



# Packaged Unit

## Cooling & Gas Heat

**15 and 20 Ton Cooling Capacity  
235,000 to 375,000 Btuh Input  
Heating Capacity**

### GCS16-180/240



#### FEATURES

- ◆ Down-flow or horizontal supply and return air configuration
- ◆ CSA International (formerly AGA/CGA) certified as combination heating/cooling unit for outdoor installation, bonded for grounding to meet safety standards for servicing required by CSA International and National and Canadian Electrical Codes
- ◆ Certified in accordance with ULE certification program, which is based on ARI Standard 340/360-2000.
- ◆ Heavy gauge galvanized steel cabinet, fully insulated, prepainted enamel paint finish, large removable access panels, electrical inlets in cabinet base and indoor section, control box with factory installed controls, lifting brackets and full perimeter base rails with forklift slots and holes for rigging
- ◆ Coil constructed of copper tube, ripple-edged enhanced aluminum fins, flared shoulder tubing connections, silver soldered construction, factory tested, evaporator coil face split with separate circuits, evaporator coil drain connection outside of unit cabinet
- ◆ Reciprocating type compressor hermetically sealed and overload protected (180 models). Copeland Compliant Scroll® hermetically sealed (240 models)
- ◆ Condenser fans have low operating sound levels and PVC coated fan guard
- ◆ Condenser fan motors are overload protected and permanently lubricated with ball bearings
- ◆ Tubular constructed, aluminized steel heat exchanger
- ◆ Heating system has aluminized steel inshot burners, direct spark ignition, electronic flame sensor, redundant automatic gas valve with manual shut-off, induced draft blower, flame rollout switch, and peep hole for flame viewing
- ◆ Disposable 2" pleated filters furnished
- ◆ Refrigeration system consists of compressors, condenser coil and direct drive fan(s), evaporator coil and belt drive blower, expansion valves, high capacity filter driers, full refrigerant charge, freezestats (prevents coil freeze-up during low ambient operation), independent refrigerant circuits (allows staging), low ambient cooling operation down to 30°F (-1°C) without additional controls
- ◆ Belt driven supply air blower statically and dynamically balanced with permanently lubricated sleeve bearings and adjustable pulley
- ◆ Developed in accordance with ISO9002 Quality Standards
- ◆ 1 Year warranty on parts
- ◆ 5 Year warranty on compressor
- ◆ 10 Year warranty on heat exchanger

## Optional Accessories

Item	GCS16-180	GCS16-240
<b>Coil Guard</b> - PVC coated steel wire guards to protect outdoor coil. Not used with Hail Guards.	<b>78L49</b>	
<b>Differential Enthalpy Control</b> - For use with economizer dampers, solid-state return air sensor allows selection between outdoor air and return air (whichever has lowest enthalpy)	<b>54G44</b>	
<b>Diffusers (Step-Down)</b> - Aluminum grilles, double deflection louvers, large center grille, insulated diffuser box with flanges, hanging rings furnished, interior transition (even air flow), internally sealed (prevents recirculation), adapts to T-bar ceiling grids or plaster ceilings	<b>RTD11-185</b> 392 lbs. (178 kg) (29G06)	<b>RTD11-275</b> 403 lbs. (183 kg) (29G07)
<b>Diffusers (Flush)</b> - Aluminum grilles, fixed blade louvers, large center grille, insulated diffuser box with flanges hanging rings furnished, interior transition (even air flow), internally sealed (prevents recirculation), adapts to T-bar ceiling grids or plaster ceilings.	<b>FD11-185</b> 289 lbs. (131 kg) (29G10)	<b>FD11-275</b> 363 lbs. (165 kg) (29G11)
<b>Transitions (Supply and Return)</b> - Used with diffusers, installs in roof mounting frame, galvanized steel construction, flanges furnished for duct connection, fully insulated.	<b>SRT16-18</b> 75 lbs. (34 kg) (97H12)	<b>SRT16-24</b> 120 lbs. (54 kg) (78L47)
<b>Economizer Dampers (Down-Flow or Horizontal)</b> - Mechanically linked recirculated air and outdoor air dampers, plug-in connections to unit, nylon bearings, stainless steel seals (outdoor dampers), 24 volt fully modulating spring return damper motor, adjustable minimum damper position switch, mixed air sensor, solid-state adjustable outdoor air enthalpy control, 0 to 100% outdoor air adjustable, powdered enamel paint finish	Model No. - Net Wt.	<b>REM16M-18/24</b> Dampers 95 lbs. (43 kg) (81L43)
<b>NOTE:</b> Economizer damper hood with cleanable aluminum mesh frame filter is required and must be ordered separately (see below).	Net face area	5.3 sq. ft. (.49 m <sup>2</sup> )
<b>NOTE:</b> - Gravity Exhaust Dampers are required for down-flow applications and must be ordered separately (see Pg.3).		
<b>Economizer Damper Hood</b> - Required with PED16-18/24 and REM16M economizer dampers (see above). Installs over outdoor air dampers. Includes cleanable aluminum mesh frame filters.	Model No. - Net Wt.	<b>REM16M-18/24</b> Damper Hood (81L45) 36 lbs. (16 kg)
	No. & Size of Filters	(2) 25 x 25 x 1 in. (635 x 635 x 25 mm)

## Model Number Guide

GCS	16	-	180	-	235	-	3HP	-	1	Y
Unit Type										Voltage
GCS = Packaged Gas Unit										Y = 208/230v-3 phase-60hz
Series										G = 460v-3 phase-60hz
Cooling Capacity Tons (kW)										J = 575v-3 phase-60hz
180 = 15 (52.8)										Minor Revision Number
240 = 20 (70.3)										
Heating Capacity Btuh										Blower Motor Horsepower
235 = 235,000 Btuh (68.8 kW)										3hp = 3 hp (2.24 kW)
375 = 375,000 Btuh (109.8 kW)										5hp = 5 hp (3.73 kW)
										7.5hp = 7.5 hp (5.60 kW)

## Optional Accessories

Item	GCS16-180	GCS16-240
<b>Economizer Gravity Exhaust Dampers</b> - Required with REMD16 economizer dampers in down-flow applications. Optional for horizontal applications. Neoprene coated fiberglass dampers. Includes rain hood. Field installs on economizer for down-flow applications. Field installs on return air duct for horizontal supply and return air applications. See dimension drawings.	<b>GED16-18/24</b> 23 lbs (10 kg) (81L44)	
<b>Economizer Power Exhaust Fans</b> - For use with REMD16M economizer dampers and GED16 Gravity Exhaust Dampers (see above). Provides pressure relief. Installs between economizer and gravity exhaust dampers ( <b>required</b> ). Interlocked to run when return air dampers are closed and supply air blowers are operating. Overload protected.	Model No. - Net Wt.	<b>PED16-18/24</b> 80 lbs. (36 kg) Y volt - (81L40) G volt - (81L41) J volt - (81L42)
	Dia. - in. (mm) No. blades	20 (508) - 5
	Total air volume - cfm (L/s)	6000 (2830)
	Motor horsepower (W)	(2) - 1/3 (250)
	Total Watts input	850
<b>Hail Guards</b> - Heavy duty field installed coil guard protects coils from damage. Not used with Coil Guards.		<b>78L48</b>
<b>Horizontal Supply and Return Air Kit</b> - Provides duct connection to unit, flanges furnished, hardware furnished, two filler panels furnished for unused air openings, filter access panel furnished		<b>HDK16-18/24</b> 55 lbs. (25 kg) (71L81)
<b>Low Ambient Controls</b> - Allows unit operation down to 0° F (-17.7°C)		<b>(85L42)</b>
<b>Outdoor Air Damper/Hood Section</b> - Linked mechanical dampers, 0 to 25% (fixed) outdoor air adjustable, cleanable aluminum mesh filter furnished in hood, section installs on unit for down-flow applications with Outdoor Air Damper Panel Kit ( <b>required</b> must be ordered separately - see below). Damper/Hood section field installs in return air duct for horizontal supply and return air applications, panel kit not required for horizontal applications.  Minimum mixed air temperature: Heat mode (aluminized heat exchanger) - 45°F (7° C). Maximum mixed air temperature: Cool mode - 90°F (32° C).	Model No. - Net Wt.	<b>OAD16-18/24</b> Damper/Hood (81L38) 52 lbs. (24 kg) (Order Air Damper/Hood and Damper Panel Kit for complete assembly for down-flow applications)
	No. & Size of Filters	(1) 26 x 28 x 1 in. (660 x 711 x 25 mm)
<b>Outdoor Air Damper Panel Kit (Down-Flow Applications)</b> - Required with OAD16 Damper/Hood. Interchangeable unit panel.		<b>OAD16-18/24</b> Panel Kit (81L39) 20 lbs. (9 kg)
<b>Outdoor Air Damper Motorized Damper Kit</b> - 3 position damper actuator, plug in connection	Model No. - Net Wt.	<b>35G21</b> 7 lbs (3 kg)
<b>Roof Mounting Frame</b> - Nailer strip furnished, mates to unit, U.S. National Roofing Contractors Approved, shipped knocked down		<b>RMF16-18/24</b> 154 lbs. (80 kg) (63L81)
<b>LPG/Propane Kits</b>		<b>81L86</b>
<b>Cycle Control</b> - Required with Electro-Mechanical Thermostat System, provides timed-on and off function, prevents compressor short cycling.		<b>45L54</b>

## Specifications

Model No.		GCS16-180	GCS16-240
Nominal Tonnage		15	20
Cooling Ratings	Gross cooling capacity - Btuh (kW)	183,200 (53.7)	226,600 (66.4)
	*Total cooling capacity - Btuh (kW)	176,000 (51.6)	216,000 (63.3)
	Total unit kW	19.5	24
	*EER (Btu/h/Watts)	9	9
	*Integrated Part Load Value	9.2	9.2
Refrigerant Charge (HCFC-22)	Circuit 1	7 lbs. 8 oz. (3.40 kg)	8 lbs. 8 oz. (3.86 kg)
	Circuit 2	7 lbs. 8 oz. (3.40 kg)	8 lbs. 8 oz. (3.86 kg)
	Circuit 3	7 lbs. 8 oz. (3.40 kg)	8 lbs. 8 oz. (3.86 kg)
Evaporator Blower and Drive Selection	Blower wheel nominal diameter x width - in. (mm)	18 x 18 (457 x 457)	
	3 hp Motor and Factory Installed 1Drives	Nominal motor hp (kW)	3 (2.24)
		Maximum usable hp (kW)	3.45 (2.57)
		Voltage & phase	208/230/460v or 575v-3ph
		RPM Range	645-845
	5 hp Motor and Factory Installed 1Drives	Nominal motor hp (kW)	5 (3.73)
		Maximum usable hp (kW)	5.75 (4.29)
		Voltage & phase	208/230/460v or 575v-3ph
		RPM Range	765-965
	7.5 hp Motor and Factory Installed 1Drives	Nominal motor hp (kW)	---
		Maximum usable hp (kW)	7.5 (5.60)
		Voltage & phase	---
		RPM Range	895-1120
Evaporator Coil	Net face area - sq. ft. (m <sup>2</sup> )	17.9 (1.66)	
	Tube diameter - in. (mm) & No. of rows	3/8 (9.5) - 3	3/8 (9.5) - 4
	Fins per inch (m)	14 (551)	
	Expansion device type	Thermostatic Expansion Valve	
	Drain connection size mpt - in. (mm)	1 (25.4)	
Condenser Coil	Net face area - sq. ft. (m <sup>2</sup> )	29.5 (2.74)	
	Tube diameter - in. (mm) & No. of rows	3/8 (9.5) - 2	
	Fins per inch (m)	20 (787)	
Condenser Fan	Diameter - in (mm) & No. of blades	(2) 24 (610) - 4	(2) 26 (660) - 4
	Air volume - cfm (L/s)	10,000 (4720)	13,500 (6370)
	Motor horsepower (W)	3/4 (560)	1 (746)
	Motor rpm	1075	1140
	Motor watts	1200	2050

\*Certified in accordance with ULE certification program, which is based on ARI Standard 340/360-93 ; 95°F (35°C) outdoor air temperature and 80°F (27°C) db/67°F (19°C) wb entering evaporator air. Integrated Part Load Value rated at 80°F (27°C) outdoor air temperature.

