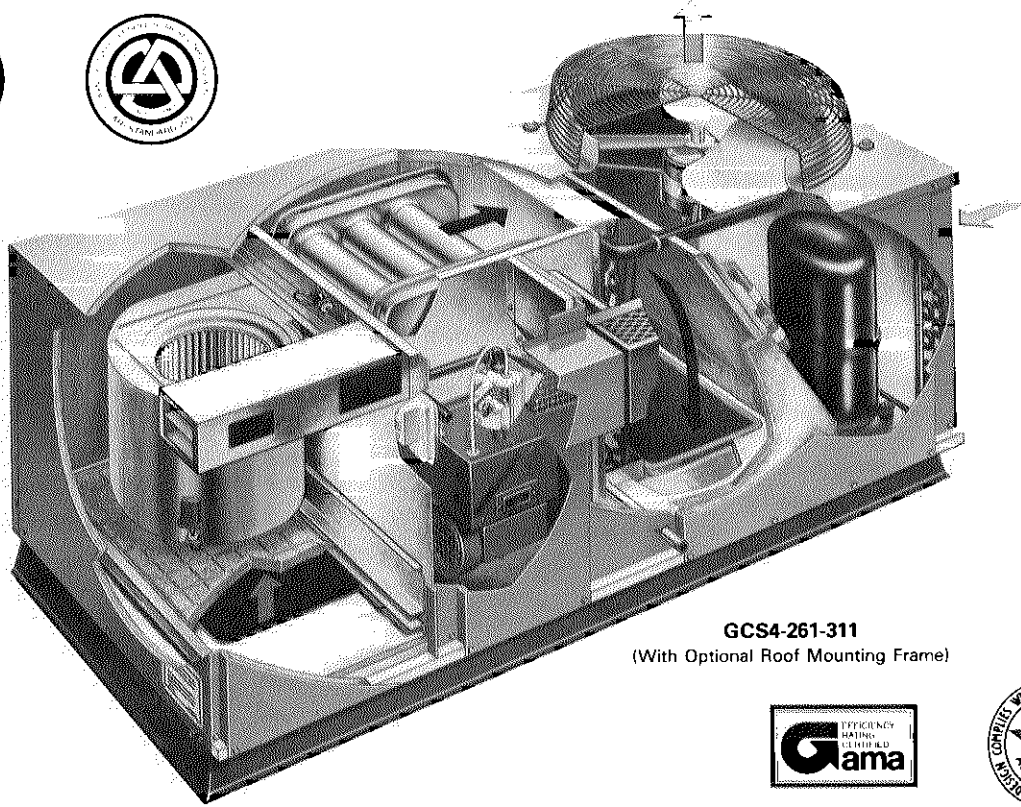




GCS4-261 & GCS4-311
ALL SEASON DX COOLING & GAS HEATING
 *23,000 to 29,200 Btuh Total Cooling Capacity
 60,000 to 90,000 Btuh Input Heating Capacity
 *ARI Standard 210 Certified Ratings

ENGINEERING DATA
COMBINATION
UNITS
ROOFTOP
 Page 1
 September 1987
 Supersedes 4-15-82



GCS4-261-311
 (With Optional Roof Mounting Frame)

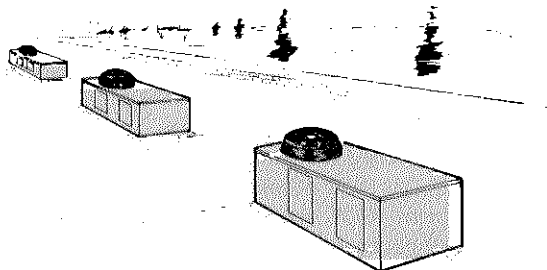


Low Profile Combination Heating-Cooling Units Provide Economical And Space Saving Installations

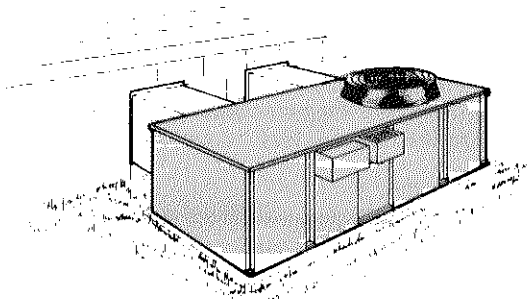
The Lennox GCS4 series combination gas fired heating and DX cooling units are designed for outdoor installation in residential or small business and commercial establishments. Equipment can be installed on a concrete slab at grade level or out of sight on a rooftop saving valuable floor space inside the structure. For ground level installation the supply and return air duct connections are made in the side of the unit. Duct connections are made in the bottom of unit in roof mounted applications. An optional mounting frame is available for rooftop installations.

