

### HIGH-EFFICIENCY GAS HEAT/ELECTRIC COOLING PACKAGED ROOFTOP 15 TO 25 NOMINAL TONS

#### BUILT TO LAST, EASY TO INSTALL AND SERVICE

- One-piece, high efficiency gas heating and electric cooling with a low profile, prewired, tested, and charged at the factory
- Dedicated vertical or horizontal air flow duct configuration models. No field kits required.
- Full perimeter base rail with built-in rigging adapters and fork truck slots
- Pre-painted exterior panels and primer-coated interior panels tested to 500 hours salt spray protection
- Fully insulated cabinet
- Two-stage cooling with independent circuits and control on all models
- Redundant gas valve for two stage gas heating capacity control
- Exclusive IGC solid-state control for on-board diagnostics with LED error code designation, burner control logic and energy saving indoor fan motor delay
- High efficiency, gas heat with induced draft flue exhaust design
- Scroll compressors on all models
- All units have high and low pressure switches
- Two inch disposable fiberglass type return air filters in dedicated rack with tool-less filter access door
- Refrigerant circuits contain a liquid line filter drier to trap dirt and moisture
- Exclusive non-corrosive composite condensate pan in accordance with ASHRAE 62 Standard, sloping design; end drain
- Belt drive evaporator-fan motor and pulley combinations available to meet most applications
- Access panels with easy grip handles provide quick and easy access to the blower and blower motor, control box, and compressors.
- “No-strip” screw system has superior holding power and guides screws into position while preventing the screw from stripping the unit’s metal.
- Newly designed terminal board facilitates simple safety circuit troubleshooting and simplified control box arrangement
- Standard outdoor temperature cooling operation range up to 125°F (52°C) and down to 35°F (2°C)
- TXV metering devices on all models to precisely control refrigerant flow
- Large, laminated control wiring and power wiring drawings are affixed to unit to make troubleshooting easy
- Capable of thru-the-base or thru-the-curb gas line routing
- Single point gas and electrical connections



15 Ton



#### WARRANTY

- 15 Year limited warranty on optional stainless steel heat exchanger.
- 10 Year limited warranty on aluminized stainless steel heat exchanger
- 5 Year compressor limited warranty
- 1 Year parts limited warranty

#### Unit Performance Data — Two Stage Cooling

UNIT	DEDICATED AIRFLOW	NOMINAL TONS	COOLING		GAS HEATING		UNIT DIMENSIONS (H x W x L)	UNIT WEIGHT lb. (kg)
			Net Cap. (Btuh)	EER	Input Cap. (Btuh) Stage 2	Thermal Efficiency %		
RGH181**AA0AAA	Vertical	15	174,000	12.0	220,000-400,000	81	49 3/8 x 86 3/8 x 127 7/8	1892 (860)
RGH183**AA0AAA	Horizontal	15	174,000	11.5	220,000-400,000	81	49 3/8 x 86 3/8 x 127 7/8	1892 (860)
RGH210**AA0AAA	Vertical	17.5	202,000	12.0	220,000-400,000	81	49 3/8 x 86 3/8 x 141 1/2	2102 (956)
RGH213**AA0AAA	Horizontal	17.5	202,000	11.3	220,000-400,000	81	49 3/8 x 86 3/8 x 141 1/2	2102 (956)
RGH240**AA0AAA	Vertical	20	232,000	12.0	220,000-400,000	81	57 3/8 x 86 3/8 x 141 1/2	2247 (1021)
RGH243**AA0AAA	Horizontal	20	232,000	11.4	220,000-400,000	81	57 3/8 x 86 3/8 x 141 1/2	2247 (1021)
RGH300**AA0AAA	Vertical	25	282,000	11.2	220,000-400,000	81	57 3/8 x 86 3/8 x 157 3/4	2292 (1042)
RGH303**AA0AAA	Horizontal	25	282,000	10.5	220,000-400,000	81	57 3/8 x 86 3/8 x 157 3/4	2292 (1042)

\* Indicates Unit voltage: H = 208/230-3-60, L = 460-3-60, S = 575-3-60

† See model number nomenclature listing for gas heating options

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# MODEL NUMBER NOMENCLATURE

## RGH MODEL NUMBER NOMENCLATURE

→

MODEL SERIES	R	G	H	1	8	1	H	D	A	B	0	A	A	A
Position Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
R = Rooftop														
G = Gas/Electric <span style="float: right;">Type</span>														
H = High Efficiency <span style="float: right;">Efficiency</span>														
181 = 181,000 = 15 Tons Dedicated Vertical SA/RA (SA = Supply Air, RA = Return Air)														
183 = 180,000 = 15 Tons Dedicated Horizontal SA/RA														
210 = 210,000 = 17.5 Tons Dedicated Vertical SA/RA														
213 = 210,000 = 17.5 Tons Dedicated Horizontal SA/RA														
240 = 240,000 = 20 Tons Dedicated Vertical SA/RA														
243 = 240,000 = 20 Tons Dedicated Horizontal SA/RA														
300 = 300,000 = 25 Tons Dedicated Vertical SA/RA														
303 = 300,000 = 25 Tons Dedicated Horizontal SA/RA <span style="float: right;">Nominal Cooling Capacity</span>														
H = 208/230-3-60														
L = 460-3-60														
S = 575-3-60 <span style="float: right;">Voltage</span>														
D = Low Heat														
E = Medium Heat														
F = High Heat														
S = Low Heat, Stainless Steel Heat Exchanger														
R = Medium Heat, Stainless Steel Heat Exchanger														
T = High Heat, Stainless Steel Heat Exchanger <span style="float: right;">Heating Capacity</span>														
A = Standard Motor (All sizes)														
C = Medium Static Motor (15 & 17.5 ton with 1 speed IFM, All sizes with 2 speed IFM)														
B = High Static Motor (15 ton with 1 speed IFM, All sizes with 2 speed IFM)														
E = High Static - High Efficiency Motor (17.5 to 25 ton with 1 speed IFM)														
F = Medium Static - High Efficiency Motor (20 & 25 ton with 1 speed IFM)														
G = High Static Motor/Drive with Hot Gas Reheat (All sizes with 1 speed IFM) <span style="float: right;">Motor Option</span>														
A = None														
B = Temp Economizer w/Bara-relief														
E = Temp Economizer w/Bara-relief + CO <sub>2</sub> sensor														
H = Enthalpy Economizer w/Bara-relief														
L = Enthalpy Economizer w/Bara-relief + CO <sub>2</sub> sensor														
U = Temp. Ultra Low Leak Economizer w/Bara-relief														
W = Enthalpy Ultra Low Leak Economizer w/Bara-relief														
P = 2-Position damper <span style="float: right;">Outdoor Air Options / Control</span>														
0A = No Options														
4B = Non-Fused Disconnect														
AA = Hinged Access Panels														
AT = Non-powered 115v C.O.														
BB = Powered Convenience Outlet														
BP = Return-Air Smoke Detector														
BR = Supply-Air Smoke Detector <span style="float: right;">Factory Installed Options</span>														
A = Aluminum Fin /Copper Tubes Cond & Evap Coil														
B = Precoat Aluminum/Copper Cond Coil														
C = E-Coated Cond Coil <span style="float: right;">Condenser / Evaporator Coil Configuration</span>														
A = Standard Motor														
T = 2 Speed Indoor Fan VFD Controller (For 2-stage units only) <span style="float: right;">Motor Type Option</span>														

# CAPACITY RATINGS

## AHRI COOLING RATING TABLE

MODEL RGH	COOLING STAGES	NOMINAL CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (kw)	EER	IEER — 1 SPEED INDOOR FAN	IEER — 2 SPEED INDOOR FAN	RATED INDOOR AIRFLOW (CFM)
<b>VERTICAL CONFIGURATION</b>								
181	2	15.0	174	14.5	12.0	13.0	13.5	4,900
210	2	17.5	202	16.8	12.0	13.0	13.6	5,700
240	2	20.0	232	19.3	12.0	13.2	13.8	6,500
300	2	25.0	282	25.2	11.2	12.0	12.5	8,125
<b>HORIZONTAL CONFIGURATION</b>								
183	2	15.0	174	15.1	11.5	12.2	13.0	4,900
213	2	17.5	202	17.9	11.3	N/A	13.2	5,700
243	2	20.0	232	20.4	11.4	12.0	13.0	6,500
303	2	25.0	282	26.9	10.5	N/A	12.2	8,125

### LEGEND

**AHRI** — Air-Conditioning, Heating and Refrigeration Institute  
**EER** — Energy Efficiency Ratio  
**IEER** — Integrated Energy Efficiency Ratio

### NOTES:

- RGH303 horizontal units are only available with a 2-speed option.
- Rated and certified under AHRI Standard 340/360.
- Ratings are based on:  
**Cooling Standard:** 80°F (27°C) db, 67°F (19°C) wb indoor air temp and 95°F (35°C) db outdoor air temp.  
**IEER Standard:** A measure that expresses cooling part-load EER efficiency for commercial unitary air conditioning and heat pump equipment on the basis of weighted operation at various load capacities.

- All RGH units meet or exceed ASHRAE 90.1-2016 and IECC-2018 minimum efficiency requirements.
- RGH units comply with US Energy Policy Act (2005).
- To evaluate code compliance requirements, refer to state and local codes or visit the following website: <http://bcap-energy.org> to determine if compliance with this standard pertains to your state, territory, or municipality.



## SOUND PERFORMANCE TABLE

RGH UNIT	COOLING STAGES	OUTDOOR SOUND (dB) AT 60Hz											
		A-weighted	Linear	AHRI-370 Rating	31.5	63	125	250	500	1000	2000	4000	8000
181/183	2	84.1	96.2	84	92.6	92.0	84.0	80.0	82.0	78.7	76.5	72.2	65.4
210/213	2	84.1	96.2	84	92.6	92.0	84.0	80.0	82.0	78.7	76.5	72.2	65.4
240/243	2	86.5	99.6	87	96.2	95.6	87.5	84.2	84.2	81.7	77.9	73.2	66.3
300/303	2	85.9	103.0	86	101.0	97.0	88.0	84.0	83.0	80.7	77.4	73.4	67.3

### LEGEND

**dB** — Decibel

### NOTES:

- Outdoor sound data is measured in accordance with AHRI.
- Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
- A-weighted sound ratings filter out very high and very low frequencies, to better approximate the response of "average" human ear. Units A-weighted measurements are taken in accordance with AHRI.

**MINIMUM — MAXIMUM AIRFLOW RATINGS — NATURAL GAS AND LIQUID PROPANE**

RGH UNIT	HEAT LEVEL	COOLING				ALUMINUM HEATING		STAINLESS STEEL HEATING	
		Minimum Single Speed Fan Motor	Minimum 2-speed Fan Motor (At High Speed)	Minimum 2-speed Fan Motor (At Low Speed)	Maximum	Minimum	Maximum	Minimum	Maximum
181/183	LOW	4,500	5,070	3,380	7,500	3,000	8,250	3,000	8,250
	MED					3,880	7,750	3,880	7,750
	HIGH					4,620	8,570	4,620	8,570
210/213	LOW	5,250	5,915	3,943	9,000	3,000	11,000	3,000	11,000
	MED					3,880	9,300	3,880	9,300
	HIGH					4,620	10,000	4,620	10,000
240/243	LOW	6,000	7,500	5,000	10,000	3,000	11,000	3,000	11,000
	MED					3,880	11,630	3,880	11,630
	HIGH					4,620	10,000	4,620	10,000
300/303	LOW	7,500	8,450	5,633	12,500	3,000	16,500	3,000	16,500
	MED					3,880	15,500	3,880	15,500
	HIGH					4,620	15,000	4,620	15,000

**HEATING RATING TABLE - NATURAL GAS AND PROPANE**

RGH UNIT	GAS HEAT	AL/SS HEAT EXCHANGER		TEMPERATURE RISE (F)	THERMAL EFFICIENCY (%)
		INPUT/OUTPUT STAGE 1 (MBH)	INPUT/OUTPUT STAGE 2 (MBH)		
181-183	LOW	220/178	176/142	20-55	81%
	MED	310/251	248/200	30-60	
	HIGH	400/324	320/260	35-65	
210-213	LOW	220/178	176/142	15-55	81%
	MED	310/251	248/200	25-60	
	HIGH	400/324	320/260	30-65	
240-243	LOW	220/178	176/142	15-55	81%
	MED	310/251	248/200	20-60	
	HIGH	400/324	320/260	30-65	
300-303	LOW	220/178	176/142	10-55	81%
	MED	310/251	248/200	15-60	
	HIGH	400/324	320/260	20-65	

**NOTES:**

- Heat ratings are for natural gas heat exchangers operated at or below 2000 ft (610 m). For information on Propane or altitudes above 2000 ft (610 m), see the Application Data section of this book. Accessory Propane/High Altitude kits are also available.
- In the USA the input rating for altitudes above 2000 ft (610 m) must be derated by 4% for each 1000 ft (305 m) above sea level. In Canada, the input rating must be derated by 10% for altitudes of 2000 ft (610 m) to 4500 ft (1372 m) above sea level.

# CAPACITY RATINGS (cont)

## RGH181/183 — 15 TON — COOLING CAPACITIES

RGH181/183			AMBIENT TEMPERATURE (F)																
			85			95			105			115			125				
			EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)				
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85		
4500 Cfm	EAT (wb)	58	THC	158.3	158.3	179.2	152.6	152.6	172.9	146.6	146.6	166.1	140.2	140.2	158.8	133.2	133.2	150.8	
			SHC	137.3	158.3	179.2	132.4	152.6	172.9	127.2	146.6	166.1	121.6	140.2	158.8	115.5	133.2	150.8	
		62	THC	166.8	166.8	169.0	159.5	159.5	165.6	151.8	151.8	161.9	143.6	143.6	157.9	134.9	134.9	153.4	
			SHC	123.1	146.1	169.0	119.7	142.6	165.6	116.1	139.0	161.9	112.3	135.1	157.9	108.2	130.8	153.4	
		67	THC	182.9	182.9	182.9	174.9	174.9	174.9	166.3	166.3	166.3	157.2	157.2	157.2	147.6	147.6	147.6	
			SHC	100.0	123.1	146.1	96.7	119.8	142.8	93.2	116.3	139.4	89.7	112.7	135.7	85.9	108.9	131.9	
	72	THC	200.5	200.5	200.5	191.6	191.6	191.6	182.2	182.2	182.2	172.2	172.2	172.2	161.7	161.7	161.7		
		SHC	76.1	99.5	122.8	72.9	96.2	119.5	69.5	92.8	116.1	66.0	89.3	112.5	62.4	85.6	108.8		
	76	THC	—	215.4	215.4	—	205.8	205.8	—	195.6	195.6	—	184.8	184.8	—	173.6	173.6		
		SHC	—	80.2	105.0	—	77.1	101.7	—	73.7	98.2	—	70.2	94.5	—	66.7	90.7		
	5250 Cfm	EAT (wb)	58	THC	166.7	166.7	188.8	160.6	160.6	181.9	154.0	154.0	174.4	147.0	147.0	166.5	139.5	139.5	157.9
				SHC	144.6	166.7	188.8	139.3	160.6	181.9	133.6	154.0	174.4	127.6	147.0	166.5	121.0	139.5	157.9
62			THC	172.0	172.0	185.1	164.3	164.3	181.2	156.3	156.3	177.0	147.8	147.8	172.4	139.6	139.6	164.3	
			SHC	132.5	158.8	185.1	128.9	155.1	181.2	125.0	151.0	177.0	120.9	146.6	172.4	114.9	139.6	164.3	
67			THC	188.3	188.3	188.3	179.7	179.7	179.7	170.7	170.7	170.7	161.0	161.0	161.0	150.9	150.9	150.9	
			SHC	106.1	132.7	159.3	102.8	129.3	155.9	99.3	125.8	152.4	95.6	122.1	148.6	91.7	118.2	144.7	
72		THC	206.1	206.1	206.1	196.7	196.7	196.7	186.7	186.7	186.7	176.2	176.2	176.2	165.3	165.3	165.3		
		SHC	78.8	105.6	132.5	75.5	102.3	129.1	72.1	98.8	125.6	68.5	95.2	121.9	64.8	91.4	118.0		
76		THC	—	221.2	221.2	—	211.0	211.0	—	200.3	200.3	—	189.0	189.0	—	177.2	177.2		
		SHC	—	83.6	111.7	—	80.3	108.2	—	76.9	104.6	—	73.3	100.9	—	69.7	97.1		
6000 Cfm		EAT (wb)	58	THC	173.8	173.8	196.8	167.2	167.2	189.4	160.2	160.2	181.4	152.7	152.7	173.0	144.7	144.7	163.8
				SHC	150.8	173.8	196.8	145.1	167.2	189.4	139.0	160.2	181.4	132.5	152.7	173.0	125.5	144.7	163.8
	62		THC	176.3	176.3	199.5	168.5	168.5	194.9	160.5	160.5	188.9	152.9	152.9	179.9	144.8	144.8	170.4	
			SHC	140.9	170.2	199.5	136.9	165.9	194.9	132.1	160.5	188.9	125.8	152.9	179.9	119.2	144.8	170.4	
	67		THC	192.3	192.3	192.3	183.4	183.4	183.4	173.9	173.9	173.9	164.0	164.0	164.0	153.4	153.4	156.9	
			SHC	112.0	142.0	172.0	108.5	138.5	168.5	104.9	134.9	164.8	101.2	131.1	161.0	97.2	127.1	156.9	
	72	THC	210.4	210.4	210.4	200.6	200.6	200.6	190.2	190.2	190.2	179.3	179.3	179.3	167.9	167.9	167.9		
		SHC	81.2	111.4	141.7	77.9	108.0	138.2	74.4	104.5	134.6	70.7	100.8	130.8	67.0	96.9	126.9		
	76	THC	—	225.6	225.6	—	215.0	215.0	—	203.8	203.8	—	192.1	192.1	—	180.0	180.0		
		SHC	—	86.7	117.9	—	83.3	114.5	—	79.9	110.8	—	76.3	107.1	—	72.6	103.2		
	6750 Cfm	EAT (wb)	58	THC	179.8	179.8	203.7	172.9	172.9	195.8	165.5	165.5	187.4	157.5	157.5	178.4	149.0	149.0	168.8
				SHC	156.0	179.8	203.7	150.0	172.9	195.8	143.5	165.5	187.4	136.7	157.5	178.4	129.3	149.0	168.8
62			THC	180.5	180.5	210.7	173.0	173.0	203.6	165.6	165.6	194.9	157.7	157.7	185.5	149.1	149.1	175.5	
			SHC	147.6	179.2	210.7	142.4	173.0	203.6	136.3	165.6	194.9	129.8	157.7	185.5	122.8	149.1	175.5	
67			THC	195.6	195.6	195.6	186.2	186.2	186.2	176.5	176.5	176.8	166.2	166.2	172.7	155.4	155.4	168.4	
			SHC	117.5	150.8	184.1	114.0	147.3	180.5	110.4	143.6	176.8	106.5	139.6	172.7	102.4	135.4	168.4	
72		THC	213.8	213.8	213.8	203.6	203.6	203.6	192.9	192.9	192.9	181.6	181.6	181.6	169.9	169.9	169.9		
		SHC	83.5	117.0	150.5	80.1	113.5	147.0	76.5	109.9	143.3	72.8	106.1	139.4	69.1	102.3	135.5		
76		THC	—	229.1	229.1	—	218.1	218.1	—	206.6	206.6	—	194.6	194.6	—	182.1	182.1		
		SHC	—	89.6	124.0	—	86.2	120.5	—	82.7	116.8	—	79.0	113.0	—	75.2	109.0		
7500 Cfm		EAT (wb)	58	THC	185.1	185.1	209.6	177.7	177.7	201.3	170.0	170.0	192.5	161.6	161.6	183.0	152.8	152.8	173.0
				SHC	160.6	185.1	209.6	154.2	177.7	201.3	147.5	170.0	192.5	140.2	161.6	183.0	132.5	152.8	173.0
	62		THC	185.2	185.2	218.0	177.9	177.9	209.3	170.1	170.1	200.2	161.8	161.8	190.4	152.9	152.9	179.9	
			SHC	152.5	185.2	218.0	146.4	177.9	209.3	140.0	170.1	200.2	133.2	161.8	190.4	125.8	152.9	179.9	
	67		THC	198.1	198.1	198.1	188.6	188.6	192.1	178.6	178.6	188.1	168.1	168.1	183.8	157.2	157.2	179.1	
			SHC	122.8	159.3	195.9	119.2	155.7	192.1	115.5	151.8	188.1	111.5	147.7	183.8	107.3	143.2	179.1	
	72	THC	216.6	216.6	216.6	206.1	206.1	206.1	195.1	195.1	195.1	183.5	183.5	183.5	171.6	171.6	171.6		
		SHC	85.6	122.3	159.0	82.2	118.8	155.5	78.6	115.2	151.7	74.9	111.3	147.8	71.1	107.4	143.8		
	76	THC	—	231.9	231.9	—	220.7	220.7	—	208.9	208.9	—	196.5	196.5	—	183.8	183.8		
		SHC	—	92.4	129.9	—	88.9	126.3	—	85.4	122.6	—	81.6	118.7	—	77.8	114.6		

### LEGEND

- Do Not Operate
- Cfm — Cubic Feet Per Minute (Supply Air)
- EAT (db) — Entering Air Temperature (Dry Bulb)
- EAT (wb) — Entering Air Temperature (Wet Bulb)
- SHC — Sensible Heat Capacity (1000 Btuh) Gross
- THC — Total Heat Capacity (1000 Btuh) Gross

**RGH210/213 — 17.5 TON — COOLING CAPACITIES**

RGH210/213			AMBIENT TEMPERATURE (F)																
			85			95			105			115			125				
			EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)				
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85		
5250 Cfm	EAT (wb)	58	THC	185.1	185.1	209.2	178.7	178.7	201.9	171.8	171.8	194.1	164.5	164.5	185.8	156.7	156.7	177.0	
			SHC	161.1	185.1	209.2	155.4	178.7	201.9	149.4	171.8	194.1	143.1	164.5	185.8	136.3	156.7	177.0	
		62	THC	193.8	193.8	199.5	185.6	185.6	195.4	176.9	176.9	191.1	167.7	167.7	186.4	158.2	158.2	181.1	
			SHC	145.6	172.6	199.5	141.7	168.6	195.4	137.6	164.4	191.1	133.2	159.8	186.4	128.3	154.7	181.1	
		67	THC	212.2	212.2	212.2	203.3	203.3	203.3	193.8	193.8	193.8	183.8	183.8	183.8	173.1	173.1	173.1	
			SHC	119.0	146.0	173.1	115.3	142.3	169.4	111.4	138.4	165.4	107.3	134.3	161.3	103.0	130.0	157.0	
	72	THC	232.3	232.3	232.3	222.7	222.7	222.7	212.4	212.4	212.4	201.6	201.6	201.6	190.1	190.1	190.1		
		SHC	91.5	118.8	146.2	87.9	115.2	142.5	84.1	111.4	138.7	80.2	107.4	134.6	76.0	103.2	130.4		
	76	THC	—	249.5	249.5	—	239.2	239.2	—	228.2	228.2	—	216.6	216.6	—	204.3	204.3		
		SHC	—	96.7	125.3	—	93.2	121.7	—	89.5	117.9	—	85.6	113.8	—	81.5	109.5		
	6125 Cfm	EAT (wb)	58	THC	194.7	194.7	220.0	187.8	187.8	212.2	180.4	180.4	203.8	172.5	172.5	194.9	164.1	164.1	185.5
				SHC	169.4	194.7	220.0	163.3	187.8	212.2	156.9	180.4	203.8	150.1	172.5	194.9	142.8	164.1	185.5
62			THC	199.6	199.6	218.0	191.1	191.1	213.5	182.1	182.1	208.4	173.0	173.0	201.2	164.3	164.3	192.8	
			SHC	156.5	187.2	218.0	152.3	182.9	213.5	147.7	178.0	208.4	141.8	171.5	201.2	135.8	164.3	192.8	
67			THC	218.0	218.0	218.0	208.7	208.7	208.7	198.7	198.7	198.7	188.2	188.2	188.2	177.1	177.1	177.1	
			SHC	126.2	157.4	188.6	122.4	153.6	184.7	118.4	149.6	180.7	114.3	145.4	176.5	109.9	141.0	172.1	
72		THC	238.5	238.5	238.5	228.4	228.4	228.4	217.7	217.7	217.7	206.3	206.3	206.3	194.3	194.3	194.3		
		SHC	94.7	126.1	157.5	91.0	122.4	153.8	87.2	118.5	149.8	83.1	114.4	145.7	78.9	110.1	141.4		
76		THC	—	255.9	255.9	—	245.1	245.1	—	233.6	233.6	—	221.4	221.4	—	208.5	208.5		
		SHC	—	100.7	133.3	—	97.1	129.6	—	93.3	125.6	—	89.3	121.5	—	85.1	117.1		
7000 Cfm		EAT (wb)	58	THC	202.7	202.7	229.1	195.4	195.4	220.8	187.5	187.5	211.9	179.2	179.2	202.5	170.3	170.3	192.4
				SHC	176.4	202.7	229.1	170.0	195.4	220.8	163.1	187.5	211.9	155.9	179.2	202.5	148.1	170.3	192.4
	62		THC	204.6	204.6	234.4	196.0	196.0	228.0	187.7	187.7	220.3	179.3	179.3	210.5	170.4	170.4	200.0	
			SHC	166.0	200.2	234.4	160.8	194.4	228.0	155.1	187.7	220.3	148.2	179.3	210.5	140.8	170.4	200.0	
	67		THC	222.5	222.5	222.5	212.8	212.8	212.8	202.4	202.4	202.4	191.5	191.5	191.5	180.0	180.0	186.4	
			SHC	133.0	168.2	203.4	129.2	164.3	199.5	125.1	160.3	195.4	120.9	156.0	191.0	116.4	151.4	186.4	
	72	THC	243.3	243.3	243.3	232.7	232.7	232.7	221.6	221.6	221.6	209.9	209.9	209.9	197.4	197.4	197.4		
		SHC	97.5	132.9	168.3	93.8	129.2	164.5	89.9	125.2	160.5	85.8	121.1	156.3	81.6	116.7	151.9		
	76	THC	—	260.8	260.8	—	249.6	249.6	—	237.7	237.7	—	225.1	225.1	—	211.7	211.7		
		SHC	—	104.4	140.8	—	100.7	137.0	—	96.9	133.0	—	92.8	128.8	—	88.5	124.4		
	7875 Cfm	EAT (wb)	58	THC	209.6	209.6	236.8	201.8	201.8	228.1	193.6	193.6	218.8	184.8	184.8	208.9	175.5	175.5	198.3
				SHC	182.3	209.6	236.8	175.6	201.8	228.1	168.4	193.6	218.8	160.8	184.8	208.9	152.7	175.5	198.3
62			THC	209.8	209.8	246.2	202.0	202.0	237.1	193.8	193.8	227.4	185.0	185.0	217.1	175.6	175.6	206.1	
			SHC	173.4	209.8	246.2	167.0	202.0	237.1	160.1	193.8	227.4	152.9	185.0	217.1	145.1	175.6	206.1	
67			THC	226.1	226.1	226.1	216.0	216.0	216.0	205.4	205.4	209.4	194.2	194.2	204.8	182.4	182.4	199.9	
			SHC	139.6	178.6	217.7	135.6	174.7	213.7	131.5	170.5	209.4	127.1	166.0	204.8	122.5	161.2	199.9	
72		THC	247.0	247.0	247.0	236.2	236.2	236.2	224.7	224.7	224.7	212.7	212.7	212.7	199.9	199.9	199.9		
		SHC	100.2	139.5	178.8	96.5	135.7	174.9	92.5	131.7	170.9	88.4	127.5	166.6	84.1	123.1	162.1		
76		THC	—	264.7	264.7	—	253.1	253.1	—	240.9	240.9	—	227.9	227.9	—	—	—		
		SHC	—	107.9	148.1	—	104.2	144.3	—	100.2	140.2	—	96.1	135.9	—	—	—		
8750 Cfm		EAT (wb)	58	THC	215.4	215.4	243.4	207.3	207.3	234.3	198.7	198.7	224.6	189.6	189.6	214.2	179.9	179.9	203.2
				SHC	187.4	215.4	243.4	180.3	207.3	234.3	172.9	198.7	224.6	164.9	189.6	214.2	156.5	179.9	203.2
	62		THC	215.5	215.5	253.0	207.5	207.5	243.5	198.9	198.9	233.4	189.7	189.7	222.7	180.0	180.0	211.2	
			SHC	178.1	215.5	253.0	171.5	207.5	243.5	164.4	198.9	233.4	156.8	189.7	222.7	148.8	180.0	211.2	
	67		THC	228.9	228.9	231.5	218.7	218.7	227.3	207.8	207.8	222.8	196.4	196.4	217.9	184.5	184.5	212.6	
			SHC	145.8	188.6	231.5	141.8	184.5	227.3	137.5	180.1	222.8	133.0	175.5	217.9	128.2	170.4	212.6	
	72	THC	250.1	250.1	250.1	239.0	239.0	239.0	227.3	227.3	227.3	214.9	214.9	214.9	201.8	201.8	201.8		
		SHC	102.8	145.8	188.9	99.0	142.0	185.0	95.0	137.9	180.9	90.8	133.7	176.5	86.4	129.2	172.0		
	76	THC	—	267.8	267.8	—	256.0	256.0	—	243.5	243.5	—	230.2	230.2	—	—	—		
		SHC	—	111.2	155.2	—	107.4	151.3	—	103.5	147.1	—	99.3	142.8	—	—	—		

**LEGEND**

- Do Not Operate
- Cfm — Cubic Feet Per Minute (Supply Air)
- EAT (db) — Entering Air Temperature (Dry Bulb)
- EAT (wb) — Entering Air Temperature (Wet Bulb)
- SHC — Sensible Heat Capacity (1000 Btuh) Gross
- THC — Total Heat Capacity (1000 Btuh) Gross