NOTE ARI capacity is net and includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.

<sup>1</sup>Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished by Armstrong are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

## Specifications

	Model No.	GCS16-180	GCS16-240
-235 Heat Models	Low fire input - Btuh (kW) Natural Gas/LPG/Propane	154,000 (45.1) Nat./170,000 (49.8) LPG/Propane	
	Input _ Btuh (kW) Natural Gas/LPG/Propane	235,000 (68.9)	
	Output - Btuh (kW) Natural Gas/LPG/Propane	188,000 (55.1) Nat./191,000 (56.0) LPG/Propane	
	CSA Thermal Efficiency Natural Gas/LPG/Propane	80.0% Nat./81.3% LPG Propane	
-375 Heat Models	Low fire input - Btuh (kW) Natural Gas/LPG/Propane	246,000 (72.1) Nat./271,000 (79.4) LPG/Propane	
	Input _ Btuh (kW) Natural Gas/LPG/Propane	375,000 (109.9)	
	Output - Btuh (kW) Natural Gas/LPG/Propane	300,000 (87.9) Nat./305,000 (89.4) LPG/Propane	
	CSA Thermal Efficiency Natural Gas/LPG/Propane	80.0% Nat./81.3% LPG Propane	
Gas Supply Connections fpt - in. (mm) Natural Gas and LPG-Propane		3/4	
Recommended Gas Supply Pressure - wc. in. (kPa)	Natural	7 (1.7)	
	LPG/Propane	11 (2.7)	
Filters (furnished)	Type of filter	Disposable, pleated	
	No. & size - in. (mm)	(6) 18 x 24 x 2 (457 x 610 x 51)	
Net weight of basic unit - lbs. (kg)		1700 (771)	1825 (828)
Shipping weight of basic unit - lbs. (kg) (1 package)		1870 (848)	1990 (903)
Electrical characteristics		208/230v, 460v or 575v - 60 hertz - 3 phase	

## Electrical Data - 180 Model

Model No.		GCS16-180				
Line voltage - 60 Hz - 3 phase		208/230v		460v		575v
Compressors (3)	Rated load amps- each (total)		16.7 (50.1)		8.6 (25.8)	
	Locked rotor amps - each (total)		110 (330)		55 (165)	
Condenser Fan Motor (2)	Full load amps (total)		3.7 (7.4)		1.9 (3.8)	
	Locked rotor amps (total)		7.3 (14.6)		3.7 (7.4)	
Evaporator Blower Motor	Motor Output - hp (kW)		3 (2.2)	5 (3.7)	3 (2.2)	5 (3.7)
	Full load amps		10.6	16.7	4.8	7.6
	Locked rotor amps		66	105	26.8	45.6
*Recommended max. fuse or circuit breaker size (amps)		With Exhaust Fans	90	90	45	50
		Less Exhaust Fans	80	90	45	45
†Minimum Circuit Ampacity		With Exhaust Fans	78	84	40	42
		Less Exhaust Fans	73	79	37	40
Optional Power Exhaust Fans	(No.) Motor Output - hp (W)		(2) 1/3 (250)			
	Full load amps (total)		2.4 (4.8)		1.3 (2.6)	
	Locked rotor amps (total)		4.7 (9.4)		2.4 (4.8)	

\*Where current does not exceed 100 amps, HACR type circuit breaker may be used in place of fuse. (U.S. only)

†Refer to National or Candian Electrical Code manual to determine wire, fuse and disconnect size requirements.

NOTE - Extremes of operating range are plus and minus 10% of line voltage.

## Electrical Data - 240 Model

Model No.		GCS16-240				
Line voltage - 60 Hz - 3 phase		208/230v		460v		575v
Compressors (3)	Rated load amps- each (total)		18.8 (56.4)		9.1 (27.3)	
	Locked rotor amps - each (total)		156 (468)		75 (225)	
Condenser Fan Motor (2)	Full load amps (total)		4.8 (9.6)		2.4 (4.8)	
	Locked rotor amps (total)		23 (46)		11.5 (23)	
Evaporator Blower Motor	Motor Output - hp (kW)		5 (3.7)	7.5 (5.6)	5 (3.7)	7.5 (5.6)
	Full load amps		16.7	24.2	7.6	11
	Locked rotor amps		105	152	45.6	66
*Recommended max. fuse or circuit breaker size (amps)		With Exhaust Fans	110	125	50	50
		Less Exhaust Fans	100	110	50	40
†Minimum Circuit Ampacity		With Exhaust Fans	93	100	45	48
		Less Exhaust Fans	88	95	42	46
Optional Power Exhaust Fans	(No.) Motor Output - hp (W)		(2) - 1/3 (250)			
	Full load amps (total)		2.4 (4.8)		1.3 (2.6)	
	Locked rotor amps (total)		4.7 (9.4)		2.4 (4.8)	

\*Where current does not exceed 100 amps, HACR type circuit breaker may be used in place of fuse. (U.S. only)

†Refer to National or Candian Electrical Code manual to determine wire, fuse and disconnect size requirements.

NOTE - Extremes of operating range are plus and minus 10% of line voltage.

## High Altitude Heating Derate

U.S. - CSA certified units must be derated when installed at an elevation of more than 2000 feet (610 m) above sea level. If unit is installed at an altitude higher than 2000 feet (610 m), the unit must be derated 4% for every 1000 feet (305 m) above sea level. Thus, at an altitude of 4000 feet (1210 m), the unit would require a derate of 16%.

Canada - CSA certified units must be derated when installed at an elevation of more than 2000 feet (610 m) above sea level. If unit is installed at an altitude higher than 2000 feet (610 m), the unit must be derated 10% for elevations between 2000 feet and 4500 feet (610 m and 1370 m) above sea level.

NOTE - This is the only permissible derate for these units.

## Cooling Ratings

### GCS16-180 - Two Compressors Operating

Entering Wet Bulb Temper- ature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			65°F (18°C)						75°F (24°C)						85°F (29°C)						95°F (35°C)					
	Total Cooling Capacity		Comp. Motor kW		Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW		Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW		Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW		Sensible to Total Ratio (S/T)			
	cfm	L/s	kBtu- h	kW	Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb			
			75°F (24°C)	80°F (27°C)	85°F (29°C)		kBtu- h	kW	75°F (24°C)	80°F (27°C)	85°F (29°C)		kBtu- h	kW	75°F (24°C)	80°F (27°C)	85°F (29°C)		kBtu- h	kW	75°F (24°C)	80°F (27°C)	85°F (29°C)			
63°F (17°C)	4800	2265	127.8	37.5	8.42	.68	.81	.93	122.8	36.0	9.00	.69	.82	.94	117.4	34.4	9.70	.70	.84	.96	111.4	32.6	10.46	.72	.86	.98
	6000	2830	132.8	38.9	8.54	.72	.87	.99	127.6	37.4	9.16	.74	.89	1.00	121.8	35.7	9.88	.75	.91	1.00	115.6	33.9	10.66	.77	.93	1.00
	7200	3400	136.8	40.1	8.62	.77	.93	1.00	131.2	38.5	9.26	.78	.95	1.00	125.4	36.8	10.00	.80	.97	1.00	119.2	34.9	10.82	.83	.99	1.00
67°F (19°C)	4800	2265	136.2	39.9	8.60	.54	.65	.77	130.8	38.3	9.24	.54	.66	.79	124.8	36.6	9.98	.55	.68	.81	118.4	34.7	10.80	.56	.69	.83
	6000	2830	140.6	41.2	8.70	.56	.70	.84	134.8	39.5	9.38	.57	.71	.86	128.6	37.7	10.14	.58	.73	.88	121.8	35.7	10.96	.59	.75	.90
	7200	3400	143.8	42.1	8.76	.59	.75	.90	137.8	40.4	9.46	.60	.76	.92	131.4	38.5	10.24	.61	.78	.94	124.4	36.5	11.08	.62	.81	.96
71°F (22°C)	4800	2265	145.0	42.5	8.78	.41	.52	.63	139.2	40.8	9.50	.41	.53	.64	132.8	38.9	10.30	.41	.53	.65	126.0	36.9	11.16	.42	.54	.67
	6000	2830	149.4	43.8	8.88	.42	.55	.67	143.2	42.0	9.62	.42	.56	.69	136.6	40.0	10.46	.42	.56	.71	129.4	37.9	11.34	.43	.58	.72
	7200	3400	152.6	44.7	8.96	.43	.58	.72	146.0	42.8	9.72	.43	.59	.74	139.0	40.7	10.56	.44	.60	.76	131.8	38.6	11.46	.44	.61	.78

### GCS16-180 - All Compressors Operating

Entering Wet Bulb Temper- ature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			85°F (29°C)						95°F (35°C)						105°F (41°C)						115°F (46°C)					
	Total Cooling Capacity		Comp. Motor kW		Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW		Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW		Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW		Sensible to Total Ratio (S/T)			
	cfm	L/s	kBtu- h	kW	Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb		Dry Bulb			
			75°F (24°C)	80°F (27°C)	85°F (29°C)		kBtu- h	kW	75°F (24°C)	80°F (27°C)	85°F (29°C)		kBtu- h	kW	75°F (24°C)	80°F (27°C)	85°F (29°C)		kBtu- h	kW	75°F (24°C)	80°F (27°C)	85°F (29°C)			
63°F (17°C)	4800	2265	176.5	51.7	14.54	.70	.84	.97	167.6	49.1	15.68	.72	.86	.98	158.5	46.5	16.88	.73	.89	1.00	149.5	43.8	18.06	.75	.91	1.00
	6000	2830	183.2	53.7	14.81	.75	.91	1.00	173.9	51.0	15.98	.77	.94	1.00	164.5	48.2	17.22	.80	.96	1.00	155.3	45.5	18.48	.82	.99	1.00
	7200	3400	188.6	55.3	14.99	.80	.97	1.00	179.3	52.5	16.23	.83	.99	1.00	170.3	49.9	17.55	.85	1.00	1.00	161.3	47.3	18.89	.88	1.00	1.00
67°F (19°C)	4800	2265	187.6	55.0	14.96	.55	.68	.81	178.1	52.2	16.18	.56	.69	.83	168.1	49.3	17.43	.57	.71	.85	158.5	46.5	18.68	.58	.73	.88
	6000	2830	193.3	56.7	15.19	.58	.73	.88	183.2	53.7	16.43	.59	.75	.90	172.9	50.7	17.72	.60	.77	.93	162.7	47.7	18.98	.62	.80	.96
	7200	3400	197.5	57.9	15.35	.61	.78	.94	187.0	54.8	16.61	.62	.81	.97	176.5	51.7	17.93	.64	.83	.99	166.0	48.6	19.22	.66	.86	1.00
71°F (22°C)	4800	2265	199.7	58.5	15.44	.41	.53	.65	189.5	55.5	16.73	.42	.54	.67	179.2	52.5	18.08	.42	.55	.69	169.0	49.5	19.40	.42	.57	.71
	6000	2830	205.3	60.2	15.67	.42	.57	.71	194.5	57.0	16.99	.43	.58	.73	183.7	53.8	18.35	.43	.59	.75	172.9	50.7	19.70	.44	.61	.77
	7200	3400	209.0	61.3	15.82	.44	.60	.76	198.1	58.1	17.17	.44	.61	.78	186.9	54.8	18.55	.45	.63	.81	175.8	51.5	19.90	.46	.65	.84

