

**CustomHeat™ SERIES
MULTI-POSITION GAS FURNACES**

G27M

Bulletin #210166

February 1997

***80.0% A.F.U.E.**

**60,000 to 120,000 Btuh (17.6 to 35.2 kW) Input
1-1/2 thru 5 Tons (3.5 thru 17.6 kW) Nominal Add-on Cooling**

**Isolated Combustion System Rating For Non-Weatherized Furnaces*



UP-FLOW POSITION



HORIZONTAL POSITION

Applications

- Natural gas only.
- Four models with high fire input capacities of 60,000, 75,000, 100,000 and 120,000 Btuh (17.6, 22.0, 29.3 and 35.2 kW).
- Energy efficiencies (AFUE) of 80.0%.
- Applicable to up-flow, down-flow or horizontal applications.
- Two stage heating operation controlled by two stage or single stage thermostat.
- Add-on evaporator coils, electronic air cleaners and power humidifiers easily added to furnace.
- Units shipped factory assembled with all controls installed and wired.
- Factory run tested to insure dependable operation in the field.

Approvals

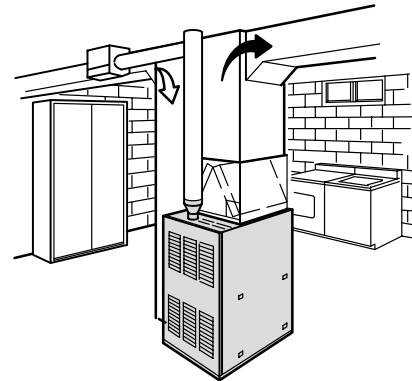
- Certified by A.G.A./C.G.A. Laboratories.
- Ratings are certified by GAMA.
- Rated and tested according to U.S. DOE test procedures and FTC labeling regulations.
- "X" models meet California Nitrogen Oxides (NO_x) Standards and California Seasonal Efficiency requirements.
- Blower data from unit tests conducted in Lennox Laboratory air test chamber.
- Developed in accordance with ISO 9001 quality standards.

Equipment Warranty

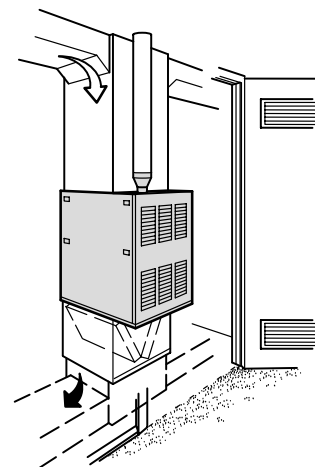
- Heat exchanger – Limited twenty year warranty.
- All other covered components – five years (residential installations), one year (non-residential installations).
- Refer to Lennox Equipment Limited Warranty certificate included with the equipment for specific details.



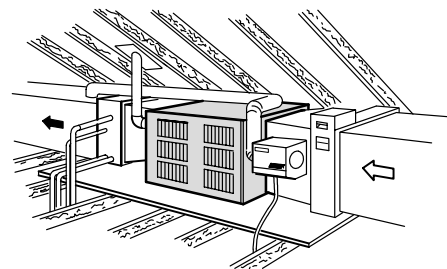
Typical Applications



Up-Flow Utility Room Installation
With Cooling Coil
and Automatic Humidifier



Down-Flow Closet Installation
With Cooling Coil



Horizontal Attic Installation
With Cooling Coil, Electronic Air Cleaner
and Automatic Humidifier

FEATURES

Cabinet

- Constructed of heavy gauge cold rolled steel.
- Subject to five station metal wash process.
- Baked-on powder paint finish.
- Cabinet surface temperatures low due to foil faced fiberglass insulation on side and back panels of heat section.
- Blower section completely insulated with mat faced fiberglass insulation.
- Complete service access by removing one-piece front panel and interior blower access door.
- Blower assembly may be completely removed for service.
- Safety interlock switch on blower access door automatically shuts off power to unit when door is removed.
- Gas piping inlets provided in both sides and top of cabinet.
- Electrical knockouts provided in both sides, top and bottom of cabinet.
- Flanges on top and bottom of cabinet may be bent out for duct connection to unit. See dimension drawing.
- Painted panel furnished to block off bottom air return air.
- Return air entry possible on either side or end of cabinet for up-flow applications.
- End return air entry for horizontal and down-flow applications.

