50.5	14.8	5220	0.64	0.79	0.92
	1830	865	61.5	18	3530	0.65	0.79	0.93	59	17.3	4030	0.66	0.81	0.96	56.5	16.6	4600	0.67	0.83	0.98	53	15.5	5240	0.69	0.86	1
	2200	1040	64	18.8	3550	0.69	0.85	1	61	17.9	4050	0.7	0.87	1	58	17	4620	0.72	0.9	1	54	15.8	5260	0.74	0.94	1
71°F (21.7°C)	1450	685	62	18.2	3530	0.47	0.59	0.71	59.5	17.4	4040	0.47	0.61	0.72	56.5	16.6	4610	0.48	0.62	0.74	53.5	15.7	5250	0.5	0.63	0.77
	1830	865	65.5	19.2	3560	0.49	0.64	0.77	62.5	18.3	4070	0.49	0.65	0.79	59	17.3	4640	0.51	0.67	0.82	56	16.4	5280	0.52	0.68	0.84
	2200	1040	67.5	19.8	3580	0.51	0.68	0.83	64	18.8	4090	0.52	0.7	0.86	61	17.9	4660	0.54	0.71	0.88	57.5	16.9	5300	0.55	0.74	0.92

5 Ton Heating - QHA060S5D

Indoor Coil Air Volume 65°F db (28°C db)		Air Temperature Entering Outdoor Coil											
		65°F (18°C)			45°F (7°C)			25°F (-4°C)			5°F (-15°C)		
		Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input
CFM	L/s	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW	
1600	755	71	20.8	4155	55.6	16.3	3815	39.9	11.7	3470	26.6	7.8	3030
1750	825	71.4	20.9	4050	56	16.4	3710	40.3	11.8	3370	26.9	7.9	2930
1900	895	71.8	21	3970	56.4	16.5	3630	40.7	11.9	3290	27.4	8	2850

QHA060S5 - Heating Performance

Outdoor Temperature		Compressor Motor kW Input	Total Output		COP
°F	°C		kBtuh	kw	
65	18	4.05	71.4	20.9	4.3
60	16	3.97	67.6	19.8	4.13
55	13	3.89	63.9	18.7	3.98
50	10	3.8	60.1	17.6	3.81
47	8	3.75	57.9	17	3.71
45	7	3.71	56	16.4	3.61
40	4	3.62	51.1	15	3.36
35	2	3.53	46.3	13.6	3.11
30	-1	3.45	43.3	12.7	2.96
25	-4	3.37	40.3	11.8	2.81
20	-7	3.29	37.2	10.9	2.64
17	-8	3.24	35.4	10.4	2.54
15	-9	3.21	33.9	9.9	2.45
10	-12	3.13	30.2	8.9	2.23
5	-15	2.93	26.9	7.9	2.12
0	-18	2.73	23.7	6.9	2.01
-5	-21	2.54	20.4	6	1.86
-10	-23	2.34	17.1	5	1.69
-15	-26	2.14	13.9	4.1	1.51
-20	-29	1.95	10.6	3.1	1.27

	Inputs					
	Cap	Watts	Cap	Watts	Cap	Watts
	Low		Med		High	
CFM	1600		1750		1900	
47	57543.68	3851.083	57895.35	3748.218	58354.52	3668.86
35	---	---	46306.6	3528.108	---	---
17	---	---	35420.38	3242.176	---	---

5 Ton Heating - QHA060S5D

Indoor Coil Air Volume 70°F db (28°C db)		Air Temperature Entering Outdoor Coil											
		65°F (18°C)			45°F (7°C)			25°F (-4°C)			5°F (-15°C)		
		Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input
CFM	L/s	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW	
1600	755	70.4	20.6	4445	54.9	16.1	4080	39.2	11.5	3715	25.9	7.6	3245
1750	825	71	20.8	4340	55.5	16.3	3980	39.8	11.7	3610	26.5	7.8	3145
1900	895	71.4	20.9	4255	56	16.4	3895	40.2	11.8	3525	27	7.9	3055

QHA060S5 - Heating Performance

Outdoor Temperature		Compressor Motor kW Input	Total Output		COP
°F	°C		kBtuh	kw	
65	18	4.34	71	20.8	4.03
60	16	4.25	67.2	19.7	3.88
55	13	4.16	63.5	18.6	3.74
50	10	4.07	59.7	17.5	3.57
47	8	4.02	57.5	16.9	3.48
45	7	3.98	55.5	16.3	3.39
40	4	3.88	50.6	14.8	3.15
35	2	3.78	45.7	13.4	2.91
30	-1	3.7	42.8	12.5	2.77
25	-4	3.61	39.8	11.7	2.62
20	-7	3.53	36.8	10.8	2.47
17	-8	3.48	35	10.3	2.37
15	-9	3.45	33.5	9.8	2.29
10	-12	3.36	29.7	8.7	2.07
5	-15	3.15	26.5	7.8	1.98
0	-18	2.93	23.3	6.8	1.87
-5	-21	2.72	20.1	5.9	1.74
-10	-23	2.51	16.9	5	1.58
-15	-26	2.3	13.7	4	1.4
-20	-29	2.09	10.5	3.1	1.19

	Inputs					
	Cap	Watts	Cap	Watts	Cap	Watts
	Low		Med		High	
CFM	1600		1750		1900	
47	56883.72	4120.465	57476.28	4017.853	57946.1	3932.833
35	---	---	45737.46	3777.495	---	---
17	---	---	34988.95	3479.203	---	---

5 Ton Heating - QHA060S5D

Indoor Coil Air Volume 75°F db (28°C db)		Air Temperature Entering Outdoor Coil											
		65°F (18°C)			45°F (7°C)			25°F (-4°C)			5°F (-15°C)		
		Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input	Total Heating Capacity		Comp. Motor Watts Input
CFM	L/s	kBtuh	kW		kBtuh	kW		kBtuh	kW		kBtuh	kW	
1600	755	69.8	20.5	4750	54.4	15.9	4370	38.7	11.3	3985	25.4	7.4	3485
1750	825	70.4	20.6	4645	55	16.1	4260	39.4	11.5	3875	26	7.6	3375
1900	895	70.8	20.7	4555	55.4	16.2	4170	39.7	11.6	3785	26.4	7.7	3285