## Cooling Ratings

### GCS16-240 - Two Compressors Operating

Entering Wet Bulb Temper- ature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																								
		65°F (18°C)						75°F (24°C)						85°F (29°C)						95°F (35°C)						
		Total Cooling Capacity		Comp. Motor kW	Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW	Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW	Sensible to Total Ratio (S/T)		Comp. Motor kW	Sensible to Total Ratio (S/T)								
		Dry Bulb			Dry Bulb		Dry Bulb			Dry Bulb		Dry Bulb			Dry Bulb				Dry Bulb							
		cfm	L/s	kBtu-h	kW	Input	75°F (24°C)	80°F (27°C)	85°F (29°C)	kBtu-h	kW	Input	75°F (24°C)	80°F (27°C)	85°F (29°C)	kBtu-h	kW	Input	75°F (24°C)	80°F (27°C)	85°F (29°C)					
63°F (17°C)	5760	2720	153.0	44.8	8.64	.69	.82	.94	148.6	43.6	9.64	.69	.83	.95	143.8	42.1	10.76	.70	.84	.97	138.6	40.6	12.04	.71	.85	.98
	7200	3400	158.8	46.5	8.82	.73	.89	1.00	154.0	45.1	9.80	.74	.90	1.00	149.0	43.7	10.92	.76	.92	1.00	143.8	42.1	12.22	.77	.93	1.00
	8640	4080	163.4	47.9	8.96	.78	.95	1.00	158.6	46.5	9.96	.80	.96	1.00	153.6	45.0	11.10	.81	.98	1.00	148.2	43.4	12.40	.83	.99	1.00
67°F (19°C)	5760	2720	162.0	47.5	8.92	.54	.66	.78	157.2	46.1	9.90	.55	.67	.79	152.0	44.5	11.04	.55	.68	.81	146.4	42.9	12.34	.56	.69	.82
	7200	3400	167.0	48.9	9.08	.57	.71	.85	161.8	47.4	10.08	.57	.72	.87	156.6	45.9	11.22	.58	.73	.88	150.8	44.2	12.50	.59	.75	.90
	8640	4080	170.6	50.0	9.22	.60	.76	.92	165.4	48.5	10.20	.61	.78	.94	159.8	46.8	11.36	.62	.79	.95	153.8	45.1	12.66	.62	.81	.97
71°F (22°C)	5760	2720	171.6	50.3	9.26	.41	.53	.64	166.6	48.8	10.26	.41	.53	.64	161.0	47.2	11.40	.42	.54	.65	155.2	45.5	12.70	.42	.54	.67
	7200	3400	176.4	51.7	9.44	.42	.56	.69	171.0	50.1	10.44	.42	.56	.70	165.4	48.5	11.58	.43	.57	.71	159.4	46.7	12.88	.43	.58	.73
	8640	4080	179.6	52.6	9.58	.43	.59	.74	174.0	51.0	10.58	.44	.60	.76	168.2	49.3	11.72	.44	.61	.77	162.0	47.5	13.02	.44	.62	.79

### GCS16-240 - All Compressors Operating

Entering Wet Bulb Temper- ature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																								
		85°F (29°C)						95°F (35°C)						105°F (41°C)						115°F (46°C)						
		Total Cooling Capacity		Comp. Motor kW	Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW	Sensible to Total Ratio (S/T)		Total Cooling Capacity		Comp. Motor kW	Sensible to Total Ratio (S/T)		Comp. Motor kW	Sensible to Total Ratio (S/T)								
		Dry Bulb			Dry Bulb		Dry Bulb			Dry Bulb		Dry Bulb			Dry Bulb				Dry Bulb							
		cfm	L/s	kBtu-h	kW	Input	75°F (24°C)	80°F (27°C)	85°F (29°C)	kBtu-h	kW	Input	75°F (24°C)	80°F (27°C)	85°F (29°C)	kBtu-h	kW	Input	75°F (24°C)	80°F (27°C)	85°F (29°C)					
63°F (17°C)	5760	2720	216.1	63.3	16.13	.70	.84	.97	208.4	61.1	18.04	.71	.86	.98	200.3	58.7	20.20	.72	.87	1.00	191.3	56.1	22.68	.74	.90	1.00
	7200	3400	224.0	65.6	16.37	.76	.92	1.00	216.2	63.4	18.31	.77	.93	1.00	207.5	60.8	20.49	.79	.95	1.00	198.8	58.3	22.98	.81	.97	1.00
	8640	4080	230.9	67.7	16.63	.81	.98	1.00	222.8	65.3	18.58	.83	.99	1.00	214.5	62.9	20.77	.85	1.00	1.00	205.8	60.3	23.29	.87	1.00	1.00
67°F (19°C)	5760	2720	228.5	67.0	16.54	.55	.68	.81	220.1	64.5	18.49	.56	.69	.82	211.3	61.9	20.66	.56	.70	.84	202.0	59.2	23.13	.57	.72	.86
	7200	3400	235.3	69.0	16.81	.58	.73	.89	226.6	66.4	18.72	.59	.75	.91	217.3	63.7	20.94	.60	.77	.93	207.5	60.8	23.42	.61	.78	.95
	8640	4080	240.1	70.4	17.01	.62	.79	.96	231.1	67.7	18.96	.63	.81	.97	221.8	65.0	21.12	.64	.83	.99	211.6	62.0	23.63	.65	.85	1.00
71°F (22°C)	5760	2720	242.0	70.9	17.08	.42	.54	.66	233.3	68.4	19.03	.42	.54	.67	224.2	65.7	21.25	.42	.55	.68	214.3	62.8	23.73	.42	.56	.69
	7200	3400	248.5	72.8	17.35	.43	.57	.71	239.5	70.2	19.30	.43	.58	.73	229.6	67.3	21.54	.43	.59	.74	219.4	64.3	24.02	.44	.60	.76
	8640	4080	252.7	74.1	17.56	.44	.61	.77	243.3	71.3	19.50	.44	.62	.79	233.2	68.3	21.72	.45	.63	.81	222.7	65.3	24.23	.45	.65	.83

## Blower Data - GCS16-180 Bold Data Indicates Field Furnished Drive

Blower table includes resistance for Base Unit Only with dry indoor coil & air filters in place. For all units add:

1 - Wet indoor coil air resistance of selected unit.

2 - Any field installed accessories air resistance (economizer, duct resistance, diffuser, etc.)

Then determine from blower table blower motor output.

See Page 11 for wet coil and optional accessory air resistance data.

Air Volume cfm (L/s)	Static Pressure External to Unit - Inches Water Gauge (Pa)																			
	.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)		2.00 (495)	
	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)		
4800 (2265)	<b>450</b>	<b>.90 (.67)</b>	<b>510</b>	<b>1.10 (.82)</b>	<b>575</b>	<b>1.35 (1.01)</b>	<b>630</b>	<b>1.55 (1.16)</b>	680	1.75 (1.31)	730	2.00 (1.49)	775	2.25 (1.68)	820	2.50 (1.87)	860	2.75 (2.05)	900	3.05 (2.28)
4900 (2310)	<b>455</b>	<b>.95 (.71)</b>	<b>515</b>	<b>1.15 (.86)</b>	<b>580</b>	<b>1.40 (1.04)</b>	<b>635</b>	<b>1.60 (1.19)</b>	685	1.85 (1.38)	735	2.10 (1.57)	780	2.35 (1.75)	820	2.55 (1.90)	865	2.85 (2.13)	900	3.10 (2.31)
5000 (2360)	<b>460</b>	<b>1.00 (.75)</b>	<b>520</b>	<b>1.20 (.90)</b>	<b>585</b>	<b>1.45 (1.08)</b>	<b>640</b>	<b>1.70 (1.27)</b>	690	1.90 (1.42)	735	2.15 (1.60)	780	2.40 (1.79)	825	2.65 (1.98)	865	2.90 (2.16)	905	3.20 (2.39)
5100 (2405)	<b>465</b>	<b>1.05 (.78)</b>	<b>530</b>	<b>1.30 (.97)</b>	<b>590</b>	<b>1.50 (1.12)</b>	645	1.75 (1.31)	695	2.00 (1.49)	740	2.20 (1.64)	785	2.45 (1.83)	830	2.75 (2.05)	870	3.00 (2.24)	910	3.30 (2.46)
5200 (2455)	<b>470</b>	<b>1.10 (.82)</b>	<b>535</b>	<b>1.35 (1.01)</b>	<b>595</b>	<b>1.55 (1.16)</b>	645	1.80 (1.34)	700	2.05 (1.53)	745	2.30 (1.72)	790	2.55 (1.90)	830	2.80 (2.09)	870	3.05 (2.28)	910	3.35 (2.50)
5300 (2500)	<b>475</b>	<b>1.15 (.86)</b>	<b>540</b>	<b>1.40 (1.04)</b>	<b>600</b>	<b>1.65 (1.23)</b>	650	1.85 (1.38)	700	2.10 (1.57)	750	2.40 (1.79)	795	2.65 (1.98)	835	2.90 (2.16)	875	3.15 (2.35)	915	3.45 (2.57)
5400 (2550)	<b>480</b>	<b>1.20 (.90)</b>	<b>545</b>	<b>1.45 (1.08)</b>	<b>605</b>	<b>1.70 (1.27)</b>	655	1.95 (1.45)	705	2.20 (1.64)	755	2.45 (1.83)	795	2.70 (2.01)	840	3.00 (2.24)	880	3.25 (2.42)	915	3.55 (2.65)
5500 (2595)	<b>490</b>	<b>1.30 (.97)</b>	<b>550</b>	<b>1.50 (1.12)</b>	<b>610</b>	<b>1.75 (1.31)</b>	660	2.00 (1.49)	710	2.25 (1.68)	755	2.50 (1.87)	800	2.80 (2.09)	840	3.05 (2.28)	880	3.35 (2.50)	920	3.65 (2.72)
5600 (2645)	<b>495</b>	<b>1.35 (1.01)</b>	<b>555</b>	<b>1.60 (1.19)</b>	<b>615</b>	<b>1.85 (1.38)</b>	665	2.10 (1.57)	715	2.35 (1.75)	760	2.60 (1.94)	805	2.90 (2.16)	845	3.15 (2.35)	885	3.45 (2.57)	925	3.75 (2.80)
5700 (2690)	<b>500</b>	<b>1.40 (1.04)</b>	<b>560</b>	<b>1.65 (1.23)</b>	<b>620</b>	<b>1.90 (1.42)</b>	670	2.15 (1.60)	720	2.45 (1.83)	765	2.70 (2.01)	810	3.00 (2.24)	850	3.25 (2.42)	890	3.55 (2.65)	925	3.80 (2.83)
5800 (2735)	<b>505</b>	<b>1.45 (1.08)</b>	<b>570</b>	<b>1.75 (1.31)</b>	<b>625</b>	<b>2.00 (1.49)</b>	675	2.25 (1.68)	725	2.50 (1.87)	770	2.80 (2.09)	810	3.05 (2.28)	850	3.30 (2.46)	890	3.60 (2.69)	930	3.90 (2.91)
5900 (2785)	<b>515</b>	<b>1.55 (1.16)</b>	<b>575</b>	<b>1.80 (1.34)</b>	<b>630</b>	<b>2.05 (1.53)</b>	680	2.30 (1.72)	725	2.60 (1.94)	775	2.90 (2.16)	815	3.15 (2.35)	855	3.40 (2.54)	895	3.70 (2.76)	935	4.05 (3.02)
6000 (2830)	<b>520</b>	<b>1.60 (1.19)</b>	<b>580</b>	<b>1.85 (1.38)</b>	<b>635</b>	<b>2.15 (1.60)</b>	685	2.40 (1.79)	730	2.65 (1.98)	775	2.95 (2.20)	820	3.25 (2.42)	860	3.55 (2.65)	900	3.85 (2.87)	935	4.10 (3.06)
6100 (2880)	<b>525</b>	<b>1.65 (1.23)</b>	<b>585</b>	<b>1.95 (1.45)</b>	<b>640</b>	<b>2.20 (1.64)</b>	690	2.50 (1.87)	735	2.75 (2.05)	780	3.05 (2.28)	825	3.35 (2.50)	865	3.65 (2.72)	900	3.90 (2.91)	940	4.25 (3.17)
6300 (2975)	<b>530</b>	<b>1.75 (1.31)</b>	<b>590</b>	<b>2.00 (1.49)</b>	645	2.30 (1.72)	695	2.60 (1.94)	740	2.85 (2.13)	785	3.15 (2.35)	830	3.45 (2.57)	870	3.75 (2.80)	905	4.00 (2.98)	945	4.35 (3.25)
6200 (2925)	<b>540</b>	<b>1.85 (1.38)</b>	<b>595</b>	<b>2.10 (1.57)</b>	650	2.40 (1.79)	700	2.65 (1.98)	745	2.95 (2.20)	790	3.25 (2.42)	830	3.50 (2.61)	870	3.80 (2.83)	910	4.15 (3.10)	945	4.45 (3.32)
6400 (3020)	<b>545</b>	<b>1.90 (1.42)</b>	<b>605</b>	<b>2.20 (1.64)</b>	655	2.45 (1.83)	705	2.75 (2.05)	750	3.05 (2.28)	795	3.35 (2.50)	835	3.65 (2.72)	875	3.95 (2.95)	915	4.25 (3.17)	950	4.55 (3.39)
6500 (2065)	<b>550</b>	<b>2.00 (1.49)</b>	<b>610</b>	<b>2.30 (1.72)</b>	660	2.55 (1.90)	710	2.85 (2.13)	755	3.15 (2.35)	800	3.45 (2.57)	840	3.75 (2.80)	880	4.05 (3.02)	915	4.35 (3.25)	955	4.70 (3.51)
6600 (3115)	<b>560</b>	<b>2.10 (1.57)</b>	<b>615</b>	<b>2.35 (1.75)</b>	665	2.65 (1.98)	715	2.95 (2.20)	760	3.25 (2.42)	805	3.55 (2.65)	845	3.85 (2.87)	885	4.20 (3.13)	920	4.45 (3.32)	960	4.80 (3.58)
6700 (3160)	<b>565</b>	<b>2.15 (1.60)</b>	<b>620</b>	<b>2.45 (1.83)</b>	670	2.75 (2.05)	720	3.05 (2.28)	765	3.35 (2.50)	810	3.65 (2.72)	850	4.00 (2.98)	890	4.30 (3.21)	925	4.60 (3.43)	960	4.90 (3.66)
6800 (3210)	<b>575</b>	<b>2.25 (1.68)</b>	<b>625</b>	<b>2.55 (1.90)</b>	680	2.85 (2.13)	725	3.15 (2.35)	770	3.45 (2.57)	815	3.80 (2.83)	855	4.10 (3.06)	890	4.40 (3.28)	930	4.75 (3.54)	965	5.05 (3.77)
6900 (3255)	<b>580</b>	<b>2.35 (1.75)</b>	<b>635</b>	<b>2.65 (1.98)</b>	685	2.95 (2.20)	730	3.25 (2.42)	775	3.55 (2.65)	815	3.85 (2.87)	855	4.20 (3.13)	895	4.50 (3.36)	935	4.85 (3.62)	<b>970</b>	<b>5.20 (3.88)</b>
7000 (3305)	<b>585</b>	<b>2.45 (1.83)</b>	<b>640</b>	<b>2.75 (2.05)</b>	690	3.05 (2.28)	735	3.35 (2.50)	780	3.70 (2.76)	820	4.00 (2.98)	860	4.30 (3.21)	900	4.65 (3.47)	935	4.95 (3.69)	<b>975</b>	<b>5.35 (3.99)</b>
7100 (3350)	<b>590</b>	<b>2.50 (1.87)</b>	645	2.85 (2.13)	695	3.15 (2.35)	740	3.45 (2.57)	785	3.80 (2.83)	825	4.10 (3.06)	865	4.45 (3.32)	905	4.75 (3.54)	940	5.10 (3.80)	<b>975</b>	<b>5.40 (4.03)</b>
7200 (3400)	<b>600</b>	<b>2.65 (1.98)</b>	650	2.95 (2.20)	700	3.25 (2.42)	745	3.60 (2.69)	790	3.90 (2.91)	830	4.20 (3.13)	870	4.55 (3.39)	910	4.90 (3.66)	945	5.25 (3.92)	<b>980</b>	<b>5.55 (4.14)</b>