Multi-Position Capability

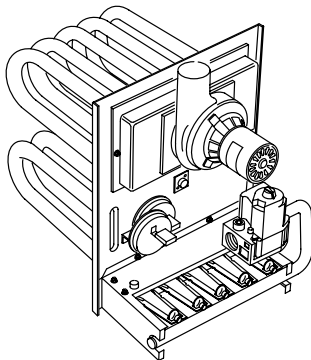
- Shipped from factory for up-flow applications and horizontal applications with right hand or left hand air discharge.
- For down-flow applications, interchange top and bottom caps, remove heat exchanger section, rotate 180° top for bottom and re-install.

Blower

- Quiet multi-speed direct drive blower.
- Blower assembly statically and dynamically balanced.
- Multiple-speed leadless motor resiliently mounted.
- Blower speeds easily changed at harness connector on blower motor. See blower performance tables.

Tubular Aluminized Steel Heat Exchanger

- Constructed of aluminized steel for superior resistance to corrosion and oxidation.
- Curving design allows complete exposure of heating surfaces to supply air stream.
- Round surfaces create minimum air resistance and allow air to surround all surfaces for excellent heat transfer.
- Compact design reduces space requirements in unit cabinet.
- Heat exchanger has been laboratory life cycle tested.



Two Speed Induced Draft Blower

- Shaded pole heavy duty two speed induced draft blower prepurges heat exchanger and safely vents flue products.
- Controlled by furnace control center board for a prepurge cycle (15 seconds) and a post purge cycle (5 seconds).
- Two pressure switches (low heat and high heat) prove blower operation before allowing gas valve to open.
- Blower operates only during heating cycle.

Inshot Burners

- Aluminized steel inshot burners provide efficient trouble free operation.
- Burner venturi mixes air and gas in correct proportion for proper combustion.
- Burner assembly is removeable from the unit as a single component for ease of service and each burner may be removed individually.

Two Stage Gas Control Valve

- 24 volt redundant combination two stage gas control valve combines a manual main shutoff valve, pressure regulation and automatic electric valve (dual) into one compact combination control.

SureLight™ Hot Surface Ignition

- Tough, reliable, long-life, trouble-free performance.
- Tungsten heater element sandwiched between two plates of silicon nitride.
- Cemented to steatite block for protection against current leakage.
- Ignition leads constructed of nickel plated copper enclosed in high temperature Teflon insulation for dependable operation.
- Adaptive technology of ignition control board monitors and adjusts voltage and temperature for ignition at just the needed combustion point – extending ignitor life.
- No electrical noise.

SureLight™ Ignition Control Board

- Control module continuously monitors and adjusts the heater power to operate at minimum igniter temperature required for ignition.
- Electronic flame sensor control assures safe and reliable operation.
- Should loss of flame occur, flame sensor controls will initiate 5 attempts at re-ignition before locking out unit operation for 60 minutes.
- Watchguard type circuit automatically resets ignition controls after one hour of continuous thermostat demand after unit lockout, eliminating nuisance calls for service.
- Ignition control has LED's to indicate status and as an aid in troubleshooting.
- Factory installed on interior blower access door.
- Microprocessor controlled board contains all necessary controls and relays to operate gas valve, combustion air blower, air circulating blower and ignition.
- Board monitors flame, limit and gas valve operation.
- Low voltage terminal strip for thermostat connections.
- Manual reset circuit breaker protects board.
- Diagnostic LED's furnished as an aid in servicing system.
- Two 120 volt accessory terminals are provided on board for operation of accessories during either cooling or heating modes.

Flame Rollout Switches

- Dual manual reset switches are factory installed on either side of burner box.
- Prevent unit operation in event combustion products passage through flueway is reduced or blocked.