QHA060S5 - Heating Performance

Outdoor Temperature		Compressor Motor kW Input	Total Output		COP
°F	°C		kBtuh	kw	
65	18	4.65	70.4	20.6	3.78
60	16	4.55	66.7	19.5	3.64
55	13	4.46	62.9	18.4	3.49
50	10	4.36	59.2	17.3	3.35
47	8	4.31	56.9	16.7	3.25
45	7	4.26	55	16.1	3.17
40	4	4.16	50.3	14.7	2.96
35	2	4.05	45.5	13.3	2.73
30	-1	3.97	42.5	12.5	2.59
25	-4	3.88	39.4	11.5	2.45
20	-7	3.79	36.3	10.6	2.3
17	-8	3.74	34.4	10.1	2.2
15	-9	3.7	32.9	9.6	2.12
10	-12	3.61	29.2	8.6	1.92
5	-15	3.38	26	7.6	1.83
0	-18	3.15	22.9	6.7	1.73
-5	-21	2.93	19.7	5.8	1.6
-10	-23	2.7	16.6	4.9	1.47
-15	-26	2.47	13.5	4	1.31
-20	-29	2.24	10.3	3	1.1

	Inputs					
	Cap	Watts	Cap	Watts	Cap	Watts
	Low		Med		High	
CFM	1600		1750		1900	
47	56291.09	4411.679	56921.68	4303.757	57293.47	4212.755
35	---	---	45543.25	4051.9	---	---
17	---	---	34407.58	3736.57	---	---

BLOWER DATA

QHA036S5D

Blower Tap		External Static (in.w.g.)									
		0.1	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**
Tap 1 (Fan Only)	Cfm	923	848	748	631	541	474	405	342	---	---
	RPM	443	496	560	623	667	707	748	788	---	---
	Watts	84	91	100	108	114	119	125	131	---	---
Tap 2 (Low Cooling)	Cfm	1488	1429	1371	1312	1250	1175	1110	1038	952	881
	RPM	676	704	734	763	794	836	873	911	951	982
	Watts	259	266	275	283	292	305	317	328	340	350
Tap 3 (High Cooling)	Cfm	1663	1612	1567	1518	1476	1424	1376	1316	1262	1193
	RPM	671	701	728	762	789	823	855	893	931	971
	Watts	322	333	343	355	366	379	390	405	419	435
[1] Tap 4 (Low Electric Heat)	Cfm	1488	1429	1371	1312	1250	1175	1110	1038	952	881
	RPM	676	704	734	763	794	836	873	911	951	982
	Watts	259	266	275	283	292	305	317	328	340	350
[1] Tap 5 (High Electric Heat)	Cfm	1663	1612	1567	1518	1476	1424	1376	1316	1262	1193
	RPM	671	701	728	762	789	823	855	893	931	971
	Watts	322	333	343	355	366	379	390	405	419	435

NOTE - All air data is measured external to unit with dry coil and without air filters.

[1] Taps 4 and 5 are used with Optional Electric Heat. Refer to Electric Heat nameplate for proper heat tap selection.

BLOWER DATA

QHA048S5D

Blower Tap		External Static (in.w.g.)									
		0.1	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**
Tap 1 (Fan Only)	Cfm	1301	1175	1053	987	904	817	715	637	579	530
	RPM	574	584	607	647	699	749	804	845	876	909
	Watts	193	177	170	177	188	197	210	218	224	231
Tap 2 (Low Cooling)	Cfm	1875	1830	1782	1734	1686	1638	1588	1536	1482	1426
	RPM	768	796	823	850	877	903	929	954	982	1011
	Watts	428	441	454	467	480	492	504	516	529	543
Tap 3 (High Cooling)	Cfm	1961	1919	1877	1838	1800	1759	1716	1676	1635	1595
	RPM	791	817	840	868	890	916	942	968	993	1020
	Watts	472	486	498	512	523	537	550	565	577	591
[1] Tap 4 (Low Electric Heat)	Cfm	1875	1830	1782	1734	1686	1638	1588	1536	1482	1426
	RPM	768	796	823	850	877	903	929	954	982	1011
	Watts	428	441	454	467	480	492	504	516	529	543
[1] Tap 5 (High Electric Heat)	Cfm	1961	1919	1877	1838	1800	1759	1716	1676	1635	1595
	RPM	791	817	840	868	890	916	942	968	993	1020
	Watts	472	486	498	512	523	537	550	565	577	591

NOTE - All air data is measured external to unit with dry coil and without air filters.

[1] Taps 4 and 5 are used with Optional Electric Heat. Refer to Electric Heat nameplate for proper heat tap selection.

QHA060S5D

Blower Tap		External Static (in.w.g.)									
		0.1	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**
Tap 1 (Fan Only)	Cfm	1401	1339	1285	1231	1177	1114	1041	978	886	811
	RPM	595	628	658	694	729	774	817	867	922	969
	Watts	212	221	227	237	246	258	269	282	297	308
Tap 2 (Low Cooling)	Cfm	1974	1926	1880	1840	1798	1756	1718	1676	1638	1596
	RPM	788	812	837	858	878	900	926	954	980	1011
	Watts	505	514	526	537	547	556	571	584	597	611
Tap 3 (High Cooling)	Cfm	2337	2302	2263	2226	2182	2147	2107	2072	2038	1992
	RPM	913	931	953	971	992	1010	1032	1044	1069	1090
	Watts	816	829	842	854	868	878	894	900	915	919
[1] Tap 4 (Low Electric Heat)	Cfm	1974	1926	1880	1840	1798	1756	1718	1676	1638	1596
	RPM	788	812	837	858	878	900	926	954	980	1011
	Watts	505	514	526	537	547	556	571	584	597	611
[1] Tap 5 (High Electric Heat)	Cfm	2337	2302	2263	2226	2182	2147	2107	2072	2038	1992
	RPM	913	931	953	971	992	1010	1032	1044	1069	1090
	Watts	816	829	842	854	868	878	894	900	915	919

NOTE - All air data is measured external to unit with dry coil and without air filters.

[1] Taps 4 and 5 are used with Optional Electric Heat. Refer to Electric Heat nameplate for proper heat tap selection.

BLOWER DATA

AIR RESISTANCE DATA - in. w.g.