All refrigeration components (evaporator and condenser sections) and gas heating section are all assembled in one compact package. A choice of heating capacity is available. The DURATUBE® heat exchanger provides maximum heating efficiency and service life. Cabinet is heavy gauge galvanized steel with an all weather enamel finish. All components are located in unit for easy service access. Unit is shipped completely factory assembled, wired and piped ready to install. Installer has only to set unit, connect duct work, gas supply, power supply and thermostat wiring.

Typical Applications



Multiple Units on a Rooftop
 (Bottom Supply and Return Air)



Unit on a Slab at Grade Level
 (Side Supply and Return Air)

NOTE — Specifications, Ratings and Dimensions subject to change without notice.

FEATURES

Rugged DURATUBE® Aluminized Steel Heat Exchanger — Cylindrical tube and drum heat exchanger construction permits normal expansion and contraction without metal fatigue. Design also results in high input to heat surface ratio, low resistance to air travel reducing blower horsepower requirements and ease of cleaning. All heat exchanger surfaces, inside and out, are of aluminized steel for superior resistance to corrosion and oxidation. Removable rear breeching provides complete service access. Return air flows through the heat exchanger before the evaporator coil minimizing condensation on heat exchanger during the cooling cycle.

Gas Power Burner — Provides efficient, trouble free operation and is unaffected by adverse wind or atmospheric conditions. Cast iron venturi mixes air and gas in correct proportion for proper combustion. Stainless steel flame spreader fits flame to combustion chamber resulting in uniform heat distribution. Electric direct spark ignition system provides sure, safe main burner ignition. Spark is intermittent and occurs only when required. 24 volt redundant combination control valve combines a manual main shut-off valve, pressure regulation and automatic electric valve (dual) into one compact control. Electronic flame sensor controls assure safe and reliable operation. Combustion air blower is equipped with air pressure switch which proves blower operation, prepurging heat exchanger, before allowing main gas valve to open. Motor is resiliently mounted. In addition, burner has inspection glass for flame viewing, easy combustion air adjustment and is easily removed for service. For LPG specified units a field conversion kit is required and must be ordered extra. See specification table.

Dependable and Quiet Compressor — Reliable compressor is hermetically sealed and provides trouble-free operation and long service life. Built-in protection devices assure protection from excessive current and temperature. Suction cooled, overload protected and equipped with internal pressure relief. The entire running gear is spring mounted within the sealed housing. In addition, the compressor is installed in the unit on resilient rubber mounts assuring quiet and vibration free operation.

Large Evaporator and Condenser Coils — Lennox designed and fabricated coils are constructed of precisely spaced ripple-edged aluminum fins machine fitted to copper tubes. Design of coil provides large surface and contact area for maximum efficiency. Fins are strengthened to resist bending which can restrict air flow and reduce efficiency. Fins are equipped with collars that grip tubing for maximum contact area resulting in excellent heat transfer. Flared shoulder tubing joints and silver soldering provide tight leak proof joints. Long life copper tubing is easy to field service. Coil is thoroughly tested under pressure to insure leak proof construction.

Efficient Condenser Fan — Direct drive fan draws air through the condenser coil and discharges it vertically, up and away from the building. Fan orifice design and low fan tip speed keeps operating sound level at a minimum. Uniform air movement through the coil results in high refrigerant cooling capacity. Permanently lubricated, inherently protected, ball bearing fan motor is totally enclosed for maximum protection from rain, dust and corrosion. A rain shield on the motor provides additional moisture protection. Corrosion resistant PVC coated steel wire fan guard is furnished.