Limit Controls

- Accurately located limit controls provide protection from abnormal operating conditions.
- Primary limit located on heating compartment vestibule panel.
- Two secondary limits are located on either side of blower housing.

Transformer

- 24 volt (40VA) control transformer is furnished and factory installed on blower access door.

Two-Stage Control Board

- Factory installed on interior blower access door.
- Control allows one of three different modes of operation:
 1. Two-stage operation controlled from two-stage thermostat.
 2. Two-stage operation controlled from single stage thermostat with timed-on second stage (adjustable 8, 12 or 15 minutes).
 3. Single Stage (high fire) operation only.

Filters

- Up-flow/Horizontal filter and rack furnished with unit for external installation.
- Includes filter, adjustable filter rack with access door and filter removal tool for bottom return air applications.
- See Specifications table for filter sizes.
- Optional Down-flow filter rack kits available.
- See optional accessories.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

Down-Flow Filter Rack (Optional)

- Available for field installation in down-flow applications.
- Filters are not furnished and must be ordered extra.
- See Specifications table for filter sizes and filter rack order number.
- Single kit or ten-packs available.

Thermostat (Optional)

- Thermostat is not furnished.
- Single stage and two stage thermostats, heating only thermostats and heat-cool thermostats are available for all-season indoor climate control.
- See Thermostats bulletin in Accessories section and Lennox Price Book.

Down-Flow Combustible Floor Base (Optional)

- Field installed additive base is required for heating only units installed on combustible floors.
- See Specifications table and dimension drawing.
- Not required in add-on cooling applications.

Hanging Bracket Kit (Optional)

- Field installed kit LB-69957 (46J66) available for suspension of unit in horizontal applications.
- Includes four vertical supports for mounting to joists and two horizontal channels.

High Altitude Pressure Switch Kits (Optional)

- Required for proper high fire unit operation at altitudes over 4500 ft. (1372 m).
- See Specifications table for correct usage and order number.

SPECIFICATIONS

Model No.		G27M2-60	G27M3-75	G27M4-100	G27M5-120
Input Btuh (kW) low fire		40,800 (12.0)	51,000 (14.9)	68,000 (19.9)	81,600 (23.9)
Output Btuh (kW) low fire		32,600 (9.6)	40,800 (12.0)	54,400 (16.0)	65,300 (19.1)
Input Btuh (kW) high fire		60,000 (17.6)	75,000 (22.0)	100,000 (29.3)	120,000 (35.2)
Output Btuh (kW) high fire		48,000 (14.1)	60,000 (17.6)	80,000 (23.5)	96,000 (28.2)
●A.F.U.E.		80%			
Flue size connection diameter — in. (mm) round		3 (76)	4 (102)		
Temperature rise range — °F (°C)	Low fire	30 – 60 (17 – 33)	40 – 70 (22 – 39)	30 – 60 (17 – 33)	
	High fire	40 – 70 (22 – 39)			
High static certified by A.G.A./C.G.A. — in wg. (Pa)		.50 (124)			
Gas Piping Size I.P.S. Natural gas only		1/2 (13)			
Blower wheel nominal diameter x width	in.	9 x 7	10 x 7	12 x 8	12 x 9
	mm	229 x 178	254 x 178	305 x 203	305 x 229
Blower motor output — hp (W)		1/4 (187)	1/3 (249)	1/2 (373)	3/4 (560)
Electrical characteristics		120 volts — 60 hertz — 1 phase (12 amps or less — all models)			
Nominal cooling that can be added	Tons	2 or 2.5	2, 2.5 or 3	3.5 or 4	3.5, 4 or 5
	kW	7.0 or 8.8	7.0, 8.8 or 10.6	12.3 or 14.1	12.3, 14.1 or 17.6
Up-flow/Horizontal Filter Kit (furnished) ‡filter size — in. (mm)		(1) 16 x 20 x 1 (406 x 508 x 25)		(1) 20 x 20 x 1 (508 x 508 x 25)	
Shipping weight — lbs. (kg) 1 package		135 (61)		175 (79)	
▼ Optional Accessories (Must Be Ordered Extra) ▼					
ⓁDown-flow Filter Kit	Catalog No.	LB-69843A (32J01) — 3 lbs. (1 kg)			
	No. & Size of Filters — in. (mm)	(2) 16 x 20 x 1 (406 x 508 x 25)			
Down-flow Combustible Floor Base		LB-79239A (67J91) — 10 lbs. (4 kg)	LB-79239B (67J92) — 10 lbs. (4 kg)		
Hanging Bracket Kit		LB-69957 (46J66) — 15 lbs. (7 kg)			
High Altitude Pressure Switch Kits (high fire)		80K40	80K43	80K41	80K42