## Blower Data - GCS16-240      Bold Data Indicates Field Furnished Drive

Blower table includes resistance for *Base Unit Only* with dry indoor coil & air filters in place. For all units add:

1 - Wet indoor coil air resistance of selected unit.

2 - Any field installed accessories air resistance (economizer, duct resistance, diffuser, etc.)

Then determine from blower table blower motor output.

See Page 11 for wet coil and optional accessory air resistance data.

Air Volume cfm (L/s)	Static Pressure External to Unit - Inches Water Gauge (Pa)																			
	.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)			
	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)		
6000 (2830)	<b>565</b> <b>1.65</b> ( <b>1.23</b> )	<b>620</b> <b>1.95</b> ( <b>1.45</b> )	<b>670</b> <b>2.20</b> ( <b>1.64</b> )	<b>720</b> <b>2.50</b> ( <b>1.87</b> )	765	2.75 (2.05)	810	3.05 (2.28)	850	3.35 (2.50)	890	3.65 (2.72)	930	3.95 (2.95)	965	4.25 (3.17)				
6100 (2880)	<b>575</b> <b>1.75</b> ( <b>1.31</b> )	<b>625</b> <b>2.00</b> ( <b>1.49</b> )	<b>675</b> <b>2.25</b> ( <b>1.68</b> )	<b>725</b> <b>2.55</b> ( <b>1.90</b> )	770	2.85 (2.13)	815	3.15 (2.35)	855	3.45 (2.57)	895	3.75 (2.80)	930	4.05 (3.02)	970	4.40 (3.28)				
6200 (2925)	<b>580</b> <b>1.80</b> ( <b>1.34</b> )	<b>635</b> <b>2.10</b> ( <b>1.57</b> )	<b>685</b> <b>2.40</b> ( <b>1.79</b> )	<b>730</b> <b>2.65</b> ( <b>1.98</b> )	775	2.95 (2.20)	820	3.25 (2.42)	860	3.55 (2.65)	900	3.85 (2.87)	935	4.15 (3.10)	975	4.50 (3.36)				
6300 (2975)	<b>590</b> <b>1.90</b> ( <b>1.42</b> )	<b>640</b> <b>2.20</b> ( <b>1.64</b> )	<b>690</b> <b>2.45</b> ( <b>1.83</b> )	<b>735</b> <b>2.75</b> ( <b>2.05</b> )	780	3.05 (2.28)	825	3.35 (2.50)	865	3.65 (2.72)	900	3.95 (2.95)	940	4.25 (3.17)	975	4.60 (3.43)				
6400 (3020)	<b>595</b> <b>2.00</b> ( <b>1.49</b> )	<b>650</b> <b>2.30</b> ( <b>1.72</b> )	<b>695</b> <b>2.55</b> ( <b>1.90</b> )	<b>740</b> <b>2.85</b> ( <b>2.13</b> )	785	3.15 (2.35)	830	3.45 (2.57)	870	3.75 (2.80)	905	4.05 (3.02)	945	4.40 (3.28)	980	4.70 (3.51)				
6500 (3065)	<b>605</b> <b>2.10</b> ( <b>1.57</b> )	<b>655</b> <b>2.35</b> ( <b>1.75</b> )	<b>700</b> <b>2.65</b> ( <b>1.98</b> )	<b>750</b> <b>2.95</b> ( <b>2.20</b> )	790	3.25 (2.42)	835	3.55 (2.65)	875	3.85 (2.87)	910	4.15 (3.10)	950	4.50 (3.36)	985	4.85 (3.62)				
6600 (3115)	<b>610</b> <b>2.15</b> ( <b>1.60</b> )	<b>660</b> <b>2.45</b> ( <b>1.83</b> )	<b>710</b> <b>2.75</b> ( <b>2.05</b> )	<b>755</b> <b>3.05</b> ( <b>2.28</b> )	795	3.35 (2.50)	840	3.65 (2.72)	880	4.00 (2.98)	915	4.30 (3.21)	955	4.65 (3.47)	990	4.95 (3.69)				
6700 (3160)	<b>620</b> <b>2.25</b> ( <b>1.68</b> )	<b>670</b> <b>2.55</b> ( <b>1.90</b> )	<b>715</b> <b>2.85</b> ( <b>2.13</b> )	<b>760</b> <b>3.15</b> ( <b>2.35</b> )	805	3.45 (2.57)	845	3.75 (2.80)	885	4.10 (3.06)	920	4.40 (3.28)	960	4.75 (3.54)	995	5.10 (3.80)				
6800 (3210)	<b>630</b> <b>2.35</b> ( <b>1.75</b> )	<b>675</b> <b>2.65</b> ( <b>1.98</b> )	<b>720</b> <b>2.95</b> ( <b>2.20</b> )	765	3.25 (2.42)	810	3.55 (2.65)	850	3.90 (2.91)	890	4.20 (3.13)	925	4.50 (3.36)	965	4.90 (3.66)	1000	5.25 (3.92)			
6900 (3255)	<b>635</b> <b>2.45</b> ( <b>1.83</b> )	<b>685</b> <b>2.75</b> ( <b>2.05</b> )	<b>730</b> <b>3.05</b> ( <b>2.28</b> )	770	3.35 (2.50)	815	3.70 (2.76)	855	4.00 (2.98)	895	4.35 (3.25)	930	4.65 (3.47)	965	4.95 (3.69)	1005	5.35 (3.99)			
7000 (3305)	<b>645</b> <b>2.55</b> ( <b>1.90</b> )	<b>690</b> <b>2.85</b> ( <b>2.13</b> )	<b>735</b> <b>3.15</b> ( <b>2.35</b> )	780	3.50 (2.61)	820	3.80 (2.83)	860	4.10 (3.06)	900	4.45 (3.32)	935	4.75 (3.54)	970	5.10 (3.80)	1005	5.45 (4.07)			
7100 (3350)	<b>650</b> <b>2.65</b> ( <b>1.98</b> )	<b>700</b> <b>2.95</b> ( <b>2.20</b> )	<b>740</b> <b>3.25</b> ( <b>2.42</b> )	785	3.60 (2.69)	825	3.90 (2.91)	865	4.25 (3.17)	905	4.60 (3.43)	940	4.90 (3.66)	975	5.25 (3.92)	1010	5.60 (4.18)			
7200 (3400)	<b>660</b> <b>2.75</b> ( <b>2.05</b> )	<b>705</b> <b>3.05</b> ( <b>2.28</b> )	<b>750</b> <b>3.40</b> ( <b>2.54</b> )	790	3.70 (2.76)	830	4.00 (2.98)	870	4.35 (3.25)	910	4.70 (3.51)	945	5.05 (3.77)	980	5.35 (3.99)	1015	5.75 (4.29)			
7300 (3445)	<b>665</b> <b>2.85</b> ( <b>2.13</b> )	<b>710</b> <b>3.15</b> ( <b>2.35</b> )	<b>755</b> <b>3.50</b> ( <b>2.61</b> )	800	3.85 (2.87)	840	4.15 (3.10)	875	4.45 (3.32)	915	4.85 (3.62)	950	5.15 (3.84)	985	5.50 (4.10)	1020	5.90 (4.40)			
7400 (3490)	<b>675</b> <b>3.00</b> ( <b>2.24</b> )	<b>720</b> <b>3.30</b> ( <b>2.46</b> )	765	3.65 (2.72)	805	3.95 (2.95)	845	4.30 (3.21)	885	4.65 (3.47)	920	4.95 (3.69)	955	5.30 (3.95)	990	5.65 (4.21)	1025	6.00 (4.48)		

Continued on Pg. 10

## Blower Data - GCS16-240

*Bold Data Indicates Field Furnished Drive*

Blower table includes resistance for **Base Unit Only** with dry indoor coil & air filters in place. For all units add:

1 - **Wet indoor coil air resistance of selected unit.**

2 - **Any field installed accessories air resistance (economizer, duct resistance, diffuser, etc.)**

Then determine from blower table blower motor output.