Powerful Evaporator Blower — Direct drive blower delivers large air volumes with low power consumption. Blower is statically and dynamically balanced as an assembly before it is installed in the unit. Motor is resiliently mounted. A choice of four blower speeds is available and are easily obtained by simple wiring change.

Fan and Limit Controls Furnished — Factory installed and accurately located. Fan control assures positive blower operation within fifteen seconds after the burner comes on and has adjustable blower off temperature setting. Dual limit controls have fixed temperature setting and protect heating system from abnormal conditions.

Rugged Cabinet — Heavy gauge galvanized steel cabinet is subject to a five station metal wash process. This preparation results in a perfect bonding surface for the finish coat of baked-on outdoor enamel. Supply and return air opening filler panels are interchangeable in side and bottom openings. Extruded flange on side air openings prevents any moisture from entering unit. Large removable panels allow complete service access to components in unit. Condensate drain outlet extends outside of cabinet.

Thick Interior Insulation — Conditioned air section of cabinet is completely lined with thick fiberglass insulation. This provides quiet and efficient operation due to the excellent acoustical and insulating qualities of fiberglass.

Cleanable Air Filters — One inch frame filter is furnished as standard equipment. Media is washable or vacuum cleanable polyurethane, coated with oil for increased efficiency. Cabinet is equipped with filter mounting provisions for bottom return air usage only. For side return air, installer must provide a filter grille or field fabricate an adapter for filter. Filter is not furnished for side return air applications and must be supplied by installer.

Thermostat (Optional) — Thermostat is not furnished with the unit and must be ordered extra. See Lennox Price Book.

RMF3-31 Roof Mounting Frame (Optional) — Mounting frame mates to the GCS4 unit and provides an automatic weather sealed rooftop installation. Shipped knocked down for ease in handling, it is easily field assembled. Approved by National Roofing Contractors Association.

SP11 Remote Status Panel (Optional) — The operation of the unit can be checked at a glance on the Remote Status Panel (12F83) conveniently located within the conditioned area. Signal lights on the panel indicate "Cool Mode", "Heat Mode", "Compressor 1", "Compressor 2", "No Heat" and "Filter". The cool mode signal light is green when lit and indicates cooling operation. Heat Mode light is green and reflects heating operation. Compressor 1 light is green when operating and will turn red if there is an operational malfunction. Compressor 2 light is not required and should be disregarded. The No Heat and Filter lights will show red and indicate a requirement for service. Additional controls are required for use with the Status Panel and must be specified when ordering. Filter switch kit (97C85) is used in conjunction with the Filter light. Status Panel Readout Relay Kit (14F92) is required to interface status panel with unit operation.

Completely Tested and Certified — The design of unit is A. G. A. certified as a combination heating-cooling unit for outdoor installation. Heating ratings are according to Department of Energy (DOE) test procedures and Federal Trade Commission (FTC) labeling regulations. Ratings are certified by GAMA. Complies with ANSI safety codes. Cooling system has been thoroughly tested and rated in the Lennox environmental test room according to DOE test procedures and ARI Standard 210. In addition, unit has been sound tested in the Lennox reverberant sound test room and rated according to ARI Standard 270. Units coming within scope of the ARI Certification Program. DOE covered products are rated under 65,000 Btuh with single phase power input. Blower data is according to actual unit tests conducted in the Lennox air test chamber. In addition, each unit is test operated at the factory before shipment to ensure dependable field performance.