●Annual Fuel Utilization Efficiency based on U.S. DOE test procedures and according to FTC labeling regulations. Isolated combustion system rating for non-weatherized furnaces.

‡Polyurethane frame type filter.

ⓁFilters are not furnished with kit and must be ordered extra.

INSTALLATION CLEARANCES — inches (mm)

UP-FLOW OR DOWN-FLOW POSITION

Vent Type	Type "B"	Type "C"
Sides	0 inches (0 mm)	0 inches (0 mm)
Rear	0 inches (0 mm)	0 inches (0 mm)
Top	1 inch (25 mm)	1 inch (25 mm)
Front	2 inches (51 mm)	2 inches (25 mm)
Front (service)	24 inches (610 mm)	24 inches (610 mm)
Floor (up-flow)	Combustible	Combustible
*Floor (down-flow)	*Combustible	*Combustible
Flue	1 inch (25 mm)	6 inch (152 mm)

NOTE—Air for combustion and supply air ventilation must conform to the methods outlined in American National Standard (ANSI-Z223.1) National Fuel Gas Code or National Standard of Canada CAN/CGA-149.1, & CAN/CGA-149.2 "Installation Code for Gas Burning Appliances".

NOTE—In the U.S. flue sizing must conform to the methods outlined in current GAMA/A.G.A. venting tables, American National Standard (ANSI-Z223.1) National Fuel Gas Code or applicable provisions of local building codes. In Canada flue sizing must conform to the methods outlined in National Standard of Canada CAN/CGA-149.1 and .2.

*Down-flow Applications Only — Clearance for installation on combustible floor if optional additive base is installed between the furnace and the combustible floor. Not required in add-on cooling applications if installed in accordance with local codes or National Fuel Gas Code ANSI-Z223.1 or CAN/CGA-149.1,.2.

HORIZONTAL POSITION

Vent Type	Type "B"	Type "C"
*Sides	*2 inches (51 mm)	*2 inches (51 mm)
Rear	0 inches (0 mm)	0 inches (0 mm)
*Top	*0 inches (0 mm)	*0 inches (0 mm)
Front	2 inches (25 mm)	2 inches (25 mm)
Front (service)	24 inches (610 mm)	24 inches (610 mm)
Floor	0 inches (0 mm)	0 inches (0 mm)
Flue	1 inch (25 mm)	6 inch (152 mm)

NOTE—Air for combustion and supply air ventilation must conform to the methods outlined in American National Standard (ANSI-Z223.1) National Fuel Gas Code or National Standard of Canada CAN/CGA-149.1, & CAN/CGA-149.2 "Installation Code for Gas Burning Appliances".

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*Line contact installation permissible between jacket top or sides and building joists.

G27M2-60 BLOWER PERFORMANCE

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1270	600	980	460	770	365	570	270
.05	12	1245	590	975	460	770	365	565	265
.10	25	1220	575	975	460	770	365	565	265
.15	37	1195	565	965	455	765	360	560	265
.20	50	1170	550	960	455	760	360	560	265
.25	62	1140	540	950	450	760	360	555	260
.30	75	1110	525	940	445	760	360	550	260
.40	100	1060	500	910	430	750	355	545	255
.50	125	990	465	880	415	740	350	540	255
.60	150	900	425	810	380	690	325	530	250
.70	175	800	380	740	350	630	295	520	245

NOTE – All air data is measured external to unit with 1 inch (25 mm) air filter in place. NOTE – Filter not furnished with unit.