See Page 11 for wet coil and optional accessory air resistance data.

Air Volu- me cfm (L/s)	Static Pressure External to Unit - Inches Water Gauge (Pa)																			
	.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)		2.00 (495)	
	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)
7500 (3540)	<b>680</b> <b>3.05</b> <b>(2.28)</b>	<b>725</b> <b>3.40</b> <b>(2.54)</b>	770	3.75 (2.80)	810	4.05 (3.02)	850	4.40 (3.28)	890	4.75 (3.54)	925	5.10 (3.80)	960	5.45 (4.07)	995	5.80 (4.33)	1030	6.15 (4.59)		
7600 (3585)	<b>690</b> <b>3.20</b> <b>(2.39)</b>	<b>735</b> <b>3.55</b> <b>(2.65)</b>	775	3.85 (2.87)	820	4.20 (3.13)	855	4.50 (3.36)	895	4.90 (3.66)	930	5.20 (3.88)	965	5.55 (4.14)	1000	5.95 (4.44)	1035	6.35 (4.74)		
7700 (3635)	<b>700</b> <b>3.35</b> <b>(2.50)</b>	<b>740</b> <b>3.65</b> <b>(2.72)</b>	785	4.00 (2.98)	825	4.35 (3.25)	865	4.70 (3.51)	900	5.00 (3.73)	935	5.35 (3.99)	970	5.70 (4.25)	1005	6.10 (4.55)	1040	6.50 (4.85)		
7800 (3680)	<b>705</b> <b>3.45</b> <b>(2.57)</b>	<b>750</b> <b>3.80</b> <b>(2.83)</b>	790	4.10 (3.06)	830	4.45 (3.32)	870	4.80 (3.58)	905	5.15 (3.84)	945	5.55 (4.14)	980	5.90 (4.40)	1010	6.25 (4.66)	1045	6.65 (4.96)		
7900 (3730)	<b>715</b> <b>3.60</b> <b>(2.69)</b>	<b>755</b> <b>3.90</b> <b>(2.91)</b>	800	4.25 (3.17)	835	4.60 (3.43)	875	4.95 (3.69)	910	5.30 (3.95)	950	5.70 (4.25)	985	6.05 (4.51)	1015	6.40 (4.77)	1050	6.80 (5.07)		
8000 (3775)	<b>720</b> <b>3.70</b> <b>(2.76)</b>	765	4.05 (3.02)	805	4.40 (3.28)	845	4.75 (3.54)	880	5.10 (3.80)	920	5.45 (4.07)	955	5.85 (4.36)	990	6.20 (4.63)	1020	6.55 (4.89)	1055	6.95 (5.18)	
8100 (3820)	<b>730</b> <b>3.85</b> <b>(2.87)</b>	770	4.15 (3.10)	810	4.50 (3.36)	850	4.90 (3.66)	890	5.25 (3.92)	925	5.60 (4.18)	960	6.00 (4.48)	995	6.35 (4.74)	1030	6.75 (5.04)	1060	7.10 (5.30)	
8200 (3870)	<b>740</b> <b>4.00</b> <b>(2.98)</b>	780	4.30 (3.21)	820	4.70 (3.51)	855	5.00 (3.73)	895	5.40 (4.03)	930	5.75 (4.29)	965	6.15 (4.59)	1000	6.50 (4.85)	1035	6.95 (5.18)	1065	7.30 (5.45)	
8300 (3915)	<b>745</b> <b>4.10</b> <b>(3.06)</b>	785	4.45 (3.32)	825	4.80 (3.58)	865	5.20 (3.88)	900	5.55 (4.14)	935	5.90 (4.40)	970	6.30 (4.70)	1005	6.70 (5.00)	1040	7.10 (5.30)	1070	7.45 (5.56)	
8400 (3965)	<b>755</b> <b>4.25</b> <b>(3.17)</b>	795	4.60 (3.43)	835	5.00 (3.73)	870	5.30 (3.95)	910	5.75 (4.29)	945	6.10 (4.55)	980	6.50 (4.85)	1010	6.85 (5.11)	1045	7.25 (5.41)	1075	7.65 (5.71)	
8500 (4010)	<b>760</b> <b>4.40</b> <b>(3.28)</b>	880	4.75 (3.54)	840	5.10 (3.80)	880	5.50 (4.10)	915	5.90 (4.40)	950	6.25 (4.66)	985	6.65 (4.96)	1015	7.00 (5.22)	1050	7.45 (5.41)	1080	7.80 (5.82)	
8600 (4060)	<b>770</b> <b>4.55</b> <b>(3.39)</b>	810	4.90 (3.66)	850	5.30 (3.95)	885	5.65 (4.21)	920	6.00 (4.48)	955	6.40 (4.77)	990	6.80 (5.07)	1025	7.25 (5.41)	1055	7.60 (5.67)	1085	8.00 (5.97)	
8700 (4105)	<b>780</b> <b>4.70</b> <b>(3.51)</b>	815	5.05 (3.77)	855	5.45 (4.07)	890	5.80 (4.33)	925	6.15 (4.59)	960	6.55 (4.89)	995	6.95 (5.18)	1030	7.40 (5.52)	1060	7.80 (5.82)	1090	8.15 (6.08)	
8800 (4155)	<b>785</b> <b>4.85</b> <b>(3.62)</b>	825	5.20 (3.88)	860	5.60 (4.18)	900	6.00 (4.48)	935	6.40 (4.77)	970	6.80 (5.07)	1000	7.15 (5.33)	1035	7.55 (5.63)	1065	7.95 (5.93)	1095	8.35 (6.23)	
8900 (4200)	<b>795</b> <b>5.00</b> <b>(3.73)</b>	830	5.35 (3.99)	870	5.75 (4.29)	905	6.15 (4.59)	940	6.55 (4.89)	975	6.95 (5.18)	1010	7.35 (5.48)	1040	7.75 (5.78)	1070	8.15 (6.08)	1105	8.60 (6.42)	
9000 (4245)	<b>800</b> <b>5.15</b> <b>(3.84)</b>	840	5.55 (4.14)	875	5.90 (4.40)	910	6.30 (4.70)	950	6.75 (5.04)	980	7.10 (5.30)	1015	7.55 (5.63)	1045	7.90 (5.89)	1080	8.40 (6.27)	<b>1110</b> <b>8.80</b> <b>(6.56)</b>		

## Accessory Air Resistance

Unit Model No.	Air Volume		Total Resistance - inches water gauge (Pa)				
			Wet Evaporator Coil	REMD16M Down-Flow Economizer	RTD11 Step-Down Diffuser		
	cfm	L/s			2 Ends Open	1 Side 2 Ends Open	All Ends & Sides Open
GCS16-180	4800	2265	.14 (35)	.03 (7)	.46 (114)	.40 (99)	.36 (90)
	5000	2360	.14 (35)	.03 (7)	.51 (127)	.44 (109)	.39 (97)
	5200	2455	.15 (37)	.03 (7)	.56 (139)	.48 (119)	.42 (104)
	5400	2550	.16 (40)	.04 (10)	.61 (152)	.52 (129)	.45 (112)
	5600	2645	.17 (42)	.04 (10)	.66 (164)	.56 (139)	.48 (119)
	5800	2735	.18 (45)	.05 (12)	.71 (177)	.59 (147)	.51 (127)
	6000	2830	.19 (47)	.05 (12)	.76 (189)	.63 (157)	.55 (137)
	6200	2925	.20 (50)	.05 (12)	.80 (199)	.68 (169)	.59 (147)
	6400	3020	.21 (52)	.06 (15)	.86 (214)	.72 (179)	.63 (157)
	6600	3115	.22 (55)	.06 (15)	.92 (229)	.77 (191)	.67 (167)
	6800	3210	.23 (57)	.07 (17)	.99 (246)	.83 (206)	.72 (174)
	7000	3305	.24 (60)	.07 (17)	1.03 (256)	.87 (216)	.76 (189)
	7200	3400	.25 (62)	.08 (20)	1.09 (271)	.92 (229)	.80 (199)
GCS16-240	6000	2830	.24 (60)	.05 (12)	.36 (90)	.31 (77)	.27 (67)
	6500	3065	.28 (70)	.06 (15)	.42 (104)	.36 (90)	.31 (77)
	7000	3305	.31 (77)	.07 (17)	.49 (122)	.41 (102)	.36 (90)
	7500	3540	.34 (85)	.09 (22)	.51 (127)	.46 (114)	.41 (102)
	8000	3775	.38 (94)	.10 (25)	.59 (147)	.49 (122)	.43 (107)
	8500	4010	.42 (104)	.11 (27)	.69 (172)	.58 (144)	.50 (124)
	9000	4245	.46 (114)	.13 (32)	.79 (196)	.67 (167)	.58 (144)

## PED16-18/24 Power Exhaust Fans Performance

Model No.	Air Volume		Return air System Static Pressure	
	cfm	L/s	In. w.g.	Pa
PED16-18/24	6000	2830	.00	0
	5700	2690	.05	12
	5300	2500	.10	25
	5000	2360	.15	37
	4700	2210	.20	50
	4200	1980	.25	62
	3600	1700	.30	75

## Ceiling Diffuser Air Throw Data

Model No.	Air Volume		Effective Throw Range			
			RTD11 Step-Down		FD11 Flush	
	cfm	L/s	ft.	m	ft.	m
GCS16-180	5600	2645	39 - 49	12 - 15	28 - 37	9 - 11
	5800	2740	42 - 51	13 - 16	29 - 38	9 - 12
	6000	2830	44 - 54	13 - 17	40 - 50	12 - 15
	6200	2925	45 - 55	14 - 17	42 - 51	13 - 16
	6400	3020	46 - 55	14 - 17	43 - 52	13 - 16
	6600	3115	47 - 56	14 - 17	45 - 56	14 - 17
GCS16-240	7200	3400	33 - 38	10 - 12	26 - 35	8 - 11
	7400	3490	35 - 40	11 - 12	28 - 37	9 - 11
	7600	3585	36 - 41	11 - 13	29 - 38	9 - 12
	7800	3680	38 - 43	11 - 13	40 - 50	12 - 15
	8000	3775	39 - 44	12 - 13	42 - 51	13 - 16
	8200	3870	41 - 46	12 - 14	43 - 52	13 - 16
	8400	3965	43 - 49	13 - 15	44 - 54	13 - 17
	8600	4060	44 - 50	13 - 15	46 - 57	14 - 17
	8800	4155	47 - 55	14 - 17	48 - 59	15 - 18

<sup>1</sup>Throw is the horizontal or vertical distance an air stream travels on leaving the outlet or diffuser before the maximum velocity is reduced to 50 ft. (15 m) per minute. Four sides open.

# Guide Specifications

**General** - Furnish and install single package combination air to air DX mechanical cooling system and gas fired heating system, complete with automatic controls. The single package unit shall be a standard product of a firm regularly engaged in the manufacture of heating-cooling equipment. The manufacturer shall have parts and service available throughout the U.S. and Canada.

**Air Distribution** - Equipment shall be capable of bottom (downflow) or side (horizontal) handling of conditioned air.

**Approvals** - Units shall be certified by CSA International (formerly AGA/CGA) as combination heating/cooling unit for outdoor installation. All electrical components shall have U.L. and C.S.A. listing. All wiring shall be in compliance with NEC and CEC. Shall be rated and certified in accordance with the ULE Certification Program, which is based on ARI Standard 340/360-2000.

**Equipment Warranty** - Heat exchangers shall have a limited warranty for a full ten years. Compressors have a limited warranty for a full five years. All other components have a limited warranty for one year. Refer to the Equipment Limited Warranty certificate included with the unit for details.

**Cooling System** - The coils shall be nonferrous construction with aluminum fins mechanically bonded to durable copper tubes. Coils shall be pressure leak tested. Condenser coil shall be formed coil construction.