# CAPACITY RATINGS (cont)

## RGH240/243 — 20 TON — COOLING CAPACITIES

RGH240/243			AMBIENT TEMPERATURE (F)																
			85			95			105			115			125				
			EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)				
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85		
6000 Cfm	EAT (wb)	58	THC	214.4	214.4	242.5	207.0	207.0	234.2	199.0	199.0	225.1	190.2	190.2	215.2	180.6	180.6	204.3	
			SHC	186.3	214.4	242.5	179.9	207.0	234.2	173.0	199.0	225.1	165.3	190.2	215.2	157.0	180.6	204.3	
		62	THC	226.8	226.8	227.7	217.3	217.3	223.0	206.9	206.9	218.0	195.8	195.8	212.5	183.7	183.7	206.4	
			SHC	167.0	197.3	227.7	162.4	192.7	223.0	157.6	187.8	218.0	152.3	182.4	212.5	146.6	176.5	206.4	
		67	THC	248.4	248.4	248.4	237.9	237.9	237.9	226.6	226.6	226.6	214.3	214.3	214.3	201.0	201.0	201.0	
			SHC	136.5	167.1	197.6	132.2	162.7	193.2	127.5	158.0	188.4	122.5	152.9	183.4	117.2	147.6	178.0	
	72	THC	271.9	271.9	271.9	260.3	260.3	260.3	247.9	247.9	247.9	234.5	234.5	234.5	220.1	220.1	220.1		
		SHC	105.1	136.0	167.0	100.8	131.7	162.5	96.3	127.1	157.9	91.4	122.1	152.9	86.3	116.9	147.6		
	76	THC	—	291.7	291.7	—	279.2	279.2	—	265.7	265.7	—	251.3	251.3	—	235.8	235.8		
		SHC	—	110.7	143.7	—	106.5	139.5	—	102.0	134.7	—	97.2	129.7	—	92.1	124.3		
	7000 Cfm	EAT (wb)	58	THC	225.8	225.8	255.3	217.8	217.8	246.3	209.1	209.1	236.5	199.6	199.6	225.7	189.2	189.2	214.0
				SHC	196.2	225.8	255.3	189.3	217.8	246.3	181.7	209.1	236.5	173.4	199.6	225.7	164.4	189.2	214.0
62			THC	233.9	233.9	248.8	223.8	223.8	243.8	213.1	213.1	238.2	201.4	201.4	231.8	190.0	190.0	221.5	
			SHC	179.4	214.1	248.8	174.6	209.2	243.8	169.4	203.8	238.2	163.7	197.8	231.8	155.9	188.7	221.5	
67			THC	255.7	255.7	255.7	244.6	244.6	244.6	232.6	232.6	232.6	219.6	219.6	219.6	205.7	205.7	205.7	
			SHC	144.7	179.7	214.8	140.2	175.2	210.2	135.4	170.4	205.4	130.3	165.2	200.2	124.9	159.8	194.7	
72		THC	279.4	279.4	279.4	267.3	267.3	267.3	254.1	254.1	254.1	240.1	240.1	240.1	224.9	224.9	224.9		
		SHC	108.7	144.1	179.6	104.3	139.7	175.1	99.6	135.0	170.3	94.7	129.9	165.1	89.5	124.6	159.7		
76		THC	—	299.4	299.4	—	286.2	286.2	—	272.1	272.1	—	256.9	256.9	—	240.7	240.7		
		SHC	—	115.3	152.9	—	110.9	148.2	—	106.3	143.3	—	101.3	138.0	—	96.1	132.6		
8000 Cfm		EAT (wb)	58	THC	235.3	235.3	266.2	226.8	226.8	256.5	217.5	217.5	246.0	207.4	207.4	234.5	196.3	196.3	222.0
				SHC	204.5	235.3	266.2	197.1	226.8	256.5	189.0	217.5	246.0	180.2	207.4	234.5	170.6	196.3	222.0
	62		THC	239.7	239.7	268.1	229.4	229.4	262.0	219.0	219.0	253.3	208.3	208.3	241.9	196.7	196.7	231.0	
			SHC	190.7	229.4	268.1	185.4	223.7	262.0	178.6	215.9	253.3	170.4	206.2	241.9	162.3	196.7	231.0	
	67		THC	261.3	261.3	261.3	249.6	249.6	249.6	237.1	237.1	237.1	223.6	223.6	223.6	209.2	209.2	210.6	
			SHC	152.3	191.8	231.2	147.7	187.1	226.6	142.9	182.2	221.6	137.7	177.0	216.3	132.2	171.4	210.6	
	72	THC	285.3	285.3	285.3	272.5	272.5	272.5	258.9	258.9	258.9	244.2	244.2	244.2	228.6	228.6	228.6		
		SHC	111.9	151.7	191.5	107.5	147.2	186.9	102.7	142.4	182.0	97.7	137.2	176.7	92.4	131.8	171.2		
	76	THC	—	305.4	305.4	—	291.6	291.6	—	276.8	276.8	—	261.2	261.2	—	244.4	244.4		
		SHC	—	119.4	161.0	—	114.9	156.2	—	110.1	151.2	—	105.1	146.0	—	99.8	140.4		
	9000 Cfm	EAT (wb)	58	THC	243.5	243.5	275.4	234.5	234.5	265.2	224.6	224.6	254.0	213.9	213.9	241.9	202.3	202.3	228.8
				SHC	211.6	243.5	275.4	203.8	234.5	265.2	195.2	224.6	254.0	185.9	213.9	241.9	175.8	202.3	228.8
62			THC	245.4	245.4	282.9	235.4	235.4	274.6	225.0	225.0	264.3	214.4	214.4	251.7	202.5	202.5	237.8	
			SHC	199.7	241.3	282.9	193.2	233.9	274.6	185.6	224.9	264.3	176.8	214.3	251.7	167.1	202.5	237.8	
67			THC	265.6	265.6	265.6	253.6	253.6	253.6	240.7	240.7	240.7	226.8	226.8	231.8	212	212.0	225.8	
			SHC	159.6	203.3	247.1	154.9	198.6	242.3	150.0	193.6	237.3	144.7	188.3	231.8	139.0	182.4	225.8	
72		THC	289.9	289.9	289.9	276.7	276.7	276.7	262.6	262.6	262.6	247.5	247.5	247.5	231.4	231.4	231.4		
		SHC	114.9	159.0	203.0	110.4	154.4	198.3	105.6	149.5	193.3	100.5	144.2	188.0	95.2	138.7	182.3		
76		THC	—	310.1	310.1	—	295.8	295.8	—	280.6	280.6	—	264.4	264.4	—	247.3	247.3		
		SHC	—	123.2	168.9	—	118.6	164.1	—	113.8	159.0	—	108.7	153.6	—	103.4	147.9		
10000 Cfm		EAT (wb)	58	THC	250.4	250.4	283.2	240.9	240.9	272.5	230.7	230.7	260.9	219.5	219.5	248.2	207.3	207.3	234.5
				SHC	217.7	250.4	283.2	209.4	240.9	272.5	200.5	230.7	260.9	190.7	219.5	248.2	180.2	207.3	234.5
	62		THC	250.8	250.8	294.6	241.1	241.1	283.3	231.1	231.1	271.4	219.6	219.6	258.0	207.5	207.5	243.7	
			SHC	207.0	250.8	294.6	199.0	241.1	283.3	190.7	231.1	271.4	181.2	219.6	258.0	171.2	207.5	243.7	
	67		THC	269.2	269.2	269.2	256.8	256.8	257.6	243.5	243.5	252.3	229.4	229.4	246.4	214.3	214.3	240.0	
			SHC	166.6	214.5	262.5	161.9	209.7	257.6	156.8	204.5	252.3	151.3	198.9	246.4	145.5	192.8	240.0	
	72	THC	293.7	293.7	293.7	280.1	280.1	280.1	265.6	265.6	265.6	250.2	250.2	250.2	233.7	233.7	233.7		
		SHC	117.8	166.0	214.2	113.2	161.3	209.3	108.3	156.3	204.3	103.2	151.0	198.8	97.8	145.4	193.1		
	76	THC	—	313.9	313.9	—	299.3	299.3	—	283.7	283.7	—	267.1	267.1	—	249.6	249.6		
		SHC	—	126.8	176.5	—	122.2	171.6	—	117.3	166.5	—	112.1	161.0	—	106.7	155.1		

### LEGEND

- Do Not Operate
- Cfm — Cubic Feet Per Minute (Supply Air)
- EAT (db) — Entering Air Temperature (Dry Bulb)
- EAT (wb) — Entering Air Temperature (Wet Bulb)
- SHC — Sensible Heat Capacity (1000 Btuh) Gross
- THC — Total Heat Capacity (1000 Btuh) Gross



**RGH300/303 — 25 TON — COOLING CAPACITIES**

RGH300/303				AMBIENT TEMPERATURE (F)															
				85			95			105			115			125			
				EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)			
Cfm	EAT (wb)	Type	75	80	85	75	80	85	75	80	85	75	80	85	75	80	85		
			7500	EAT (wb)	58	THC	264.4	264.4	298.9	254.6	254.6	287.9	244.1	244.1	276.0	232.7	232.7	263.1	220.3
	SHC	229.9	264.4		298.9	221.4	254.6	287.9	212.2	244.1	276.0	202.3	232.7	263.1	191.5	220.3	249.1		
	62	THC	278.7		278.7	282.4	266.3	266.3	276.4	252.8	252.8	269.8	238.5	238.5	262.4	223.9	223.9	251.3	
	SHC	206.8	244.6		282.4	200.9	238.7	276.4	194.6	232.2	269.8	187.7	225.0	262.4	178.7	215.0	251.3		
	67	THC	305.3		305.3	305.3	291.9	291.9	291.9	277.3	277.3	277.3	261.5	261.5	261.5	244.5	244.5	244.5	
	SHC	169.0	207.0		245.0	163.4	201.4	239.4	157.4	195.3	233.3	151.0	188.9	226.8	144.2	182.1	219.9		
	72	THC	334.0		334.0	334.0	319.4	319.4	319.4	303.6	303.6	303.6	286.5	286.5	286.5	268.1	268.1	268.1	
	SHC	129.9	168.5		207.1	124.5	163.0	201.5	118.7	157.1	195.5	112.5	150.8	189.2	106.0	144.2	182.3		
	76	THC	—	358.2	358.2	—	342.4	342.4	—	325.4	325.4	—	307.1	307.1	—	287.4	287.4		
	SHC	—	137.0	178.2	—	131.7	172.9	—	126.0	166.9	—	119.9	160.4	—	113.4	153.4			
8750	EAT (wb)	58	THC	278.2	278.2	314.5	267.8	267.8	302.8	256.5	256.5	289.9	244.2	244.2	276.1	230.8	230.8	261.0	
		SHC	241.9	278.2	314.5	232.8	267.8	302.8	223.0	256.5	289.9	212.3	244.2	276.1	200.7	230.8	261.0		
		62	THC	287.2	287.2	308.3	274.3	274.3	301.5	260.8	260.8	291.7	247.0	247.0	280.9	232.0	232.0	269.1	
		SHC	222.1	265.2	308.3	215.7	258.6	301.5	207.7	249.7	291.7	199.0	240.0	280.9	189.7	229.4	269.1		
		67	THC	314.0	314.0	314.0	299.8	299.8	299.8	284.4	284.4	284.4	267.8	267.8	267.8	250.0	250.0	250.0	
		SHC	179.1	222.7	266.4	173.3	216.9	260.6	167.2	210.8	254.3	160.7	204.2	247.7	153.7	197.2	240.6		
		72	THC	343.0	343.0	343.0	327.7	327.7	327.7	311.1	311.1	311.1	293.1	293.1	293.1	273.8	273.8	273.8	
		SHC	134.3	178.5	222.6	128.8	172.9	216.9	122.9	166.9	210.8	116.6	160.4	204.3	109.9	153.6	197.3		
	76	THC	—	367.3	367.3	—	350.8	350.8	—	333.0	333.0	—	313.8	313.8	—	293.2	293.2		
	SHC	—	142.6	189.4	—	137.1	183.5	—	131.2	177.3	—	125.0	170.7	—	118.4	163.7			
10000	EAT (wb)	58	THC	289.7	289.7	327.5	278.7	278.7	315.0	266.6	266.6	301.4	253.6	253.6	286.7	239.4	239.4	270.7	
		SHC	251.9	289.7	327.5	242.3	278.7	315.0	231.8	266.6	301.4	220.5	253.6	286.7	208.2	239.4	270.7		
		62	THC	294.6	294.6	329.6	282.2	282.2	319.7	268.7	268.7	309.1	254.1	254.1	298.4	239.7	239.7	281.4	
		SHC	234.7	282.1	329.6	226.8	273.3	319.7	218.4	263.7	309.1	209.7	254.1	298.4	197.9	239.7	281.4		
		67	THC	320.6	320.6	320.6	305.9	305.9	305.9	289.9	289.9	289.9	272.7	272.7	272.7	254.3	254.3	260.3	
		SHC	188.6	237.7	286.8	182.7	231.8	280.9	176.5	225.5	274.5	169.8	218.8	267.7	162.8	211.5	260.3		
		72	THC	350.0	350.0	350.0	334.0	334.0	334.0	316.8	316.8	316.8	298.2	298.2	298.2	278.3	278.3	278.3	
		SHC	138.4	187.9	237.5	132.8	182.2	231.7	126.8	176.1	225.5	120.4	169.6	218.8	113.6	162.6	211.7		
	76	THC	—	374.4	374.4	—	357.3	357.3	—	338.7	338.7	—	318.9	318.9	—	297.5	297.5		
	SHC	—	147.7	199.5	—	142.1	193.7	—	136.1	187.4	—	129.7	180.6	—	123.0	173.5			
11250	EAT (wb)	58	THC	299.4	299.4	338.4	287.8	287.8	325.4	275.2	275.2	311.1	261.4	261.4	295.6	246.6	246.6	278.8	
		SHC	260.3	299.4	338.4	250.2	287.8	325.4	239.2	275.2	311.1	227.3	261.4	295.6	214.4	246.6	278.8		
		62	THC	302.2	302.2	346.0	289.3	289.3	335.7	275.5	275.5	323.5	262.1	262.1	307.7	246.8	246.8	289.8	
		SHC	244.8	295.4	346.0	236.7	286.2	335.7	227.5	275.5	323.5	216.4	262.1	307.7	203.8	246.8	289.8		
		67	THC	325.9	325.9	325.9	310.7	310.7	310.7	294.2	294.2	294.2	276.6	276.6	286.7	257.7	257.7	278.9	
		SHC	197.6	252.1	306.5	191.7	246.1	300.4	185.3	239.6	293.9	178.5	232.6	286.7	171.2	225.1	278.9		
		72	THC	355.5	355.5	355.5	339.1	339.1	339.1	321.3	321.3	321.3	302.2	302.2	302.2	281.8	281.8	281.8	
		SHC	142.1	197.0	251.8	136.4	191.2	245.9	130.4	185.0	239.6	123.9	178.3	232.8	117.1	171.3	225.5		
	76	THC	—	380.0	380.0	—	362.4	362.4	—	343.3	343.3	—	322.8	322.8	—	300.9	300.9		
	SHC	—	152.4	209.4	—	146.8	203.4	—	140.7	197.0	—	134.2	190.2	—	127.3	182.8			
12500	EAT (wb)	58	THC	307.7	307.7	347.9	295.7	295.7	334.2	282.5	282.5	319.3	268.2	268.2	303.2	252.7	252.7	285.7	
		SHC	267.6	307.7	347.9	257.1	295.7	334.2	245.6	282.5	319.3	233.2	268.2	303.2	219.7	252.7	285.7		
		62	THC	308.4	308.4	362.2	295.9	295.9	347.4	283.1	283.1	332.4	268.4	268.4	315.2	252.8	252.8	296.9	
		SHC	254.6	308.4	362.2	244.4	295.9	347.4	233.8	283.1	332.4	221.7	268.4	315.2	208.8	252.8	296.9		
		67	THC	330.2	330.2	330.2	314.6	314.6	319.2	297.8	297.8	312.3	279.8	279.8	304.7	260.6	260.6	295.9	
		SHC	206.3	265.9	325.5	200.3	259.7	319.2	193.8	253.1	312.3	186.7	245.7	304.7	179.0	237.4	295.9		
		72	THC	360.1	360.1	360.1	343.2	343.2	343.2	325.0	325.0	325.0	305.4	305.4	305.4	284.6	284.6	284.6	
		SHC	145.7	205.7	265.7	139.9	199.8	259.7	133.8	193.5	253.3	127.3	186.8	246.3	120.4	179.7	238.9		
	76	THC	—	384.6	384.6	—	366.5	366.5	—	346.9	346.9	—	325.9	325.9	—	303.5	303.5		
	SHC	—	157.0	218.9	—	151.2	212.9	—	145.1	206.3	—	138.5	199.3	—	131.5	191.7			

**LEGEND**

- Do Not Operate
- Cfm — Cubic Feet Per Minute (Supply Air)
- EAT (db) — Entering Air Temperature (Dry Bulb)
- EAT (wb) — Entering Air Temperature (Wet Bulb)
- SHC — Sensible Heat Capacity (1000 Btuh) Gross
- THC — Total Heat Capacity (1000 Btuh) Gross

# CAPACITY RATINGS (cont)

## RGH181/183 COOLING CAPACITIES, SUBCOOLING MODE

TEMP (F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - CFM								
		4,500			6,000			7,500		
		Air Entering Evaporator - Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	202.90	184.60	166.20	213.70	194.60	175.40	222.30	202.50	182.70
	SHC	91.90	112.40	132.90	106.10	126.40	146.80	117.50	137.70	158.00
	kW	10.19	10.12	9.78	10.51	10.19	9.95	10.61	10.36	10.12
85	TC	189.80	171.80	153.80	201.00	182.20	163.30	209.90	190.40	170.80
	SHC	75.90	101.00	126.20	91.20	116.30	141.30	103.40	128.40	153.50
	kW	11.57	11.49	11.15	11.88	11.56	11.32	11.98	11.73	11.49
95	TC	176.70	159.10	141.40	188.30	169.70	151.20	197.50	178.20	159.00
	SHC	59.80	89.70	119.60	76.20	106.10	135.90	89.40	119.20	149.00
	kW	12.87	12.81	12.47	13.20	12.88	12.64	13.30	13.05	12.81
105	TC	163.60	146.30	129.00	175.60	157.30	139.10	185.10	166.10	147.10
	SHC	43.80	78.40	112.90	61.30	95.90	130.40	75.30	109.90	144.40
	kW	14.05	14.00	13.65	14.39	14.07	13.82	14.40	14.24	14.00
115	TC	150.50	133.50	116.50	162.90	144.90	127.00	172.70	154.00	135.30
	SHC	27.70	67.00	106.30	46.40	85.70	125.00	61.30	100.60	133.40
	kW	15.44	15.36	15.02	15.75	15.43	15.19	15.85	15.60	15.36
125	TC	137.40	120.80	104.10	150.20	132.50	114.90	160.30	141.90	123.50
	SHC	11.70	55.70	99.60	31.40	75.50	112.90	47.30	91.30	123.00
	kW	16.77	16.71	16.37	17.10	16.78	16.54	17.20	16.95	16.71

## RGH181/183 COOLING CAPACITIES, HOT GAS REHEAT MODE

TEMP (F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Ewb (F)								
		75 Dry Bulb 62.5 Wet Bulb (50% Relative)			75 Dry Bulb 64 Wet Bulb (56% Relative)			75 Dry Bulb 65.3 Wet Bulb (60% Relative)		
		Air Entering Evaporator - Cfm								
		4,500	6,000	7,500	4,500	6,000	7,500	4,500	6,000	7,500
80	TC	64.50	71.00	73.30	68.40	74.50	77.30	71.20	79.70	80.60
	SHC	12.60	24.90	36.80	6.80	13.70	23.90	-0.80	5.50	13.80
	kW	10.10	10.26	10.42	10.18	10.40	10.56	10.33	10.47	10.67
75	TC	66.60	73.10	75.60	70.50	76.60	79.50	73.20	80.80	82.90
	SHC	14.30	26.70	38.50	8.10	14.90	25.70	0.70	7.00	15.00
	kW	10.05	10.22	10.36	10.14	10.36	10.52	10.28	10.43	10.62
70	TC	68.70	75.10	77.40	72.50	78.60	81.40	75.20	82.80	84.90
	SHC	15.40	27.80	40.00	9.50	16.20	26.80	2.10	8.40	16.30
	kW	10.00	10.18	10.33	10.10	10.31	10.47	10.23	10.40	10.58
60	TC	72.80	79.30	81.60	76.70	82.80	85.70	79.40	86.90	88.80
	SHC	19.00	31.10	43.20	12.70	19.90	30.10	5.30	11.60	20.00
	kW	9.92	10.09	10.24	10.01	10.22	10.37	10.14	10.31	10.49
50	TC	76.80	83.40	85.70	80.80	86.90	89.70	83.50	90.90	92.80
	SHC	21.70	34.20	46.20	15.80	22.70	33.20	8.40	14.70	22.80
	kW	9.83	10.00	10.15	9.92	10.13	10.29	10.05	10.21	10.39
40	TC	80.90	87.30	89.60	84.90	90.80	93.60	87.40	94.80	96.70
	SHC	24.90	37.10	49.30	19.00	26.00	36.10	11.60	17.90	26.20
	kW	9.74	9.91	10.06	9.83	10.04	10.20	9.96	10.12	10.30

### LEGEND

- Edb — Entering Dry Bulb
- Ewb — Entering Wet Bulb
- kW — Kilowatts
- SHC — Sensible Heat Capacity
- TC — Total Capacity

**RGH210/213 COOLING CAPACITIES, SUBCOOLING MODE**

TEMP (F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - CFM								
		5250			7000			8750		
		Air Entering Evaporator - Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	232.00	211.30	190.60	242.40	221.00	199.70	250.70	228.90	207.00
	SHC	110.90	133.70	156.40	127.60	150.30	173.00	141.10	163.70	186.40
	KW	12.45	12.16	11.81	12.74	12.41	12.02	12.93	12.51	12.18
85	TC	215.90	195.70	175.50	226.00	205.20	184.40	234.20	212.80	191.50
	SHC	90.60	118.80	147.00	108.40	136.60	164.90	122.70	151.00	179.20
	KW	13.48	13.20	12.88	13.77	13.47	13.07	13.96	13.58	13.23
95	TC	199.70	180.00	160.30	209.70	189.40	169.10	217.60	196.80	176.10
	SHC	70.30	104.00	137.70	89.20	123.00	156.70	104.40	138.20	172.10
	KW	14.60	14.25	13.94	14.89	14.51	14.15	15.08	14.63	14.31
105	TC	183.60	164.50	145.20	193.30	173.50	153.80	201.00	180.80	160.60
	SHC	50.00	89.10	128.30	70.00	109.30	148.60	86.00	125.50	158.60
	KW	15.64	15.36	15.01	15.93	15.60	15.21	16.12	15.72	15.37
115	TC	167.50	148.80	130.10	176.90	157.70	138.50	184.50	164.80	145.10
	SHC	29.70	74.30	118.90	50.70	95.60	138.10	67.70	112.70	145.10
	KW	16.70	16.38	15.82	16.98	16.63	16.03	17.17	16.75	16.19
125	TC	151.40	133.20	115.00	160.60	141.90	123.10	167.90	148.80	129.70
	SHC	9.40	59.50	109.60	31.50	81.90	123.00	49.30	100.00	129.70
	KW	17.71	17.39	17.09	18.01	17.65	17.30	18.20	17.76	17.46

**RGH210/213 COOLING CAPACITIES, HOT GAS REHEAT MODE**

TEMP (F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Ewb (F)								
		75 Dry Bulb 62.5 Wet Bulb (50% Relative)			75 Dry Bulb 64 Wet Bulb (56% Relative)			75 Dry Bulb 65.3 Wet Bulb (60% Relative)		
		Air Entering Evaporator - Cfm								
		5,250	7,000	8,750	5,250	7,000	8,750	5,250	7,000	8,750
80	TC	67.80	71.30	74.10	70.50	74.80	79.80	73.30	78.20	82.40
	SHC	9.00	26.50	41.70	2.20	13.20	26.90	-5.20	2.90	13.80
	KW	11.65	11.75	11.87	11.82	11.90	11.98	11.93	12.10	12.19
75	TC	72.50	76.00	78.80	75.00	79.20	84.30	78.00	83.00	86.90
	SHC	13.40	30.90	46.10	6.50	18.00	31.30	-2.10	7.20	17.90
	KW	11.44	11.54	11.66	11.61	11.68	11.75	11.70	11.86	11.95
70	TC	77.10	80.60	83.40	79.50	83.90	88.90	82.40	87.30	91.10
	SHC	17.60	34.70	49.90	10.80	22.20	35.10	3.20	11.50	22.20
	KW	11.22	11.33	11.45	11.40	11.46	11.54	11.49	11.64	11.75
60	TC	86.30	89.90	92.70	88.80	93.20	98.20	91.70	96.60	100.50
	SHC	26.20	43.20	58.40	19.40	30.80	43.60	11.60	20.10	30.70
	KW	10.76	10.86	10.98	10.93	11.00	11.07	11.03	11.18	11.28
50	TC	95.50	99.10	101.90	98.00	102.40	107.40	101.00	106.00	109.80
	SHC	34.80	51.80	67.00	28.00	39.40	52.20	20.10	28.70	39.40
	KW	10.33	10.43	10.55	10.50	10.52	10.63	10.59	10.74	10.85
40	TC	104.80	108.40	111.20	107.30	111.70	116.60	110.30	115.30	119.10
	SHC	43.40	60.40	75.60	36.60	48.00	60.80	28.80	37.30	47.90
	KW	9.87	9.97	10.09	10.04	10.11	10.18	10.14	10.28	10.40

LEGEND

- Edb** — Entering Dry Bulb
- Ewb** — Entering Wet Bulb
- kW** — Kilowatts
- SHC** — Sensible Heat Capacity
- TC** — Total Capacity

# CAPACITY RATINGS (cont)

## RGH240/243 COOLING CAPACITIES, SUBCOOLING MODE

TEMP (F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - CFM								
		6,000			8,000			10,000		
		Air Entering Evaporator - Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	281.60	256.50	231.30	293.10	267.00	240.90	302.30	275.40	248.60
	SHC	114.70	141.00	167.40	140.60	166.60	192.60	161.60	187.30	212.90
	KW	13.52	13.25	12.95	13.82	13.46	13.21	13.97	13.60	13.31
85	TC	261.30	236.90	212.40	272.10	247.70	221.30	280.70	254.60	228.50
	SHC	90.90	123.50	156.10	118.80	151.10	183.30	141.40	173.40	205.40
	KW	14.95	14.68	14.48	15.25	14.89	14.64	15.40	15.03	14.74
95	TC	241.10	217.20	193.40	251.10	226.40	201.70	259.20	233.80	208.40
	SHC	67.20	106.00	144.80	97.10	120.10	174.10	121.20	159.50	197.80
	KW	16.52	16.25	15.95	16.82	16.46	16.21	16.97	16.60	16.31
105	TC	220.80	197.50	174.40	230.20	206.20	182.20	237.70	213.00	188.40
	SHC	43.40	88.40	133.50	75.30	120.10	164.90	101.00	145.70	178.90
	KW	18.09	17.82	17.52	18.39	18.03	17.78	18.54	18.17	17.88
115	TC	200.50	178.00	155.50	209.20	185.90	162.60	216.20	192.20	168.70
	SHC	19.70	70.90	122.20	53.50	104.60	155.70	80.90	131.80	161.20
	KW	19.65	19.38	19.08	19.95	19.59	19.34	20.10	19.73	19.44
125	TC	180.20	158.40	136.50	188.20	165.60	143.00	194.70	171.40	148.20
	SHC	-4.10	53.40	110.80	31.70	89.10	142.20	60.70	118.00	145.10
	KW	20.59	20.32	20.02	20.89	20.53	20.28	21.04	20.67	20.38

## RGH240/243 COOLING CAPACITIES, HOT GAS REHEAT MODE

TEMP (F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Ewb (F)								
		75 Dry Bulb 62.5 Wet Bulb (50% Relative)			75 Dry Bulb 64 Wet Bulb (56% Relative)			75 Dry Bulb 65.3 Wet Bulb (60% Relative)		
		Air Entering Evaporator - Cfm								
		6,000	8,000	10,000	6,000	8,000	10,000	6,000	8,000	10,000
80	TC	115.20	123.30	130.60	120.40	129.30	138.20	122.80	135.00	143.70
	SHC	40.80	58.30	76.10	32.30	45.50	60.40	20.10	34.30	48.00
	KW	13.24	13.32	13.39	13.43	13.57	13.65	13.49	13.68	13.74
75	TC	119.80	128.60	135.90	125.50	135.30	143.20	128.00	139.50	148.40
	SHC	45.60	62.80	82.10	37.00	49.80	65.20	24.30	38.70	52.60
	KW	13.05	13.10	13.17	13.21	13.35	13.43	13.27	13.46	13.52
70	TC	122.50	133.10	140.20	129.80	140.70	147.60	132.40	144.40	153.20
	SHC	49.80	76.00	86.10	41.10	54.30	69.20	28.80	41.40	56.80
	KW	12.80	12.87	12.94	12.98	13.12	13.20	13.04	13.23	13.29
60	TC	133.80	142.50	149.60	139.30	150.40	157.40	141.50	154.20	163.00
	SHC	58.60	76.00	95.00	50.20	63.50	78.10	37.80	52.10	65.90
	KW	12.34	12.42	12.49	12.53	12.67	12.75	12.59	12.78	12.84
50	TC	143.50	151.80	159.30	149.00	160.00	167.00	151.30	163.60	172.50
	SHC	67.70	84.80	103.80	59.10	72.40	87.00	46.70	61.00	74.90
	KW	11.88	11.95	12.03	12.07	12.21	12.29	12.13	12.32	12.38
40	TC	153.20	161.30	168.70	158.60	169.20	176.60	160.80	173.10	182.00
	SHC	76.50	93.60	111.60	68.00	81.50	95.80	55.80	69.80	84.00
	KW	11.42	11.49	11.56	11.60	11.74	11.82	11.66	11.85	11.91

### LEGEND

- Edb — Entering Dry Bulb
- Ewb — Entering Wet Bulb
- kW — Kilowatts
- SHC — Sensible Heat Capacity
- TC — Total Capacity

**RGH300/303 COOLING CAPACITIES, SUBCOOLING MODE**

TEMP (F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - CFM								
		7,500			10,000			12,500		
		Air Entering Evaporator - Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	351.30	319.50	287.80	370.40	337.30	304.10	385.80	351.50	317.20
	SHC	166.50	199.40	232.30	191.20	245.60	258.50	211.40	245.60	279.90
	KW	16.75	16.55	15.20	17.30	16.75	15.85	17.80	17.50	16.50
85	TC	327.50	296.40	265.30	346.10	313.60	281.20	361.10	327.50	294.00
	SHC	137.40	178.20	219.00	162.60	204.50	246.40	183.30	226.00	268.70
	KW	18.65	18.45	17.25	19.20	18.65	17.80	19.45	19.15	18.15
95	TC	303.70	273.30	242.90	321.80	290.00	258.30	336.40	303.50	270.70
	SHC	108.20	157.00	205.80	134.00	184.10	234.30	155.10	206.40	257.60
	KW	20.60	20.40	19.34	21.15	20.60	19.95	21.60	21.30	20.30
105	TC	279.90	250.20	220.40	297.50	266.40	235.30	311.70	279.50	247.40
	SHC	79.00	135.80	192.50	105.40	163.80	222.20	127.10	186.70	246.40
	KW	22.85	22.65	21.45	23.40	22.85	22.05	23.70	23.40	22.40
115	TC	256.20	227.10	198.00	273.20	242.80	212.40	287.00	255.50	224.10
	SHC	49.90	114.50	179.20	76.80	143.40	210.10	98.90	167.10	223.80
	KW	25.05	24.85	23.65	25.60	25.05	24.25	25.90	25.60	24.60
125	TC	232.40	203.90	175.50	248.90	219.20	189.50	262.30	231.50	200.80
	SHC	20.70	93.30	166.00	48.20	123.10	188.90	70.80	147.40	200.80
	KW	27.25	27.05	25.80	27.80	27.25	26.50	28.15	27.85	26.85