Air Volume cfm	Wet Indoor Coil			Optional Economizer
	036	048	060	
600	0.01	0.01	- - -	0.02
700	0.01	0.01	0.01	0.03
800	0.01	0.01	0.01	0.04
900	0.02	0.01	0.01	0.05
1000	0.02	0.02	0.02	0.06
1100	0.02	0.02	0.02	0.07
1200	0.03	0.02	0.02	0.08
1300	0.03	0.03	0.03	0.10
1400	0.04	0.03	0.03	0.12
1500	0.05	0.04	0.03	0.13
1600	0.05	0.05	0.03	0.15
1700	0.05	0.05	0.04	0.18
1800	0.06	0.05	0.04	0.20
1900	0.06	0.06	0.04	0.21
2000	0.07	0.06	0.05	0.24

NOTE - Optional Electric Heat has no appreciable air resistance.

DUCT ADAPTER RESISTANCE DATA - in. w.g.

Air Volume cfm	Rectangular to Round Duct Adaptor Kits					
	Downflow		Horizontal			
	14 in. Diameter		14 in. Diameter		16 in. Diameter	18 in. Diameter
	36	48, 60	36	48, 60	48, 60	48, 60
500	0.03	- - -	0.04	- - -	- - -	- - -
600	0.05	- - -	0.07	- - -	- - -	- - -
700	0.08	0.13	0.08	0.13	- - -	- - -
800	0.10	0.17	0.12	0.16	- - -	- - -
900	0.12	0.21	0.15	0.21	- - -	- - -
1000	0.17	0.24	0.19	0.25	0.11	0.03
1100	0.18	0.30	0.23	0.30	0.11	0.03
1200	0.20	0.36	0.29	0.37	0.13	0.03
1300	0.26	0.43	0.31	0.43	0.17	0.03
1400	0.31	0.50	0.39	0.51	0.20	0.03
1500	- - -	0.57	- - -	0.57	0.21	0.05
1600	- - -	0.63	- - -	0.65	0.26	0.05
1700	- - -	0.71	- - -	0.72	0.30	0.06
1800	- - -	0.80	- - -	0.81	0.30	0.06
1900	- - -	0.91	- - -	0.90	0.40	0.06
2000	- - -	0.99	- - -	1.01	0.41	0.06

ELECTRICAL/ELECTRIC HEAT DATA — 3 TON

		Model No.	QHA036S4D	
[1] Voltage - 60Hz			208/230V-3ph	460V-3ph
Compressor		Rated Load Amps	12.2	5.8
		Locked Rotor Amps	102.8	50
Outdoor Fan Motor		Full Load Amps	1.8	1
Indoor Blower Motor		Horsepower	0.75	0.75
		Type	ECM	ECM
		Full Load Amps	6	3.2
[2] Maximum Overcurrent Protection (MOCP)		Unit Only	30	15
[3] Minimum Circuit Ampacity (MCA)		Unit Only	21.95	11.9

ELECTRIC HEAT DATA

Model	Heater	Heater Circuit 240V		Heater Circuit 208V		Heater Circuit 480V		SPP Circuit 240V		SPP Circuit 208V		SPP Circuit 480V	
		[3]Minimum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Over-current Protection (MOCP)	[3]Mini-mum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Over-current Protection (MOCP)
QHA036	5 KW	19.3	20	17.3	20	11.5	15	37	45	35	40	19.42	20
	10 KW	34.3	35	30.3	35	19	20	52	60	48	50	26.94	30
	15 KW	49.4	50	43.3	45	26.6	30	67.1	70	61	70	34.45	35

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

NOTE - Field wiring for electric heat is separate from the unit power supply. A second, separate power source is required.

[1] Extremes of operating range are plus and minus 10% of line voltage.

[2] HACR type breaker or fuse.

[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL/ELECTRIC HEAT DATA — 4 TON

		Model No.	QHA048S4D
[1] Voltage - 60Hz		208/230V-3ph	460V-3ph
Compressor	Rated Load Amps	12.2	5.12
	Locked Rotor Amps	120.4	41
Outdoor Fan Motor	Full Load Amps	1.8	1
Indoor Blower Motor	Horsepower	1.0	1.0
	Type	ECM	ECM
	Full Load Amps	7.6	4
[2] Maximum Overcurrent Protection (MOCP)	Unit Only	35	15
[3] Minimum Circuit Ampacity (MCA)	Unit Only	26.2	11.9

ELECTRIC HEAT DATA

Model	Heater	Heater Circuit 240V		Heater Circuit 208V		Heater Circuit 480V		SPP Circuit 240V		SPP Circuit 208V		SPP Circuit 480V	
		[3]Minimum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Mini-mum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Over-current Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Over-current Protection (MOCP)
QHA048	5 KW	24.5	25	22.5	25	12.5	15	41.2	50	39.2	45	19.42	20
	10 KW	39.6	40	35.6	40	20	25	56.2	60	52.2	60	26.94	30
	15 KW	54.6	60	48.6	50	27.6	30	71.3	80	65.2	70	34.45	35
	20 KW	80.6	90	71.2	80	40.6	45	97.3	100	87.8	90	47.47	50

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

NOTE - Field wiring for electric heat is separate from the unit power supply. A second, separate power source is required.

[1] Extremes of operating range are plus and minus 10% of line voltage.

[2] HACR type breaker or fuse.

[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL/ELECTRIC HEAT DATA — 5 TON

		Model No.	QHA060S4D
[1] Voltage - 60Hz		208/230V-3ph	460V-3ph
Compressor	Rated Load Amps	15.96	6.6
	Locked Rotor Amps	93	60
Outdoor Fan Motor	Full Load Amps	1.8	1
Indoor Blower Motor	Horsepower	1.0	1.0
	Type	ECM	ECM
	Full Load Amps	7.6	4
[2] Maximum Overcurrent Protection (MOCP)	Unit Only	45	20
[3] Minimum Circuit Ampacity (MCA)	Unit Only	29.2	13.7

ELECTRIC HEAT DATA

Model	Heater	Heater Circuit 240V		Heater Circuit 208V		Heater Circuit 480V		SPP Circuit 240V		SPP Circuit 208V		SPP Circuit 480V	
		[3]Minimum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Mini-mum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Mini-mum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Overcurrent Protection (MOCP)	[3]Minimum circuit Ampacity (MCA)	[2]Maximum Over-current Protection (MOCP)
QHA060	5 KW	24.5	25	20.4	25	12.5	15	44.2	50	42.2	50	21.26	25
	10 KW	39.6	40	33.4	35	20	25	59.3	60	55.3	60	28.78	30
	15 KW	54.6	60	46.5	50	27.6	30	74.3	80	68.3	70	36.29	40
	20 KW	80.6	90	69	70	40.6	45	100.3	110	90.9	100	49.31	50
	23 KW	91.3	100	78.3	80	45.9	50	111	125	100.1	110	54.65	60

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

NOTE - Field wiring for electric heat is separate from the unit power supply. A second, separate power source is required.