Compressor shall be resiliently mounted and have overload protection. The refrigeration system shall have suction and liquid line service gauge ports, driers, freezestats and full refrigerant charge. Control option available shall consist of low ambient controls.

**Heating System** - Tubular heat exchanger and inshot type gas burners shall be constructed of aluminized steel. Controls shall consist of direct spark ignition, electronic flame sensor controls, flame rollout switch, limit controls and automatic redundant dual gas valve with staging control and centrifugal switch on induced draft blower. Unit shall be available for use with LPG/Propane as an optional kit. Complete service access shall be provided for controls and wiring. Shall be CSA International design certified for outdoor installation.

**Cabinet** - Shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal. Cabinet panels where conditioned air is handled shall be fully insulated to prevent sweating and minimize sound. Openings shall be provided for power connection entry. Bottom power entry shall be furnished. Shall have peep hole with cover for flame viewing of burners. Evaporator coil condensate drain extended outside cabinet shall be provided. Lifting holes in full perimeter base rails shall be furnished.

**Service Access** - Large removeable panels shall allow complete service access to compressor/heating/controls, blower and air filter/economizer compartments.

**Supply Air Blowers** - Centrifugal supply air blower shall have permanently lubricated ball bearings and adjustable belt drive. Motor mount base shall permit ease of motor changeover and belt tension adjustment. Blower wheel shall be statically and dynamically balanced. Supply air blower motor shall have ball bearings.

**Condenser Fans** - Direct drive propeller type condenser fans shall discharge vertically. Fan motor shall have ball bearings and be permanently lubricated and inherently protected. Fans shall have a safety guard.

**Air Filters** - Disposable 2 inch (51 mm) thick pleated filters shall be furnished.

## Optional Accessories

**Roof Mounting Frame** - Furnish and install a steel roof mounting frame for bottom discharge and return air duct connection. It shall mate to the bottom perimeter of the equipment. When flashed into the roof it shall make a unit mounting curb and provide weatherproof duct connection and entry into the conditioned area. Flashing shall be the responsibility of the roofing contractor. Frame shall be approved by U.S. National Roofing Contractors Association.

**Economizer Damper Section** - Furnish and install complete with recirculated air dampers, outside air dampers, damper actuator and controls. Low leakage dampers shall ride in nylon bearings. The economizer section shall provide for the introduction of 100% outdoor air for minimum ventilation and free cooling. Integrated economizer cycle shall allow compressors to cycle for dehumidification and additional cooling, as needed, with 100% outdoor air intake. Damper actuator shall be 24 volt, fully modulating spring return. Controls shall include fixed 55°F (13°C) mixed air controller, damper actuator, adjustable minimum position switch and solid-state adjustable outdoor air enthalpy control. Damper hood (required and ordered separately) with filters shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal. Gravity exhaust dampers shall be required and ordered separately for down-flow air applications and optional for horizontal applications.

**Gravity Exhaust Dampers** - Pressure operated dampers shall be required for field installation on economizer in down-flow air applications. Dampers shall be available as an option for field installation in return air duct for horizontal air applications. Neoprene coated fiberglass dampers shall prevent blow-back and outdoor air infiltration during off cycle.

**Economizer Power Exhaust Fans** - Shall be available for all models with economizer (down-flow applications only). Direct drive propeller type fans shall exhaust air through optional gravity exhaust dampers (required). Motor shall be overload protected. Fans shall be field installed between economizer and gravity exhaust dampers.

**Outdoor Air Damper Section** - Outdoor dampers shall be available to provide outdoor air requirements of up to 25%. Shall be available for manual or automatic (with optional motorized damper kit) operation. Hood with filters shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal. Damper/hood assembly shall be field installed external to the unit in down-flow applications. Optional panel kit that replaces unit panel shall be required for damper/hood installation in down-flow applications. Damper/hood assembly shall be field installed in return air duct in horizontal applications.

**Horizontal Supply & Return Air Kit** - Optional kit shall provide necessary cabinet parts to field convert unit for side (horizontal) supply and return air duct connections.

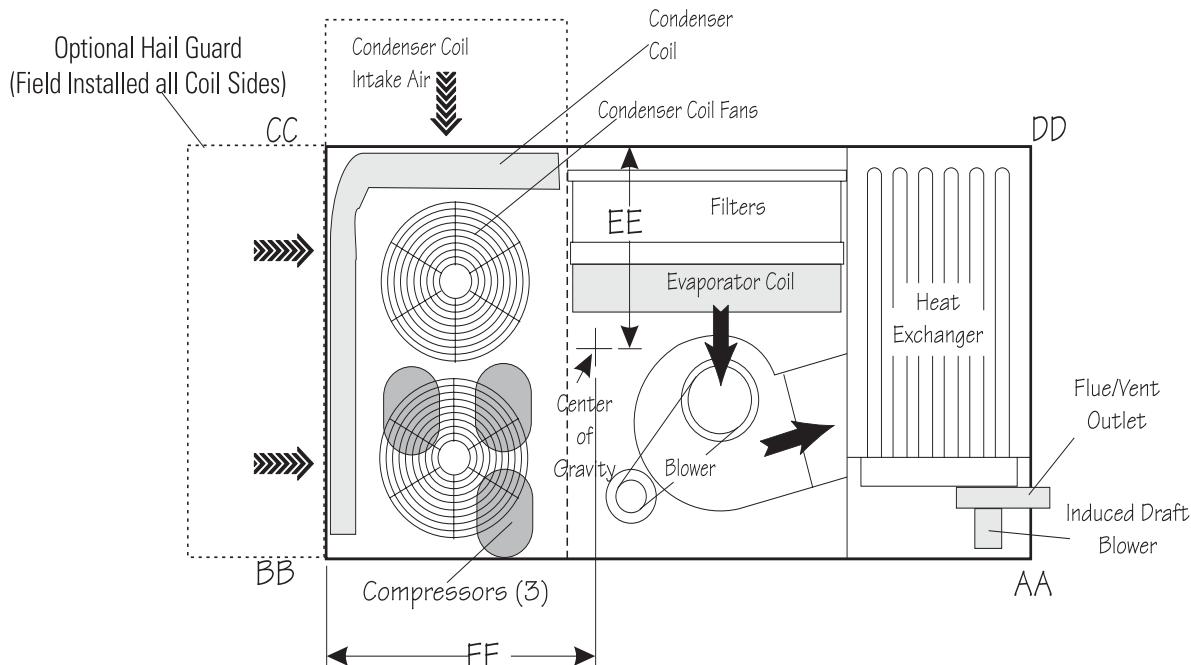
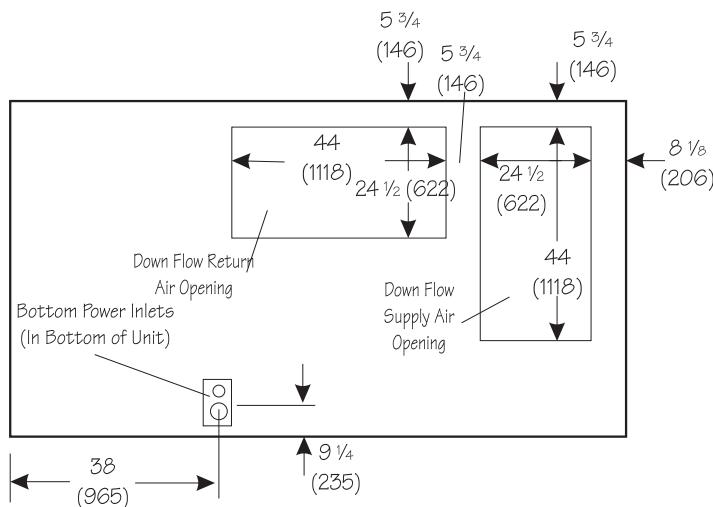
**Ceiling Diffusers** - Furnish and install a (flush or stepdown) optional combination ceiling supply and return air diffuser. Supply and return transitions shall be available, for field installation in the roof mounting frame, to provide duct connection to the diffuser.

**Basic Unit Dimensions - Inches (mm)****Corner Weights**

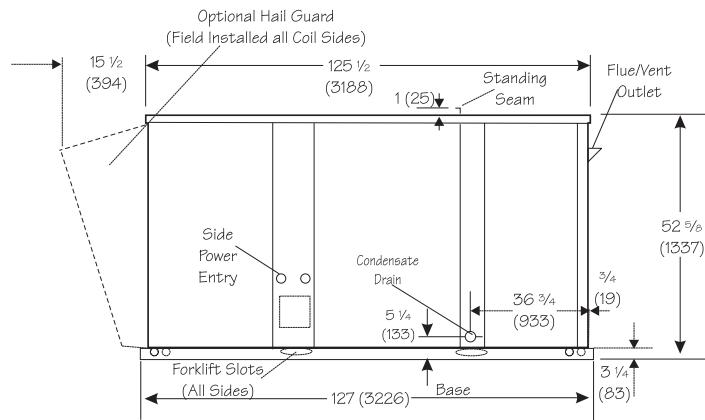
Model No.	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
GCS16-180	413	187	474	215	430	195	383	174
GCS16-240	434	197	522	237	468	212	401	182

**Center of Gravity**

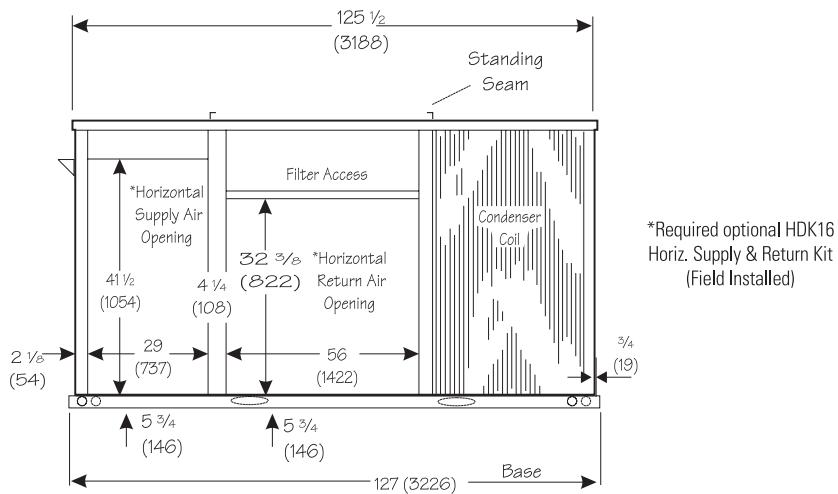
Model No.	EE		FF	
	In.	mm	in.	mm
GCS16-180	41 3/8	1051	58 1/4	1480
GCS16-240	41 7/8	1064	56 1/2	1435

**Top View****Top View Base Section**

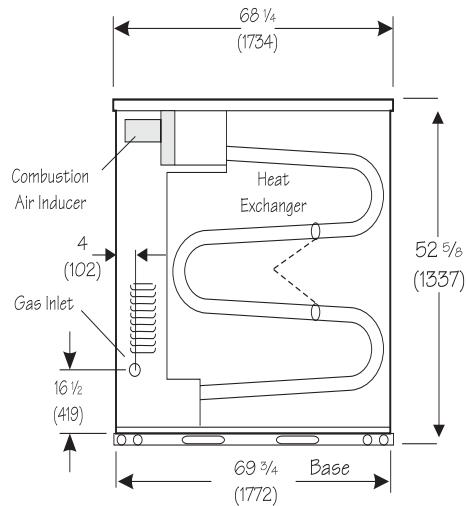
## Basic Unit Dimensions - Inches (mm)