**RGH300/303 COOLING CAPACITIES, HOT GAS REHEAT MODE**

TEMP (F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Ewb (F)								
		75 Dry Bulb 62.5 Wet Bulb (50% Relative)			75 Dry Bulb 64 Wet Bulb (56% Relative)			75 Dry Bulb 65.3 Wet Bulb (60% Relative)		
		Air Entering Evaporator - Cfm								
		7,500	10,000	12,500	7,500	10,000	12,500	7,500	10,000	12,500
80	TC	124.40	133.90	139.00	132.00	142.10	145.10	135.60	149.10	151.50
	SHC	37.60	60.70	82.20	27.80	45.40	65.80	17.50	34.20	50.10
	KW	15.83	15.90	16.00	15.97	16.13	16.16	16.11	16.31	16.38
75	TC	129.00	138.50	144.60	136.60	147.60	150.10	140.60	154.00	156.30
	SHC	47.10	70.60	92.10	37.30	55.30	75.70	27.00	43.70	60.00
	KW	15.77	15.83	15.94	15.91	16.07	16.10	16.05	16.25	16.32
70	TC	133.60	143.10	149.20	141.20	152.30	154.80	145.30	158.80	161.10
	SHC	57.30	80.70	102.20	47.50	65.40	85.80	37.20	53.90	70.10
	KW	15.68	15.75	15.86	15.83	16.00	16.04	15.88	16.08	16.15
60	TC	142.80	158.40	158.40	150.40	161.40	163.90	153.90	167.40	169.70
	SHC	76.50	121.40	121.40	66.70	84.60	105.00	56.40	73.10	89.30
	KW	15.54	15.60	15.71	15.68	15.84	15.87	15.82	16.02	16.09
50	TC	151.80	161.30	167.40	159.40	170.50	173.20	162.80	176.20	178.80
	SHC	94.10	117.50	139.00	84.30	102.20	122.60	74.00	90.70	106.90
	KW	15.40	15.47	15.58	15.54	15.68	15.71	15.66	15.86	15.93
40	TC	161.20	170.70	176.80	168.80	179.80	182.50	172.20	185.70	188.20
	SHC	114.10	137.60	159.10	104.30	122.30	142.70	94.00	110.70	127.00
	KW	15.24	15.31	15.42	15.39	15.55	15.58	15.53	15.73	15.80

**LEGEND**

- Edb** — Entering Dry Bulb
- Ewb** — Entering Wet Bulb
- kW** — Kilowatts
- SHC** — Sensible Heat Capacity
- TC** — Total Capacity

# PHYSICAL DATA

## RGH 15 TO 25 TON PHYSICAL DATA

RGH UNIT		181/183	210/213	240/243	300/303
<b>REFRIGERATION SYSTEM</b>					
# Circuits / # Comp. / Type		2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll
R-410A Charge A/B (lbs)		17/16.4	17.5/16.8	23.8/23.1	24.9/27.7
Metering device		TXV	TXV	TXV	TXV
High-Pressure Trip / Reset (psig)		630 / 505	630 / 505	630 / 505	630 / 505
Low-Pressure Trip / Reset (psig)		54 / 117	54 / 117	54 / 117	54 / 117
Compressor Capacity Staging (%)		50% / 100%	50% / 100%	50% / 100%	50% / 100%
<b>EVAPORATOR COIL</b>					
Material		Cu / Al	Cu / Al	Cu / Al	Cu / Al
Tube Diameter (in.)		3/8 RTPF	3/8 RTPF	3/8 RTPF	3/8 RTPF
Rows / FPI		4 / 15	4 / 15	4 / 15	4 / 15
Total Face Area (ft <sup>2</sup> )		22	22	26	26
Condensate Drain Connection Size (in.)		3/4	3/4	3/4	3/4
<b>HOT GAS REHEAT COIL</b>					
Material		Cu / Al	Cu / Al	Cu / Al	Cu / Al
Tube Diameter		3/8 RTPF	3/8 RTPF	3/8 RTPF	3/8 RTPF
Rows / FPI		1 / 17	1 / 17	1 / 17	1 / 17
Total Face Area (ft <sup>2</sup> )		22	22	26	26
<b>EVAPORATOR FAN AND MOTOR VERTICAL SUPPLY</b>					
STANDARD STATIC	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.2	3.3	4.9	4.9
	Rpm Range	514-680	622-822	690-863	717-911
	Motor Frame Size	56	56	56	56
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15
MEDIUM STATIC	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	3.3	4.9	6.5	6.5
	Rpm Range	679-863	713-879	835-1021	913-1116
	Motor Frame Size	56	56	184T	184T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15
HIGH STATIC	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	4.9	6.5	8.7	8.7
	Rpm Range	826-1009	882-1078	941-1176	941-1176
	Motor Frame Size	56	185T	213T	213T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15
<b>EVAPORATOR FAN AND MOTOR HORIZONTAL SUPPLY</b>					
STANDARD STATIC	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.2	3.3	4.9	4.9
	Rpm Range	514-680	622-822	690-864	647-791
	Motor Frame Size	56	56	56	184T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	18 x 15/15 x 11	18 x 15/15 x 11	18 x 15/15 x 11	18 x 15/15 x 11
MEDIUM STATIC	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	3.3	4.9	6.5	6.5
	Rpm Range	614-780	713-879	835-1021	755-923
	Motor Frame Size	56	56	184T	184T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	18 x 15/15 x 11	18 x 15/15 x 11	18 x 15/15 x 11	18 x 15/15 x 11

**RGH 15 TO 25 TON PHYSICAL DATA (cont)**

RGH UNIT		181/183	210/213	240/243	300/303
<b>EVAPORATOR FAN AND MOTOR HORIZONTAL SUPPLY (CONT)</b>					
<b>HIGH STATIC</b>	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	4.9	6.5	8.7	8.7
	Rpm Range	746-912	882-1078	941-1176	827-1010
	Motor Frame Size	56	184T	213T	213T
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	18 x 15/15 x 11	18 x 15/15 x 11	18 x 15/15 x 11	18 x 15/15 x 11
<b>CONDENSER COIL (CIRCUIT A)</b>					
	Coil type	RTPF	RTPF	RTPF	RTPF
	Coil Length (in.)	70	72	82	95
	Coil Height (in.)	44	44	52	52
	Rows / FPI (Fins Per Inch)	2 / 17	2 / 17	2 / 17	2 / 17
	Total Face Area (ft <sup>2</sup> )	21.4	22.0	29.6	34.3
<b>CONDENSER COIL (CIRCUIT B)</b>					
	Coil type	RTPF	RTPF	RTPF	RTPF
	Coil Length (in.)	70	64	80	95
	Coil Height (in.)	44	44	52	52
	Rows / FPI (Fins Per Inch)	2 / 17	2 / 17	2 / 17	2 / 17
	Total Face Area (ft <sup>2</sup> )	21.4	19.5	29.6	34.3
<b>CONDENSER FAN/MOTOR</b>					
	Qty/Motor Drive Type	3 / Direct	4 / Direct	4 / Direct	6 / Direct
	Motor HP / RPM	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100
	Fan Diameter (in.)	22	22	22	22
<b>FILTERS</b>					
	RA Filter # / Size (in.)	6 / 10 x 25 x 2	6 / 10 x 25 x 2	9 / 16 x 25 x 2	9 / 16 x 25 x 2
	OA Inlet Screen # / Size (in.)	4 / 16 x 25 x 1	4 / 16 x 25 x 1	4 / 16 x 25 x 1	4 / 16 x 25 x 1
<b>GAS CONNECTION</b>					
	# of Gas Valves	1	1	1	1
	Natural Gas Supply Line Press (in. wg)/(PSIG)	5-13 / 0.18-0.47	5-13 / 0.18-0.47	5-13 / 0.18-0.47	5-13 / 0.18-0.47
	Propane Supply Line Press (in. wg)/(PSIG)	11-13 / 0.40-0.47	11-13 / 0.40-0.47	11-13 / 0.40-0.47	11-13 / 0.40-0.47
<b>HEAT ANTICIPATOR SETTING (AMPS)</b>					
	1st Stage	0.14	0.14	0.14	0.14
	2nd Stage	0.14	0.14	0.14	0.14
<b>NATURAL GAS HEAT</b>					
<b>LOW</b>	# of Stages / # of Burners (total)	2 / 5	2 / 5	2 / 5	2 / 5
	Connection Size	3/4 NPT	3/4 NPT	3/4 NPT	3/4 NPT
	Rollout Switch Opens / Closes	195 / 115	195 / 115	195 / 115	195 / 115
	Temperature Rise Range (°F)	25 - 55	25 - 55	25 - 55	25 - 55
<b>MEDIUM</b>	# of Stages / # of Burners (total)	2 / 7	2 / 7	2 / 7	2 / 7
	Connection Size	3/4 NPT	3/4 NPT	3/4 NPT	3/4 NPT
	Rollout Switch Opens / Closes	195 / 115	195 / 115	195 / 115	195 / 115
	Temperature Rise Range (°F)	30 - 60	30 - 60	30 - 60	30 - 60
<b>HIGH</b>	# of Stages / # of Burners (total)	2 / 10	2 / 10	2 / 10	2 / 10
	Connection Size	3/4 NPT	3/4 NPT	3/4 NPT	3/4 NPT
	Rollout Switch Opens / Closes	195 / 115	195 / 115	195 / 115	195 / 115
	Temperature Rise Range (°F)	35 - 65	35 - 65	35 - 65	35 - 65
<b>LIQUID PROPANE HEAT</b>					
<b>LOW</b>	# of Stages / # of Burners (total)	2 / 5	2 / 5	2 / 5	2 / 5
	Connection Size	3/4 NPT	3/4 NPT	3/4 NPT	3/4 NPT
	Rollout Switch Opens / Closes	195 / 115	195 / 115	195 / 115	195 / 115
	Temperature Rise Range (°F)	25 - 55	25 - 55	25 - 55	25 - 55

# PHYSICAL DATA (cont)

## RGH 15 TO 25 TON PHYSICAL DATA (cont)

RGH UNIT		181/183	210/213	240/243	300/303
<b>LIQUID PROPANE HEAT (CONT)</b>					
<b>MEDIUM</b>	# of Stages / # of Burners (total)	2 / 7	2 / 7	2 / 7	2 / 7
	Connection Size	3/4 NPT	3/4 NPT	3/4 NPT	3/4 NPT
	Rollout Switch Opens / Closes	195 / 115	196 / 115	197 / 115	198 / 115
	Temperature Rise Range (°F)	30 - 60	30 - 60	30 - 60	30 - 60
<b>HIGH</b>	# of Stages / # of Burners (total)	2 / 10	2 / 10	2 / 10	2 / 10
	Connection Size	3/4 NPT	3/4 NPT	3/4 NPT	3/4 NPT
	Rollout Switch Opens / Closes	195 / 115	195 / 115	195 / 115	195 / 115
	Temperature Rise Range (°F)	35 - 65	35 - 65	35 - 65	35 - 65



# OPTIONS AND ACCESSORIES

ITEM	OPTION*	ACCESSORY†
<b>CABINET</b>		
Dedicated Vertical Air Flow Duct Configuration	X	
Dedicated Horizontal Air Flow Duct Configuration	X	
Hinged Access Panels	X	
<b>COIL OPTIONS</b>		
Cu/Cu Indoor/Outdoor Coils	X	
Pre-Coated Outdoor Coils	X	
Premium, E-coated Outdoor Coils	X	
<b>CONDENSER PROTECTION</b>		
Condenser Coil Hail Guard (Louvered Design)		X
<b>HUMIDITY CONTROL</b>		
Hot Gas Reheat Dehumidification System	X	
<b>CONTROLS</b>		
Smoke Detectors (Supply Air)	X	
Time Guard II Compressor Delay Control Circuit		X
Phase Monitor		X
<b>ECONOMIZERS AND OUTDOOR AIR DAMPERS</b>		
EconoMi\$er IV	X	X
Low Leak EconoMi\$er X for 2-Speed Indoor VFD Controller (For 2-Stage Units Only) Vertical and Horizontal Supply/Return	X	X
Motorized 2 Position Outdoor-Air Damper	X	X
Manual Outdoor-Air Damper (25%)		X
Barometric Relief <sup>1</sup> (Horizontal Economizer)	X	X
Power Exhaust		X
<b>ECONOMIZER SENSORS AND IAQ DEVICES</b>		
Single Dry Bulb Temperature Sensors <sup>2</sup>	X	X
Single Enthalpy Sensors <sup>2</sup>	X	X
Differential Enthalpy Sensors <sup>2</sup>		X
Duct Mounted CO <sub>2</sub> Sensor <sup>2</sup>		X
4-in. Filter Track Assembly		X
<b>GAS HEAT</b>		
Propane Conversion Kit		X
Stainless Steel Heat Exchanger	X	
High Altitude Conversion Kit		X
Flue Discharge Deflector		X
<b>INDOOR MOTOR AND DRIVE</b>		
Multiple Motor and Drive Packages	X	
2-Speed VFD Drive Motor System	X	
VFD Remote Keypad Kit		X
<b>LOW AMBIENT CONTROL</b>		
Winter Start Kit <sup>3</sup>		X
Motormaster Head Pressure Controller <sup>3</sup>		X
<b>POWER OPTIONS</b>		
Convenience Outlet (Unpowered)	X	
Non-Fused Disconnect <sup>4</sup>	X	
<b>ROOF CURBS</b>		
Roof Curb 14-in. (356 mm)		X
Roof Curb 24-in. (610 mm)		X

\*Factory-installed option.  
†Field-installed accessory.

**NOTES:**

1. Included with economizer.
2. Sensors used to optimize economizer performance.
3. See application data for assistance.
4. Non-fused disconnect switch cannot be used when MOCP electrical rating exceeds 70 amps at 460/575 volt and 150 amps at 208/230 volt.

## OPTIONS AND ACCESSORIES (cont)

### 2-Speed VFD Drive Motor

The 2-speed VFD drive motor system saves energy and installation time by utilizing a Variable Frequency Drive (VFD) to automatically adjust the indoor fan motor speed in sequence with the units cooling operation. Per ASHRAE 90.1-2016 standard, during the first stage of cooling operation the VFD will adjust the fan motor to provide 2/3rd of the total cfm established for the unit. When a call for the second stage of cooling is required, the VFD will allow the total cfm for the unit established (100%). During the heating mode the VFD will allow total design cfm (100%) operation and during the ventilation mode the VFD will allow operation to 2/3rd of total cfm.

Compared to single speed indoor fan motor systems, 2 speed system can save substantial energy, 25%+, versus single speed indoor fan motor systems.

The VFD used in the system has soft start capabilities to slowly ramp up the speeds, thus eliminating any high inrush air volume during initial start-up. It also has internal over-current protection for the fan motor and a field-installed display kit that allows adjustment and in depth diagnostics of the VFD.

This system is available on models with 2-stage cooling operation with electro-mechanical controls. Both space sensor and conventional thermostats/controls can be used to provide accurate control in any application.

The system is very flexible for initial fan performance set up and adjustment. The standard factory shipped VFD is pre-programmed to automatically stage the fan speed between the first and second stage of cooling. The unit fan performance static pressure and cfm can be easily adjusted using the traditional means of pulley adjustments. The other means to adjust the unit static and cfm performance is to utilize the field-installed Display Kit and adjust the frequency and voltage in the VFD to performance requirements. In either case, once set up, the VFD will automatically adjust the speed between the cooling stage operations.

### Economizer (Dry-bulb or Enthalpy)

Economizers save money. They bring in fresh, outside air for ventilation; and provide cool, outside air to cool your building. This is the preferred method of low-ambient cooling. When coupled to CO<sub>2</sub> sensors, economizers can provide even more savings by coupling the ventilation air to only that amount required.

Economizers are available, installed and tested by the factory, with either enthalpy or dry-bulb temperature inputs. Additional sensors are available as accessories to optimize the economizers.

Economizers include gravity controlled, barometric relief equalizes building pressure and ambient air pressures. This can be a cast effective solution to prevent building pressurization. If further control of exhaust air is required, a dual centrifugal fan power exhaust system is also available.

### CO<sub>2</sub> Sensor

Improves productivity and saves money by working with the economizer to intake only the correct amount of outside air for ventilation. As occupants fill your building, the CO<sub>2</sub> sensor detects their presence through increasing CO<sub>2</sub> levels, and opens the economizer appropriately.

When the occupants leave, the CO<sub>2</sub> levels decrease, and the sensor appropriately closes the economizer. This intelligent control of the ventilation air, called Demand Controlled Ventilation (DCV) reduces the overall load on the rooftop, saving money.

### Smoke Detector

Smoke detectors make your application safer and your job easier. Smoke detectors immediately shut down the rooftop unit when smoke is detected. It is available for supply air.

### Louvered Hail Guards (Accessory Only)

Sleek, louvered panels protect the condenser coil from hail damage, foreign objects, and incidental contact.

### Convenience Outlet (Un-powered)

Reduce service and/or installation costs by including a convenience outlet in your specification. The convenience outlet provides, 15 amp, 115v GFCI receptacle with "Wet in Use" cover. This option is to be powered from a separate 115/120v power source.

### Non-Fused Disconnect

This OSHA-compliant, factory-installed, safety switch allows a service technician to locally secure power to the rooftop capable of providing protection to a MOCP maximum of 200A.

### Power Exhaust with Barometric Relief

Superior internal building pressure control. This field-installed accessory may eliminate the need for costly, external pressure control fans.

### Time Guard II Control Circuit

This accessory protects your compressor by preventing short-cycling in the event of some other failure, prevents the compressor from restarting for 30 seconds after stopping.

### Filter or Fan Status Switches (Accessory Only)

Use these differential pressure switches to detect a filter clog or indoor fan motor failure. When used in conjunction with a compatible unit controller/thermostat, the switches will activate an alarm to warn the appropriate personnel.

### Motorized 2-Position Damper

The new 2-position, motorized outdoor air damper admits up to 100% outside air. Using reliable, gear-driven technology, the 2-position damper opens to allow ventilation air and closes when the rooftop stops, stopping unwanted infiltration.

### Manual OA Damper (Accessory Only)

Manual outdoor air dampers are an economical way to bring in ventilation air. The dampers are available in 25% versions.

### Motormaster Head Pressure Controller

The Motormaster motor controller is a low ambient, head pressure controller kit that is designed to maintain the unit's condenser head pressure during periods of low ambient cooling operation. This device should be used as an alternative to economizer free cooling not when economizer usage is either not appropriate or desired. The Motormaster will either cycle the outdoor-fan motors or operate them at reduced speed to maintain the unit operation, depending on the model.

### Hot Gas Reheat Dehumidification System

Our Hot Gas Reheat Dehumidification System is an all-inclusive factory-installed option that can be ordered with any High Static motor.

This system expands the envelope of operation of our rooftop products to provide unprecedented flexibility to meet year round comfort conditions.

The Hot Gas Reheat Dehumidification System has the industry's only dual dehumidification mode setting. The system includes two new modes of operation.

The rooftop unit coupled with the Hot Gas Reheat Dehumidification System is capable of operating in normal design cooling mode, subcooling mode, and hot gas reheat mode. Normal design cooling mode is when the unit will operate under its normal sequence of operation by cycling compressors to maintain comfort conditions.

Subcooling mode will operate to satisfy part load type conditions when the space requires combined sensible and a higher proportion of latent load control. Hot Gas Reheat Dehumidification mode will operate when outdoor temperatures diminish and the need for latent capacity is required for sole humidity control. Hot Gas Reheat mode will provide neutral air for maximum dehumidification operation.

NOTE: Hot Gas Reheat Dehumidification System includes Motormaster Head Pressure Controller.

### **Winter Start Kit (Accessory Only)**

The winter start kit extends the low ambient limit of your rooftop to 25°F (-4°C). The kit bypasses the low pressure switch, preventing nuisance tripping of the low pressure switch. Other low ambient precautions may still be prudent.

### **Propane Heating (Accessory Only)**

Convert your gas heat rooftop from standard natural gas operation to propane using this field-installed kit.

### **High Altitude Heating (Accessory Only)**

High altitudes have less oxygen, which means heat exchangers need less fuel. The new gas orifices in this field-installed kit make the necessary adjustment for high altitude applications. They restore the optimal fuel to air mixture and

maintain healthy combustion at altitudes above 2000 ft (610m). Kits may not be required in all areas.

### **Optional Stainless Steel Heat Exchanger**

The stainless steel heat exchanger option provides the tubular heat exchanger be made out of a minimum 20 gauge type 409 stainless steel for applications where the mixed air to the heat exchanger is expected to drop below 45°F (7°C). Stainless steel may be specified on applications where the presence of airborne contaminants require its use or in area with very high outdoor humidity that may result in severe condensation in the heat exchanger during cooling operation.

### **Flue Discharge Deflector (Accessory Only)**

The flue discharge deflector is a useful accessory when flue gas recirculation is a concern. By venting the flue discharge upwards, the deflector minimizes the chance for a neighboring unit to intake the flue exhaust.

### **Alternate Motors and Drives**

Some applications need larger horsepower motors, some need more airflow, and some need both. A wide selection of motors and pulleys (drives) are available, factory-installed, to handle nearly any application.

### **Barometric Hood (Accessory Only)**

For Horizontal Economizer applications where relief damper is installed in duct work. This kit provides the needed protection.

### **Hinged Access Panels**

Allows access to unit's major components with specifically designed hinged access panels. Panels are filter, control box, indoor fan motor.

# OPTIONS AND ACCESSORIES (cont)

## OPTIONS AND ACCESSORY — WEIGHT ADDERS

BASE UNIT WITH OPTIONS AND ACCESSORIES (WEIGHT ADDERS)	MAX WEIGHT ADD							
	RGH181/183		RGH210/213		RGH240/243		RGH300/303	
	lb	kg	lb	kg	lb	kg	lb	kg
Base Unit operating Weight	1892	858	2102	953	2247	1019	2292	1040
Hot Gas Re-heat*	83	38	83	38	88	40	92	42
Power Exhaust	125	57	125	57	125	57	125	57
Economizer	170	77	170	77	170	77	195	88
Copper Tube/Fin Evaporator Coil	110	50	110	50	135	61	161	73
Low Gas Heat	85	39	85	39	85	39	85	39
Medium Gas Heat	91	41	90	41	90	41	90	41
High Gas Heat	113	51	113	51	113	51	113	51
Flue Discharge Deflector	7	3	7	3	7	3	7	3
Roof Curb 14-in. (356 mm)	240	109	240	109	240	109	255	116
Roof Curb 24-in. (610 mm)	340	154	340	154	340	154	355	161
Louvered Hail Guard	60	27	60	27	120	54	150	68
CO <sub>2</sub> Sensor	5	2	5	2	5	2	5	2
Supply Smoke Detector	5	2	5	2	5	2	5	2
Fan/Filter Status Switch	2	1	2	1	2	1	2	1
Non-Fused Disconnect	15	7	15	7	15	7	15	7
Non-Powered Convenience Outlet	5	2	5	2	5	2	5	2
Enthalpy Sensor	2	1	2	1	2	1	2	1
Differential Enthalpy Sensor	3	1	3	1	3	1	3	1
Two-Position Motorized Damper	50	23	50	23	50	23	65	29
Manual Damper	35	16	35	16	35	16	40	18
Field Filter Track 4-in. (102 mm)	12	5	12	5	12	5	18	8
MotorMaster® Controller	35	16	35	16	35	16	35	16
Standard Static Motor/Drive	0	0	0	0	0	0	0	0
Medium Static Motor/Drive	5	2	6	3	6	3	6	3
High Static Motor/Drive	11	5	12	5	16	7	16	7
Barometric Relief Hood (Horizontal)	25	11	25	11	25	11	25	11
2 Speed VFD Drive Motor System	20	9	20	9	20	9	20	9

**ACCESSORIES — RGH181-303**

**FLAT ROOF CURBS**

Model Number	Description	Use With Model Size
CRRFCURB045A00	14-in. (356 mm) High Roof Curb. Ductwork attaches to the roof curb. Includes thru-the-bottom capability.	181/183
CRRFCURB047A00		210/213 - 240/243
CRRFCURB049A00		300/303
CRRFCURB046A00	24-in. (356 mm) High Roof Curb. Ductwork attaches to the roof curb. Includes thru-the-bottom capability.	181/183
CRRFCURB048A00		210/213 - 240/243
CRRFCURB050A00		300/303

**ECONOMIZERS\*1,2**

Model Number	Description	Use With Model Size
CRECOMZR052A00	EconoMi\$er IV, Vertical and Horizontal with solid state controller	181/183 - 210/213
CRECOMZR053A00	EconoMi\$er IV, Vertical and Horizontal with solid state controller	240/243 - 300/303
CRECOMZR074A00	Ultra Low Leak Horizontal and Vertical EconoMi\$er X with solid-state controller, gear-driven, fully modulating damper, spring return actuator, up to 100% barometric relief, supply and outdoor air sensors, and CO <sub>2</sub> sensor compatible.	181/183 - 210/213
CRECOMZR075A00	Ultra Low Leak Horizontal and Vertical EconoMi\$er X with solid-state controller, gear-driven, fully modulating damper, spring return actuator, up to 100% barometric relief, supply and outdoor air sensors, and CO <sub>2</sub> sensor compatible.	240/243 - 300/303

\* Barometric relief hood is not included in the horizontal economizer and must be installed in return ductwork on Horizontal configured models. Order separately, see below, CRBARHOD001A00.

1. EconoMi\$er X cannot be installed with EconoMi\$er IV, manual damper, or motorized damper.
2. Can only be used on electrical mechanical units with 2-stage cooling and 2-speed fan control.

**ECONOMIZER SENSORS**

Model Number	Description	Use With Model Size
DNTEMPSN002A00	Single (dry-bulb) Control	EconoMi\$er IV
DNCBDIOX005A00	CO <sub>2</sub> Sensor and aspirator box for use in return air stream.	EconoMi\$er IV and X
DNENTDIF004A00	Return Air Enthalpy Sensor.	EconoMi\$er IV
AXB078ENT	Enthalpy Control.	EconoMi\$er IV
CRTEMPSN005A00	Outdoor or return dry bulb temperature sensor used with Honeywell W7220 electro-mechanical control.	EconoMi\$er X
HH57AC081	Enthalpy control for W7220 controller only. (One required for single enthalpy two required for differential enthalpy)	EconoMi\$er X

NOTE: Supply air temperature sensor (SAT and low ambient lockout switch) provided with EconoMi\$er IV or EconoMi\$er X.

**BAROMETRIC RELIEF HOOD**

Model Number	Description	Use With Model Size
CRBARHOD001A00	For horizontal economizer applications where relief damper is installed in duct work, this kit provides needed protection.	181-213-243-303

**POWER EXHAUST\***

Model Number	Description	Use With Model Size
CRPWREXH068A00	Vertical and Horizontal, 208/230-3-60	181/183-210/213-240/243-300/303
CRPWREXH069A00	Vertical and Horizontal, 460-3-60	181/183-210/213-240/243-300/303
CRPWREXH070A00	Vertical and Horizontal, 575-3-60	181/183-210/213-240/243-300/303

**MANUAL OUTDOOR AIR DAMPERS**

Model Number	Description	Use With Model Size
CRMANDPR009A00	25% Open Manual Fresh Air Damper	181/183-210/213
CRMANDPR010A00	25% Open Manual Fresh Air Damper	240/243-300/303

**MOTORIZED OUTDOOR AIR DAMPERS**

Model Number	Description	Use With Model Size
CRTWOPOS012A00	Motorized 2-position outdoor air damper	181/183-210/213
CRTWOPOS013A00	Motorized 2-position outdoor air damper	240/243-300/303

**LOW AMBIENT CONTROLS**

Model Number	Description	Use With Model Size
CRLOWAMB041A00 <sup>1</sup>	Motormaster I –20° Low Ambient Control 208/230-3-60	181/183-210/213-240/243-300/303
CRLOWAMB042A00 <sup>1</sup>	Motormaster I –20° Low Ambient Control 460-3-60, 575-3-60	181/183-210/213-240/243-300/303
CRTRXKIT001A00	Motormaster I –20° Low Ambient Control 575-3-60. Must be used in conjunction with Low Ambient Controller if used on 575-3-60 models.	181/183-210/213-240/243-300/303

1. Also requires one DNWINSTR001A00 winter start kit per circuit.

## OPTIONS AND ACCESSORIES (cont)

### ACCESSORIES — RGH181-303 (cont)

<b>CONTROL UPGRADE KITS</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
<b>CRDISKIT001A00</b>	VFD Remote keypad kit for programming replacement VFD drive module.	All
<b>NRTIMEGD001A00</b>	Time Guard II	181-303
<b>CRSDTEST001A00</b>	Smoke detector remote Test/Reset/Alarm indicator kit	181-303
<b>CRPHASE3001A02</b>	Electronic Phase Monitor - All 208/230/460-3-60	181-303
<b>CRPHASE3002A00</b>	Electronic Phase Monitor - All 575-3-60 models	181-303
<b>CRSTATUS005A00</b>	Fan/filter Status Switch - Indicator light not included	181-303
<b>CRSMKSEN002A00</b>	Smoke Detector Control Module	181-303
<b>CRSMKKIT002A00</b>	Smoke Detector Control Module (Smoke Detector Sensor with sampling tube and exhaust tube)	181-303
<b>DNWINSTR001A00</b>	Winter Start Kit - Contains time delay relay for timed bypass of low pressure switch on startup.	181-303
<b>PROPANE GAS CONVERSION KIT</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
<b>CRLPKIT9001A00</b>	Propane Conversion kit for use between 0'-2,000'	181-303
<b>CRLPELEV005A00</b>	Propane and Hi Altitude conversion kit for use between 2001'-10,000'	181-303
<b>CRLPELEV006A00</b>	Propane and Hi Altitude conversion kit for use between 10,000'-14,000'	181-303
<b>NATURAL GAS HIGH ALTITUDE CONVERSION KITS</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
<b>CRNGELEV001A00</b>	High Altitude Conversion kit for use between 3,000'-10,000'	181-303
<b>CRNGELEV002A00</b>	High Altitude Conversion kit for use between 10,001'-14,000'	181-303
<b>HEATING UPGRADE KITS</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
<b>CRFLUEDS006A00</b>	Flue Discharge Deflector	181-303
<b>4-IN. FILTER TRACK UPGRADE KIT</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
<b>CRFLTTRK001A00</b>	4-in. Field Conversion Kit	181-303
<b>LOUVERED HAIL GUARDS</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
<b>CRLVHLGD017A00</b>	Louvered Condenser Coil Hail Guard	181/183
<b>CRLVHLGD030A00</b>	Louvered Condenser Coil Hail Guard	210/213
<b>CRLVHLGD031A00</b>	Louvered Condenser Coil Hail Guard	240/243
<b>CRLVHLGD029A00</b>	Louvered Condenser Coil Hail Guard	300/303

#### LEGEND

— Not Available



\* For hot gas re-heat system add Motormaster® controller.