G27M3-75 BLOWER PERFORMANCE

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1425	670	1240	585	1000	470	800	380
.05	12	1415	670	1230	580	995	470	800	380
.10	25	1400	660	1220	575	990	465	795	375
.15	37	1385	655	1200	565	985	465	795	375
.20	50	1370	645	1180	555	980	460	790	375
.25	62	1350	635	1160	545	970	460	780	370
.30	75	1330	630	1140	540	955	450	770	365
.40	100	1280	605	1095	515	925	435	750	355
.50	125	1210	570	1040	490	900	425	720	340
.60	150	1135	535	985	465	860	405	680	320
.70	175	1070	505	920	435	800	380	630	300

NOTE – All air data is measured external to unit with 1 inch (25 mm) air filter in place. NOTE – Filter not furnished with unit.

G27M4-100 BLOWER PERFORMANCE

External Static Pressure		Air Volume at Various Blower Speeds									
		High		Medium-High		Medium		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1830	865	1600	755	1325	625	1070	505	880	415
.05	12	1815	855	1585	750	1320	625	1070	505	880	415
.10	25	1800	850	1570	740	1315	620	1070	505	880	415
.15	37	1875	885	1550	730	1310	620	1065	505	875	415
.20	50	1750	825	1530	720	1300	615	1060	500	875	415
.25	62	1725	815	1515	715	1290	610	1050	495	870	410
.30	75	1700	800	1500	710	1275	600	1040	490	870	410
.40	100	1650	780	1460	690	1245	590	1020	480	860	405
.50	125	1600	755	1420	670	1210	570	1000	470	840	395
.60	150	1550	730	1380	650	1170	550	980	460	820	385
.70	175	1480	700	1330	630	1130	535	960	455	790	375

NOTE – All air data is measured external to unit with 1 inch (25 mm) air filter in place. NOTE – Filter not furnished with unit.

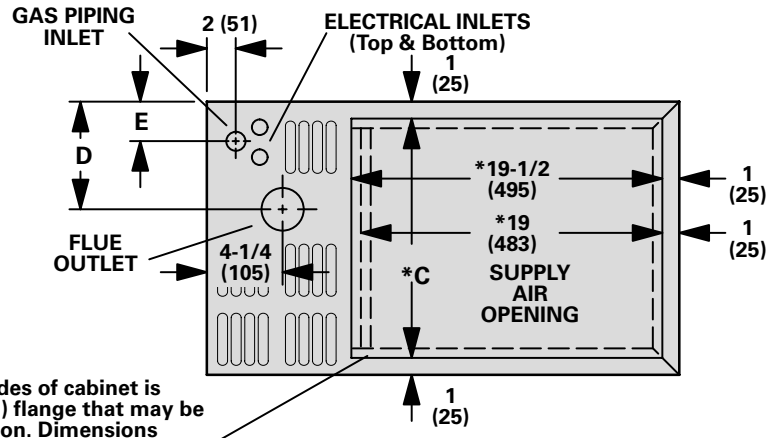
G27M5-120 BLOWER PERFORMANCE

External Static Pressure		Air Volume at Various Blower Speeds									
		High		Medium-High		Medium		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2450	1155	2160	1020	1970	930	1700	800	1500	710
.05	12	2440	1150	2155	1015	1965	925	1695	800	1500	710
.10	25	2430	1145	2150	1015	1960	925	1690	800	1495	705
.15	37	2415	1140	2135	1010	1950	920	1685	795	1495	705
.20	50	2400	1135	2120	1000	1940	915	1680	795	1490	705
.25	62	2380	1125	2105	995	1930	910	1675	790	1480	700
.30	75	2360	1115	2090	985	1915	905	1670	790	1470	695
.40	100	2310	1090	2050	965	1870	880	1650	780	1440	680
.50	125	2260	1065	2000	945	1810	855	1610	760	1410	665
.60	150	2180	1030	1950	920	1750	825	1560	735	1370	645
.70	175	2100	990	1890	890	1700	800	1520	715	1330	630

NOTE – All air data is measured external to unit with 1 inch (25 mm) air filter in place. NOTE – Filter not furnished with unit.