**Front View**



**Back View  
w/Horiz. Supply & Return Opening**



**Heat Section End View**

## Accessory Dimensions - inches (mm)

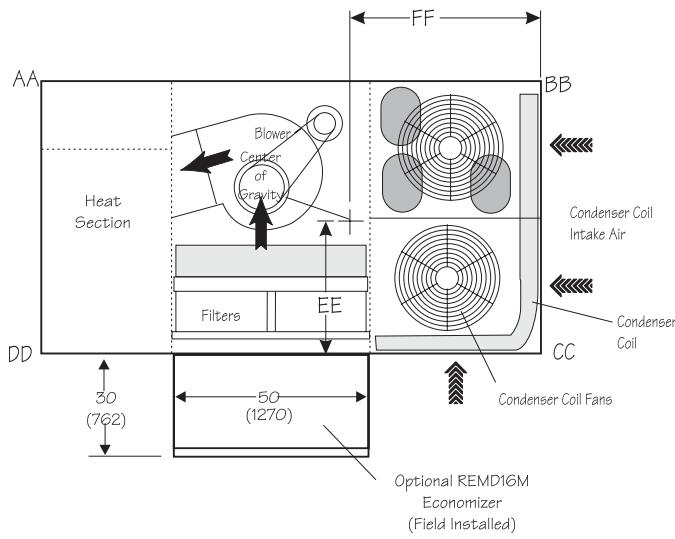
**Basic Unit with REMD16M Economizer & RMF16 Roof Mounting Frame (Down-Flow Applications)**

### Corner Weights

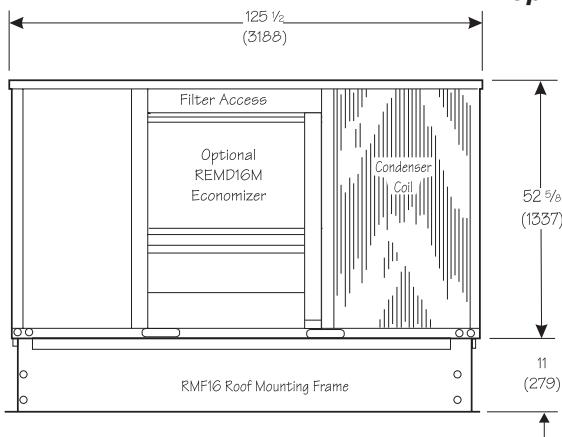
Model No.	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
GCS16-180	455	206	517	235	512	232	451	205
GCS16-240	474	215	563	255	554	251	469	213

### Center of Gravity

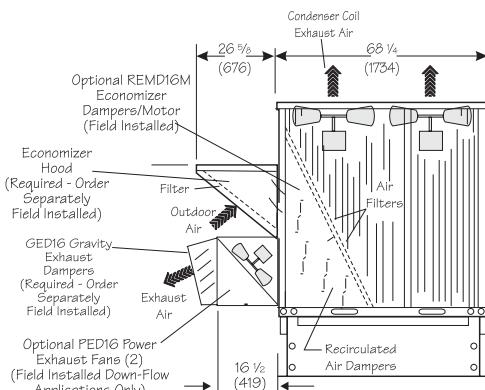
Model No.	EE		FF	
	In.	mm	in.	mm
GCS16-180	35 3/8	899	58 1/4	1480
GCS16-240	35 7/8	911	56 1/2	1435



**Top View**

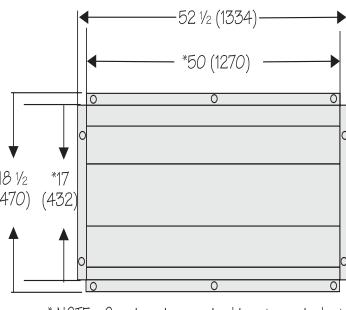


**Back View**

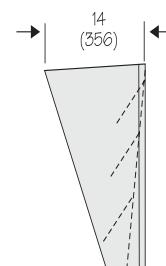


**Condenser Section End View**

### GED16 Gravity Exhaust Dampers



\* NOTE - Opening size required in return air duct for horizontal applications.



## Accessory Dimensions - inches (mm)

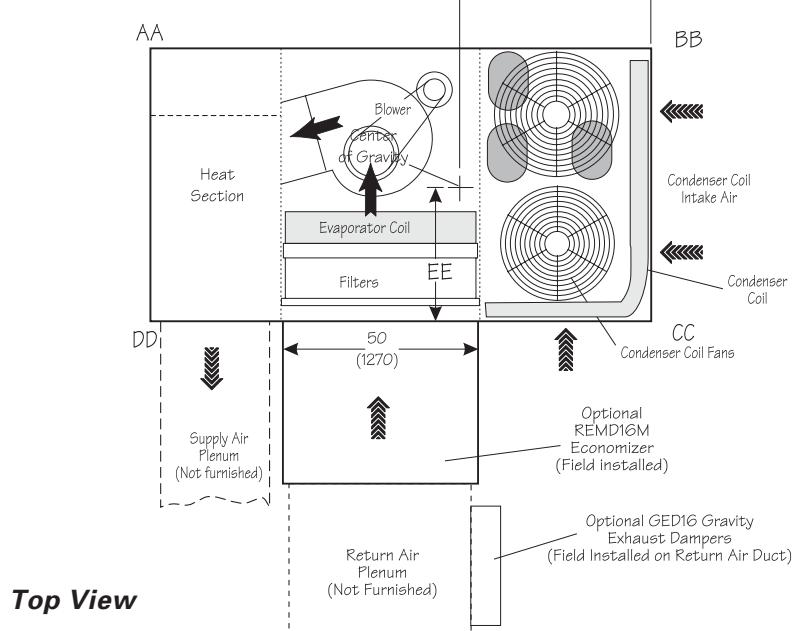
**Basic Unit with REMD16M Economizer (Horizontal Application)**

### Corner Weights

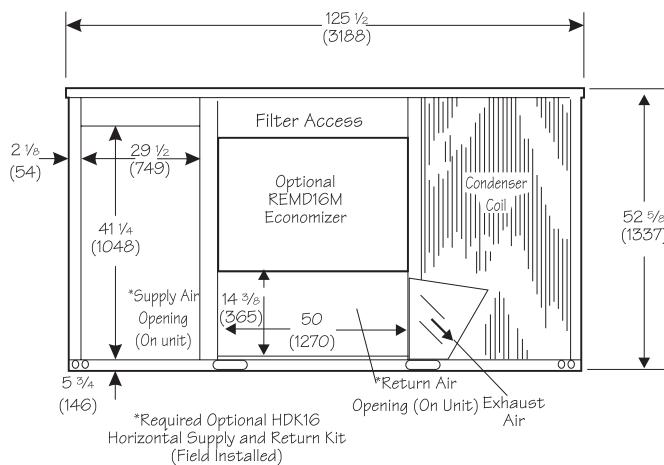
Model No.	AA		BB		CC		DD	
	Lbs.	kg	Lbs.	kg	Lbs.	kg	Lbs.	kg
GCS16-180	449	204	511	232	496	225	436	198
GCS16-240	468	212	559	254	533	242	453	205

### Center of Gravity

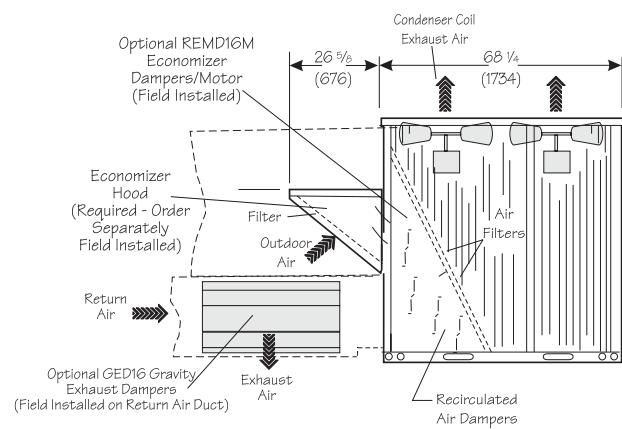
Model No.	EE		FF	
	in.	mm	in.	mm
GCS16-180	37 3/8	949	58 1/4	1480
GCS16-240	37 7/8	962	56 1/2	1435



**Top View**



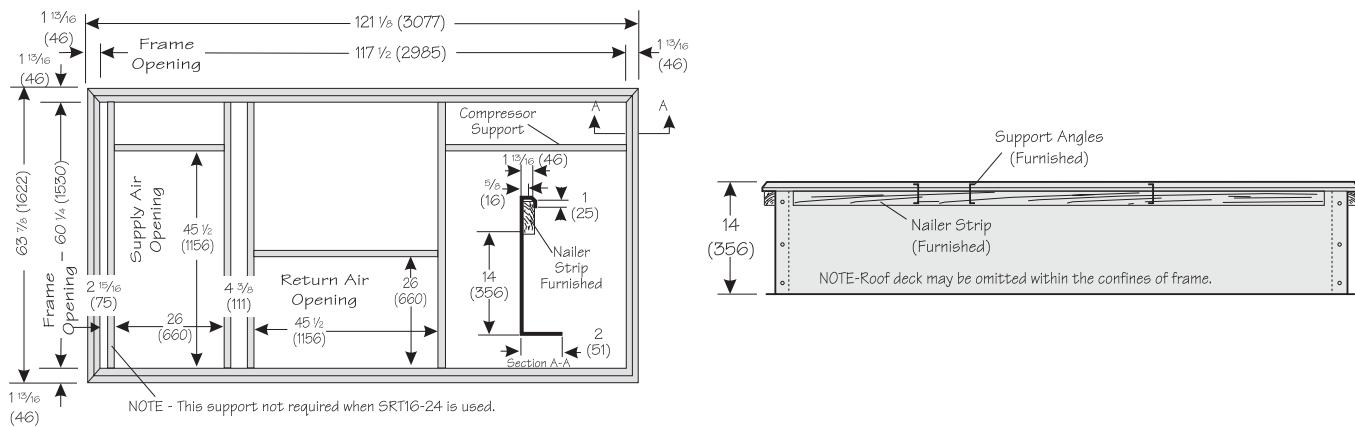
**Back View with Horz. Supply & Return Air Openings**



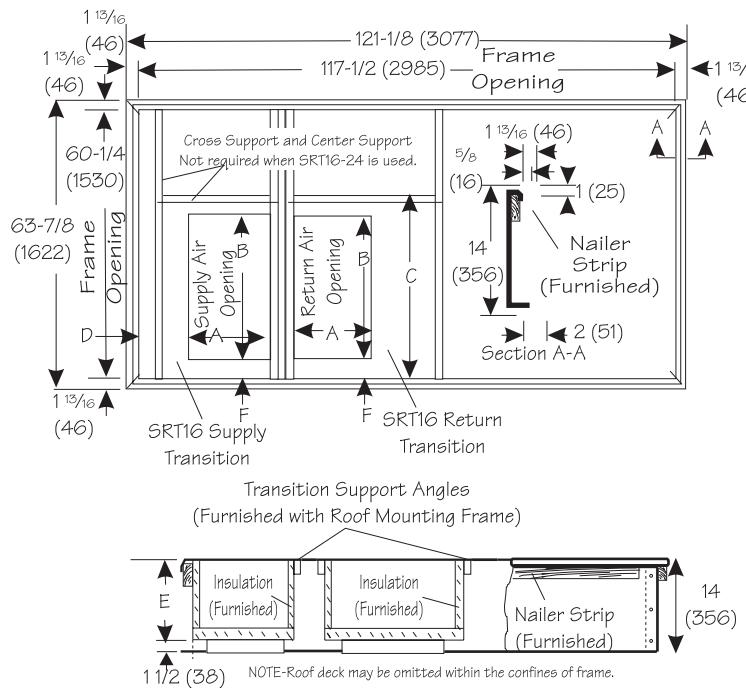
**Condenser Section End View**

## Accessory Dimensions - inches (mm)

### RMF16-18/24 Series Roof Mounting Frame with Double Duct Opening



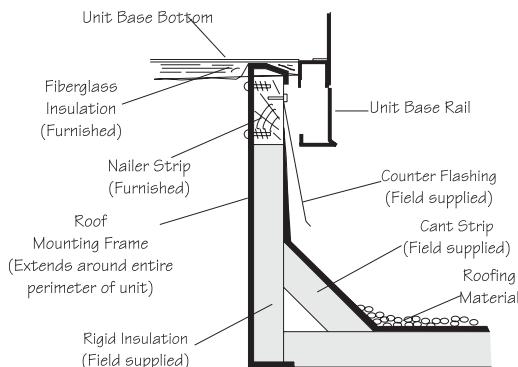
### RMF16-18/24 Roof Mounting Frame with SRT16-18 and SRT16-24 Supply and Return Air Transitions for FD11 & RTD11 Ceiling Diffusers