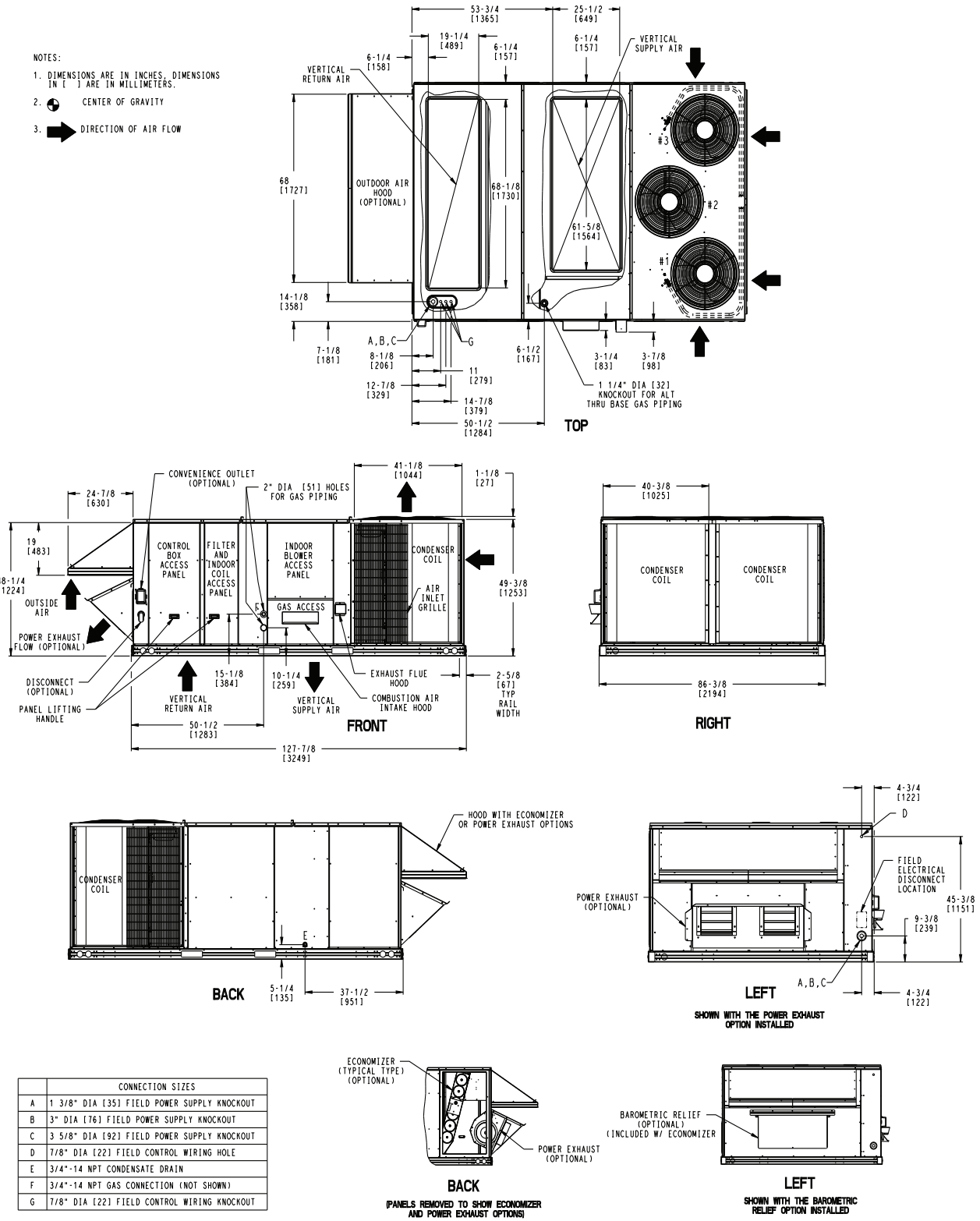
NOTE: Where multiple variations are available, the heaviest combination is listed.

# UNIT DIMENSIONS

## RGH181/183 BASE UNIT DIMENSIONS

**NOTES:**

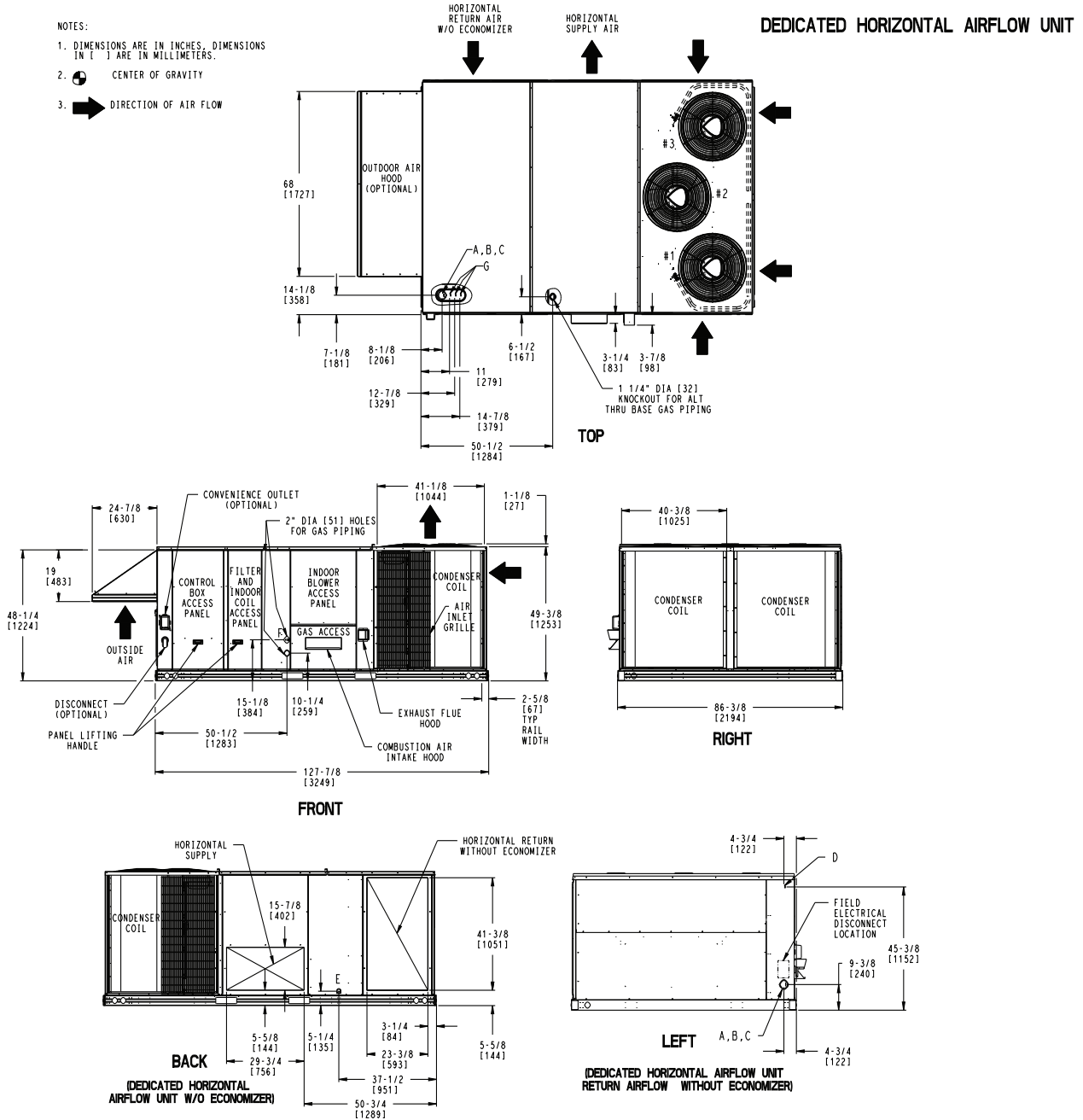
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN ( ) ARE IN MILLIMETERS.
2.  CENTER OF GRAVITY
3.  DIRECTION OF AIR FLOW



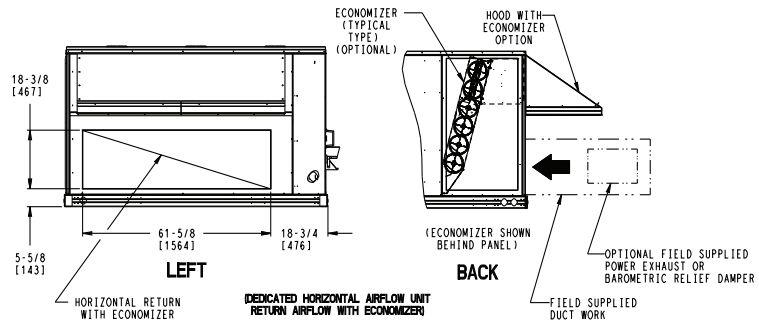
# UNIT DIMENSIONS (cont)

## RGH181/183 BASE UNIT DIMENSIONS (cont)

- NOTES:
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
  2. CENTER OF GRAVITY
  3. DIRECTION OF AIR FLOW



CONNECTION SIZES	
A	1 3/8" DIA [35] FIELD POWER SUPPLY KNOCKOUT
B	3" DIA [76] FIELD POWER SUPPLY KNOCKOUT
C	3 5/8" DIA [92] FIELD POWER SUPPLY KNOCKOUT
D	7/8" DIA [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	3/4"-14 NPT GAS CONNECTION (NOT SHOWN)
G	7/8" DIA [22] FIELD CONTROL WIRING KNOCKOUT



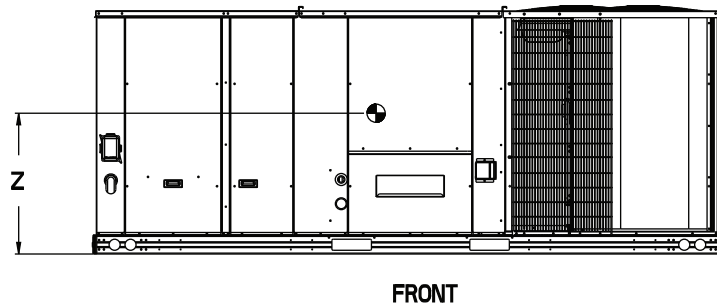
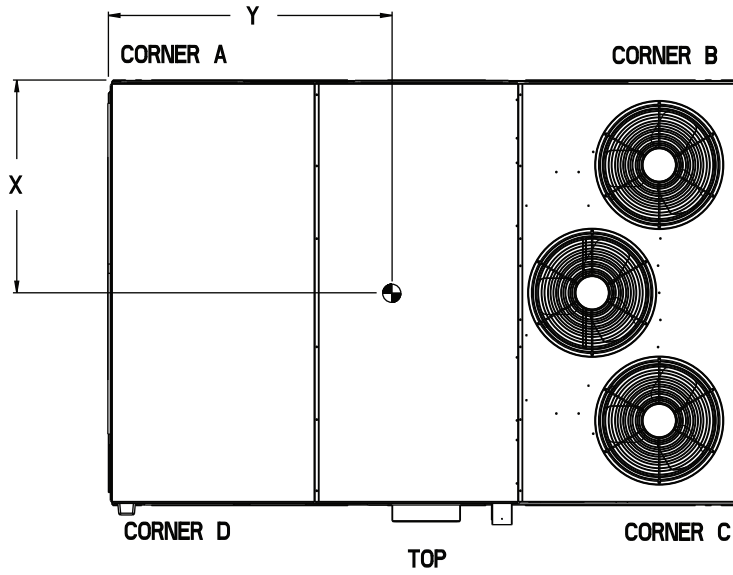
50HE502162 REV A



### RGH181/183 CORNER WEIGHTS

UNIT	STD UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
RGH 181/183	1892	860	401	182	449	204	565	257	505	230	48 [1219]	67 3/8 [1711]	16 1/2 [419]

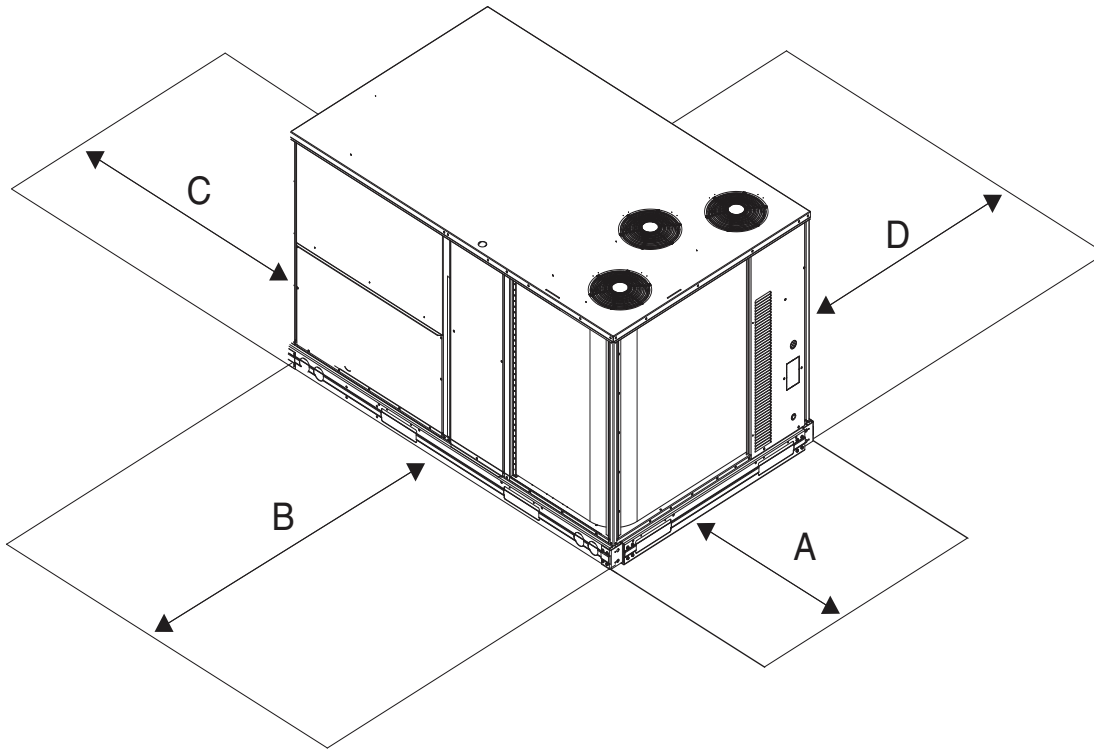
\* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.  
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



50HE502162 REV A

# UNIT DIMENSIONS (cont)

## RGH181/183 SERVICE CLEARANCES



LOCATION	DIMENSION (in.)	CONDITION
A	36	Recommended clearance for airflow and service.
B	42	Recommended clearance for airflow and service.
C	18	No convenience outlet. No economizer. No field-installed disconnect on economizer hood side (factory-installed disconnect installed).
	36	Convenience outlet installed. Vertical surface behind servicer is electrically non-conductive (e.g. wood, fiberglass).
	42	Convenience outlet installed. Vertical surface behind servicer is electrically conductive (e.g. metal, masonry)
	96	Economizer and/or Power Exhaust installed. Check for sources of flue products within 10-ft. of economizer fresh air intake.
D	42	Recommended clearance for service.

NOTE: Unit is not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or for vertical clearances.

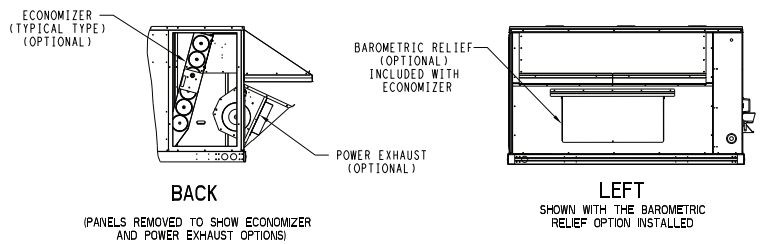
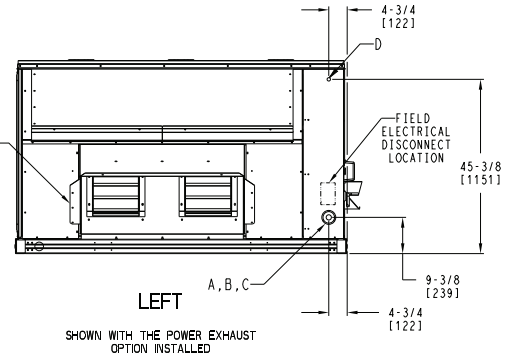
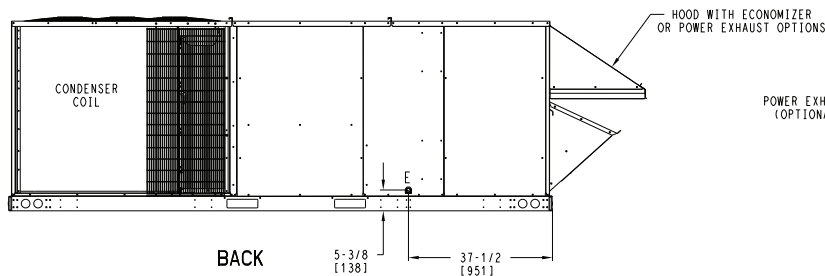
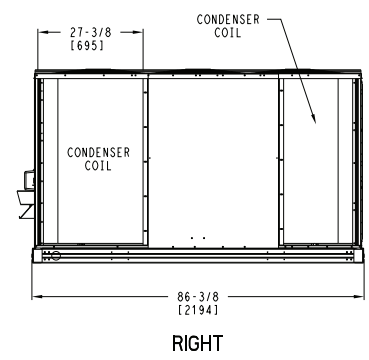
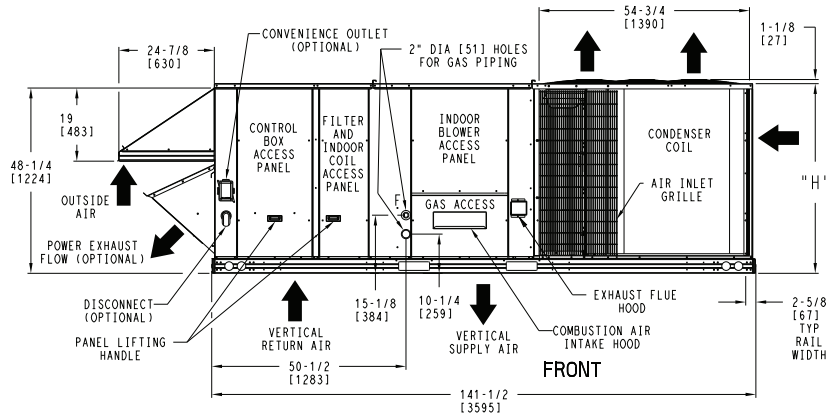
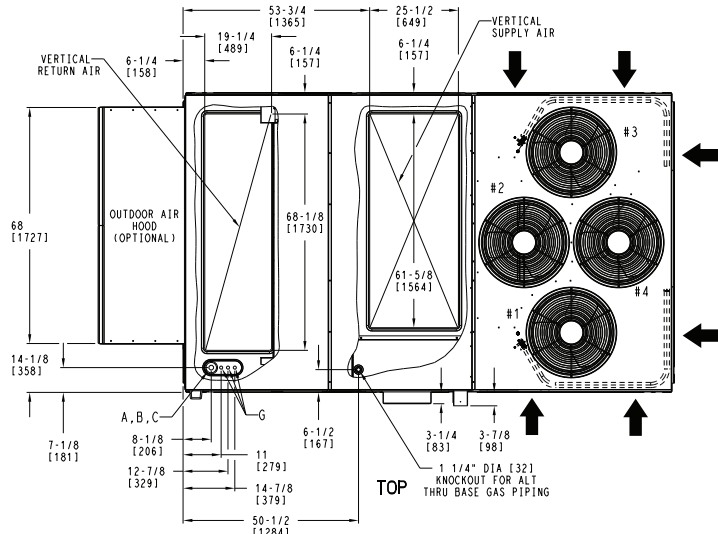
## RGH210/213-240/243 BASE UNIT DIMENSIONS

**NOTES:**

1. DIMENSIONS ARE IN INCHES. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW

CONNECTION SIZES	
A	1 3/8" DIA [35] FIELD POWER SUPPLY KNOCKOUT
B	3" DIA [76] FIELD POWER SUPPLY KNOCKOUT
C	3 5/8" DIA [92] FIELD POWER SUPPLY KNOCKOUT
D	7/8" DIA [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	3/4"-14 NPT GAS CONNECTION (NOT SHOWN)
G	7/8" DIA [22] FIELD CONTROL WIRING KNOCKOUT

UNIT	H
17.5 TON	49-3/8 [1253]
20 TON	57-3/8 [1456]



### DEDICATED VERTICAL AIRFLOW UNIT

# UNIT DIMENSIONS (cont)

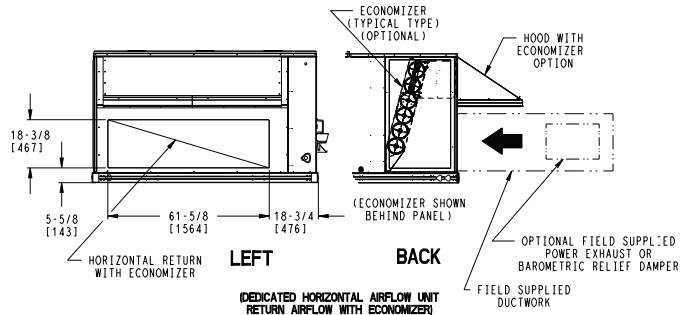
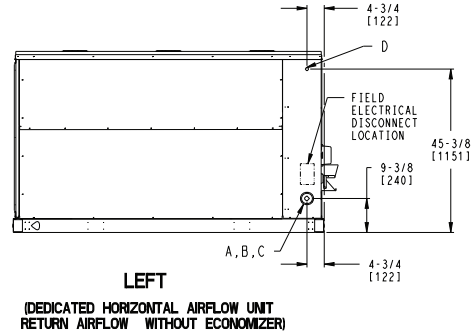
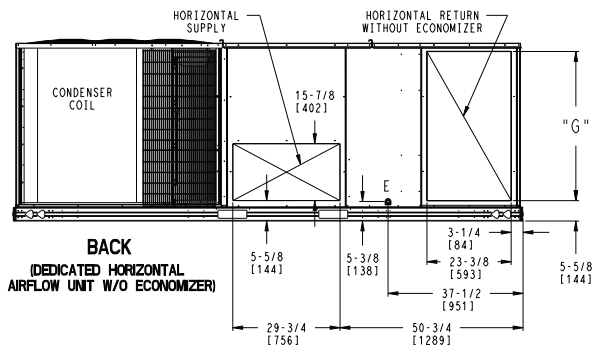
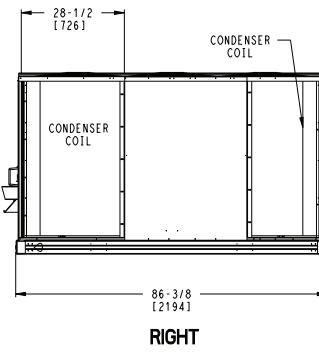
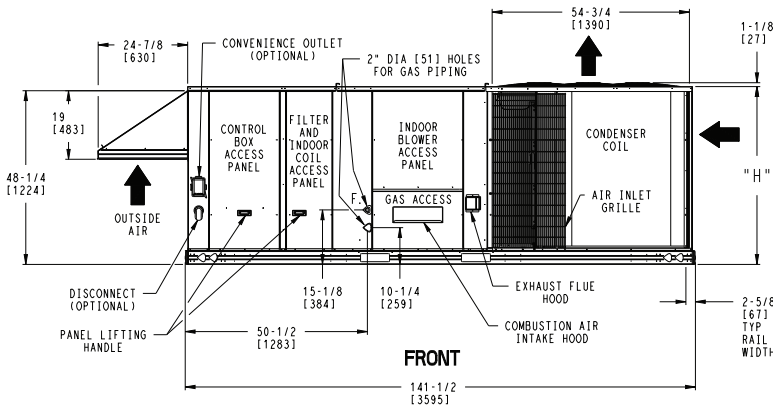
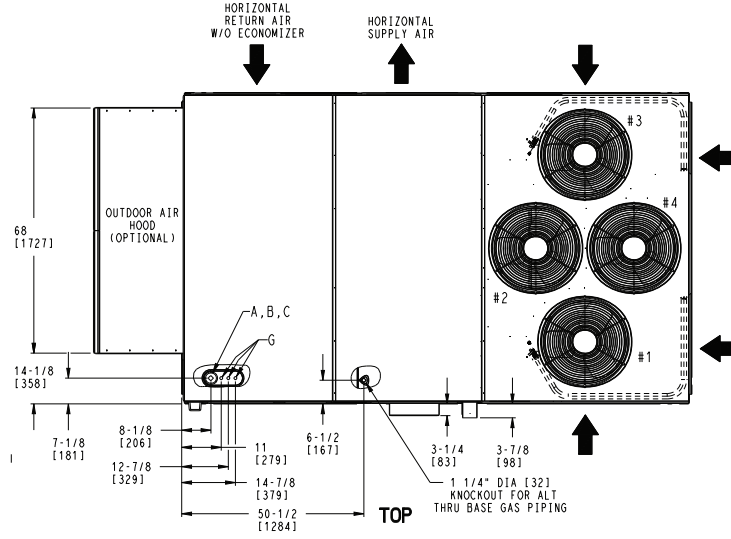
## RGH210/213-240/243 BASE UNIT DIMENSIONS (cont)

### DEDICATED HORIZONTAL AIRFLOW UNIT

- NOTES:
1. DIMENSIONS ARE IN INCHES. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
  2. CENTER OF GRAVITY
  3. DIRECTION OF AIR FLOW

CONNECTION SIZES	
A	1 3/8" DIA [35] FIELD POWER SUPPLY KNOCKOUT
B	3" DIA [76] FIELD POWER SUPPLY KNOCKOUT
C	3 5/8" DIA [92] FIELD POWER SUPPLY KNOCKOUT
D	7/8" DIA [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	3/4"-14 NPT GAS CONNECTION (NOT SHOWN)
G	7/8" DIA [22] FIELD CONTROL WIRING KNOCKOUT

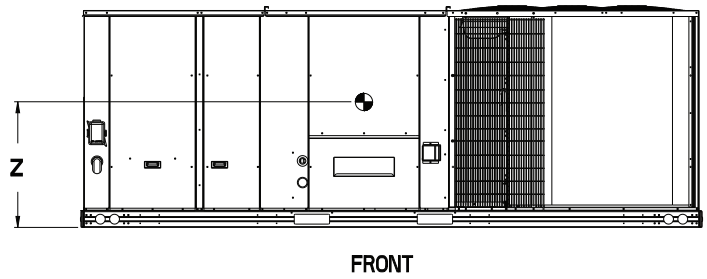
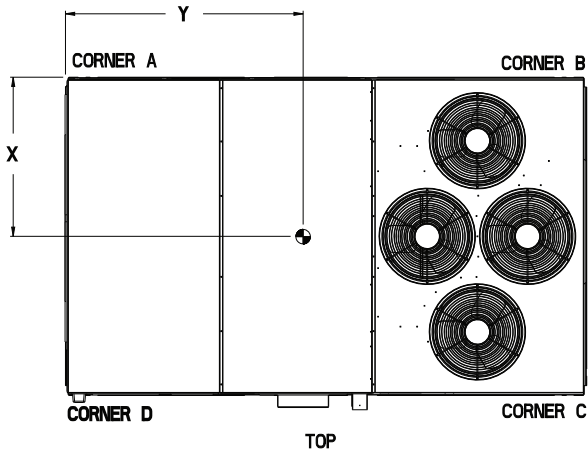
UNIT	G	H
11.5 TON	41-3/8 [1051]	49-3/8 [1253]
20 TON	49-3/8 [1253]	57-3/8 [1456]



## RGH210/213-240/243 CORNER WEIGHTS

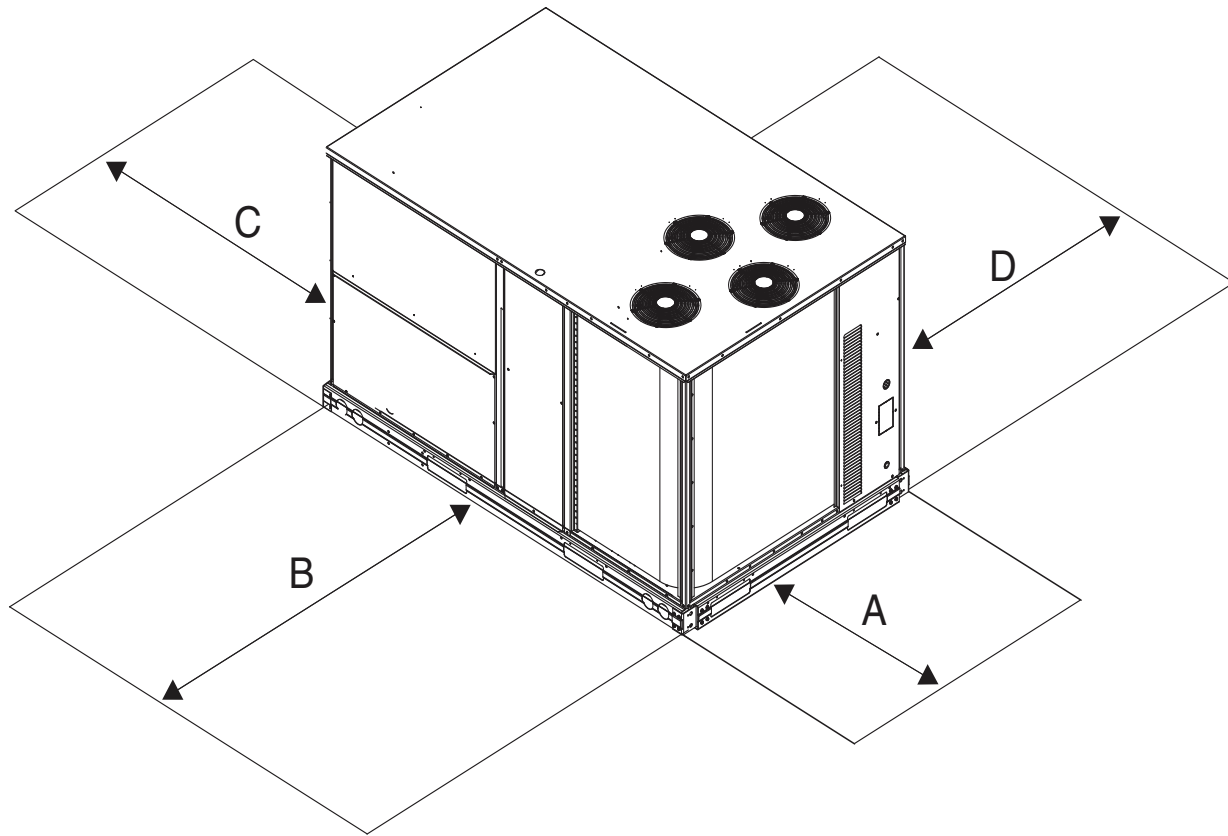
UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C. G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
17.5 TON	2102	956	474	215	390	177	593	269	582	265	47 1/2 [1207]	71 1/4 [1810]	16 1/2 [419]
20 TON	2247	1021	540	246	556	253	598	272	581	264	44 5/8 [1133]	71 5/8 [1819]	19 [483]

\* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.  
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



# UNIT DIMENSIONS (cont)

## RGH210/213-240/243 SERVICE CLEARANCES



LOCATION	DIMENSION (in.)	CONDITION
A	36	Recommended clearance for airflow and service.
B	42	Recommended clearance for airflow and service.
C	18	No convenience outlet. No economizer. No field-installed disconnect on economizer hood side (factory-installed disconnect installed).
	36	Convenience outlet installed. Vertical surface behind servicer is electrically non-conductive (e.g. wood, fiberglass).
	42	Convenience outlet installed. Vertical surface behind servicer is electrically conductive (e.g. metal, masonry)
	96	Economizer and/or Power Exhaust installed. Check for sources of flue products within 10-ft. of economizer fresh air intake.
D	42	Recommended clearance for service.