SPECIFICATIONS

Model No.	GCS4-261-60	GCS4-261-90	GCS4-311-90
Heating capacity input (Btuh)	60,000	90,000	90,000
†Heating capacity output (Btuh)	46,000	65,000	64,000
†A.F.U.E.	74.2%	70.7%	70.1%
★ARI Standard 270 SRN (bels)	8.0	8.0	8.6
*ARI Standard 210 Ratings	Total cooling capacity (Btuh)	23,000	29,200
	Total unit watts	3320	4460
	SEER (Btuh/Watts)	7.65	7.30
Blower wheel nominal diameter x width (in.)	10 x 9	10 x 9	10 x 9
Blower motor horsepower	1/3	1/3	1/3
Refrigerant (R-22) charge	3 lbs. 8 oz.	3 lbs. 8 oz.	4 lbs. 5 oz.
Condenser Coil	Net face area (sq. ft.)	3.60	3.60
	Tube diameter (in.) & No. of rows	1/2 – 2	1/2 – 2
	Fins per inch	15	15
Condenser Fan	Diameter (in.) & No. of blades	20 – 3	20 – 3
	Air volume	2160	1700
	Motor horsepower	1/5	1/5
	Motor watts	290	290
Evaporator coil	Net face area (sq. ft.)	2.50	2.50
	Tube diameter (in.) & No. of rows	1/2 – 3	1/2 – 3
	Fins per inch	10	10
No. & size of filters (in.) (bottom return)	(1) 16 x 25 x 1	(1) 16 x 25 x 1	(1) 16 x 25 x 1
Gas supply connections mpt (in.) (nat & **LPG)	1/2	1/2	1/2
Recommended gas supply pressure WC (in.)	Natural	7	7
	**LPG	11	11
Condensate drain size (in.)	3/4	3/4	3/4
No. of packages in shipment	1	1	1
Shipping weight (lbs.)	525	525	565
Optional Roof Mounting Frame – Shipping Weight	RMF3-31 (107 lbs.)		
**LPG Kit – Optional	LB-25881CE	LB-25881CF	LB-25881CF

†Annual Fuel Utilization Efficiency based on DOE test procedures and FTC labeling regulations.

*Sound Rating Number in accordance with ARI Standard 270.

†Rated in accordance with ARI Standard 210 and DOE; 450 cfm (maximum) evaporator air volume per ton of cooling capacity, 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air.

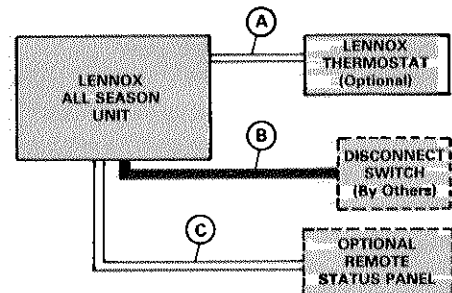
**For LPG units a field changeover kit is required and must be ordered extra.

HIGH ALTITUDE DERATE

If the heating value of the gas does not exceed values listed in the table, derating of the unit is not required. Should the heating value of the gas exceed the table values, or if the elevation is greater than 6,000 feet above sea level it will be necessary to derate the unit. Lennox requires that derate conditions be 4% per thousand feet above sea level. Thus at an altitude of 4000 feet, if the heating value of the gas exceeds 1000 Btu/ft³, unit will require a 16% derate.

Elevation Above Sea Level (Feet)	Maximum Heating Value (Btu/ft ³)
5001 – 6000	900
4001 – 5000	950
3001 – 4000	1000
2001 – 3000	1050
Sea Level – 2000	1100

FIELD WIRING



A – Four wire low voltage – 18 ga. minimum.

B – Two wire power – See Electrical Data table.

C – Seven wire low voltage – 18 ga. minimum.

– Field Wiring not furnished

All wiring must conform to NEC and local electrical codes.