[1] Extremes of operating range are plus and minus 10% of line voltage.

[2] HACR type breaker or fuse.

[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRIC HEAT CAPACITIES

Input Voltage	5 kW			10 kW			15 kW			20 kW			23 kW		
	No of Stages	kW input	Btuh Output	No of Stages	kW input	Btuh Output	No of Stages	kW input	Btuh Output	No of Stages	kW input	Btuh Output	No of Stages	kW input	Btuh Output
208	1	3.8	12,800	1	7.5	25,600	1	11.2	38,400	1	17.3	59,100	1	19.9	68,000
220	1	4.2	14,300	1	8.4	28,700	1	12.6	43,000	1	18.3	62,600	1	21.1	71,900
230	1	4.6	15,700	1	9.2	31,400	1	13.8	47,000	1	19.2	65,400	1	22.0	75,200
240	1	5.0	17,100	1	10.0	34,200	1	15.0	51,200	1	20.0	68,200	1	23.0	78,500
440	1	4.2	14,300	1	8.4	28,700	1	12.6	43,000	1	18.3	62,600	1	21.1	71,900
460	1	4.6	15,700	1	9.2	31,400	1	13.8	47,000	1	19.2	65,400	1	22.0	75,200
480	1	5.0	17,100	1	10.0	34,200	1	15.0	51,200	1	20.0	68,200	1	23.0	78,500

INSTALLATION CLEARANCES

	in.	mm
Front	24	610
Right Side (blower and evaporator coil access)	24	610
Left Side (compressor access)	24	610
Back	0	0
Top	48	1219

WEIGHT DATA — UNIT

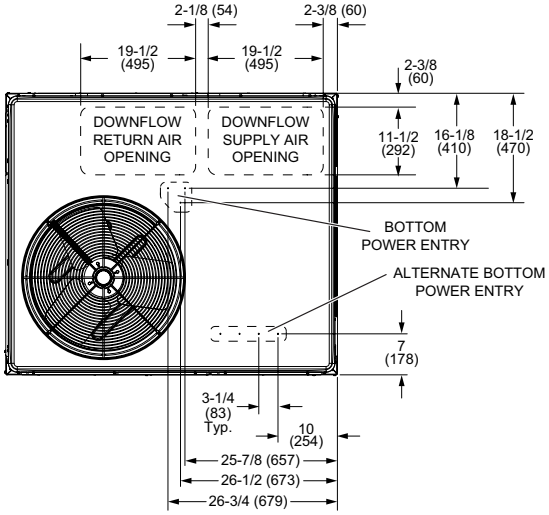
Model Number	Net		Shipping	
	lbs.	kg	lbs.	kg
QHA036	505	229	515	234
QHA048	526	239	536	243
QHA060	536	243	546	248

WEIGHT DATA — OPTIONS / ACCESSORIES

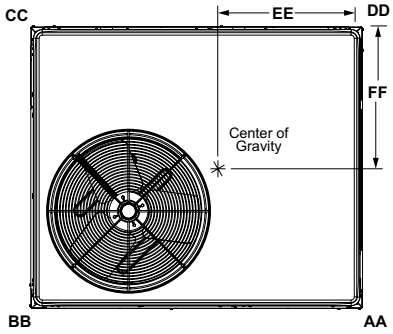
	Shipping	
	lbs.	kg
CABINET		
Tool-Less Filter Access Kit	20	9
ECONOMIZER / OUTDOOR AIR		
Economizer		
Economizer, Includes Barometric Relief Dampers and Exhaust Hood	95	43
Outdoor Air Dampers		
Motorized	35	16
Manual	28	13
ELECTRIC HEAT		
5 kW	6	3
7.5 kW	7	3
10 kW	8	4
15 kW	8	4
20 kW	8	4
23 kW	9	4
ROOF CURBS		
Clip Curbs		
8 in. height	63	29
14 in. height	77	35
18 in. height	99	45
24 in. height	132	60
Adjustable Pitch Roof Curb (Knock-Down Style), Downflow		
14 in. height	95	43
Adjustable Pitch Roof Curb (Welded), Downflow		
14 in. height	68	31

DIMENSIONS — UNIT

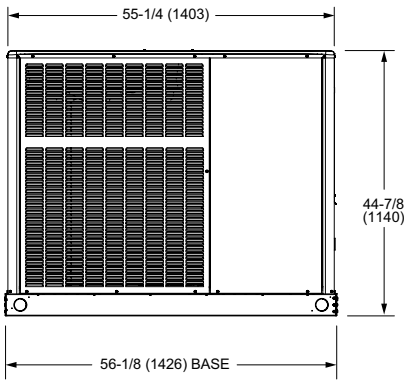
Model Number	CORNER WEIGHTS								CENTER OF GRAVITY			
	AA		BB		CC		DD		EE		FF	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm
QHA036	116	53	126	57	137	62	126	57	25.25	641	21.50	546
QHA048	120	54	132	60	143	65	131	59	25.25	641	21.50	546
QHA060	123	56	134	61	145	66	134	61	25.25	641	21.50	546



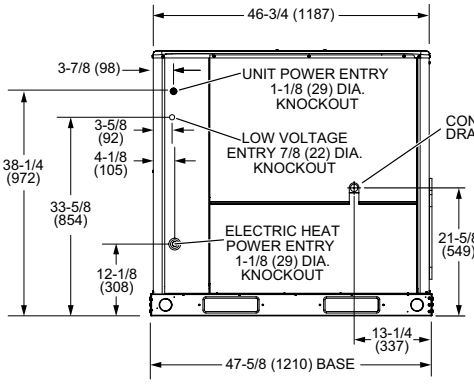
TOP VIEW (Base)



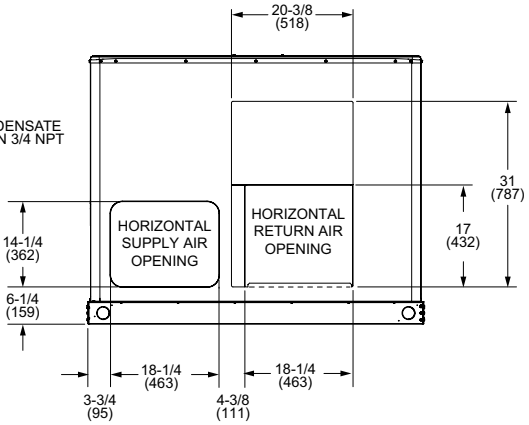
TOP VIEW (Corner Weight and Center of Gravity)