NOTE: Unit is not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or for vertical clearances.

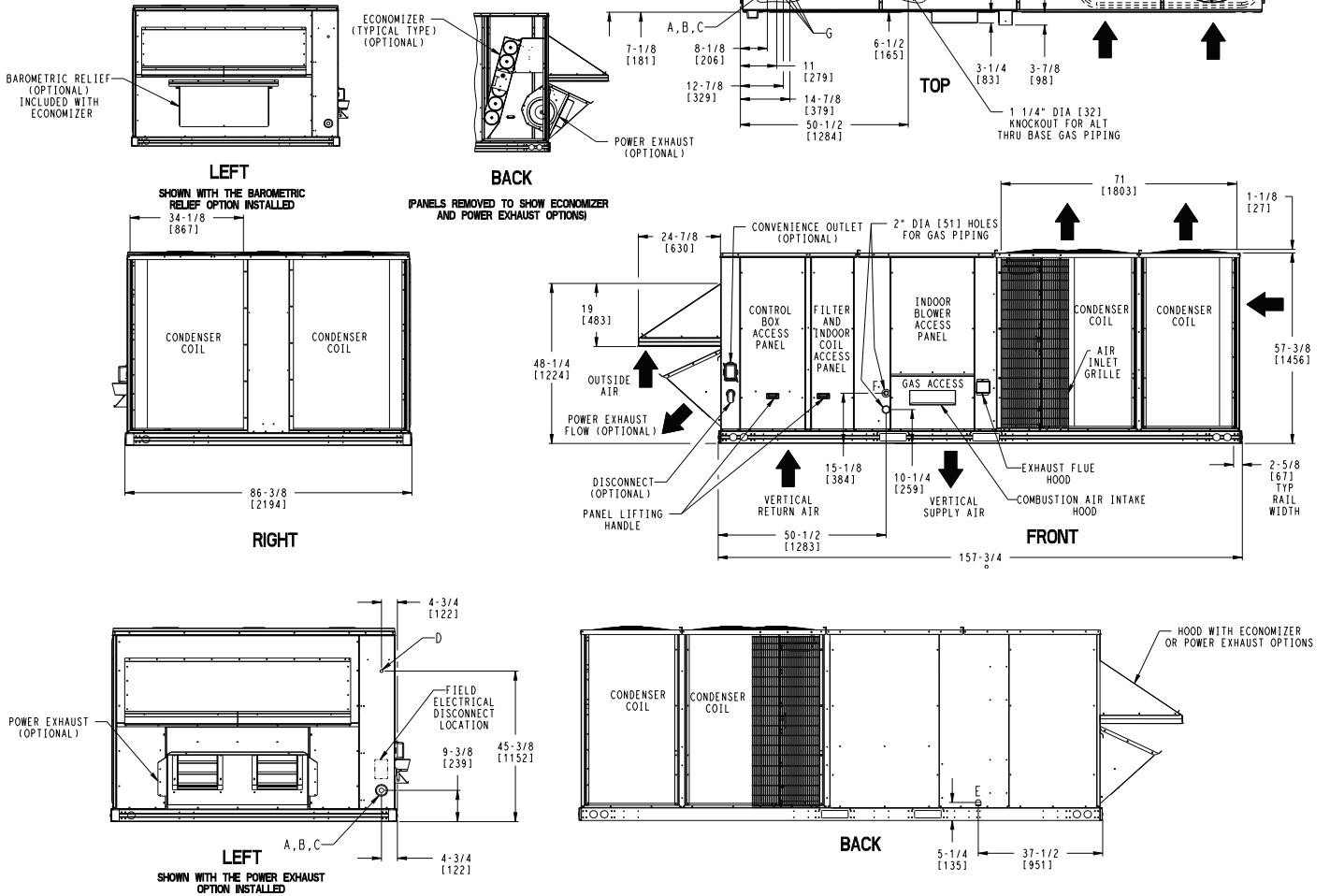
## RGH300/303 BASE UNIT DIMENSIONS

CONNECTION SIZES	
A	1 3/8" DIA [35] FIELD POWER SUPPLY KNOCKOUT
B	3" DIA [76] FIELD POWER SUPPLY KNOCKOUT
C	3 5/8" DIA [92] FIELD POWER SUPPLY KNOCKOUT
D	7/8" DIA [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	3/4"-14 NPT GAS CONNECTION (NOT SHOWN)
G	7/8" DIA [22] FIELD CONTROL WIRING KNOCKOUT

**NOTES:**

1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW



### DEDICATED VERTICAL AIRFLOW UNIT



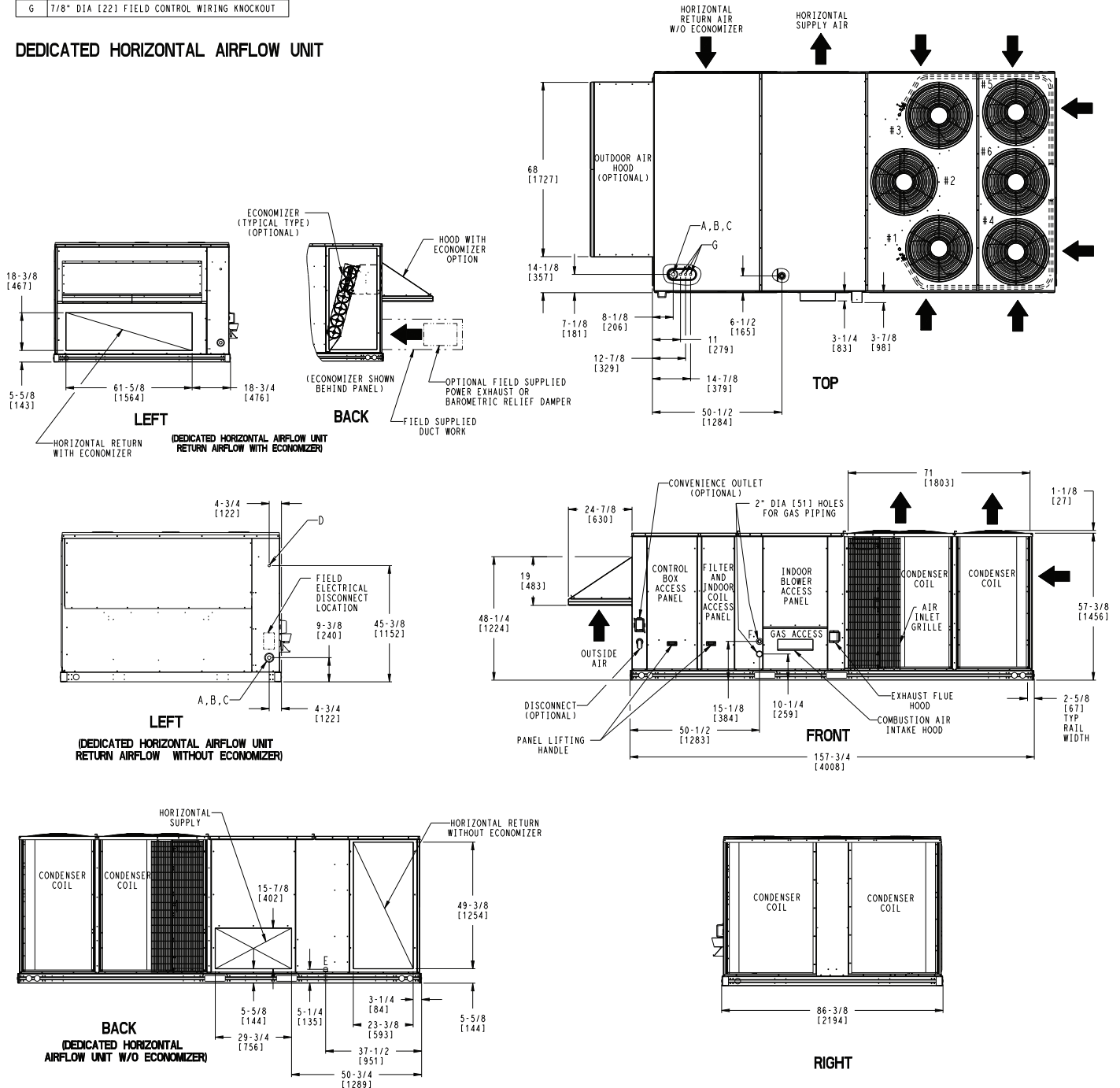
# UNIT DIMENSIONS (cont)

## RGH300/303 BASE UNIT DIMENSIONS (cont)

CONNECTION SIZES	
A	1 3/8" DIA [35] FIELD POWER SUPPLY KNOCKOUT
B	3" DIA [76] FIELD POWER SUPPLY KNOCKOUT
C	3 5/8" DIA [92] FIELD POWER SUPPLY KNOCKOUT
D	7/8" DIA [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	3/4"-14 NPT GAS CONNECTION (NOT SHOWN)
G	7/8" DIA [22] FIELD CONTROL WIRING KNOCKOUT

- NOTES:
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
  2.  CENTER OF GRAVITY
  3.  DIRECTION OF AIR FLOW

### DEDICATED HORIZONTAL AIRFLOW UNIT

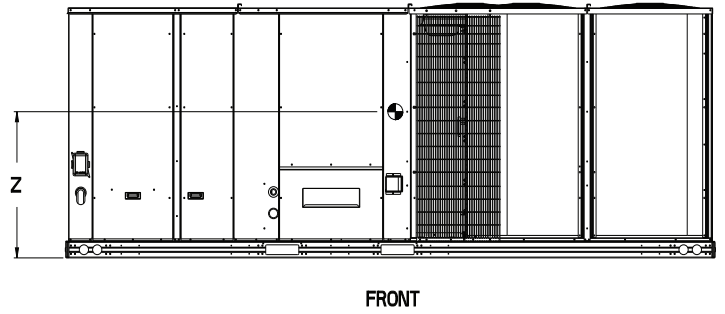
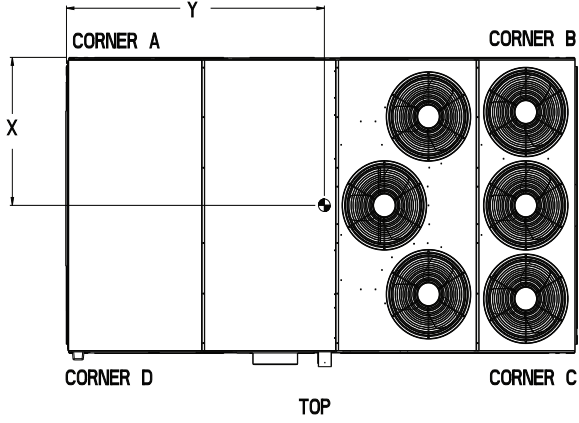




### RGH300/303 CORNER WEIGHTS

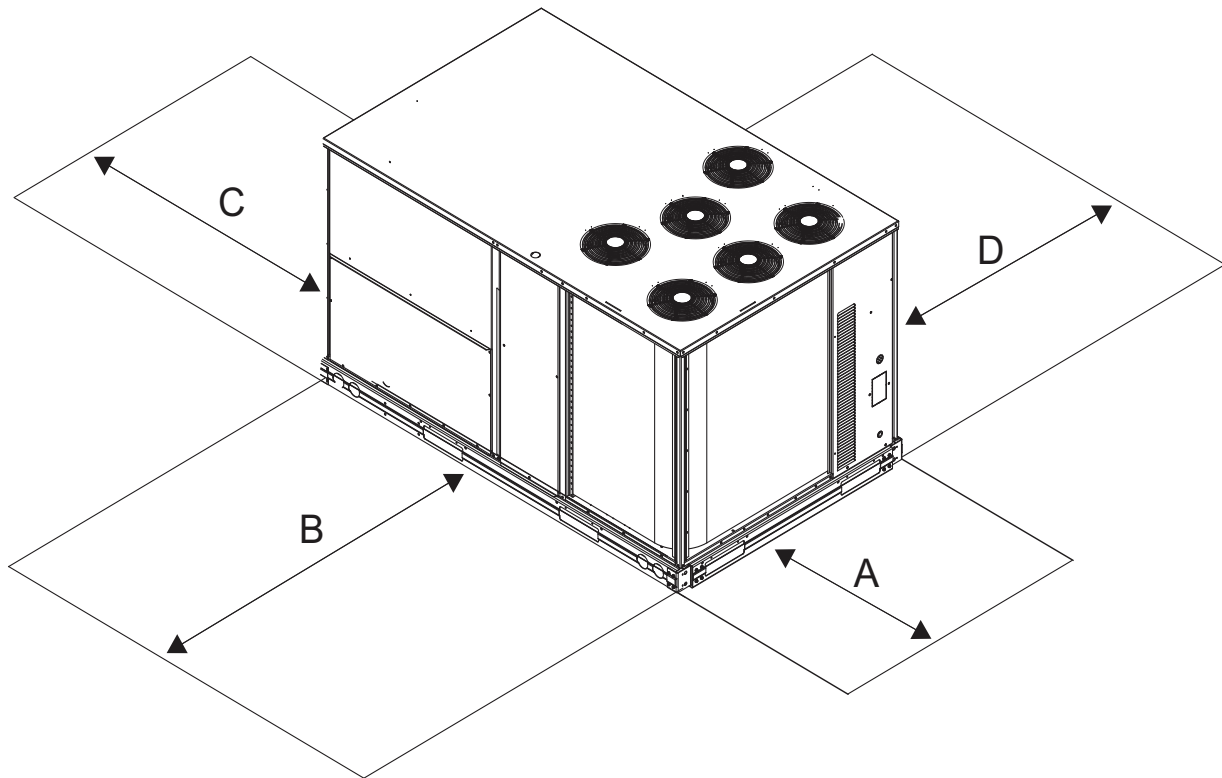
UNIT	STD UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
25 TON	2292	1042	577	262	559	254	583	265	602	274	44 [1118]	77 1/2 [1969]	19 [483]

\* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.  
 FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



# UNIT DIMENSIONS (cont)

## RGH300/303 SERVICE CLEARANCES



LOCATION	DIMENSION (in.)	CONDITION
A	36	Recommended clearance for airflow and service.
B	42	Recommended clearance for airflow and service.
C	18	No convenience outlet. No economizer. No field-installed disconnect on economizer hood side (factory-installed disconnect installed).
	36	Convenience outlet installed. Vertical surface behind servicer is electrically non-conductive (e.g. wood, fiberglass).
	42	Convenience outlet installed. Vertical surface behind servicer is electrically conductive (e.g. metal, masonry)
	96	Economizer and/or Power Exhaust installed. Check for sources of flue products within 10-ft. of economizer fresh air intake.
D	42	Recommended clearance for service.

NOTE: Unit is not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or for vertical clearances.

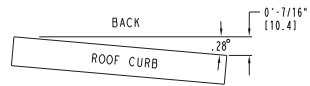
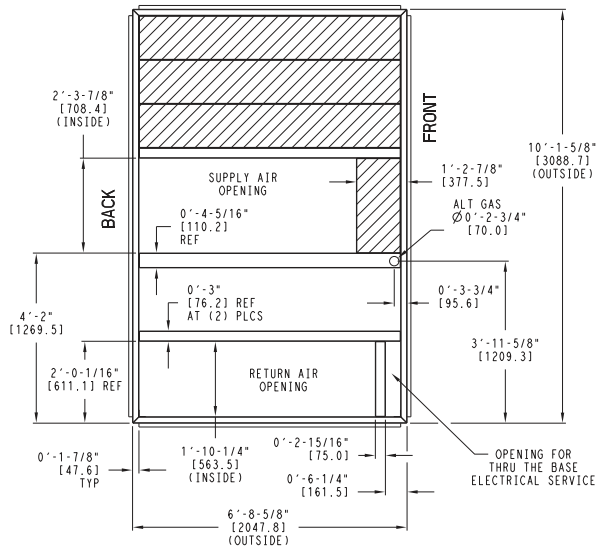
## RGH180/183 — ROOF CURB DIMENSIONS

UNIT SIZE	"A"	ROOF CURB ACCESSORY
RGH 181/183	1'-2" [356.0]	CRRFCURB045A00
	2'-0" [610.0]	CRRFCURB046A00

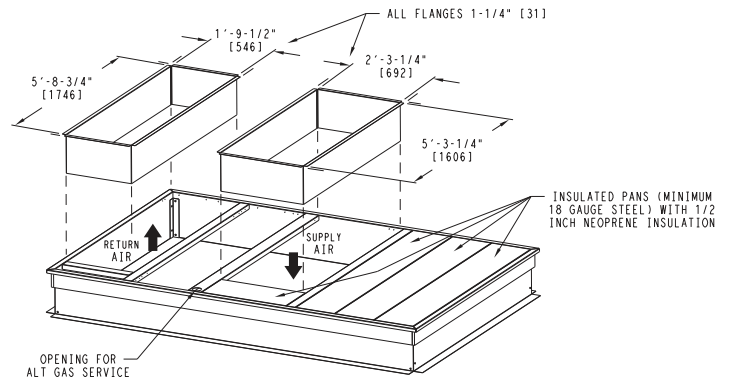
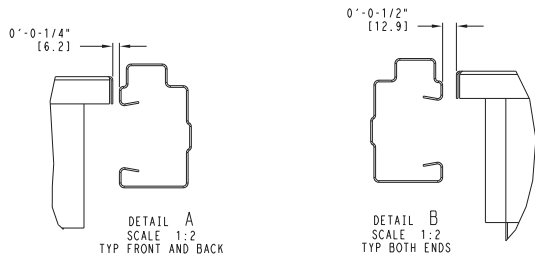
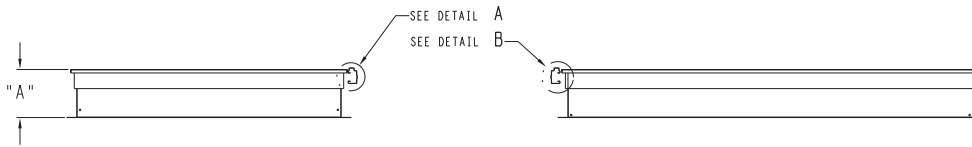
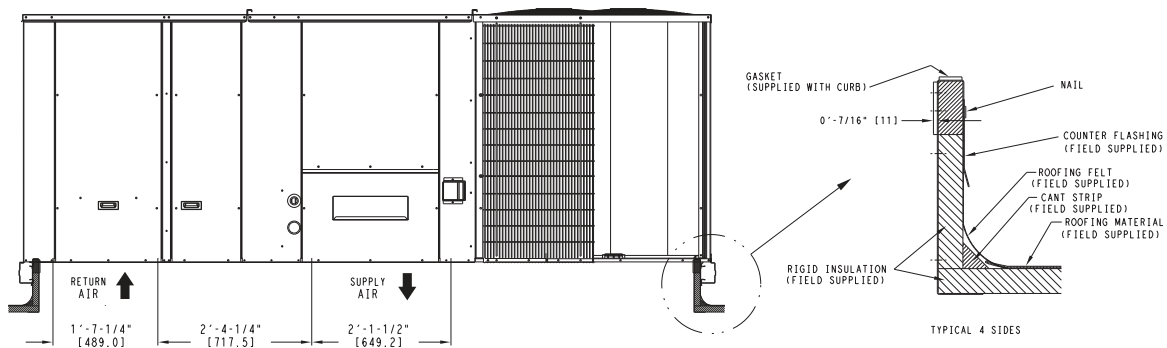
**NOTES:**

- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
- 2 DIMENSIONS IN ( ) ARE IN MILLIMETERS.
- 3 ROOF CURB GALVANIZED STEEL.
- 4 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
- 5 SERVICE CLEARANCE 4 FT ON EACH SIDE

➔ DIRECTION OF AIR FLOW



**MAX CURB LEVELING TOLERANCES**



# UNIT DIMENSIONS (cont)

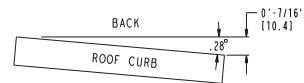
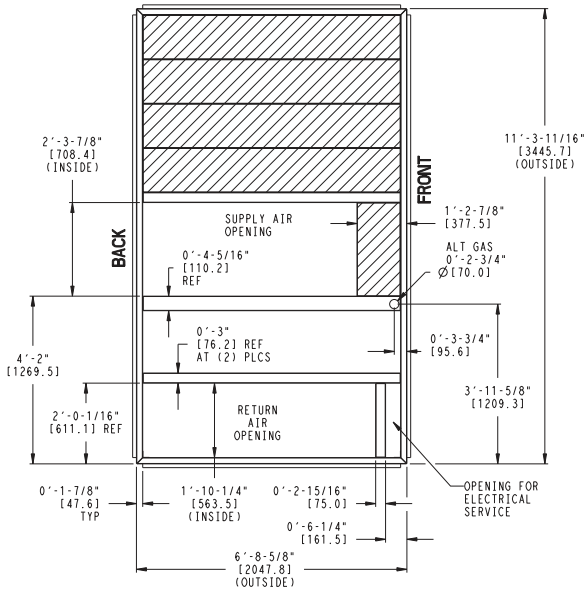
## RGH210/213-240/243 — ROOF CURB DIMENSIONS

UNIT SIZE	"A"	ROOF CURB ACCESSORY
RGH210\213-240\243	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB047A00 CRRFCURB048A00

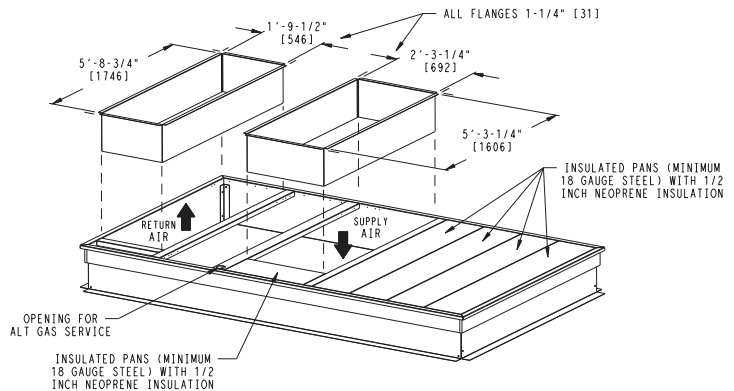
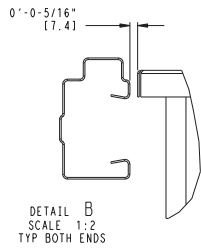
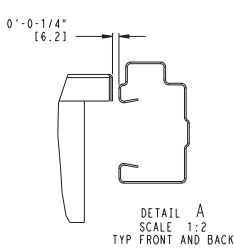
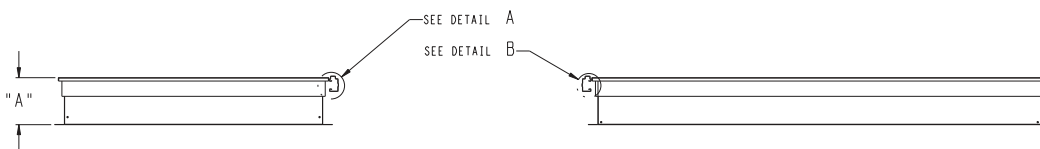
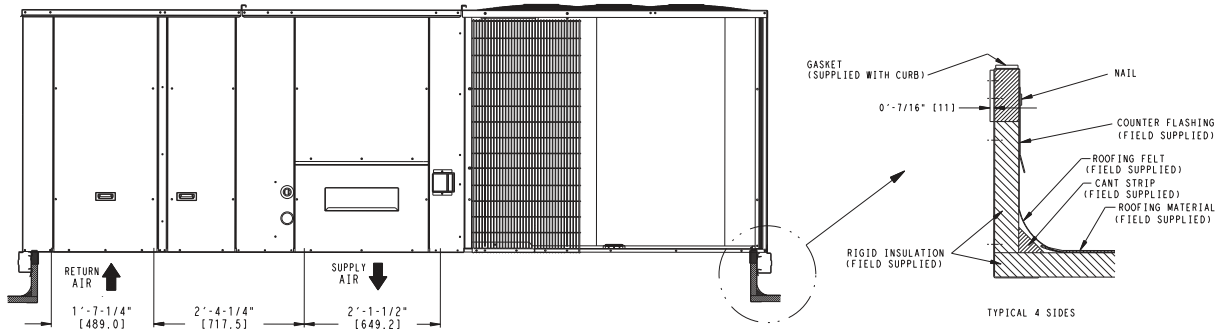
**NOTES:**

- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
- 2 DIMENSIONS IN [ ] ARE IN MILLIMETERS.
- 3 ROOF CURB GALVANIZED STEEL.
- 4 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
- 5 SERVICE CLEARANCE 4 FT ON EACH SIDE

➔ DIRECTION OF AIR FLOW



**MAX CURB LEVELING TOLERANCES**

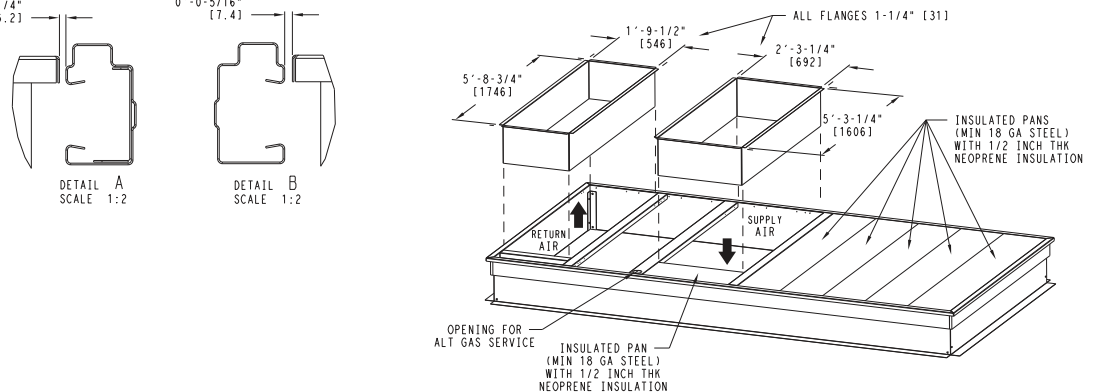
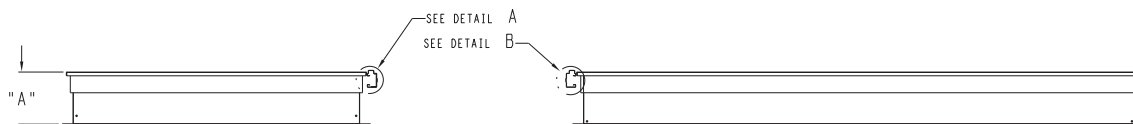
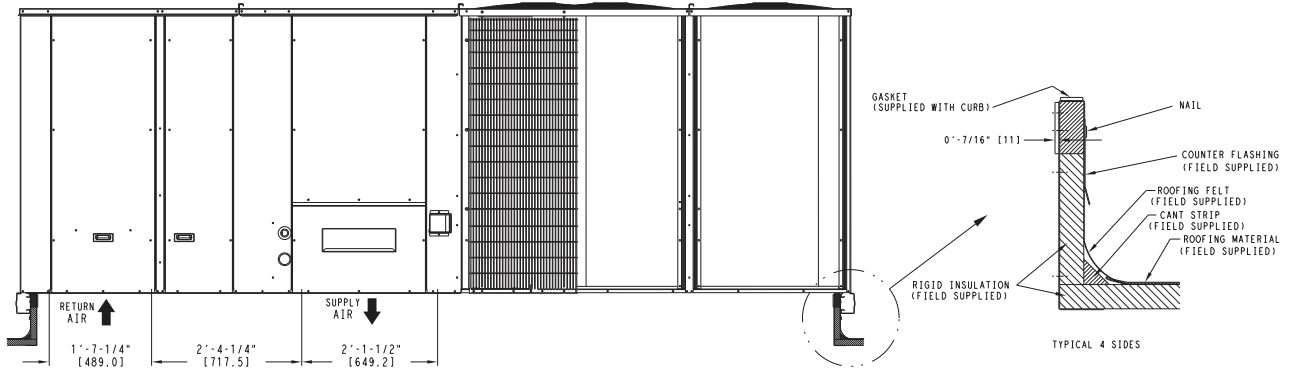
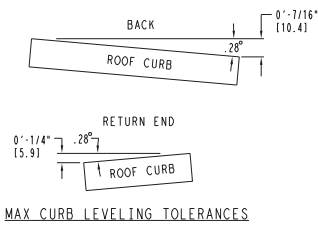
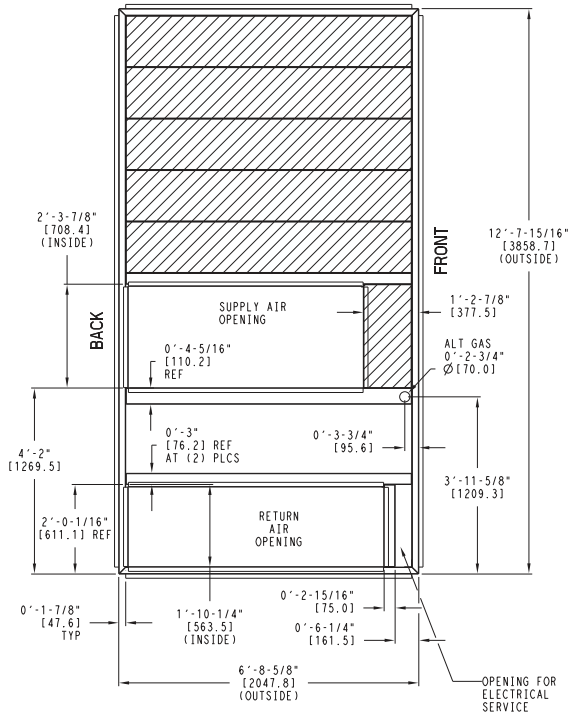


## RGH300/303 ROOF CURB DIMENSIONS

UNIT SIZE	"A"	ROOF CURB ACCESSORY
RGH 300x303	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB049A00 CRRFCURB050A00

- NOTES:
- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
  - 2 BOLT HEADS TO BE ON INSIDE OF FLANGE. CLEARANCE IS (11) 0'-0-7/16" TYP ALL CORNERS.
  - 3 DIMENSIONS IN [ ] ARE IN MILLIMETERS.
  - 4 ROOF CURB GALVANIZED STEEL.
  - 5 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
  - 6 SERVICE CLEARANCE 4 FT ON EACH SIDE
  - 7 GAS SERVICE PLATE IS PART OF A SEPARATELY SHIPPED ACCESSORY PACKAGE.
  - 8 GAS SERVICE PLATE CAN BE USED WITH EITHER ACCESSORY ROOF CURB.