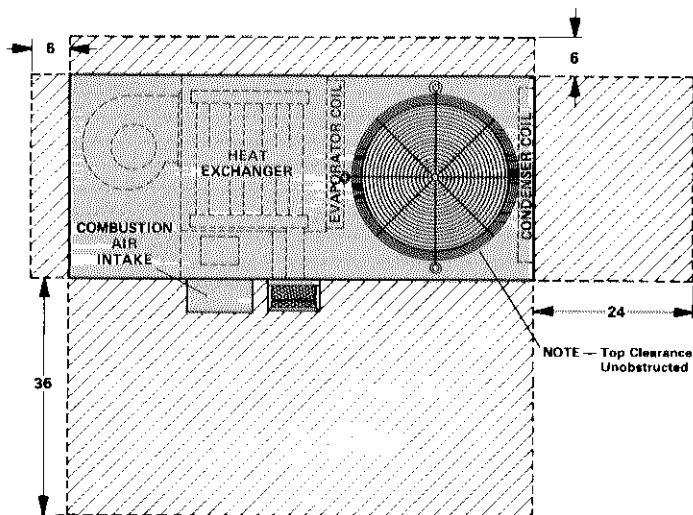
ELECTRICAL DATA

Model No.	GCS4-261-60	GCS4-261-90	GCS4-311-90
Line voltage data – 60 hertz/1 phase	208/230v	208/230v	208/230v
Compressor	Rated load amps	12.4	18.5
	Locked rotor amps	59.0	85.0
Condenser Coil Fan	Full load amps	1.2	2.4
	Locked rotor amps	2.4	2.4
Evaporator Coil Blower	Full load amps	2.3	5.3
	Locked rotor amps	5.3	5.3
Recommended maximum fuse or circuit breaker size (amps)	30	30	45
*Minimum circuit ampacity	19.0	19.0	26.6
Unit power factor	.97	.97	.96

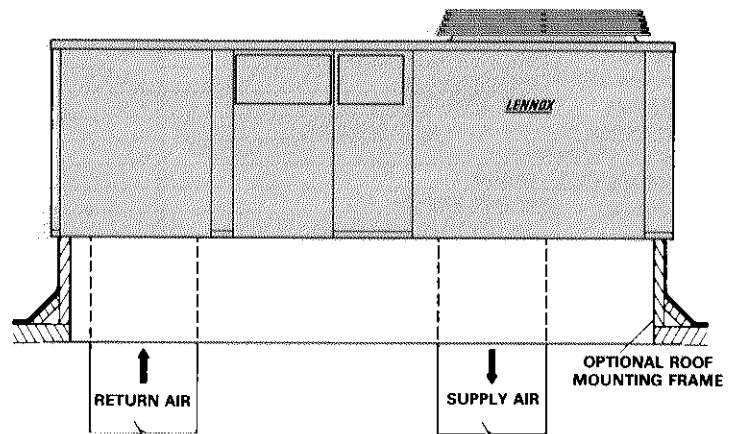
*Refer to National Electric Code manual to determine wire, fuse and disconnect size requirements.

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

INSTALLATION CLEARANCES (inches)



AIR PATTERN



Separate Supply and Return (Double) Duct

GUIDE SPECIFICATIONS

Prepared for the guidance of architects, consulting engineers and mechanical contractors.

General — Furnish and install a 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 United States.

The installed weight shall not be more than lbs. Entire unit shall have a width of not more than inches, a depth of not more than inches and an overall height of not more than inches. The equipment shall be shipped completely factory assembled, pre-charged, piped and wired internally ready for field connections. In addition, manufacturer shall test operate system at the factory before shipment.

Roof Mounting Frame — Furnish and install a steel roof mounting frame. 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 a roofing contractor. Frame shall be approved by National Roofing Contractors Association.

Air Distribution — Equipment shall be capable of bottom or side handling of conditioned air. All air distribution ducts shall be fiberglass or ga. galvanized steel insulated with inch thick lb. density fiberglass or equivalent.

Air Movers — Centrifugal conditioned air blowers shall be direct driven by a multi-speed motor and be capable of delivering cfm at an external static pressure of inches water gauge requiring not more than bhp and rpm. Blowers shall be statically and dynamically balanced.

Propeller type condenser fan shall discharge vertically and be direct driven by a hp motor. Fan motor shall be totally enclosed with ball bearings, permanently lubricated, inherently protected and equipped with rain shield. Fan shall have a safety guard.

Air Filter — Cleanable filter furnished shall have not less than sq. ft. of free area.

Cooling System — The total certified cooling capacity shall not be less than Btuh with an evaporator air volume of cfm, an entering wet bulb air temperature of °F, an entering dry bulb air temperature of °F and a condenser entering temperature of °F. The compressor power input shall not exceed kw at these conditions.

The coils shall be non-ferrous construction with aluminum fins mechanically bonded to durable copper tubes. Coils shall be pressure leak tested. Coil face area shall be not less than sq. ft. (evaporator) and sq. ft. (condenser). The compressor shall be resiliently mounted, have overload protection and internal pressure relief. The refrigeration system shall have suction and discharge line service gauge ports, liquid line strainer and full refrigerant charge. Shall comply with ARI Standard 210 Test Conditions and DOE test procedures.

Heating System — The heating capacity output shall be Btuh with a gas input of Btuh.