DIMENSIONS – inches (mm)

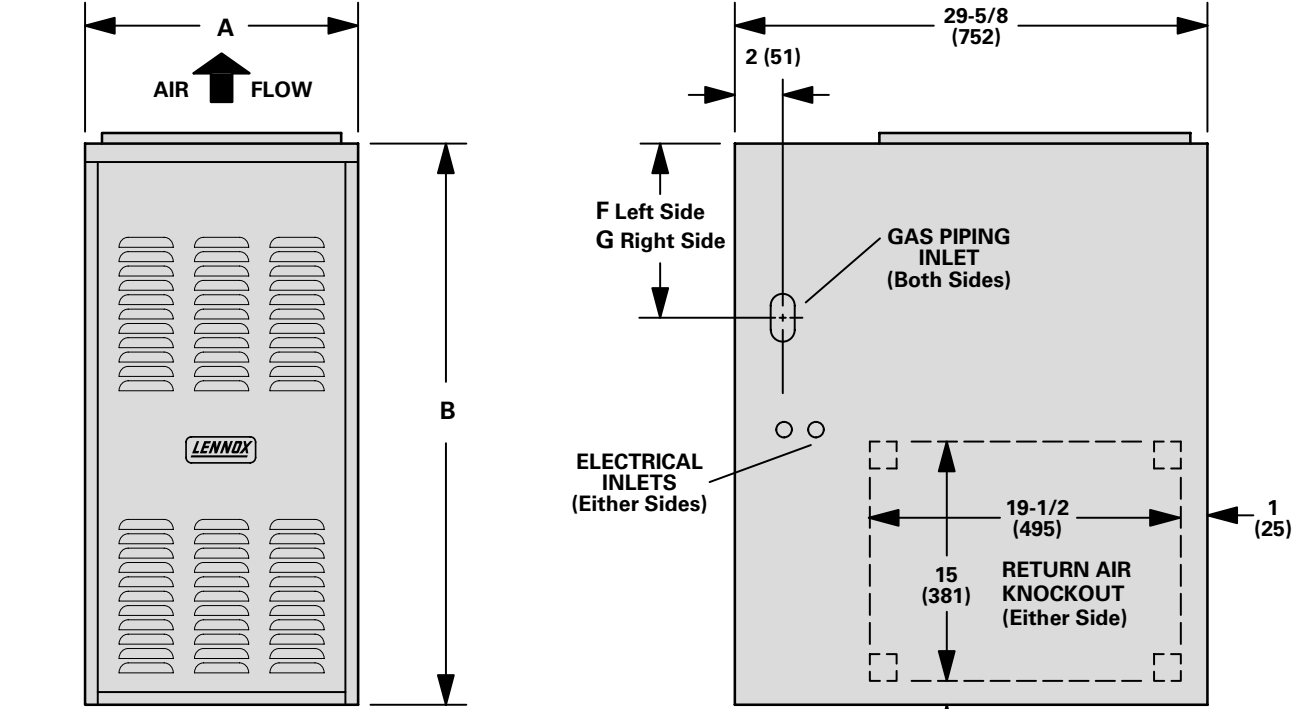
(UP-FLOW POSITION SHOWN)



TOP VIEW

***NOTE**—Supply air opening at rear and sides of cabinet is equipped with a 3/4 inch (19 mm) flange that may be bent out 90° for plenum connection. Dimensions shown are after flange is bent out,

Flange at front of supply air opening may be bent out for a total opening dimension (front to rear) of either 19-1/2 inches (495 mm) or 19 inches (483 mm).