➔ DIRECTION OF AIR FLOW



# APPLICATION DATA

## Minimum Operating Ambient Temperature (Cooling)

In mechanical cooling mode, your rooftop unit can safely operate down to an outdoor ambient temperature of 35°F (2°C). It is possible to provide cooling at lower outdoor ambient temperatures by using less outside air, economizers, and/or accessory low ambient kits.

## Maximum Operating Ambient Temperature (Cooling)

The maximum operating ambient temperature for cooling mode is 125°F (52°C). While cooling operation above 125°F (52°C) may be possible, it could cause either a reduction in performance, reliability, or a protective action by the unit's internal safety devices.

## Minimum Mixed Air Temperature (Heating)

Using the factory settings, the minimum temperatures for the mixed air (the combined temperature of the warm return air and the cold outdoor air) entering the dimpled, gas heat exchangers are shown in the table below.

**MINIMUM MIXED AIR TEMPERATURE**

ALUMINIZED	STAINLESS STEEL
50°F (10°C) Continuous	40°F (4°C) Continuous
45°F (7°C) Intermittent	35°F (2°C) Intermittent

Operating at lower mixed-air temperatures may be possible, if a field-supplied, outdoor air thermostat initiates both heat stages when the temperature is less than the minimum temperatures listed above. Please contact your local representative for assistance.

## Minimum and Maximum Airflow (Heating and Cooling)

To maintain safe and reliable operation of your rooftop, operate within the heating airflow limits during heating mode and cooling airflow limits during cooling mode. Operating above the max may cause blow-off, undesired airflow noise, or airflow related problems with the rooftop unit. Operating below the min may cause problems with coil freeze-up and unsafe heating operation. Heating and cooling limitations differ when evaluating operating CFM, the minimum value is the HIGHER of the cooling and heating minimum CFM values published on page 5 and the maximum value is the LOWER of the cooling and heating minimum values published on page 5.

## Heating-to-Cooling Changeover

Your unit will automatically change from heating to cooling mode when using a thermostat with an auto-changeover feature.

## Airflow

All units are draw-through in cooling mode and blow-through in heating mode.

## Outdoor Air Application Strategies

Economizers reduce operating expenses and compressor run time by providing a free source of cooling and a means of ventilation to match application changing needs. In fact, they should be considered for most applications. Also, consider the various economizer control methods and their benefits, as well as sensors required to accomplish your application goals. Please contact your local representative for assistance.

## Motor Limits, Break Horsepower (BHP)

Due to internal design of these units, the air path, and specially designed motors, the full horsepower (maximum continuous BHP) band, as listed in the Fan Performance tables, can be used with the utmost confidence. There is no need for extra safety factors, as motors are designed and rigorously tested to use the entire, listed BHP range without either nuisance tripping or premature motor failure.

## Propane Heating

Propane has different physical qualities than natural gas. As a result, propane requires different fuel to air mixture. To optimize the fuel/air mixture for propane, different burner orifices are sold in an easy to install accessory kit. To select the correct burner orifices or determine the heat capacity for a propane application, use either the selection software, or the unit's service manual.

## High Altitude Heating

High altitudes have less oxygen, which affects the fuel/air mixture in heat exchangers. In order to maintain a proper fuel/air mixture, heat exchangers operating in altitudes above 2000 ft (610 m) require different orifices. To select the correct burner orifices or determine the heat capacity for a high altitude application, use either the selection software, or the unit's service manual.

High altitudes have less oxygen, which means heat exchangers need less fuel. The new gas orifices in this field-installed kit make the necessary adjustment for high altitude applications. They restore the optimal fuel to air mixture and maintain healthy combustion on altitudes above 2000 ft (610 m).

NOTE: Typical natural gas heating value ranges from 975 to 1050 Btu/ft<sup>3</sup> at sea level nationally. The heating value goes down approximately 1.7% per every thousand feet elevation. Standard factory orifices can typically be used up to 2000 ft (610 m) elevation without any operational issues.

The optional economizer can adequately cool your space by bringing in fresh, cool outside air. In fact, when so equipped, accessory low-ambient kit may not be necessary. In low ambient conditions, unless the outdoor air is excessively humid or contaminated, economizer-based "free cooling" is the preferred less costly and energy conscious method. In low ambient applications where outside air might not be desired (such as contaminated or excessively humid outdoor environments), your rooftop unit can operate to ambient temperatures down to -20°F (-29°C) using the recommended accessory Motormaster® low ambient controller.

## Sizing a Rooftop

Bigger isn't necessarily better. While an air conditioner needs to have enough capacity to meet the design loads, it doesn't need excess capacity. In fact, excess capacity typically results in very poor part load performance and humidity control.

Using higher design temperatures than ASHRAE recommends for your location, adding "safety factors" to the calculated load, are all signs of oversizing air conditioners. Oversizing the air conditioner leads to poor humidity control, reduced efficiency, higher utility bills, larger indoor temperature swings, excessive noise, and increased wear and tear on the air conditioner.

Rather than oversizing an air conditioner, engineers should "right-size" or even slightly undersize air conditioners. Correctly sizing an air conditioner controls humidity better; promotes efficiency; reduces utility bills; extends equipment life, and maintains even, comfortable temperatures. Please contact your local representative for assistance.

## Low Ambient Applications

The optional economizer can adequately cool your space by bringing in fresh, cool outside air. In fact, when so equipped, accessory low-ambient kit may not be necessary. In low ambient conditions, unless the outdoor air is excessively humid or contaminated, economizer-based “free cooling” is the preferred less costly and energy conscious method. In low ambient applications where outside air might not be desired (such as contaminated or excessively humid outdoor environments), your rooftop unit can operate to ambient temperatures down to  $-20^{\circ}\text{F}$  ( $-29^{\circ}\text{C}$ ) using the recommended accessory Motormaster® low ambient controller.

## 2-Speed Indoor Fan Motor System with Variable Frequency Drive (VFD)

The 2-Speed Indoor Fan Motor System utilizes a Variable Frequency Drive (VFD) to automatically adjust the indoor fan motor speed in sequence with the units cooling operation. Per ASHRAE 90.1-2016 standard section 6.4.3.10.b, during the first stage of cooling operation the VFD will adjust the fan motor to provide  $\frac{2}{3}$  of the total cfm established for the unit. When a call for the second stage of cooling is required, the VFD will allow the total cfm for the unit established (100%). During the heating mode, the VFD will allow total design cfm (100%) operation and during the ventilation mode the VFD will allow operation to  $\frac{2}{3}$  of total cfm.

The VFD used in the 2-Speed Indoor Fan Motor System has soft start capabilities to slowly ramp up the speeds, thus eliminating any high inrush air volume during initial start-up. It also has internal over current protection for the fan motor and a **field-installed** display kit that allows adjustment and in depth diagnostics of the VFD.

This 2-Speed Indoor Fan Motor System is available on models with 2-stage cooling operation with electrical mechanical controls. Both space sensor and conventional thermostats controls can be used to provide accurate control in any application.

The 2-Speed Indoor Fan Motor System is very flexible for initial fan performance set up and adjustment. The standard factory shipped VFD is pre programmed to automatically stage the fan speed between the first and second stage of cooling. The unit fan performance static pressure and cfm can be easily adjusted using the traditional means of pulley adjustments. The other means to adjust the unit static and cfm performance is to utilize the **field-installed** display module and adjust the frequency and voltage in the VFD to required performance requirements. In either case, once set up the VFD will automatically adjust the speed between the cooling stage operation.

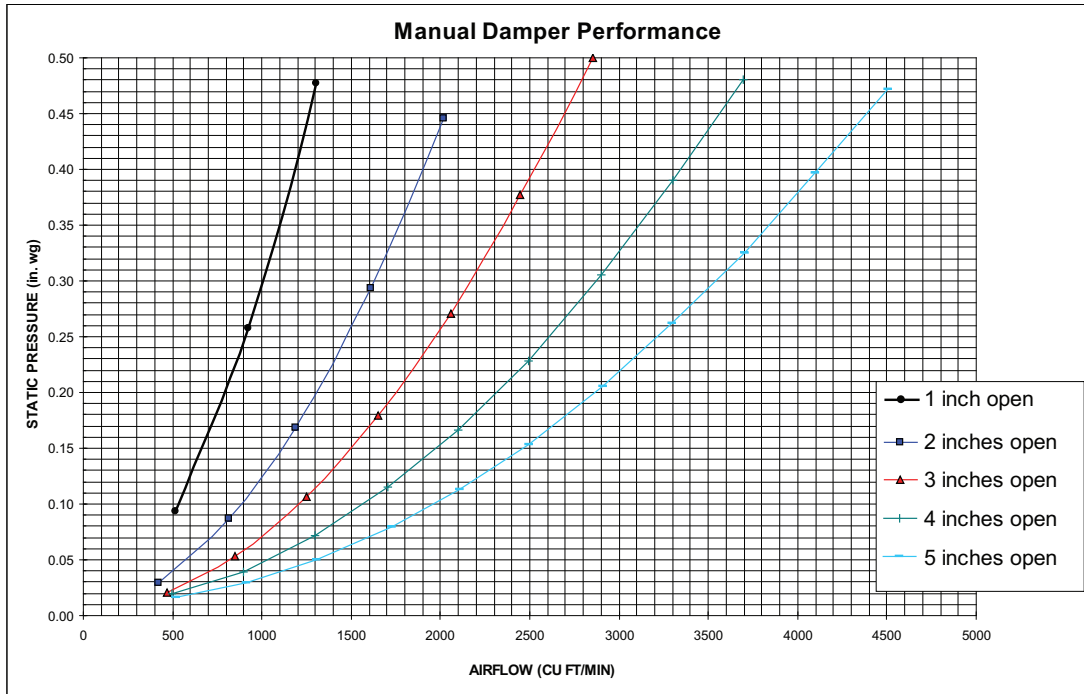
## RGH 2-SPEED INDOOR FAN SYSTEM — VARIABLE FREQUENCY DRIVE (VFD) HP RATING

UNIT SIZE	STATIC OPTION	VOLTAGE	VFD HP
181/183	STD	208/230	3.0
		460	3.0
		575	5.0
	MED	208/230	3.0
		460	5.0
		575	5.0
	HIGH	208/230	7.5
		460	
		575	
210/213	STD	208/230	3.0
		460	5.0
		575	5.0
	MED	208/230	7.5
		460	
		575	
	HIGH	208/230	7.5
		460	
		575	
240/243	STD	208/230/460/575	7.5
	MED	208/230/460/575	7.5
	HIGH	208/230/460/575	7.5
300/303	STD	208/230/460/575	7.5
	MED	208/230/460/575	7.5
	HIGH	208/230/460/575	7.5

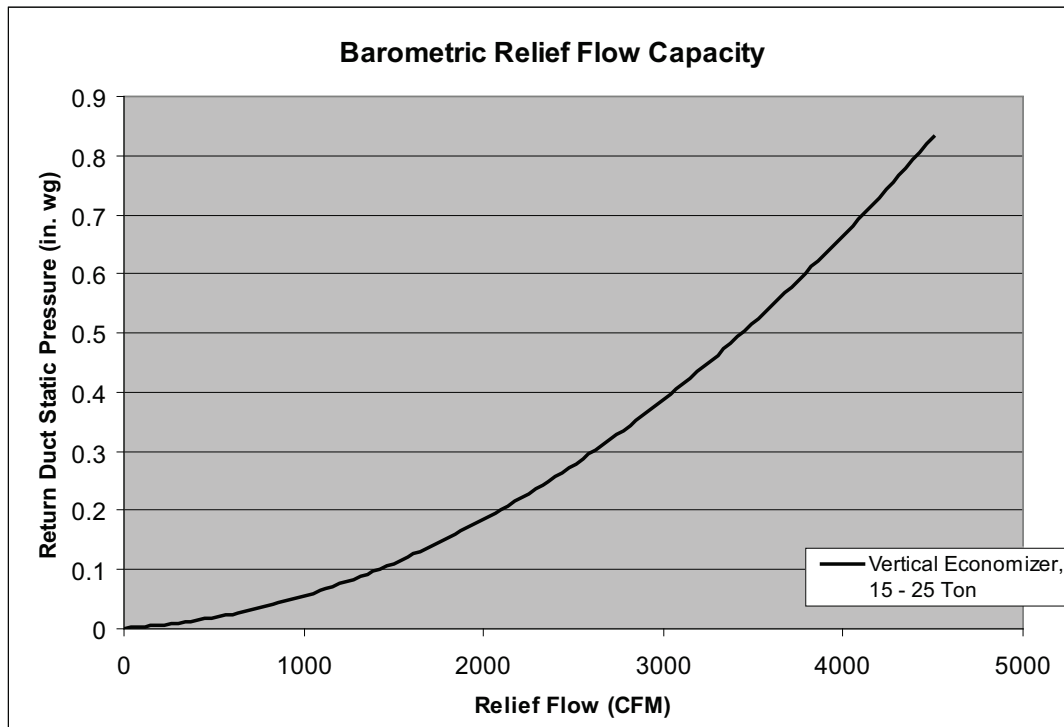
# PERFORMANCE DATA

## ACCESSORY PRESSURE DROPS, BAROMETRIC RELIEF AND POWER EXHAUST PERFORMANCE

### MANUAL DAMPER PERFORMANCE



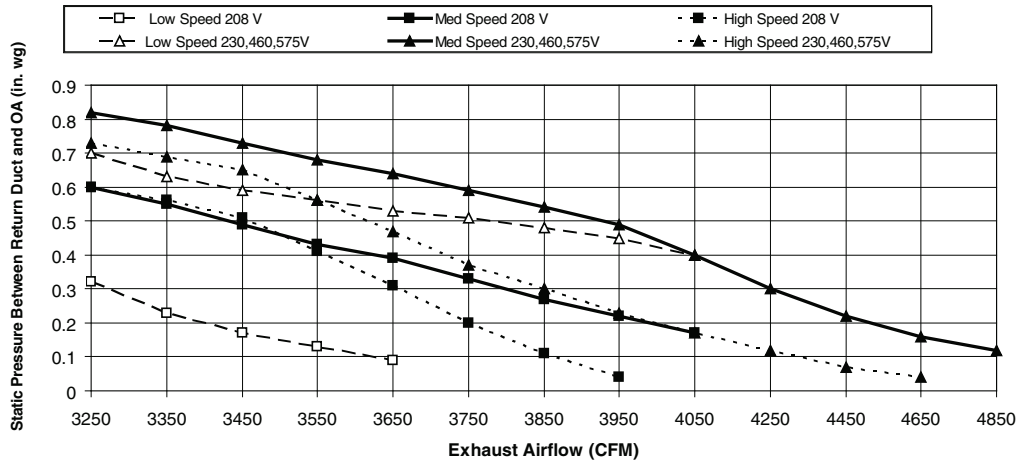
### BAROMETRIC RELIEF FLOW CAPACITY





ACCESSORY PRESSURE DROPS, BAROMETRIC RELIEF AND POWER EXHAUST PERFORMANCE (cont)

POWER EXHAUST FAN PERFORMANCE



FAN PERFORMANCE — POWER EXHAUST

AIRFLOW	208V		230V/460V/575V	
	ESP	BHP	ESP	BHP
3,850	0.600	1.845	0.730	1.99
3,950	0.560	1.870	0.690	2.01
4,050	0.510	1.890	0.650	2.04
4,250	0.410	1.915	0.560	2.06
4,450	0.310	1.965	0.470	2.12
4,650	0.200	2.035	0.370	2.19
4,850	0.110	2.085	0.300	2.24
5,050	0.040	2.125	0.230	2.28
5,250	—	—	0.170	2.33
5,450	—	—	0.120	2.38
5,650	—	—	0.070	2.40
5,850	—	—	0.040	2.42

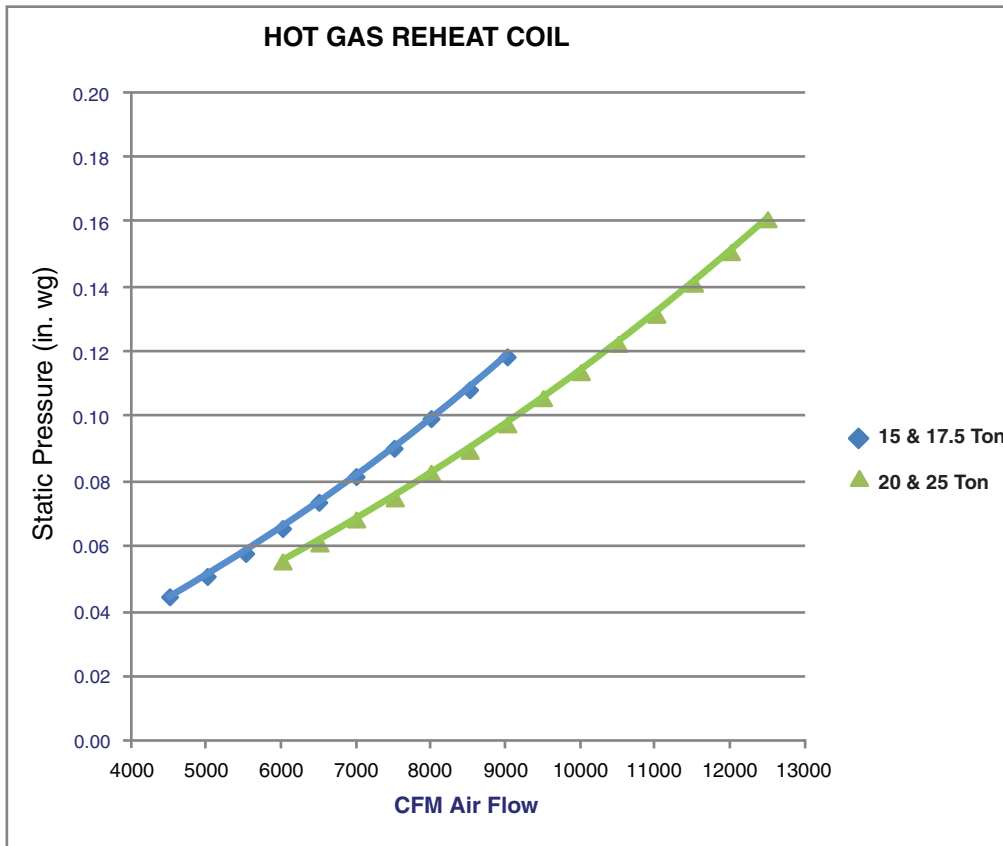
LEGEND

ESP — External Static Pressure  
 BHP — Brake Horsepower

# PERFORMANCE DATA (cont)

## STATIC PRESSURE ADDERS

### STATIC PRESSURE ADDERS — HOT GAS REHEAT COIL



### ECONOMIZER — VERTICAL AND HORIZONTAL DUCT CONFIGURATION

MODEL SIZES 181-303								
CFM	4500	5000	5500	6000	6500	7000	7500	8000
Vertical and Horizontal	0.047	0.052	0.057	0.062	0.067	0.072	0.077	0.082

MODEL SIZES 181-303									
CFM	8500	9000	9500	10000	10500	11000	11500	12000	12500
Vertical and Horizontal	0.088	0.093	0.098	0.103	0.109	0.114	0.119	0.125	0.131

GENERAL FAN PERFORMANCE NOTES:

1. Interpolation is permissible. Do not extrapolate.
2. External static pressure is the static pressure difference between the return duct and the supply duct plus the static pressure caused by any FIOPs or accessories.
3. Tabular data accounts for pressure loss due to clean filters, unit casing, and wet coils. Factory options and accessories may add static pressure losses. Selection software is available, through your salesperson, to help you select the best motor/drive combination for your application.
4. The Fan Performance tables offer motor/drive recommendations. In cases when two motor/drive combinations would work, the lower horsepower option is recommended.
5. For information on the electrical properties of motors, please see the Electrical information section of this book.
6. For more information on the performance limits of motors, see the application data section of this book.
7. The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements.

# PERFORMANCE DATA (cont)

## RGH181, 15 TON, VERTICAL SUPPLY/RETURN — FAN PERFORMANCE

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	<b>494</b>	<b>0.77</b>	583	1.09	662	1.43	732	1.80	796	2.19
4900	522	0.93	605	1.27	681	1.64	750	2.03	813	2.44
5250	547	1.10	626	1.45	700	1.84	766	2.24	828	2.67
5650	577	1.32	651	1.68	721	2.09	786	2.51	846	2.96
6000	603	1.53	674	1.91	741	2.33	804	2.78	863	3.24
6400	634	1.81	701	2.20	765	2.64	826	3.10	883	3.59
6750	662	2.07	725	2.49	787	2.94	846	3.42	902	3.92
7150	694	2.42	754	2.85	813	3.31	869	3.81	923	4.33
7500	722	2.74	779	3.19	836	3.67	890	4.19	943	4.72

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	856	2.60	911	3.02	963	3.46	<i>1012</i>	3.92	<i>1059</i>	4.39
4900	871	2.86	926	3.30	977	3.76	<i>1026</i>	4.23	<i>1072</i>	4.72
5250	885	3.11	939	3.57	990	4.05	<i>1038</i>	<i>4.54</i>	—	—
5650	903	3.43	956	3.91	1006	4.40	—	—	—	—
6000	918	3.72	971	4.22	<i>1020</i>	<i>4.73</i>	—	—	—	—
6400	937	4.09	988	4.61	—	—	—	—	—	—
6750	954	4.44	—	—	—	—	—	—	—	—
7150	975	4.87	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—

NOTES:

1. Boldface indicates field-supplied drive is required.
2. Italics requires high static drive package with different motor pulley.

	Standard static 514-680 RPM, 2.9 BHP, max
	Medium static 679-863 RPM, 3.7 BHP max
	High static 826-1009 RPM, 4.9 BHP max

## RGH183, 15 TON, HORIZONTAL SUPPLY/RETURN — FAN PERFORMANCE

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	508	1.25	582	1.76	647	2.31	705	2.89	758	3.51
4900	540	1.51	610	2.05	672	2.64	729	3.26	781	3.91
5250	568	1.78	635	2.35	695	2.96	750	3.61	801	4.29
5650	600	2.13	664	2.73	723	3.37	776	4.05	825	4.76
6000	629	2.47	691	3.10	747	3.77	799	4.48	—	—
6400	663	2.91	721	3.57	776	4.28	—	—	—	—
6750	693	3.34	749	4.03	801	4.76	—	—	—	—
7150	727	3.88	781	4.61	—	—	—	—	—	—
7500	757	4.40	—	—	—	—	—	—	—	—

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	807	4.16	852	4.83	—	—	—	—	—	—
4900	829	4.58	—	—	—	—	—	—	—	—
5250	—	—	—	—	—	—	—	—	—	—
5650	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—
6400	—	—	—	—	—	—	—	—	—	—
6750	—	—	—	—	—	—	—	—	—	—
7150	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—

	Standard static 508-680 RPM, 2.9 BHP, max
	Medium static 614-780 RPM, 3.7 BHP max
	High static 746-912 RPM, 4.9 BHP max

**RGH210, 17.5 TON, VERTICAL SUPPLY/RETURN — FAN PERFORMANCE**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	<b>547</b>	<b>1.10</b>	626	1.45	700	1.84	766	2.24	828	2.67
5700	<b>581</b>	<b>1.35</b>	655	1.72	724	2.12	789	2.55	849	3.00
6150	<b>615</b>	<b>1.63</b>	684	2.02	750	2.44	812	2.90	871	3.37
6550	646	1.92	711	2.32	774	2.77	834	3.24	891	3.73
7000	682	2.28	743	2.71	803	3.17	860	3.66	915	4.17
7450	718	2.70	775	3.14	832	3.62	887	4.13	940	4.67
7900	755	3.16	809	3.62	863	4.12	915	4.65	966	5.21
8300	787	3.62	839	4.09	891	4.61	941	5.16	990	5.73
8750	825	4.18	874	4.68	923	5.22	971	5.78	1018	6.38

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	885	3.11	939	3.57	990	4.05	1038	4.54	1084	5.04
5700	905	3.47	958	3.95	1008	4.45	1055	4.96	1100	5.48
6150	925	3.86	977	4.36	1026	4.88	1073	5.42	1118	5.96
6550	945	4.24	995	4.76	1043	5.30	1090	5.86	1134	6.42
7000	967	4.71	1017	5.26	1064	5.82	1109	6.39	—	—
7450	991	5.22	1039	5.79	1085	6.38	—	—	—	—
7900	1015	5.78	1062	6.38	—	—	—	—	—	—
8300	1038	6.33	—	—	—	—	—	—	—	—
8750	—	—	—	—	—	—	—	—	—	—

NOTE: Boldface indicates field-supplied drive is required.

- Standard static 622-822 RPM, 3.7 BHP, max
- Medium static 713-879 RPM, 4.9 BHP max
- High static 882-1078 RPM, 208V (6.5 Max BHP) / 230V (6.9 Max BHP) / 460V (7.0 Max BHP) / 575V (8.3 Max BHP)
- Operation point covered by high static drive. Confirm Max BHP coverage based on unit voltage selected.

**RGH213, 17.5 TON, HORIZONTAL SUPPLY/RETURN — FAN PERFORMANCE**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	568	1.78	635	2.35	695	2.96	750	3.61	801	4.29
5700	604	2.17	668	2.78	726	3.43	779	4.11	829	4.82
6150	642	2.63	702	3.27	758	3.95	809	4.67	857	5.42
6550	676	3.09	733	3.76	786	4.48	836	5.23	883	6.01
7000	714	3.67	769	4.38	820	5.14	868	5.92	913	6.74
7450	753	4.33	805	5.08	854	5.87	900	6.69	944	7.54
7900	792	5.06	841	5.85	888	6.68	933	7.54	—	—
8300	827	5.78	874	6.61	920	7.47	—	—	—	—
8750	867	6.69	912	7.55	—	—	—	—	—	—

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	848	4.99	893	5.72	934	6.47	974	7.25	1012	8.05
5700	875	5.56	918	6.33	959	7.12	998	7.93	—	—
6150	902	6.20	944	7.00	985	7.83	—	—	—	—
6550	927	6.82	968	7.65	—	—	—	—	—	—
7000	955	7.58	—	—	—	—	—	—	—	—
7450	—	—	—	—	—	—	—	—	—	—
7900	—	—	—	—	—	—	—	—	—	—
8300	—	—	—	—	—	—	—	—	—	—
8750	—	—	—	—	—	—	—	—	—	—

- Standard static 622-822 RPM, 3.7 BHP, max
- Medium static 713-879 RPM, 4.9 BHP max
- High static 835-1021 RPM, 208V (6.5 Max BHP) / 230V (6.9 Max BHP) / 460V (7.0 Max BHP) / 575V (8.3 Max BHP)
- Operation point covered by high static drive. Confirm Max BHP coverage based on unit voltage selected.

# PERFORMANCE DATA (cont)

## RGH240, 20 TON, VERTICAL SUPPLY/RETURN — FAN PERFORMANCE

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6,000	<b>615</b>	<b>1.25</b>	690	1.56	757	1.89	819	2.22	875	2.57
6,500	<b>653</b>	<b>1.52</b>	725	1.87	789	2.21	848	2.57	903	2.94
7,000	692	1.85	760	2.21	822	2.58	879	2.96	932	3.35
7,500	731	2.21	796	2.60	856	3.00	911	3.40	963	3.81
8,000	771	2.63	833	3.04	890	3.47	944	3.89	994	4.33
8,500	812	3.10	871	3.54	926	3.98	977	4.43	1026	4.89
9,000	852	3.62	909	4.09	961	4.55	1011	5.03	1059	5.51
9,500	893	4.20	947	4.69	998	5.19	1046	5.69	1092	6.19
10,000	934	4.85	986	5.36	1035	5.88	1082	6.40	1126	6.93

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6,000	928	2.92	978	3.28	1025	3.65	1071	4.03	1114	4.42
6,500	955	3.31	1003	3.69	1050	4.09	1094	4.49	1137	4.89
7,000	983	3.75	1030	4.15	1075	4.56	1119	4.98	1161	5.41
7,500	1011	4.23	1058	4.66	1102	5.09	1145	5.53	<b>1186</b>	<b>5.98</b>
8,000	1041	4.77	1087	5.21	1130	5.67	1171	6.13	—	—
8,500	1072	5.35	1116	5.82	1158	6.30	—	—	—	—
9,000	1104	6.00	1147	6.49	<b>1188</b>	<b>6.99</b>	—	—	—	—
9,500	1136	6.70	<b>1178</b>	<b>7.22</b>	—	—	—	—	—	—
10,000	1169	7.47	—	—	—	—	—	—	—	—

NOTES:

1. Boldface indicates field-supplied drive is required.
2. Italics requires high static drive package with different motor pulley.