FRONT VIEW

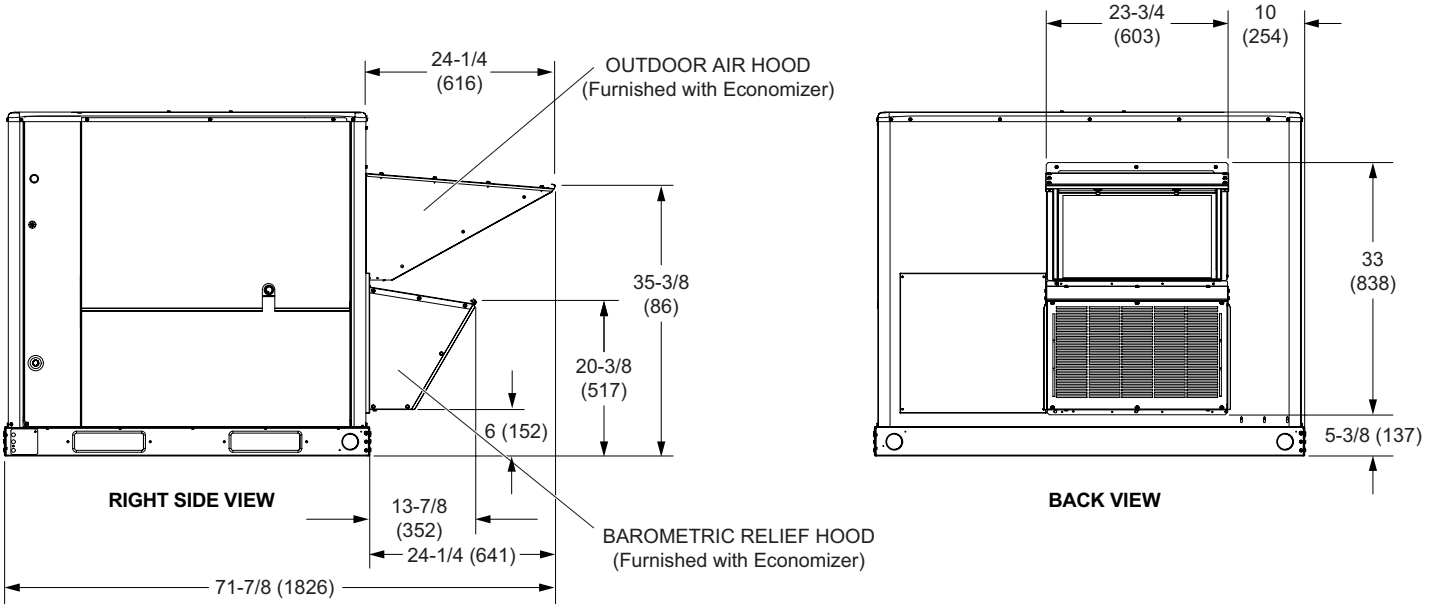


RIGHT SIDE VIEW

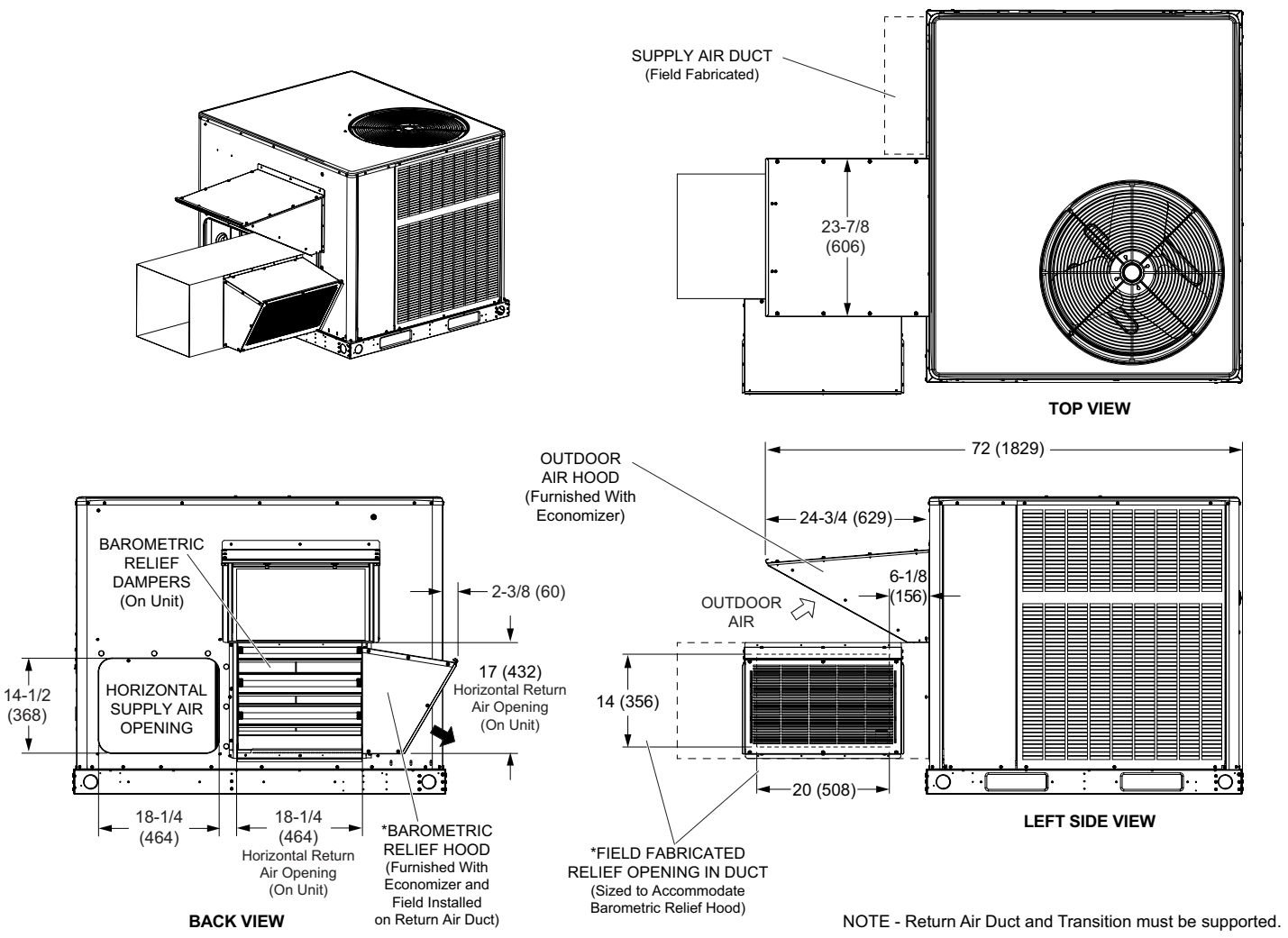


BACK VIEW

OUTDOOR AIR HOOD DETAIL FOR OPTIONAL ECONOMIZER WITH BAROMETRIC RELIEF DAMPERS
(Downflow Applications)