Model No.	A		B		C		D		E		F	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
RMF16-18/24 with SRT16-18	18	457	36	914	45	1143	7 1/2	191	8	203	4 1/2	114
RMF16-18/24 with SRT16-24	24	610	48	1219	50	1270	4 1/2	114	12	305	1	25

## Accessory Dimensions - inches (mm)

### Typical Flashing Detail for RMF16 Roof Mounting Frame



### Roof Mounting Frame Specifications

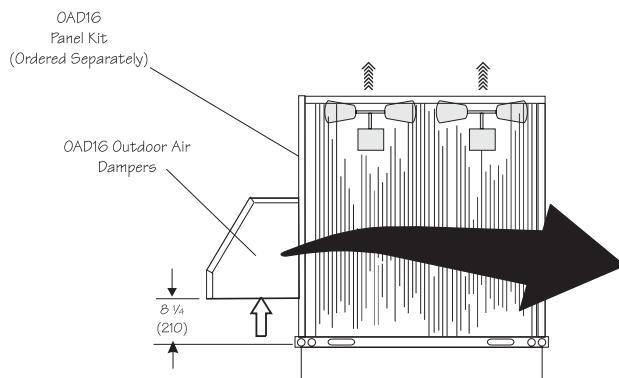
**Roof Mounting frame is rigid enough to be spanned over its entire length or cantilevered if supported on both sides of center of gravity.**

Roof Mounting Frames	RMF16
*Moment of inertia ( $I$ ) ( $\text{in}^4$ ) ( $\text{cm}^4$ )	42 (1748)
*Section modulus $I/C$ ( $\text{in.}^3$ ) ( $\text{cm}^3$ )	5.8 (95)
Maximum weight (lb./ft.) (kg/m) of length	5.5 (8.2)
Design strength (psi) (kPa)	20,000 (137,900)

\*Includes both sides of frame.

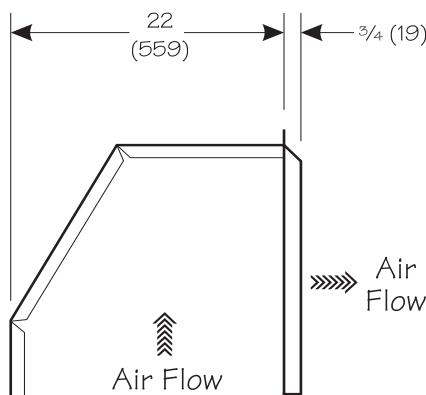
### GCS16 Unit with OAD16 Outdoor Air Damper Section Downflow Supply and Return Air

**Note- For Horizontal (Side) Supply and Return Air, OAD16 Field Installs on Return Air Duct Panel Kit not required for horizontal applications**

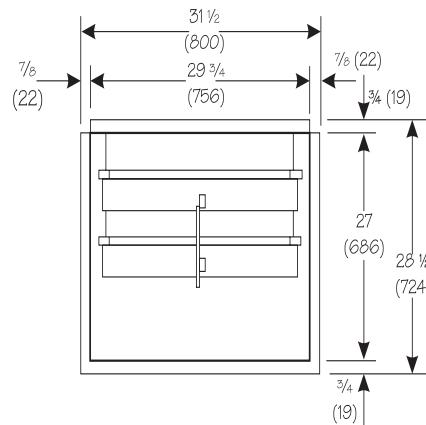


End View

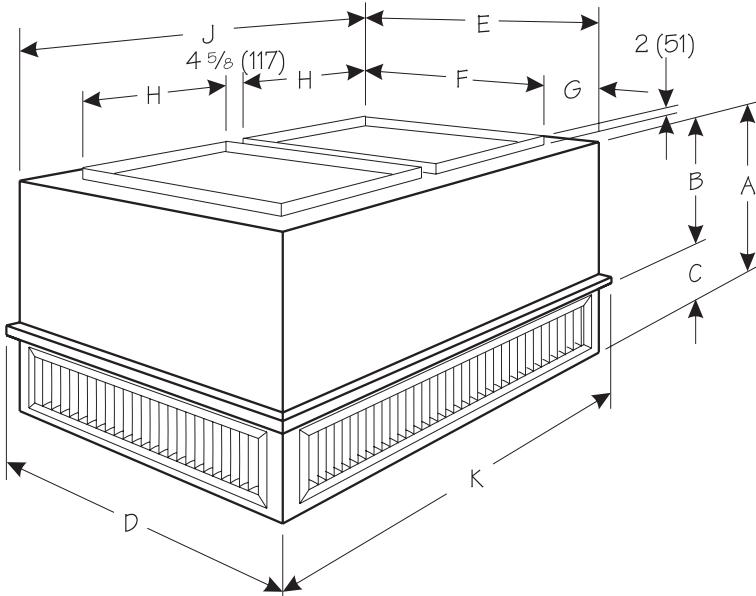
### OAD16 Outdoor Air Damper Section



Side View

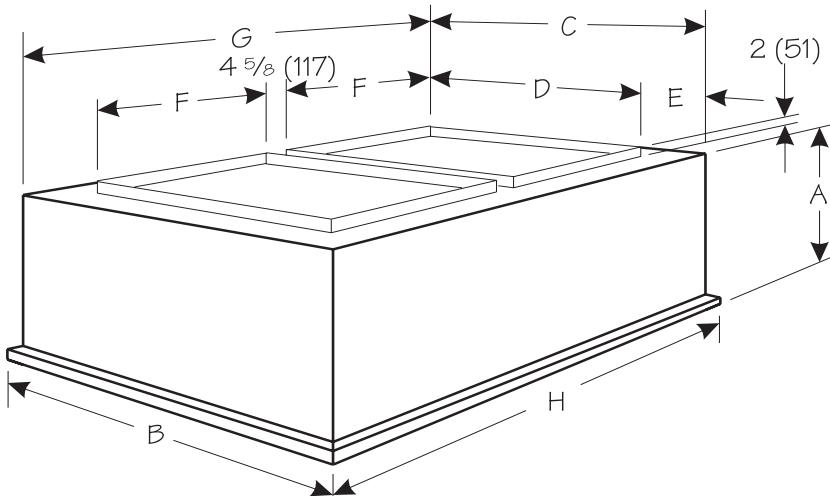


Back View

**Accessory Dimensions - inches (mm)****Combination Ceiling Supply and Return Air Diffusers**  
**Step-Down Ceiling Diffuser**

Model No.	A		B		C		D		E	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
RTD11-185	34	864	23 7/8	606	10 1/8	257	47 5/8	1210	45 5/8	1159
RTD11-275	40	1016	28 7/8	225	11 1/8	283	59 5/8	1514	57 7/8	1470

Model No.	F		G		H		J		K	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
RTD11-185	36	914	4 13/16	122	18	457	45 5/8	1159	47 5/8	1210
RTD11-275	48	1219	4 13/16	122	24	610	57 5/8	1464	59 5/8	1521

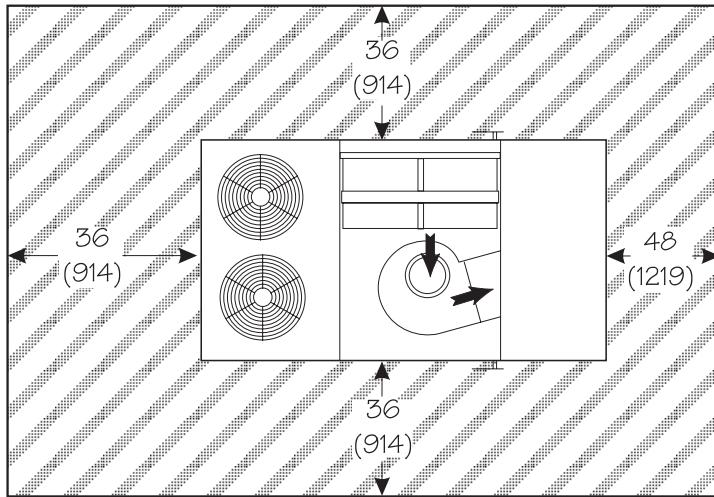
**Flush Ceiling Diffuser**

Model No.	A		B		C		D	
	in.	mm	in.	mm	in.	mm	in.	mm
FD11-185	30 1/8	613	47 5/8	1210	45 5/8	1159	36	914
FD11-275	36 1/8	918	59 5/8	1514	57 5/8	1464	48	1219

Model No.	E		F		G		H	
	in.	mm	in.	mm	in.	mm	in.	mm
FD11-185	4 13/16	122	18	457	45 5/8	1159	47 5/8	1210
FD11-275	4 13/16	122	24	610	57 5/8	1464	59 5/8	1521

## ***Installation Clearances - inches (mm)***

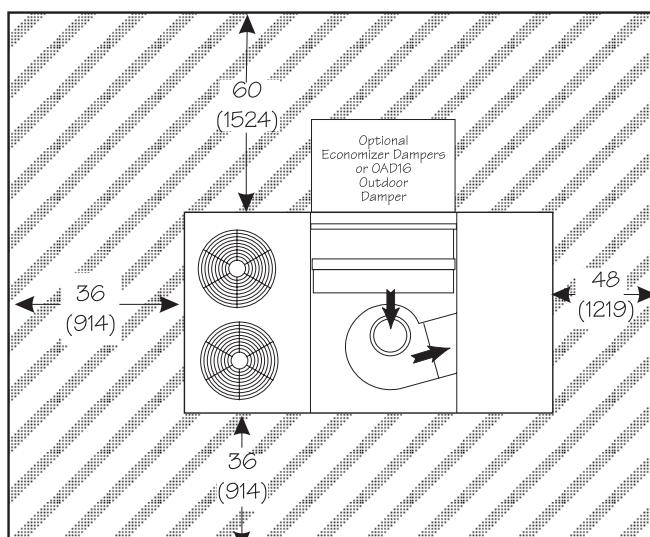
***GCS16 Basic Unit***



NOTE - Top Clearance Unobstructed

NOTE - Entire perimeter of unit requires support when elevated above mounting surface.

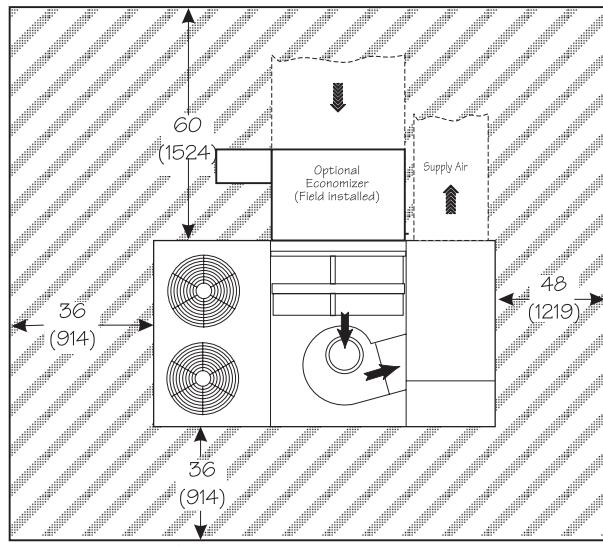
## ***GCS16 Unit with REMD16M Economizer Damper Section or OAD16 Outdoor Air Damper Section (Down-flow Applications)***



NOTE - Top Clearance Unobstructed

***Installation Clearances - inches (mm)***

**GCS16 Unit with REMD16M (Horizontal Applications)  
Damper Section**





All specifications are subject to change  
without notice.



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