Standard static 690-863 RPM; 208V (6.5 Max BHP) / 230V (6.9 Max BHP) / 460V (7.0 Max BHP) / 575 V (8.3 Max BHP)

Medium static 835-1021 RPM; 208V (6.5 Max BHP) / 230V (6.9 Max BHP) / 460V (7.0 Max BHP) / 575 V (8.3 Max BHP)

High static 941-1176 RPM; 208V (10.5 Max BHP) / 230V (11.9 Max BHP) / 460V (11.9 Max BHP) / 575 V (11.0 Max BHP)

## RGH243, 20 TON, HORIZONTAL SUPPLY/RETURN — FAN PERFORMANCE

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6,000	<b>633</b>	<b>1.92</b>	700	2.44	759	2.98	812	3.53	861	4.10
6,500	<b>674</b>	<b>2.34</b>	738	2.90	795	3.48	847	4.07	894	4.67
7,000	715	2.83	776	3.43	831	4.05	882	4.67	928	5.31
7,500	757	3.39	816	4.03	869	4.68	917	5.35	963	6.03
8,000	800	4.02	856	4.70	907	5.39	954	6.10	<b>998</b>	<b>6.81</b>
8,500	843	4.73	896	5.45	945	6.18	<b>991</b>	<b>6.93</b>	1034	7.68
9,000	886	5.52	937	6.28	<b>984</b>	<b>7.06</b>	1029	7.84	1071	8.63
9,500	929	6.40	<b>978</b>	<b>7.21</b>	1024	8.02	1067	8.84	—	—
10,000	<b>973</b>	<b>7.38</b>	<b>1020</b>	<b>8.22</b>	1064	9.08	—	—	—	—

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6,000	907	4.68	949	5.27	990	5.88	1028	6.50	1064	7.13
6,500	939	5.29	981	5.92	<b>1020</b>	<b>6.56</b>	1058	7.21	1094	7.88
7,000	972	5.97	<b>1013</b>	<b>6.63</b>	1052	7.31	1089	8.00	—	—
7,500	<b>1005</b>	<b>6.72</b>	1046	7.42	1084	8.13	—	—	—	—
8,000	1040	7.54	1079	8.28	—	—	—	—	—	—
8,500	1075	8.45	—	—	—	—	—	—	—	—
9,000	—	—	—	—	—	—	—	—	—	—
9,500	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—

NOTES:

1. Boldface indicates field-supplied drive is required.
2. UNDERSCORE: Operation point covered by mid static drive; Confirm Max BHP coverage based on the unit voltage selected.

Standard static 690-863 RPM; 208V (6.5 Max BHP) / 230V (6.9 Max BHP) / 460V (7.0 Max BHP) / 575 V (8.3 Max BHP)

Medium static 835-1021 RPM; 208V (6.5 Max BHP) / 230V (6.9 Max BHP) / 460V (7.0 Max BHP) / 575 V (8.3 Max BHP)

High static 941-1100 RPM; 208V (10.5 Max BHP) / 230V (11.9 Max BHP) / 460V (11.9 Max BHP) / 575 V (11.0 Max BHP)

**RGH300, 25 TON, VERTICAL SUPPLY/RETURN — FAN PERFORMANCE**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7,500	731	2.21	796	2.60	856	3.00	911	3.40	963	3.81
8,150	783	2.76	844	3.19	901	3.61	954	4.05	1003	4.49
8,750	832	3.35	890	3.80	943	4.26	994	4.73	1042	5.19
9,400	885	4.08	940	4.57	991	5.06	1039	5.55	1085	6.05
10,000	934	4.85	986	5.36	1035	5.88	1082	6.40	1126	6.93
10,650	988	5.78	1038	6.33	1084	6.88	1129	7.44	1172	8.00
11,250	1038	6.74	1086	7.32	1130	7.91	1173	8.49	—	—
11,900	1093	7.91	1138	8.52	1181	9.14	—	—	—	—
12,500	1144	9.10	1187	9.74	—	—	—	—	—	—

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7,500	1011	4.23	1058	4.66	1102	5.09	1145	5.53	1186	5.98
8,150	1050	4.94	1095	5.39	1138	5.85	1180	6.32	—	—
8,750	1088	5.67	1131	6.15	1173	6.64	—	—	—	—
9,400	1129	6.56	1172	7.07	—	—	—	—	—	—
10,000	1169	7.47	—	—	—	—	—	—	—	—
10,650	—	—	—	—	—	—	—	—	—	—
11,250	—	—	—	—	—	—	—	—	—	—
11,900	—	—	—	—	—	—	—	—	—	—
12,500	—	—	—	—	—	—	—	—	—	—

NOTES:

1. Italics requires high static drive package with different motor pulley.
2. **UNDERSCORE**: Operation point covered by mid static drive; Confirm Max BHP coverage based on the unit voltage selected.

	Standard static 717-911 RPM, 4.9 BHP, max
	Medium static 913-1116 RPM, 208V (6.5 Max BHP) / 230V (6.9 Max BHP) / 460V (7.0 Max BHP) / 575 V (8.3 Max BHP)
	High static 941-1176 RPM, 208V (10.5 Max BHP) / 230V (11.9 Max BHP) / 460V (11.9 Max BHP) / 575 V (11.0 Max BHP)

**RGH303, 25 TON, HORIZONTAL SUPPLY/RETURN — FAN PERFORMANCE**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7,500	757	3.39	816	4.03	869	4.68	917	5.35	963	6.03
8,000	800	4.02	856	4.70	907	5.39	954	6.10	998	6.81
8,500	843	4.73	896	5.45	945	6.18	991	6.93	1034	7.68
9,000	886	5.52	937	6.28	984	7.06	1029	7.84	1071	8.63
9,500	929	6.40	978	7.21	1024	8.02	1067	8.84	—	—
10,000	973	7.38	1020	8.22	1064	9.08	—	—	—	—
10,500	1017	8.45	1062	9.33	—	—	—	—	—	—
11,000	1061	9.63	—	—	—	—	—	—	—	—
11,500	—	—	—	—	—	—	—	—	—	—

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7,500	1005	6.72	1046	7.42	1084	8.13	—	—	—	—
8,000	1040	7.54	1079	8.28	—	—	—	—	—	—
8,500	1075	8.45	—	—	—	—	—	—	—	—
9,000	—	—	—	—	—	—	—	—	—	—
9,500	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—
10,500	—	—	—	—	—	—	—	—	—	—
11,000	—	—	—	—	—	—	—	—	—	—
11,500	—	—	—	—	—	—	—	—	—	—

NOTE: Boldface indicates field-supplied drive is required.

	Medium static 755-923 RPM, Voltage: 208V / 230V / 460V / 575V Max BHP: 6.5 / 6.9 / 7.0 / 8.3
	High static 906-1100 RPM, Voltage: 208V / 230V / 460V / 575V Max BHP: 10.5 / 11.9 / 11.9 / 11.0

# PERFORMANCE DATA (cont)

## PULLEY ADJUSTMENT

RGH	MOTOR/DRIVE COMBO	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
181-183	Standard Static	680	663	647	630	614	597	580	564	547	531	514
	Medium Static	863	845	826	808	789	771	753	734	716	697	679
	High Static	1009	991	972	954	936	918	899	881	863	844	826
210-213	Standard Static	822	802	782	762	742	722	702	682	662	642	622
	Medium Static	879	862	846	829	813	796	779	763	746	730	713
	High Static	1078	1058	1039	1019	1000	980	960	941	921	902	882
240-243	Standard Static	863	846	828	811	794	777	759	742	725	707	690
	Medium Static	1021	1002	984	965	947	928	909	891	872	854	835
	High Static	1176	1153	1129	1106	1082	1059	1035	1012	988	965	941
300-303	Standard Static	911	892	872	853	833	814	795	775	756	736	717
	Medium Static	1116	1096	1075	1055	1035	1015	994	974	954	933	913
	High Static	1176	1153	1129	1106	1082	1059	1035	1012	988	965	941



# ELECTRICAL DATA

## RGH181-303 COOLING ELECTRICAL DATA

RGH UNIT SIZE	V-Ph-Hz	VOLTAGE		COMP 1		COMP 2		OFM (EA)		IFM			COMBUSTION FAN MOTOR	POWER EXHAUST	
		RANGE		RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFFCY AT FULL LOAD	FLA	FLA	KIT QTY	FLA (EA KIT)
		MIN	MAX												
181/183	208-3-60	187	253	25.0	164	25.0	164	350	1.5	STD	81.3%	7.5	0.52	2	5.9
										MED	87.0%	10.6			
										HIGH	82.9%	13.6			
	230-3-60	187	253	25.0	164	25.0	164	350	1.5	STD	81.3%	7.5	0.52	2	5.9
										MED	87.0%	10.6			
										HIGH	82.9%	12.7			
	460-3-60	414	506	12.8	100	12.8	100	277	0.9	STD	81.3%	3.4	0.3	2	3.1
										MED	87.0%	5.3			
										HIGH	82.9%	6.4			
	575-3-60	518	633	9.6	78	9.6	48	397	0.6	STD	81.1%	2.8	0.24	2	2.4
										MED	81.1%	2.8			
										HIGH	83.6%	5.6			
210/213	208-3-60	187	253	27.6	191	25.0	164	350	1.5	STD	83.8%	10.2	0.52	2	5.9
										MED	82.9%	13.6			
										HIGH-HE	89.5%	17.1			
	230-3-60	187	253	27.6	191	25.0	164	350	1.5	STD	83.8%	10.2	0.52	2	5.9
										MED	82.9%	12.7			
										HIGH-HE	89.5%	17.1			
	460-3-60	414	506	12.8	100	12.2	100	277	0.9	STD	83.8%	4.8	0.3	2	3.1
										MED	82.9%	6.4			
										HIGH-HE	89.5%	8.6			
	575-3-60	518	633	9.6	78	9.0	78	397	0.6	STD	81.1%	2.8	0.24	2	2.4
										MED	83.6%	5.6			
										HIGH-HE	89.5%	7.6			
240/243	208-3-60	187	253	28.2	239	28.2	239	350	1.5	STD	89.5%	17.1	0.52	2	5.9
										MED-HE	89.5%	17.1			
										HIGH-HE	91.7%	28.5			
	230-3-60	187	253	28.2	239	28.2	239	350	1.5	STD	89.5%	17.1	0.52	2	5.9
										MED-HE	89.5%	17.1			
										HIGH-HE	91.7%	28.5			
	460-3-60	414	506	14.7	130	14.7	130	277	0.9	STD	89.5%	8.6	0.3	2	3.1
										MED-HE	89.5%	8.6			
										HIGH-HE	91.7%	14.3			
	575-3-60	518	633	11.3	94	11.3	94	397	0.6	STD	83.6%	5.6	0.24	2	2.4
										MED-HE	89.5%	7.6			
										HIGH-HE	91.7%	9.5			
300/303	208-3-60	187	253	48.1	245	33.9	240	350	1.5	STD	82.9%	13.6	0.52	2	5.9
										MED-HE	89.5%	17.1			
										HIGH-HE	91.7%	28.5			
	230-3-60	187	253	48.1	245	33.9	240	350	1.5	STD	82.9%	12.7	0.52	2	5.9
										MED-HE	89.5%	17.1			
										HIGH-HE	91.7%	28.5			
	460-3-60	414	506	18.6	125	16.0	140	277	0.9	STD	82.9%	6.4	0.3	2	3.1
										MED-HE	89.5%	8.6			
										HIGH-HE	91.7%	14.3			
	575-3-60	518	633	14.7	100	12.9	108	397	0.6	STD	83.6%	5.6	0.24	2	2.4
										MED-HE	89.5%	7.6			
										HIGH-HE	91.7%	9.5			

**LEGEND**

- FLA** — Full Load Amps
- HIGH-HE** — High-High Efficiency
- IFM** — Indoor (Evaporator) Fan Motor
- LRA** — Locked Rotor Amps
- MED-HE** — Medium-High Efficiency
- OFM** — Outdoor Fan Motor
- RLA** — Rated Load Amps

NOTE: Refer to Packaged Rooftop Builder (Selection Software) for additional electrical data.

# ELECTRICAL DATA (cont)

## 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

RGH UNIT SIZE	V-Ph-Hz	VOLTAGE		COMP 1		COMP 2		OFM (EA)		IFM			COMBUSTION FAN MOTOR	POWER EXHAUST	
		RANGE		RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFFCY AT FULL LOAD	FLA	FLA	KIT QTY	FLA (EA KIT)
		MIN	MAX												
181/183	208-3-60	187	253	25.0	164	25.0	164	350	1.5	STD	85.0%	8.6	0.52	2	5.9
										MED	81.5%	10.8			
										HIGH	83.6%	13.6			
	230-3-60	187	253	25.0	164	25.0	164	350	1.5	STD	85.0%	7.8	0.52	2	5.9
										MED	81.5%	9.8			
										HIGH	83.6%	12.7			
	460-3-60	414	506	12.8	100	12.8	100	277	0.9	STD	85.0%	3.8	0.3	2	3.1
										MED	81.5%	4.9			
										HIGH	83.6%	6.4			
	575-3-60	518	633	9.6	78	9.6	78	397	0.6	STD	81.1%	4.5	0.24	2	2.4
										MED	81.1%	4.5			
										HIGH	83.6%	6.2			
210/213	208-3-60	187	253	27.6	191	25.0	164	350	1.5	STD	81.5%	10.8	0.52	2	5.9
										MED	83.6%	13.6			
										HIGH	89.5%	17.1			
	230-3-60	187	253	27.6	191	25.0	164	350	1.5	STD	81.5%	9.8	0.52	2	5.9
										MED	83.6%	12.7			
										HIGH	89.5%	17.1			
	460-3-60	414	506	12.8	100	12.2	100	277	0.9	STD	81.5%	4.9	0.3	2	3.1
										MED	83.6%	6.4			
										HIGH	89.5%	8.6			
	575-3-60	518	633	9.6	78	9.0	78	397	0.6	STD	81.1%	4.5	0.24	2	2.4
										MED	83.6%	6.2			
										HIGH	89.5%	7.6			
240/243	208-3-60	187	253	28.2	239	28.2	239	350	1.5	STD	83.6%	13.6	0.52	2	5.9
										MED	89.5%	17.1			
										HIGH	91.7%	28.5			
	230-3-60	187	253	28.2	239	28.2	239	350	1.5	STD	83.6%	12.7	0.52	2	5.9
										MED	89.5%	17.1			
										HIGH	91.7%	28.5			
	460-3-60	414	506	14.7	130	14.7	130	277	0.9	STD	83.6%	6.4	0.3	2	3.1
										MED	89.5%	8.6			
										HIGH	91.7%	14.3			
	575-3-60	518	633	11.3	94	11.3	94	397	0.6	STD	83.6%	6.2	0.24	2	2.4
										MED	89.5%	7.6			
										HIGH	91.7%	9.5			
300/303	208-3-60	187	253	48.1	245	33.9	240	350	1.5	STD	83.6%	13.6	0.52	2	5.9
										MED	89.5%	17.1			
										HIGH	91.7%	28.5			
	230-3-60	187	253	48.1	245	33.9	240	350	1.5	STD	83.6%	12.7	0.52	2	5.9
										MED	89.5%	17.1			
										HIGH	91.7%	28.5			
	460-3-60	414	506	18.6	125	16.0	140	277	0.9	STD	83.6%	6.4	0.3	2	3.1
										MED	89.5%	8.6			
										HIGH	91.7%	14.3			
	575-3-60	518	633	14.7	100	12.9	108	397	0.6	STD	83.6%	6.2	0.24	2	2.4
										MED	89.5%	7.6			
										HIGH	91.7%	9.5			

**UNIT WIRE/FUSE OR HACR BREAKER SIZING DATA**

RGH UNIT TYPE	NOM. V-Ph-Hz	IFM TYPE	NO CONVENIENCE OUTLET OR UNPOWERED CONVENIENCE OUTLET							
			NO POWERED EXHAUST				WITH POWERED EXHAUST (POWERED FROM UNIT)			
			MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA
181/183	208/230-3-60	STD	68.3	90	71	393	80.1	100	85	413
		MED	71.4	90	75	423	83.2	100	88	443
		HIGH	74.4	90	78/77	425	86.2	100	92/91	445
	460-3-60	STD	34.9	45	36	234	41.1	50	44	246
		MED	36.8	45	39	249	43.0	50	46	261
		HIGH	37.9	50	40	250	44.1	50	47	262
	575-3-60	STD	26.2	30	27	184	31.0	40	33	192
		MED	26.2	30	27	184	31.0	40	33	192
		HIGH	29.0	35	31	198	33.8	40	36	206
210/213	208/230-3-60	STD	75.7	100	79	440	87.5	100	93	460
		MED	79.1	100	83/82	455	90.9	100	97/96	475
		HIGH-HE	82.6	100	87	451	94.4	110	101	471
	460-3-60	STD	36.6	45	38	245	42.8	50	46	257
		MED	38.2	50	40	252	44.4	50	47	264
		HIGH-HE	40.4	50	43	250	46.6	50	50	262
	575-3-60	STD	26.2	30	27	186	31.0	40	33	194
		MED	29.0	35	31	200	33.8	40	36	208
		HIGH-HE	31.0	40	33	198	35.8	45	38	206
240/243	208/230-3-60	STD	86.6	100	91	574	98.4	125	105	594
		MED-HE	86.6	100	91	574	98.4	125	105	594
		HIGH-HE	98.0	125	105	653	109.8	125	118	673
	460-3-60	STD	45.3	50	48	310	51.5	60	55	322
		MED-HE	45.3	50	48	310	51.5	60	55	322
		HIGH-HE	51.0	60	54	350	57.2	70	62	362
	575-3-60	STD	33.4	40	35	232	38.2	45	41	240
		MED-HE	35.4	45	37	230	40.2	50	43	238
		HIGH-HE	37.3	45	40	257	42.1	50	45	265
300/303	208/230-3-60	STD	116.6	150	120/119	591	128.4	175/175	134/133	611
		MED-HE	120.1	150	124	587	131.9	175	138	607
		HIGH-HE	131.5	175	137	666	143.3	175	151	686
	460-3-60	STD	51.1	60	53	321	57.3	70	60	333
		MED-HE	53.3	60	56	319	59.5	70	63	331
		HIGH-HE	59.0	70	62	359	65.2	80	70	371
	575-3-60	STD	40.5	50	42	256	45.3	50	48	264
		MED-HE	42.5	50	45	254	47.3	60	50	262
		HIGH-HE	44.4	50	47	281	49.2	60	52	289

**LEGEND**

- BRKR** — Circuit Breaker
- DISC** — Disconnect
- FLA** — Full Load Amps
- HACR** — Heating Air-conditioning and Refrigeration
- IFM** — Indoor Fan Motor
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps
- RLA** — Rated Load Amps

Example: Supply voltage is 230-3-60



- AB = 224 v
- BC = 231 v
- AC = 226 v

**NOTES:**

1. Refer to Packaged Rooftop Builder (Selection Software) for additional electrical data.
2. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
3. For 208/230 v units, where one value is shown it is the same for either 208 or 230 volts.
4. Unbalanced 3-Phase Supply Voltage  
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

$$\text{Average Voltage} = \frac{(224 + 231 + 226)}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.

(AB) 227-224 = 3 v

(BC) 231-227 = 4 v

(AC) 227-226 = 1 v

Maximum deviation is 4 v.

Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227} = 1.78\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

**IMPORTANT:** If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

# SEQUENCE OF OPERATION

## General

The sequence below describes the sequence of operation for an electro-mechanical unit with and without a factory-installed EconoMi\$er® IV and X (called “economizer” in this sequence). For information regarding a direct digital controller, see the start-up, operations, and troubleshooting manual for the applicable controller.

## Electro-Mechanical Units with No Economizer Cooling (Single Speed Indoor Fan Motor)

When the thermostat calls for cooling, terminals G and Y1 are energized. As a result, the indoor-fan contactor (IFC) and the compressor contactor (C1) are energized, causing the indoor-fan motor (IFM), compressor #1, and outdoor fan to start. If the unit has 2 stages of cooling, the thermostat will additionally energize Y2. The Y2 signal will energize compressor contactor #2 (C2), causing compressor #2 to start. Regardless of the number of stages, the outdoor-fan motor runs continuously while unit is cooling.

### COOLING (2-SPEED INDOOR FAN MOTOR)

Per ASHRAE 90.1-2016 standards during the first stage of cooling operation the VFD will adjust the fan motor to provide 66% of the total cfm established for the unit. When a call for the second stage of cooling is required, the VFD will allow the total cfm established for the unit (100%).

## HEATING

NOTE: RGH units have 2 stages of gas heat.

When the thermostat calls for heating, power is sent to W on the Integrated Gas Controller (IGC) board. An LED (light-emitting diode) on the IGC board turns on and remains on during normal operation. A check is made to ensure that the roll-out switch and limit switch are closed. If the check was successful, the induced-draft motor is energized, and when its speed is satisfactory, as proven by the “hall effect” sensor, the ignition activation period begins. The burners will ignite within 5 seconds. If the burners do not light, there is a 22-second delay before another 5-second attempt. This sequence is repeated for 15 minutes or until the burners light. If, after the 15 minutes, the burners still have not lit, heating is locked out. To reset the control, break 24-v power to the thermostat.

When ignition occurs, the IGC board will continue to monitor the condition of the roll-out switch, the limit switches, the “hall effect” sensor, as well as the flame sensor. Forty-five seconds after ignition occurs, assuming the unit is controlled through a room thermostat set for fan auto, the indoor-fan motor will energize (and the outdoor-air dampers will open to their minimum position). If, for some reason, the over-temperature limit opens prior to the start of the indoor fan blower, the unit will shorten the 45-second delay to 5 seconds less than the time from initiation of heat to when the limit tripped.

Gas will not be interrupted to the burners and heating will continue. Once the fan-on delay has been modified, it will not change back to 45 seconds until power is reset to the control.

On units with 2 stages of heat, when additional heat is required, W2 closes and initiates power to the second stage of the main gas valve. When the thermostat is satisfied, W1 and W2 open and the gas valve closes, interrupting the flow of gas to the main burners.

If the call for W1 lasted less than 1 minute, the heating cycle will not terminate until 1 minute after W1 became active. If the unit is controlled through a room thermostat set for fan auto, the indoor-fan motor will continue to operate for an additional 45 seconds then stop. If the over-temperature limit opens after the indoor motor is stopped, but within 10

minutes of W1 becoming inactive, on the next cycle the time will be extended by 15 seconds. The maximum delay is 3 minutes. Once modified, the fan off delay will not change back to 45 seconds unless power is reset to the control. A LED indicator is provided on the IGC to monitor operation.

## Electro-Mechanical Units with Factory-Installed EconoMi\$er Cooling (Single Speed Indoor Fan Motor)

### COOLING

When free cooling is not available, the compressors will be controlled by the zone thermostat. When free cooling is available, the outdoor-air damper is modulated by the EconoMi\$er IV and X control to provide a 50°F (10°C) to 55°F (13°C) mixed-air temperature into the zone. As the mixed air temperature fluctuates above 55°F (13°C) or below 50°F (10°C) dampers will be modulated (open or close) to bring the mixed-air temperature back within control. If mechanical cooling is utilized with free cooling, the outdoor-air damper will maintain its current position at the time the compressor is started. If the increase in cooling capacity causes the mixed-air temperature to drop below 45°F (7°C), then the outdoor-air damper position will be decreased to the minimum position. If the mixed-air temperature continues to fall, the outdoor-air damper will close. Control returns to normal once the mixed-air temperature rises above 48°F (9°C). The power exhaust fans will be energized and de-energized, if installed, as the outdoor-air damper opens and closes.

If field-installed accessory CO<sub>2</sub> sensors are connected to the EconoMi\$er IV and X control, a demand controlled ventilation strategy will begin to operate. As the CO<sub>2</sub> level in the zone increases above the CO<sub>2</sub> set-point, the minimum position of the damper will be increased proportionally. As the CO<sub>2</sub> level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed. For EconoMi\$er IV and X operation, there must be a thermostat call for the fan (G). If the unit is occupied and the fan is on, the damper will operate at minimum position. Otherwise, the damper will be closed.

When the EconoMi\$er IV and X control is in the occupied mode and a call for cooling exists (Y1 on the thermostat), the control will first check for indoor fan operation. If the fan is not on, then cooling will not be activated. If the fan is on, then the control will open the EconoMi\$er IV and X damper to the minimum position.

On the initial power to the EconoMi\$er IV and X control, it will take the damper up to 2 1/2 minutes before it begins to position itself. After the initial power-up, further changes in damper position can take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take between 1 1/2 and 2 1/2 minutes. If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to maintain the mixed-air temperature set-point at 50°F (10°C) to 55°F (13°C). If there is a further demand for cooling (cooling second stage – Y2 is energized), then the control will bring on compressor stage 1 to maintain the mixed-air temperature set-point. The EconoMi\$er IV and X damper will be open at maximum position.

NOTE: When operating in ventilation mode only, the indoor fan motor will automatically adjust to 66% of the total cfm established.

## HEATING

The sequence of operation for the heating is the same as an electro-mechanical unit with no economizer. The only difference is how the economizer acts. The economizer will stay at the Economizer Minimum Position while the evaporator fan is operating. The outdoor-air damper is closed when the indoor fan is not operating.

Refer to Service and Maintenance Manual for further details.

### OPTIONAL HOT GAS RE-HEAT DEHUMIDIFICATION SYSTEM

Units with the factory equipped Hot Gas Re-Heat system option are capable of providing multiple modes of improved dehumidification as a variation of the normal cooling cycle. The Hot Gas Re-Heat system option includes additional valves in the liquid line and discharge line of each refrigerant circuit, a small reheat condenser coil downstream of the evaporator, and Motormaster® variable-speed control of some or all outdoor fans. Operation of the revised refrigerant circuit for each mode is described below.

The Hot Gas Re-Heat system provides three sub-modes of operation: Cool, Reheat1, and Reheat2.

#### Cool Mode:

Provides a normal ratio of Sensible and Latent Cooling effect from the evaporator coil.

#### Reheat1

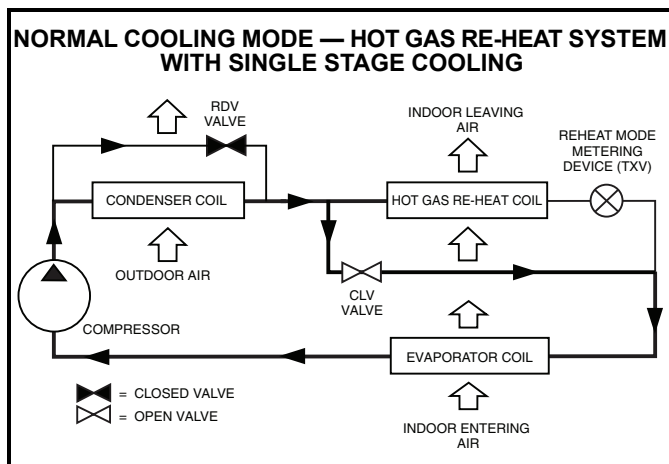
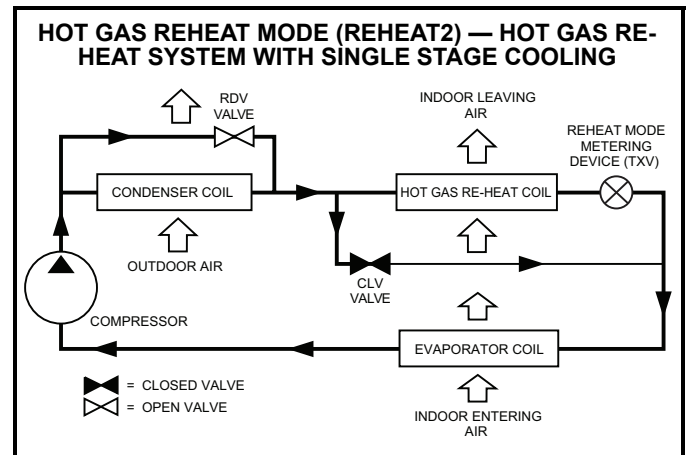
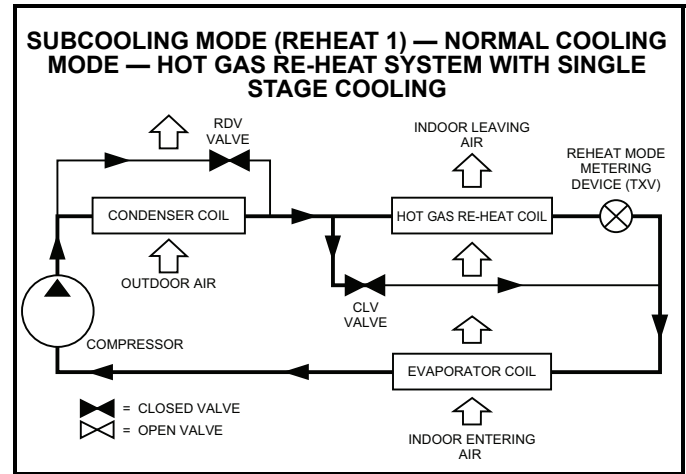
Provides increased Latent Cooling while slightly reducing the Sensible Cooling effect.

#### Reheat2

Provides normal Latent Cooling but with null or minimum Sensible Cooling effect delivered to the space.

The Reheat1 and Reheat2 modes are available when the unit is not in a Heating mode and when the Low Ambient Lockout switch is closed.

The figures on this page depict piping for single stage cooling units.



# GUIDE SPECIFICATIONS

"Masterformat" as published by the Construction Specification Institute. Please feel free to copy this specification directly into your building spec.

## Preferred Series Gas Heat/Electric Cooling Packaged Rooftop

### HVAC guide specifications

Size range: **15 to 25 Nominal Tons**

#### Part 1 — (23 06 80) Schedules for decentralized HVAC equipment

1.01 (23 06 80.13) Decentralized Unitary HVAC Equipment Schedule

- A. (23 06 80.13.A.) Rooftop unit (RTU) schedule  
Schedule is per the project specification requirements.

#### Part 2 — (23 07 16) HVAC equipment insulation

2.01 (23 07 16.13) Decentralized, Rooftop Units:

- A. (23 07 16.13.A.) Evaporator fan compartment:
  - 1. Interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, minimum 1 1/2-lb density, flexible fiberglass insulation bonded with a phenolic binder, neoprene coated on the air side.
  - 2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
- B. (23 07 16.13.B.) Gas heat compartment:
  - 1. Aluminum foil-faced fiberglass insulation shall be used.
  - 2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

#### Part 3 — (23 09 13) Instrumentation and control devices for HVAC

3.01 (23 09 13.23) Sensors and Transmitters

- A. (23 09 13.23.A.) Thermostats
  - 1. Thermostat must
    - a. energize both "W" and "G" when calling for heat.
    - b. have capability to energize 2 different stages of cooling, and 2 different stages of heating.
    - c. include capability for occupancy scheduling.

#### Part 4 — (23 09 33) Electric and electronic control system for HVAC

4.01 (23 09 33.13) Decentralized, rooftop units

- A. (23 09 33.13.A) General:
  - 1. Shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-v transformer side. Transformer shall have 75VA capability.
  - 2. Shall utilize color-coded wiring.
  - 3. Shall include a central control terminal board to conveniently and safely provide connection points for vital control functions such as: smoke

detectors, phase monitor, economizer, thermostat, DDC control options, loss of charge, freeze switch, high pressure switches.