Cylindrical tubes and drum heat exchanger shall be constructed of aluminized steel. Power burner shall have electric direct spark ignition, safety shutoff, electronic flame sensing controls, flame inspection glass window, prepurging and combustion air adjustment. All controls shall be listed for operation at low outdoor air temperatures. System shall be equipped with dual limit safety controls. Shall be A.G.A. design certified for outdoor installation. Shall be rated and tested according to DOE, FTC and GAMA.

Cabinet — Shall be of galvanized steel with a baked-on outdoor enamel paint finish. Base section and 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.

Remote Status Panel — Shall be available for installation within the conditioned area to observe equipment operation. The panel shall include signal lights for Cool Mode, Heat Mode, Compressor, No Heat and Filter.

Service Access — All components, wiring and inspection areas shall be completely accessible through removable panels.

COOLING RATINGS

NOTE To determine sensible capacity, leaving wet bulb and dry bulb temperatures not shown in the tables, see Miscellaneous Engineering Data, Page 9.

GCS4-261 COOLING CAPACITY

Enter. Wet Bulb (°F)	Total Air Vol. (cfm)	Outdoor Air Temperature Entering Condenser Coil (°F)																			
		85			95			105			115										
		Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T)							
				Dry Bulb (°F)					Dry Bulb (°F)					Dry Bulb (°F)							
76	80	84	76	80	84	76	80	84	76	80	84	76	80	84							
63	600	22,600	2290	.74	.84	.94	21,600	2460	.75	.86	.95	20,400	2650	.77	.88	.99	19,200	2880	.79	.91	1.00
	800	23,700	2340	.79	.90	1.00	22,500	2500	.80	.93	1.00	21,300	2700	.82	.95	1.00	20,000	2940	.85	.99	1.00
	1000	24,500	2370	.83	.97	1.00	23,300	2540	.85	.99	1.00	22,000	2740	.88	1.00	1.00	20,600	2980	.91	1.00	1.00
67	600	24,500	2370	.59	.69	.78	23,300	2540	.60	.70	.80	22,000	2750	.61	.71	.82	20,600	2990	.62	.73	.84
	800	25,500	2410	.62	.73	.84	24,200	2590	.63	.74	.86	22,800	2800	.64	.76	.89	21,300	3040	.66	.79	.92
	1000	26,300	2440	.64	.77	.90	24,900	2620	.66	.79	.92	23,400	2830	.67	.82	.96	21,800	3070	.70	.85	1.00
71	600	26,300	2440	.46	.55	.63	25,000	2620	.46	.55	.65	23,600	2840	.47	.56	.66	22,000	3090	.47	.57	.68
	800	27,400	2480	.47	.57	.67	25,900	2670	.47	.58	.69	24,400	2890	.48	.59	.71	22,700	3140	.49	.61	.75
	1000	28,100	2510	.48	.60	.71	26,600	2700	.49	.61	.73	24,900	2920	.49	.63	.76	23,100	3180	.50	.65	.79

GCS4-311 COOLING CAPACITY

Enter. Wet Bulb (°F)	Total Air Vol. (cfm)	Outdoor Air Temperature Entering Condenser Coil (°F)																			
		85			95			105			115										
		Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T)							
				Dry Bulb (°F)					Dry Bulb (°F)					Dry Bulb (°F)							
76	80	84	76	80	84	76	80	84	76	80	84	76	80	84							
63	750	28,800	3110	.75	.85	.95	27,400	3360	.77	.87	.97	25,900	3580	.78	.89	1.00	24,400	3770	.80	.92	1.00
	1000	30,200	3200	.80	.91	1.00	28,600	3450	.81	.94	1.00	27,000	3660	.83	.96	1.00	25,400	3840	.86	1.00	1.00
	1250	31,200	3260	.84	.98	1.00	29,600	3510	.86	1.00	1.00	28,000	3720	.89	1.00	1.00	26,200	3900	.92	1.00	1.00
67	750	31,000	3250	.60	.70	.79	29,500	3500	.61	.71	.81	27,900	3720	.62	.72	.83	26,300	3900	.63	.74	.85
	1000	32,400	3340	.63	.74	.85	30,700	3580	.64	.75	.87	29,000	3800	.65	.77	.89	27,200	3970	.67	.80	.93
	1250	33,400	3400	.66	.78	.91	31,600	3640	.67	.80	.93	29,800	3850	.69	.83	.97	27,900	4010	.70	.85	1.00
71	750	33,300	3390	.47	.56	.65	31,600	3640	.47	.57	.66	29,900	3860	.48	.57	.67	28,100	4030	.48	.58	.69
	1000	34,700	3480	.48	.58	.68	32,900	3720	.48	.59	.70	31,000	3920	.49	.60	.72	29,100	4090	.50	.62	.74
	1250	35,600	3530	.49	.61	.73	33,700	3770	.50	.62	.75	31,800	3970	.50	.64	.77	29,700	4130	.51	.65	.79