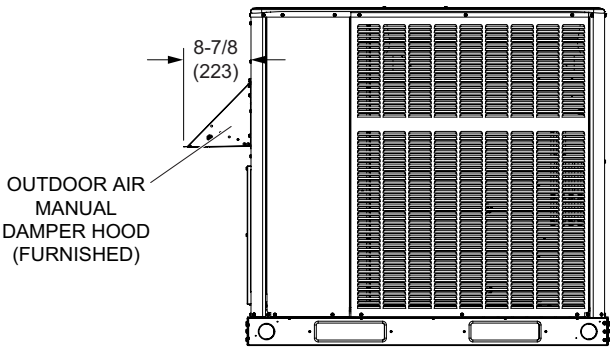
OUTDOOR AIR HOOD DETAIL FOR OPTIONAL ECONOMIZER WITH BAROMETRIC RELIEF DAMPERS
(Horizontal Applications)



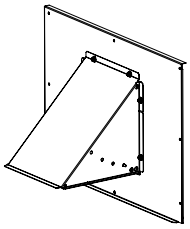
NOTE - Return Air Duct and Transition must be supported.

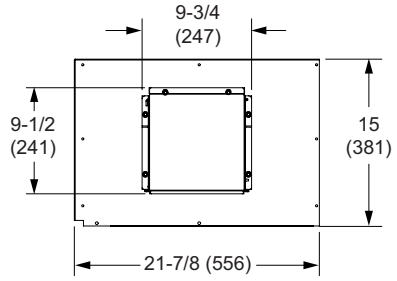
OUTDOOR AIR HOOD DETAIL FOR OPTIONAL OUTDOOR AIR DAMPERS

MANUAL OUTDOOR AIR DAMPERS

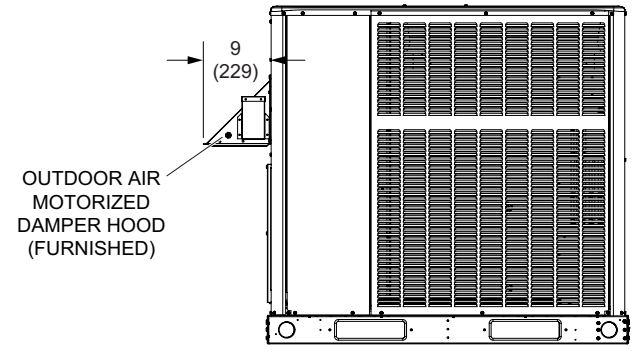


LEFT SIDE VIEW

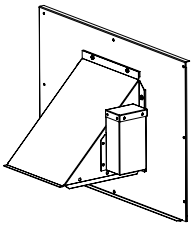


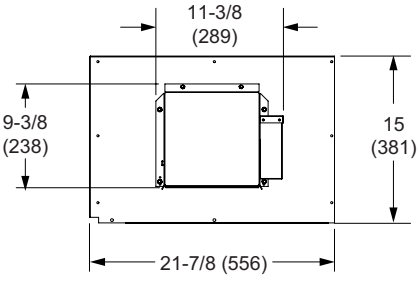