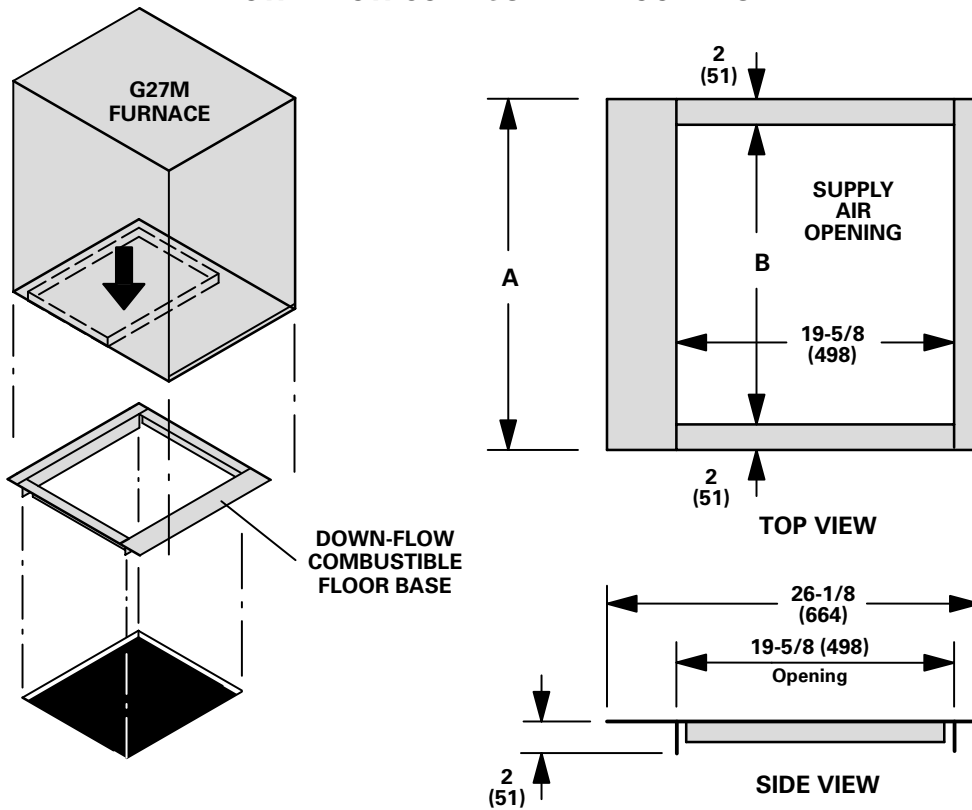
FRONT VIEW

SIDE VIEW

****NOTE**— Return air opening is equipped with a 3/4 inch (19 mm) flange that may be bent out 90° for plenum connection. Dimensions shown are after flange is bent out,

Model No.		A	B	C	D	E	F	G
G27M3-60 G27M3-75	in.	17	36-1/4	15	6-3/4	2-7/16	6-1/2	12
	mm	432	921	381	171	62	114	254
G27M5-100 G27M5-120	in.	20-1/2	39	18-1/2	8-3/8	4-1/4	8	13-1/2
	mm	521	991	470	213	108	203	343

DOWN-FLOW COMBUSTIBLE FLOOR BASE



Furnace Model No.	A		B	
	in.	mm	in.	mm
G27M3-60 G27M3-75	19-1/8	486	15-1/8	384
G27M5-100 G27M5-120	22-1/2	572	18-1/2	470

HIGH ALTITUDE DERATE

Pressure regulator adjustment may be required depending on altitude. See table below for proper pressure regulator setting.

FUEL	ALTITUDE ft. (m)			
	0-4500 (0-1372)	4501-5500 (1373-1676)	5501-6500 (1677-1981)	6501-7500 (1982-2286)
	Manifold Absolute Pressure (Outlet) in. w.g. (kPa)			
Natural Gas	3.5 (.87)	3.4 (.85)	3.3 (.82)	3.1 (.77)

NOTE – Combustion air pressure switches are factory set. No adjustment is necessary. All models operate satisfactorily in the high fire mode at altitudes up to 4500 ft. (1370 m). At altitudes over 4500 ft. (1372 m), High Altitude Pressure Switch Kits are required for proper high fire operation. See Specifications table for correct kit usage.