BLOWER DATA

GCS4-261-60 & 90 BLOWER PERFORMANCE (Side Supply And Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds			
	High	Med-High	Med-Low	Low
0	1390	1290	1145	985
.05	1360	1265	1130	980
.10	1330	1240	1115	980
.15	1300	1210	1095	975
.20	1265	1180	1075	970
.25	1235	1150	1055	960
.30	1200	1120	1030	950
.40	1125	1055	980	910
.50	1045	985	920	860

NOTE All cfm data is measured external to the unit.

GCS4-311-90 BLOWER PERFORMANCE (Side Supply And Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds			
	High	Med-High	Med-Low	Low
0	1215	1120	930	780
.05	1190	1090	910	770
.10	1160	1060	885	755
.15	1130	1030	865	740
.20	1090	1000	840	725
.25	1055	970	820	705
.30	1020	935	795	680
.40	950	865	740	630
.50	870	790	680	575

NOTE All cfm data is measured external to the unit.

GCS4-261-60 & 90 BLOWER PERFORMANCE (Bottom Supply And Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds			
	High	Med-High	Med-Low	Low
0	1520	1420	1275	1065
.05	1490	1400	1260	1065
.10	1465	1375	1240	1060
.15	1435	1350	1225	1060
.20	1400	1320	1205	1055
.25	1370	1290	1180	1045
.30	1335	1260	1155	1035
.40	1265	1195	1100	1005
.50	1190	1120	1035	955

NOTE All cfm data is measured external to the unit.

GCS4-311-90 BLOWER PERFORMANCE (Bottom Supply And Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds			
	High	Med-High	Med-Low	Low
0	1385	1240	1080	915
.05	1350	1210	1060	900
.10	1320	1185	1035	885
.15	1280	1150	1010	870
.20	1240	1120	985	850
.25	1205	1090	955	830
.30	1165	1055	930	800
.40	1080	985	875	755
.50	1000	910	810	700

NOTE All cfm data is measured external to the unit.

FILTER AIR RESISTANCE

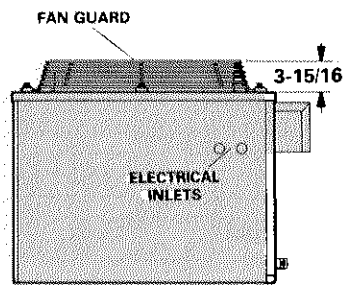
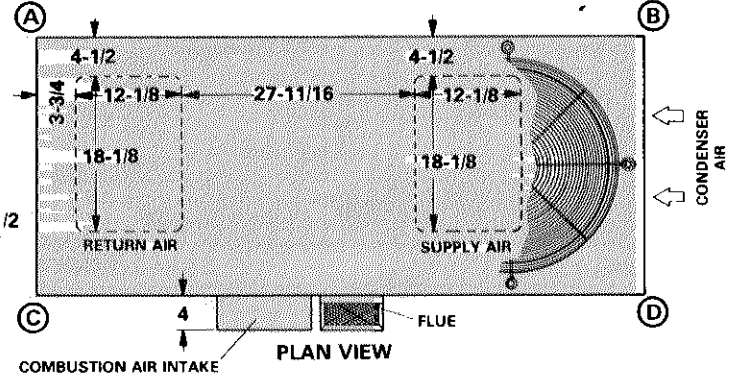
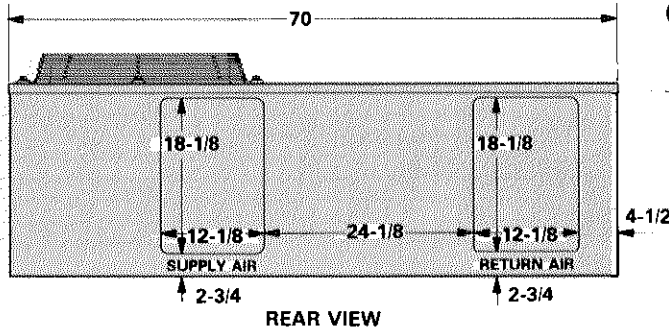
Air Volume (cfm)	Total Resistance (inches water gauge)
800	.04
900	.05
1000	.06
1100	.08
1200	.09
1300	.11
1400	.12