MOTORIZED OUTDOOR AIR DAMPERS



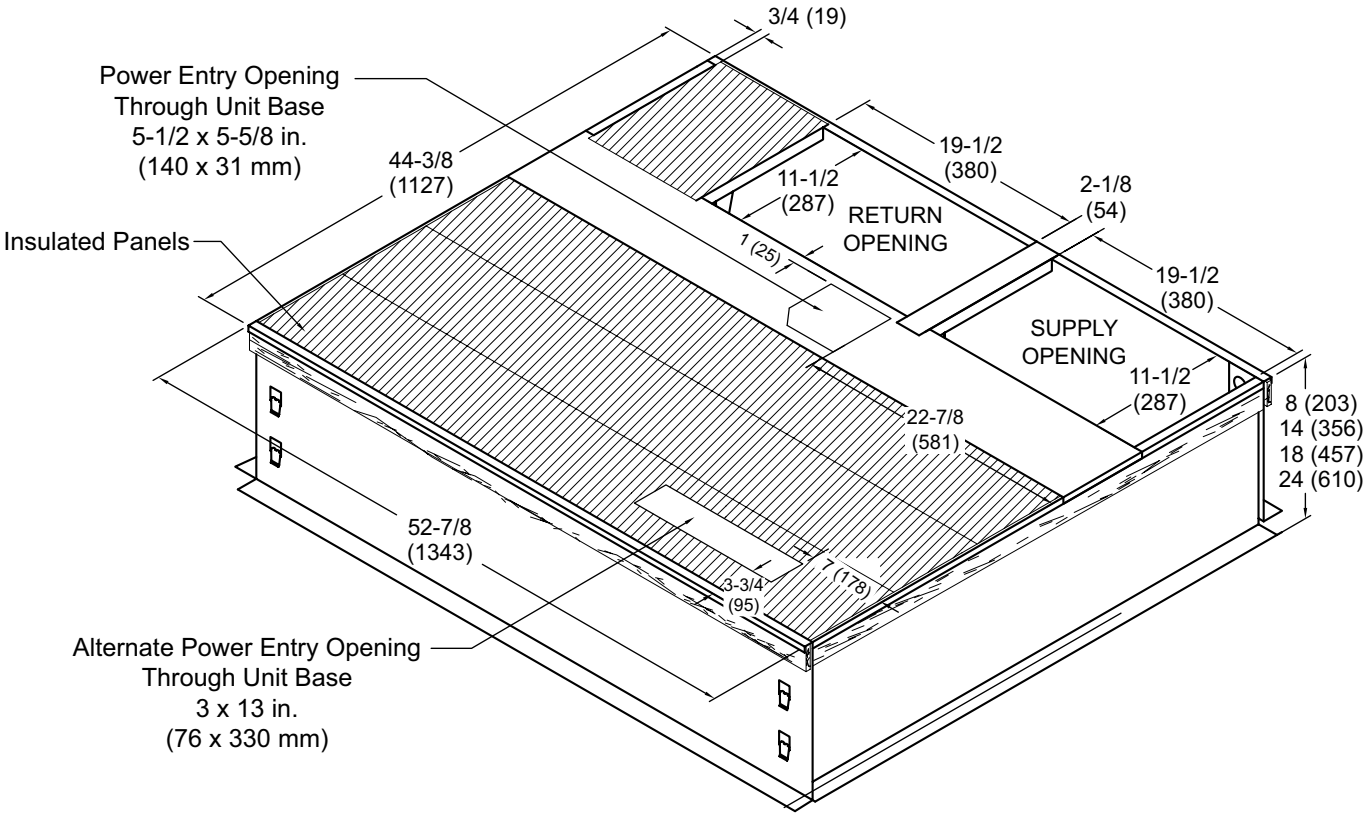
LEFT SIDE VIEW





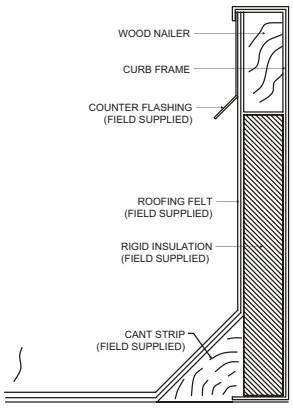
NOTE - Outdoor Air Hood and Panel replaces existing panel on unit.

CLIP CURB

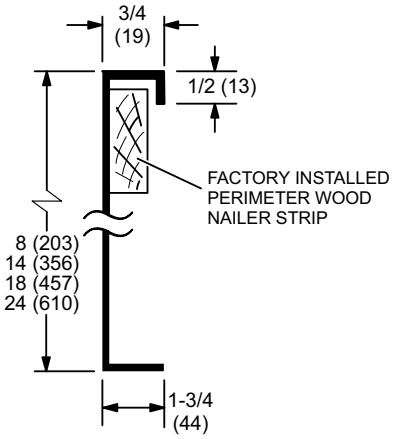


NOTE - Roof deck may be omitted within confines of curb.

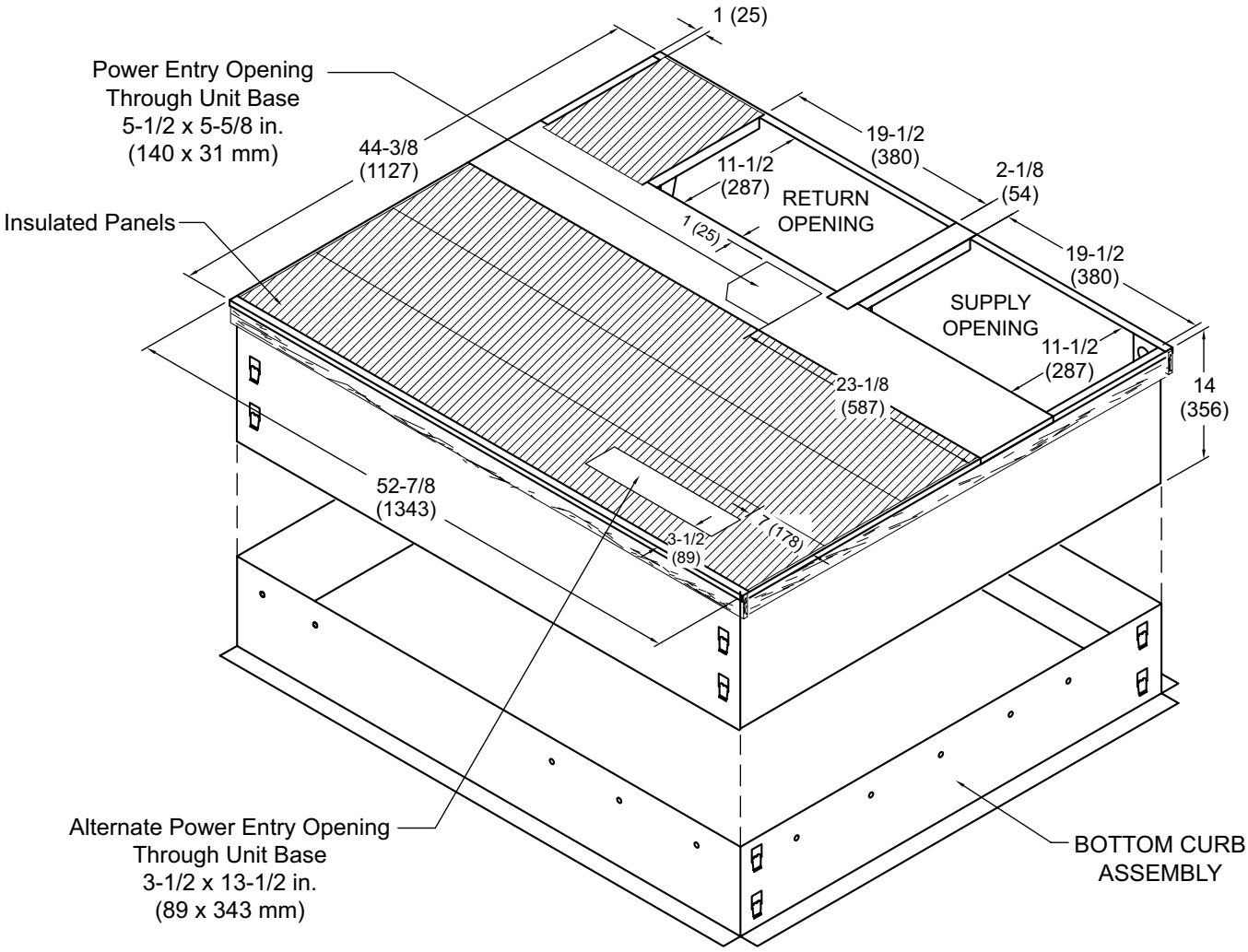
TYPICAL FLASHING DETAIL FOR ROOF CURB



DETAIL ROOF CURB

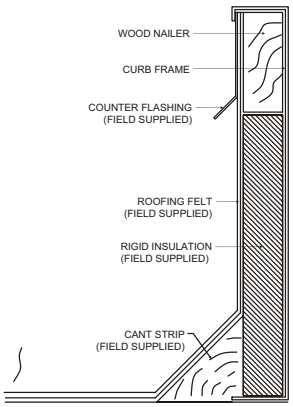


ADJUSTABLE PITCH ROOF CURB (KNOCK-DOWN STYLE)