4. The heat exchanger shall be controlled by an integrated gas controller (IGC) microprocessor. See heat exchanger section of this specification.

5. Unit shall include a minimum of one 8-pin screw terminal connection board for connection of control wiring.

B. (23 09 33.23.B) Safeties:

- 1. Compressor over-temperature, over-current.
- 2. Low-pressure switch.
  - a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 loss of charge switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
  - b. Loss of charge switch shall use different color wire than the high pressure switch. The purpose is to assist the installer and service technician to correctly wire and/or troubleshoot the rooftop unit.
- 3. High-pressure switch.
  - a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 high pressure switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
  - b. High-pressure switch shall use different color wire than the low-pressure switch. The purpose is to assist the installer and service technician to correctly wire and/or troubleshoot the rooftop unit.
- 4. Automatic reset, motor thermal overload protector.
- 5. Heating section shall be provided with the following minimum protections.
  - a. High-temperature limit switches.
  - b. Induced draft motor speed sensor.
  - c. Flame rollout switch.
  - d. Flame proving controls.

#### Part 5 — (23 09 93) Sequence of operations for HVAC controls

5.01 (23 09 93.13) Decentralized, Rooftop Units:  
(23 09 93.13.A) INSERT SEQUENCE OF OPERATION

#### Part 6 — (23 40 13) Panel air filters

6.01 (23 40 13 13) Decentralized rooftop units:

- A. (23 40 13 13.A) Standard filter section
  - 1. Shall consist of factory-installed, low velocity, throwaway 2-in. thick fiberglass filters of commercially available sizes.
  - 2. Unit shall use only one filter size. Multiple sizes are not acceptable.

3. Filters shall be accessible through a dedicated, weather tight access panel.
4. 4-in. filter capabilities shall be capable with pre-engineered and approved filter track field-installed accessory. This kit requires field furnished filters.

**Part 7 — (23 81 19) Self-contained air conditioners**

7.01 (23 81 19.13) Medium-Capacity Self-Contained Air Conditioners (RGH 181-303)

A. (23 81 19.13.A) General

1. Outdoor, rooftop mounted, electrically controlled, heating and cooling unit utilizing hermetic scroll compressor(s) for cooling duty and gas combustion for heating duty.
2. Factory assembled, single piece heating and cooling rooftop unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and special features required prior to field start-up.
3. Unit shall use R-410A refrigerant.
4. Unit shall be installed in accordance with the manufacturer's instructions.
5. Unit must be selected and installed in compliance with local, state, and federal codes.

B. (23 81 19.13.B.) Quality Assurance

1. Unit meets ASHRAE 90.1-2016 and IECC<sup>1</sup>-2018 minimum efficiency requirements.
2. Units are ENERGY STAR<sup>2</sup> certified where sizes are required.
3. Unit shall be rated in accordance with AHRI Standard 340/360.
4. Unit shall be designed to conform to ASHRAE 15.
5. Unit shall be ETL-tested and certified in accordance with ANSI Z21.47 Standards and ETL-listed and certified under Canadian standards as a total package for safety requirements.
6. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
7. Unit internal insulation linings shall be resistant to mold growth in accordance with "mold growth and humidity" test in ASTM C1338, G21, and UL 181 or comparable test method. Air stream surfaces shall be evaluated in accordance with the "Erosion Test" in UL 181, as part of ASTM C1071.
8. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
9. Roof curb shall be designed to conform to NRCA Standards.

10. Unit shall be subjected to a completely automated run test on the assembly line. The data for each unit will be stored at the factory, and must be available upon request.

11. Unit shall be designed in accordance with UL Standard 1995, ETL listed including tested to withstand rain.

12. Unit shall be constructed to prevent intrusion of snow and tested to prevent snow intrusion into the control box up to 40 mph.

13. Unit shake tested to assurance level 1, ASTM D4169 to ensure shipping reliability.

14. High-Efficiency Motors listed shall meet section 313 of the Energy Independence and Security Act of 2007 (EISA 2007).

C. (23 81 19.13.C) Delivery, storage, and handling

1. Unit shall be stored and handled per manufacturer's recommendations.
2. Lifted by crane requires either shipping top panel or spreader bars.
3. Unit shall only be stored or positioned in the upright position.

D. (23 81 19.13.D) Project conditions

As specified in the contract.

E. (23 81 19.13.E) Operating characteristics

1. Unit shall be capable of starting and running at 125°F (52°C) ambient outdoor temperature, meeting maximum load criteria of AHRI Standard 340/360 at ± 10% voltage.
2. Compressor with standard controls shall be capable of operation from 35°F (2°C), ambient outdoor temperatures. Accessory kits are necessary if mechanically cooling at ambient temperatures below 35°F (2°C).
3. Unit shall discharge supply air vertically as shown on contract drawings.
4. Unit shall be factory configured and ordered for vertical supply and return configurations.
5. Unit shall be factory furnished for either vertical or horizontal configuration without the use of special conversion kits. No field conversion is possible.

F. (23 81 19.13.F) Electrical Requirements

Main power supply voltage, phase, and frequency must match those required by the manufacturer.

G. (23 81 19.13.G) Unit Cabinet

1. Unit cabinet shall be constructed of galvanized steel, and shall be bonderized and coated with a pre-painted baked enamel finish on all externally exposed surfaces.
2. Unit cabinet exterior paint shall be: film thickness, (dry) 0.003 inches minimum, gloss (per ASTM D523, 60°F): 60, Hardness: H-2H Pencil hardness.
3. Evaporator fan compartment interior cabinet insulation shall conform to AHRI Standards

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1. IECC is a registered trademark of the International Code Council, Inc.  
 2. Energy Star is a registered trademark of the United States Department of Energy.

## GUIDE SPECIFICATIONS (cont)

340/360 minimum exterior sweat criteria. Interior surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density, flexible fiberglass insulation, neoprene coated on the air side. Aluminum foil-faced fiberglass insulation shall be used in the heat compartment.

4. Unit internal insulation linings shall be resistant to mold growth in accordance with “mold growth and humidity” test in ASTM C1338, G21, and UL 181 or comparable test method. Air stream surfaces shall be evaluated in accordance with the “Erosion Test” in UL 181, as part of ASTM C1071.
5. Base of unit shall have a minimum of four locations for factory thru-the-base gas and electrical connections<sup>1</sup> standard. Connections shall be internal to the cabinet to protect from environmental issues.
6. Base Rail
  - a. Unit shall have base rails on a minimum of 2 sides.
  - b. Holes shall be provided in the base rails for rigging shackles to facilitate maneuvering and overhead rigging.
  - c. Holes shall be provided in the base rail for moving the rooftop by fork truck.
  - d. Base rail shall be a minimum of 16 gauge thickness.
7. Condensate pan and connections:
  - a. Shall be a sloped condensate drain pan made of a non-corrosive material.
  - b. Shall comply with ASHRAE Standard 62.
  - c. Shall use a 3/4-in. 14 NPT drain connection at the end of the drain pan. Connection shall be made per manufacturer’s recommendations.
8. Top panel:

Shall be a multi-piece top panel linked with water tight flanges and interlocking systems.
9. Gas Connections:
  - a. All gas piping connecting to unit gas valve shall enter the unit cabinet at a single location on side of unit (horizontal plane).
  - b. Thru-the-base capability
    - 1) Standard unit shall have a thru-the-base gas-line location using a raised, embossed portion of the unit basepan.
    - 2) Optional, factory-approved, water-tight connection method must be used for thru-the-base gas connections.
    - 3) No basepan penetration, other than those authorized by the manufacturer, is permitted.

### 10. Electrical Connections

- a. All unit power wiring shall enter unit cabinet at a single, factory-prepared, knockout location.
- b. Thru-the-base capability
  - 1) Thru-the-base provisions/connections are available as standard with every unit. When bottom connections are required, field furnished couplings are required.
  - 2) No basepan penetration, other than those authorized by the manufacturer, is permitted.

### 11. Component access panels (standard)

- a. Cabinet panels shall be easily removable for servicing.
- b. Unit shall have one factory-installed, tool-less, removable, filter access panel.
- c. Panels covering control box and filters shall have molded composite handles while the blower access door shall have an integrated flange for easy removal.
- d. Handles shall be UV modified, composite, permanently attached, and recessed into the panel.
- e. Screws on the vertical portion of all removable access panel shall engage into heat resistant, molded composite collars.
- f. Collars shall be removable and easily replaceable using manufacturer recommended parts.

### H. (23 81 19.13.H.) Gas Heat

#### 1. General

- a. Heat exchanger shall be an induced draft design. Positive pressure heat exchanger designs shall not be allowed.
- b. Shall incorporate a direct-spark ignition system and redundant main gas valve.
- c. Gas supply pressure at the inlet to the rooftop unit gas valve must match that required by the manufacturer.

#### 2. The heat exchanger shall be controlled by an integrated gas controller (IGC) microprocessor.

- a. IGC board shall notify users of fault using an LED (light-emitting diode).
- b. IGC board shall contain algorithms that modify evaporator-fan operation to prevent future cycling on high temperature limit switch.
- c. Unit shall be equipped with anti-cycle protection with one short cycle on unit flame rollout switch or 4 continuous short cycles on the high temperature limit switch. Fault indication shall be made using an LED.

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1. Thru-the-base gas connections can be factory or field-installed. Thru-the-base electrical connections are only available as a field-installed option.



3. Standard Heat Exchanger construction
  - a. Heat exchanger shall be of the tubular-section type constructed of a minimum of 20-gauge steel coated with a nominal 1.2 mil aluminum-silicone alloy for corrosion resistance.
  - b. Burners shall be of the in-shot type constructed of aluminum-coated steel.
  - c. Burners shall incorporate orifices for rated heat output up to 2000 ft (610 m) elevation. Additional accessory kits may be required for applications above 2000 ft (610 m) elevation, depending on local gas supply conditions.
  - d. Each heat exchanger tube shall contain multiple dimples for increased heating effectiveness.
4. Optional Stainless Steel Heat Exchanger construction
  - a. Use energy saving, direct-spark ignition system.
  - b. Use a redundant main gas valve.
  - c. Burners shall be of the in-shot type constructed of aluminum-coated steel.
  - d. All gas piping shall enter the unit cabinet at a single location on side of unit (horizontal plane).
  - e. The optional stainless steel heat exchanger shall be of the tubular-section type, constructed of a minimum of 20-gauge type 409 stainless steel.
  - f. Type 409 stainless steel shall be used in heat exchanger tubes and vestibule plate.
  - g. Complete stainless steel heat exchanger allows for greater application flexibility.
5. Induced draft combustion motor and blower
  - a. Shall be a direct-drive, single inlet, forward-curved centrifugal type.
  - b. Shall be made from steel with a corrosion-resistant finish.
  - c. Shall have permanently lubricated sealed bearings.
  - d. Shall have inherent thermal overload protection.
  - e. Shall have an automatic reset feature.
- I. (23 81 19.13.I.) Coils
  1. Standard Aluminum Fin/Copper Tube Coils:
    - a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
    - b. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
    - c. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.
  2. Optional Pre-coated aluminum-fin condenser coils:
    - a. Shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments.
    - b. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube.
    - c. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.
    - d. Corrosion durability of fin stock shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90.
    - e. Corrosion durability of fin stock shall be confirmed through testing to have no visible corrosion after 48 hour immersion in a room temperature solution of 5% salt, 1% acetic acid.
    - f. Fin stock coating shall pass 2000 hours of the following: one week exposure in the prohesion chamber followed by one week of accelerated ultraviolet light testing. Prohesion chamber: the solution shall contain 3.5% sodium chloride and 0.35% ammonium sulfate. The exposure cycle is one hour of salt fog application at ambient followed by one hour drying at 95°F (35°C).
  3. Optional Copper-fin evaporator and condenser coils:
    - a. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
    - b. Galvanized steel tube sheets shall not be acceptable.
    - c. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.
  4. Optional E-coated aluminum-fin evaporator and condenser coils:
    - a. Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins.
    - b. Coating process shall ensure complete coil encapsulation of tubes, fins and headers.
    - c. Color shall be high gloss black with gloss per ASTM D523-89.
    - d. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges.
    - e. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93.

## GUIDE SPECIFICATIONS (cont)

- f. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93).
  - g. Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D224-92 and ASTM D870-92).
  - h. Corrosion durability shall be confirmed through testing to be no less than 6000 hours salt spray per ASTM B117-90.0
- J. (23 81 19.13.J) Refrigerant components
- 1. Refrigerant circuit shall include the following control, safety, and maintenance features:
    - a. Thermostatic Expansion Valve (TXV) shall help provide optimum performance across the entire operating range. Shall contain removable power element to allow change out of power element and bulb without removing the valve body.
    - b. Refrigerant filter drier - solid core design.
    - c. Service gauge connections on suction and discharge lines.
    - d. Pressure gauge access through a specially designed access screen on the side of the unit.
  - 2. Compressors
    - a. Unit shall use fully hermetic, scroll compressor for each independent refrigeration circuit.
    - b. Models shall be available with 2 compressor/2-stage cooling.
    - c. Compressor motors shall be cooled by refrigerant gas passing through motor windings.
    - d. Compressors shall be internally protected from high discharge temperature conditions.
    - e. Compressors shall be protected from an over-temperature and over-amperage conditions by an internal, motor overload device.
    - f. Compressor shall be factory mounted on rubber grommets.
    - g. Compressor motors shall have internal line break thermal, current overload and high pressure differential protection.
    - h. Crankcase heaters shall not be required for normal operating range, unless provided by the factory.
- K. (23 81 19.13.K) Filter section
- 1. Filters access is specified in the unit cabinet section of this specification.
  - 2. Filters shall be held in place by a preformed slide out filter tray, facilitating easy removal and installation.
  - 3. Shall consist of factory-installed, low velocity, throw-away 2-in. thick fiberglass filters.
  - 4. Filters shall be standard, commercially available sizes.
  - 5. Only one size filter per unit is allowed.
  - 6. 4-in. filter capability is possible with a field-installed pre-engineered slide out filter track accessory. 4-in. filters are field furnished.
- L. (23 81 19.13.L) Evaporator fan and motor
- 1. Evaporator fan motor:
    - a. Shall have inherent automatic-reset thermal overload protection or circuit breaker.
    - b. Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating shall be required.
  - 2. Belt-driven evaporator fan:
    - a. Belt drive shall include an adjustable-pitch motor pulley and belt break protection system.
    - b. Shall use rigid pillow block bearing system with lubricate fittings at are accessible or lubrication line.
    - c. Blower fan shall be double-inlet type with forward-curved blades.
    - d. Shall be constructed from steel with a corrosion resistant finish and dynamically balanced.
- M. (23 81 19.13.M) Condenser Fans and Motors
- 1. Condenser fan motors:
    - a. Shall be a totally enclosed motor.
    - b. Shall use permanently lubricated bearings.
    - c. Shall have inherent thermal overload protection with an automatic reset feature.
    - d. Shall use a shaft down design on all sizes.
  - 2. Condenser fans:
    - a. Shall be a direct driven propeller type fan.
    - b. Shall have aluminum blades riveted to corrosion resistant steel spiders and shall be dynamically balanced.
- N. (23 81 19.13.N) Special Features Options and Accessories
- 1. 2-Speed Indoor Fan Motor System for 2-stage cooling models only:
    - a. Evaporator fan motor:
      - 1) Shall have permanently lubricated bearings.
      - 2) Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating.
      - 3) Shall be Variable Frequency duty and 2-speed control.
      - 4) Shall contain motor shaft grounding ring to prevent electrical bearing fluting damage by safely diverting harmful shaft voltages and bearing currents to ground.

2. Variable Frequency Drive (VFD). Only available on 2-speed indoor fan motor option:
  - a. Factory-supplied VFDs qualify, through ABB for a 12-month warranty from date of commissioning or 18 months from date of sale, whichever occurs first.
  - b. Shall be installed inside the unit cabinet, mounted, wired and tested.
  - c. Shall contain Electromagnetic Interference (EMI) frequency protection.
  - d. Insulated Gate Bi-Polar Transistors (IGBT) used to produce the output pulse width modulated (PWM) waveform, allowing for quiet motor operation.
  - e. Self diagnostics with fault and power code LED indicator. Field accessory Display Kit available for further diagnostics and special setup applications.
  - f. RS485 capability standard.
  - g. Electronic thermal overload protection.
  - h. 5% swinging chokes for harmonic reduction and improved power factor.
  - i. All printed circuit boards shall be conformal coated.
3. Integrated EconoMi\$er® IV and EconoMi\$er X low leak rate models. (Factory-installed on 3-phase models only. field-installed on all 3 and 1-phase models):
  - a. Integrated, gear driven opposing modulating blade design type capable of simultaneous economizer and compressor operation.
  - b. Independent modules for vertical or horizontal return configuration shall be available. Vertical return modules shall be available as a factory-installed option.
  - c. Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on intake or return shall not be acceptable.
  - d. Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.
  - e. Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.
  - f. Low leak rate models shall be equipped with dampers not to exceed 2% leakage at 1 in. wg pressure differential.
  - g. Economizer controller on EconoMi\$er IV models shall be Honeywell W7212 that provides:
    - 1) Combined minimum and DCV maximum damper position potentiometers with compressor staging relay.
  - 2) Functions with solid state analog enthalpy or dry bulb changeover control sensing.
  - 3) LED indicators for: when free cooling is available, when module is in DCV mode, when exhaust fan contact is closed.
- h. Economizer controller on EconoMi\$er X models shall be the Honeywell W7220 that provides:
  - 1) 2-line LCD interface screen for setup, configuration and troubleshooting.
  - 2) On-board Fault Detection and Diagnostics (FDD) that senses and alerts when the economizer is not operating properly, per California Title 24.
  - 3) Sensor failure loss of communication identification.
  - 4) Automatic sensor detection.
  - 5) Capabilities for use with multiple-speed indoor fan systems.
  - 6) Utilize digital sensors: Dry bulb and Enthalpy.
- i. Shall be capable of introducing up to 100% outdoor air.
- j. Shall be equipped with a barometric relief damper capable of relieving up to 100% return air and contain seals that meet ASHRAE 90.1-2016 and IECC-2018 requirements.
- k. Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.
- l. Dry bulb outdoor air temperature sensor shall be provided as standard. Enthalpy sensor is also available on factory-installed only. Outdoor air sensor setpoint shall be adjustable and shall range from 40 to 100°F (4 to 38°C). Additional sensor options shall be available as accessories.
- m. The economizer controller shall also provide control of an accessory power exhaust unit function. Factory set at 100%, with a range of 0% to 100%.
- n. The economizer shall maintain minimum airflow into the building during occupied period and provide design ventilation rate for full occupancy.
- o. Dampers shall be completely closed when the unit is in the unoccupied mode.
- p. Economizer controller shall accept a 2 to 10 Vdc CO<sub>2</sub> sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor air damper to provide ventilation based on the sensor input.
- q. Compressor lockout temperature on W7220 is adjustable from -45°F to 80°F, set at a factory default of 32°F. Others shall

## GUIDE SPECIFICATIONS (cont)

- open at 35°F (2°C) and close at 50°F (10°C).
- r. Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
  - s. Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.
4. Integrated EconoMi\$er X Ultra Low Leak rate models. (Factory-installed on 3-phase models only. Field-installed on all 3 and 1-phase models):
- a. Integrated, gear driven opposing modulating blade design type capable of simultaneous economizer and compressor operation.
  - b. Independent modules for vertical or horizontal return configuration shall be available. Vertical return modules shall be available as a factory-installed option.
  - c. Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on intake or return shall not be acceptable.
  - d. Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.
  - e. Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.
  - f. Ultra Low Leak design meets California Title 24 section 140.4 and, ASHRAE 90.1-2016 and IECC-2018 requirements for 4 cfm per sq. ft. on the outside air dampers and 10 cfm per sq. ft. on the return dampers.
  - g. Economizer controller shall be the Honeywell W7220 that provides:
    - 1) 2-line LCD interface screen for setup, configuration and troubleshooting
    - 2) On-board Fault Detection and Diagnostics (FDD) that senses and alerts when the economizer is not operating properly, per California Title 24.
    - 3) Sensor failure loss of communication identification
    - 4) Automatic sensor detection
    - 5) Capabilities for use with multiple-speed indoor fan systems
    - 6) Utilize digital sensors: Dry bulb and Enthalpy
  - h. Shall be capable of introducing up to 100% outdoor air.
  - i. Shall be equipped with a barometric relief damper capable of relieving up to 100% return air and contain seals that meet ASHRAE 90.1-2016 and IECC-2018 requirements.
  - j. Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.
  - k. Dry bulb outdoor air temperature sensor shall be provided as standard. Enthalpy sensor is also available on factory-installed only. Outdoor air sensor setpoint shall be adjustable and shall range from 40 to 100°F (4 to 38°C). Additional sensor options shall be available as accessories.
  - l. The economizer controller shall also provide control of an accessory power exhaust unit function. Factory set at 100%, with a range of 0% to 100%.
  - m. The economizer shall maintain minimum airflow into the building during occupied period and provide design ventilation rate for full occupancy.
  - n. Dampers shall be completely closed when the unit is in the unoccupied mode.
  - o. Economizer controller shall accept a 2 to 10 Vdc CO<sub>2</sub> sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor air damper to provide ventilation based on the sensor input.
  - p. Compressor lockout temperature on W7220 is adjustable from -45°F to 80°F, set at a factory default of 32°F. Others shall open at 35°F (2°C) and closes at 50°F (10°C).
  - q. Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
  - r. Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.
5. Two-Position Damper
- a. Damper shall be a Two-Position Damper. Damper travel shall be from the full closed position to the field adjustable %—open setpoint.
  - b. Damper shall include adjustable damper travel from 25% to 100% (full open).
  - c. Damper shall include single or dual blade, gear driven dampers and actuator motor.
  - d. Actuator shall be direct coupled to damper gear. No linkage arms or control rods shall be acceptable.
  - e. Damper will admit up to 100% outdoor air for applicable rooftop units.
  - f. Damper shall close upon indoor (evaporator) fan shutoff and/or loss of power.
  - g. The damper actuator shall plug into the rooftop unit's wiring harness plug. No hard wiring shall be required.
  - h. Outside air hood shall include aluminum water entrainment filter.

6. Manual damper
  - a. Manual damper package shall consist of damper, air inlet screen, and rain hood which can be preset to admit up to 25% outdoor air for year round ventilation.
7. Hot Gas Reheat Dehumidification System:
  - a. The Hot Gas Reheat Dehumidification System shall be factory-installed and shall provide greater dehumidification of the occupied space by two modes of dehumidification operations in addition to its normal design cooling mode:
    - 1) Subcooling mode further sub cools the hot liquid refrigerant leaving the condenser coil when both temperature and humidity in the space are not satisfied.
    - 2) Hot gas reheat mode shall mix a portion of the hot gas from the discharge of the compressor with the hot liquid refrigerant leaving the condenser coil to create a two-phase heat transfer in the system, resulting in a neutral leaving air temperature when only humidity in the space is not satisfied.
    - 3) Includes Motormaster® head pressure controller
8. Head Pressure Control Package (Motormaster)
  - a. Controller shall control coil head pressure by condenser-fan speed modulation or condenser-fan cycling and wind baffles.
  - b. Shall consist of solid-state control and condenser-coil temperature sensor to maintain condensing temperature at outdoor ambient temperatures between 90°F (32°C) and 110°F (43°C) at outdoor ambient temperatures down to 0°F (-18°C).
9. Low Ambient Controller (Factory-installed only)
  - a. Controller shall control coil head pressure by condenser-fan speed modulation or condenser-fan cycling and wind baffles.
  - b. Shall consist of solid-state control and condenser-coil temperature sensor to maintain condensing temperature between 90°F (32°C) and 110°F (43°C) at outdoor ambient temperatures down to 0°F (-18°C).
10. Propane Conversion Kit
 

Package shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane. Kits shall be available for elevations from 0 up to 14,000 ft (4,276 m).
11. Condenser Coil Hail Guard Assembly:
  - a. Shall protect against damage from hail.
  - b. Shall be of louvered style.
12. Unit-Mounted, Non-Fused Disconnect Switch:
  - a. Switch shall be factory-installed, internally mounted.
  - b. National Electric Code (NEC) and UL or ETL approved non-fused switch shall provide unit power shutoff.
  - c. Shall be accessible from outside the unit.
  - d. Shall provide local shutdown and lockout capability.
  - e. Sized only for the unit as ordered from the factory. Does not accommodate field-installed devices.
13. Convenience outlet:
  - a. Powered convenience outlet. (Not available on single phase models):
    - 1) Outlet shall be powered from main line power to the rooftop unit.
    - 2) Outlet shall be powered from line side or load side of disconnect by installing contractor, as required by code. If outlet is powered from load side of disconnect, unit electrical ratings shall be UL certified and rated for additional outlet amperage.
    - 3) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
    - 4) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
    - 5) Voltage required to operate convenience outlet shall be provided by a factory-installed step down transformer.
    - 6) Outlet shall be accessible from outside the unit.
    - 7) Outlet shall include a field-installed "Wet in Use" cover.
  - b. Non-powered convenience outlet.
    - 1) Outlet shall be powered from a separate 115-120v power source.
    - 2) A transformer shall not be included.
    - 3) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
    - 4) Outlet shall include 15 amp GFI receptacles.
    - 5) Outlet shall be accessible from outside the unit.
    - 6) Outlet shall include a field-installed "Wet in Use" cover.
14. Flue Discharge Deflector:
  - a. Flue discharge deflector shall direct unit exhaust vertically instead of horizontally.
  - b. Deflector shall be defined as a "natural draft" device by the National Fuel and Gas (NFG) code.

## GUIDE SPECIFICATIONS (cont)

15. Fan/Filter Status Switch:
  - a. Switch shall provide status of indoor evaporator fan (ON/OFF) or filter (CLEAN/DIRTY).
  - b. Status shall be displayed either over communication bus (when used with direct digital controls) or with an indicator light at the thermostat.
16. Centrifugal Propeller Power Exhaust:
  - a. Power exhaust shall be used in conjunction with an integrated economizer.
  - b. Independent modules for vertical or horizontal return configurations shall be available.
  - c. Horizontal power exhaust is shall be mounted in return ductwork.
  - d. Power exhaust shall be controlled by economizer controller operation. Exhaust fans shall be energized when dampers open past the 0-100% adjustable setpoint on the economizer control.
17. Roof Curbs (Vertical):
  - a. Full perimeter roof curb with exhaust capability providing separate air streams for energy recovery from the exhaust air without supply air contamination.
  - b. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
  - c. Permits installation and securing of ductwork to curb prior to mounting unit on the curb.
18. Adapter Curb (Vertical):
  - a. Full perimeter – fully assembled and welded roof curb with exhaust capability providing separate air streams for energy recovery from the exhaust air without supply air contamination.
  - b. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
  - c. Permits installation of new RGH 181-303 models to past design curb models. Check with your sales expert for further details and information.
19. High Altitude Gas Conversion Kit:

Package shall contain all the necessary hardware and instructions to convert a standard natural gas unit to operate from 3,000 to 10,000 ft (914 to 3048 m) elevation and 10,001 to 14,000 ft (3049 to 4267 m) elevation.
20. Outdoor Air Enthalpy Sensor:

The outdoor air enthalpy sensor shall be used to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the unit will provide differential enthalpy control. The sensor allows the unit to determine if outside air is suitable for free cooling.
21. Return Air Enthalpy Sensor:

The return air enthalpy sensor shall be used in conjunction with an outdoor air enthalpy sensor to provide differential enthalpy control.
22. Indoor Air Quality (CO<sub>2</sub>) Sensor:
  - a. Shall be able to provide demand ventilation indoor air quality (IAQ) control.
  - b. The IAQ sensor shall be available in duct mount, wall mount, or wall mount with LED display. The setpoint shall have adjustment capability.
23. Smoke Detectors:
  - a. Shall be a Four-Wire Controller and Detector.
  - b. Shall be environmental compensated with differential sensing for reliable, stable, and drift-free sensitivity.
  - c. Shall use magnet-activated test/reset sensor switches.
  - d. Shall have tool-less connection terminal access.
  - e. Shall have a recessed momentary switch for testing and resetting the detector.
  - f. Controller shall include:
    - 1) One set of normally open alarm initiation contacts for connection to an initiating device circuit on a fire alarm control panel.
    - 2) Two Form-C auxiliary alarm relays for interface with rooftop unit or other equipment.
    - 3) One Form-C supervision (trouble) relay to control the operation of the Trouble LED on a remote test/reset station.
    - 4) Capable of direct connection to two individual detector modules.
    - 5) Can be wired to up to 14 other duct smoke detectors for multiple fan shut-down applications.
24. Horn/Strobe Annunciator
  - a. Provides an audible/visual signaling device for use with factory-installed option or field-installed accessory smoke detectors.
    - 1) Requires installation of a field-supplied 24-v transformer suitable for 4.2 VA (AC) or 3.0 VA (DC) per horn/strobe accessory.
  - b. Requires field-supplied electrical box, North American 1-gang box, 2-in. (51 mm) x 4-in. (102 mm).
  - c. Shall have a clear colored lens.
25. Winter start kit
  - a. Shall contain a bypass device around the low pressure switch.
  - b. Shall be required when mechanical cooling is required down to 25°F (-4°C).

- c. Shall not be required to operate on an economizer when below an outdoor ambient of 40°F (4°C).
26. Time Guard
- a. Shall prevent compressor short cycling by providing a 5-minute delay ( $\pm 2$  minutes) before restarting a compressor after shut-down for any reason.
  - b. One device shall be required per compressor.
27. Barometric Hood (Horizontal Economizer Applications)
- Shall be required when a horizontal economizer and barometric relief are required. Barometric relief damper must be installed in the return air (horizontal) duct work. This hood provides weather protection.
28. Hinged Access Panels
- a. Shall provide easy access through integrated quarter turn latches.
  - b. Shall be on major panels of – filter, control box, fan motor and compressor.
29. Display Kit for Variable Frequency Drive
- a. Kit allows the ability to access the VFD controller programs to provide special setup capabilities and diagnostics.
  - b. Kit contains display module and communication cable.
  - c. Display Kit can be permanently installed in the unit or used on any 2-Speed Indoor Fan Motor System VFD controller as needed.
30. Condensate Overflow Switch:
- a. This sensor and related controller monitors the condensate level in the drain pan and shuts down compression operation when overflow conditions occur. It includes:
    - 1) Indicator light - solid red (more than 10 seconds on water contact - compressors disabled), blinking red (sensor disconnected).
    - 2) 10 second delay to break - eliminates nuisance trips from splashing or waves in pan (sensor needs 10 seconds of constant water contact before tripping).
    - 3) Disables the compressor(s) operation when condensate plug is detected, but still allows fans to run for Economizer.

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