DIMENSIONS (inches)

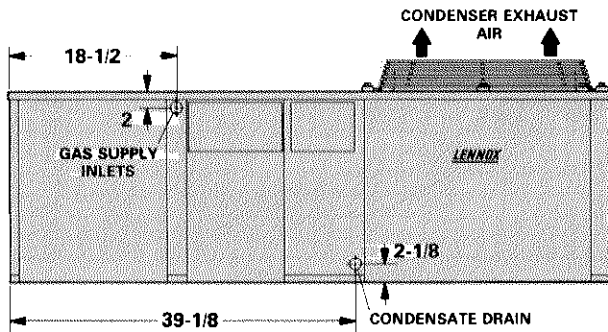
BASIC UNIT

CORNER WEIGHTS (lbs.)

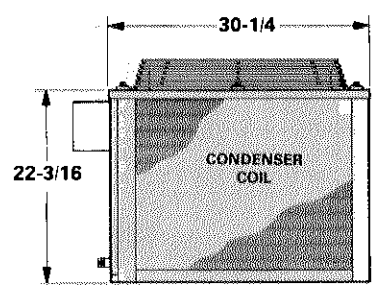
Model No.	A	B	C	D
GCS4-261-60 & 90	127	135	113	150
GCS4-311-90	122	145	136	162



EVAPORATOR END VIEW

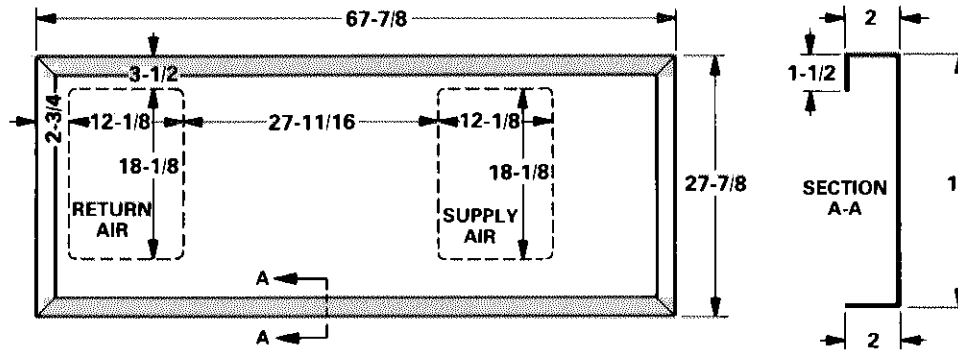


FRONT VIEW

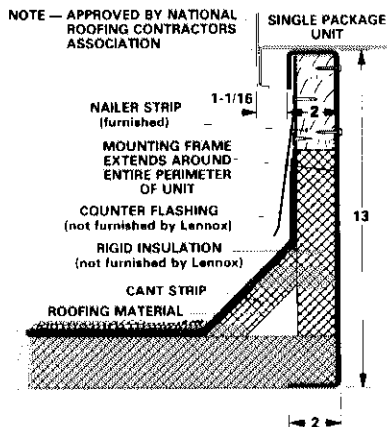


CONDENSER END VIEW

RMF3-31 ROOF MOUNTING FRAME



RECOMMENDED FLASHING FOR RMF3-31 ROOF MOUNTING FRAME



RMF3-31 ROOF MOUNTING FRAME INSTALLATION ON A PITCHED ROOF