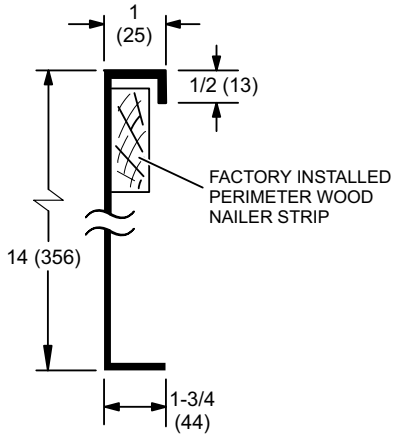


NOTE - Roof deck may be omitted within confines of curb.

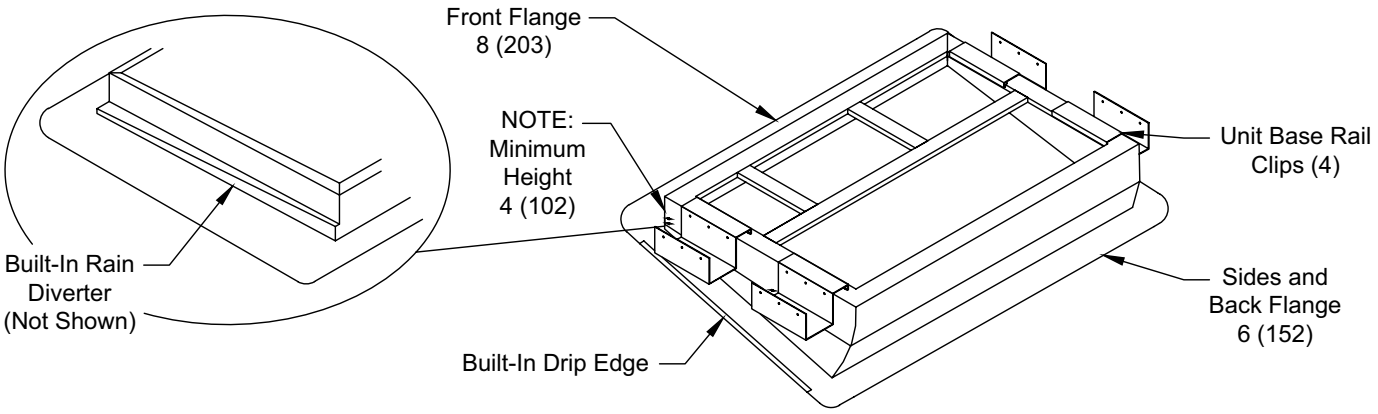
TYPICAL FLASHING DETAIL FOR ROOF CURB

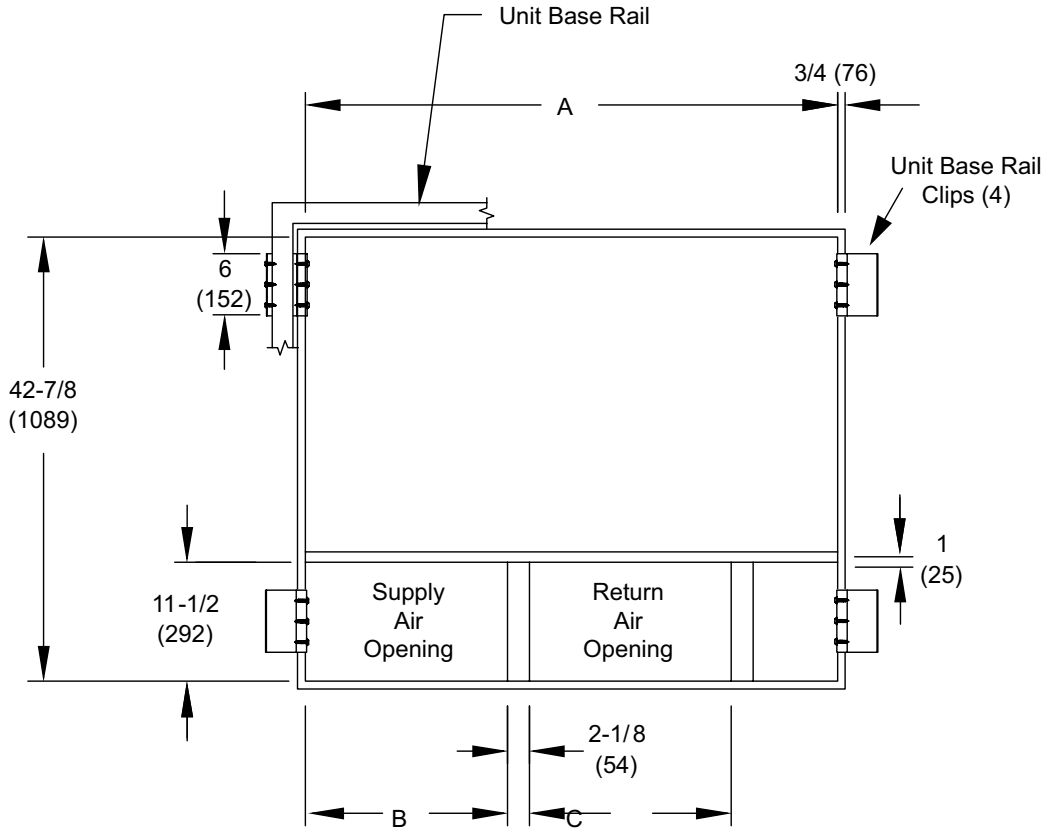


DETAIL ROOF CURB



ADJUSTABLE PITCH ROOF CURB (WELDED STYLE)





ALLIED™ Commercial

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NOTE - Due to Allied Commercial ongoing commitment to quality, Specifications, Ratings and Dimensions subject to change without notice and without incurring liability.
Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury.
Installation and service must be performed by a qualified installer and servicing agency.