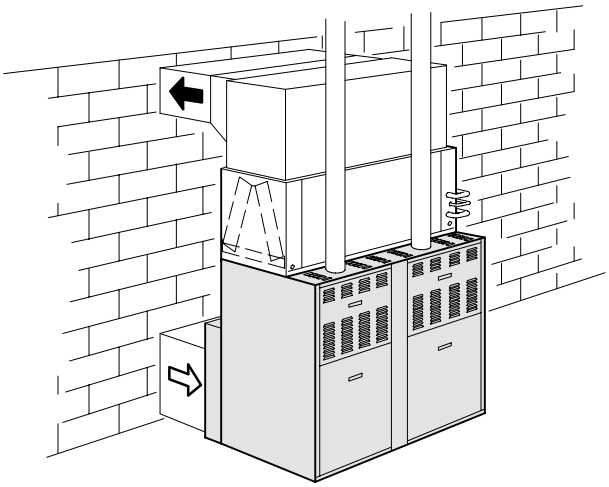
LENNOX®
ENGINEERING DATA

G24-200
COMMERCIAL UP–FLOW GAS FURNACE
*80.0% A.F.U.E.
200,000 Btuh (58.6 kW) Input Heating Capacity
7.5 or 10 Tons (26.4 or 35.2 kW) Nominal Add-On Cooling

G24-200
Bulletin #210211
October 1997

*Isolated Combustion System Rating For Non-Weatherized Furnaces

Typical Application

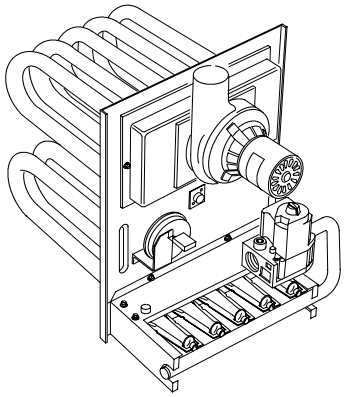


FEATURES

Applications
G24--200 commercial gas fired furnace is applicable to residential, small business or commercial installations. Especially designed to handle air volumes required for larger heating and air conditioning requirements. Quiet belt drive blowers assures low operating sound levels. Lennox C17--090/120 add-on evaporator coil can be easily added to the furnace. Filter box is optional and must be ordered extra. Units are shipped factory assembled with all controls installed and wired less blower drive and motor kits. Each unit is factory test operated to insure proper operation.

Approvals
Units are design certified by A.G.A./C.G.A. Laboratories. Blower data is from unit tests conducted in the Lennox Laboratory air test chamber. Units are approved for conventional vertical venting. Units are developed in accordance with ISO 9001 quality standards.

Dual Tubular Aluminized Steel Heat Exchangers
Tubular heat exchangers are 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 exchangers have been laboratory life cycle tested.



Equipment Warranty
Aluminized steel heat exchanger has a limited warranty for a full ten years. Solid-state ignition modules have a limited warranty for three years. All other covered components have a limited warranty for one year. Refer to the Lennox Equipment Limited Warranty certificate included with the equipment for specific details.

Dual Induced Draft Blowers
Shaded pole heavy duty induced draft blowers prepurge heat exchangers and safely vent flue products. Pressure switches prove blower operation before allowing gas valve to open. Induced draft blowers operate 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.

Dual Gas Control Valves
24 volt redundant combination gas control valve combines a manual main shutoff valve, pressure regulation and automatic electric valve (dual) into one compact combination control.

Direct Spark Ignition
Solid-state electronic direct spark ignition control provides positive and safe main burner ignition. Spark is intermittent and occurs only when required. Separate electronic flame sensor control assures safe and reliable operation. Should loss of flame occur, flame sensor controls will initiate 3 attempts at re-ignition before locking out unit operation for 60 minutes. Ignition control has LED to indicate status and as an aid in troubleshooting. Watchguard circuit automatically resets ignition controls after one hour of continuous thermostat demand after unit lockout, eliminating nuisance calls for service.

FEATURES

Direct Spark Ignition
Solid-state electronic direct spark ignition control provides positive and safe main burner ignition. Spark is intermittent and occurs only when required. Separate electronic flame sensor control assures safe and reliable operation. Should loss of flame occur, flame sensor controls will initiate 3 attempts at re-ignition before locking out unit operation for 60 minutes. Ignition control has LED to indicate status and as an aid in troubleshooting. Watchguard circuit automatically resets ignition controls after one hour of continuous thermostat demand after unit lockout, eliminating nuisance calls for service.

Cabinet
Constructed of heavy gauge painted cold rolled steel. Cabinet surface temperatures are low due to foil faced fiberglass insulation on side and back panels of heat section. Complete service access is accomplished by removing front top access panels and front bottom blower access doors. Safety interlock switches located on blower access doors automatically shut off power to the unit when either door is removed. Gas piping inlets and low voltage electrical knockouts are provided in both sides of cabinet. Units are shipped with bottom return air. Return air entry is also possible on back of cabinet. See dimension drawing. Holes for leveling are furnished in cabinet base, installer must furnish bolts and nuts

Flame Rollout Switches
Dual manual reset switches are furnished as standard and are factory installed on side of each burner box. Switches prevent unit operation in the event combustion products passage through the flueway is reduced or blocked.

Control Box
Control box is located behind left side blower access panel and includes all necessary relays and controls to operate the furnace. Control transformer is furnished with drive kits.

Field Wiring Make-up Box
Two make-up boxes are furnished for line voltage wiring. Boxes may be installed on either side of furnace. Boxes contain all necessary hardware for installation.

Dual Limit Controls
Factory installed and accurately located fixed limit controls provide protection from abnormal operating conditions. Controls are located on heating compartment vestibule panels above each heat exchanger.

Blower Contactor
Furnished as standard. Blower is automatically energized on thermostat demand.

Dual Belt Drive Blowers
Equipped with twin belt drive blowers. All moving parts are mounted on a steel frame secured to blower housing on resilient rubber mounts, assuring quiet and vibration free operation. Motor mount design allows easy belt adjustment and pulley alignment. Blower wheels are statically and dynamically balanced. Adjustable motor pulley allows various speed selection. Bearings are rubber enclosed, self aligning, solid bronze grooved and graphite filled. Large grease cups are furnished for lubrication. Motor and drive kit must be ordered extra. See Drive Kit Selection table.

Transformers
Matching line voltage to 24 volt control transformer with circuit breaker is furnished with drive kit ordered. Matching auto–transformer for combustion air blowers is furnished with drive kit ordered (all except 208/230v kits).

Fan Control
Fan control consists of fixed timed--on delay (30 to 40 seconds) and fixed timed–off delay (100 to120 seconds).

OPTIONAL ACCESSORIES - Must Be Ordered Extra

Thermostat (Optional)
Heating thermostat is not furnished. See Thermostats bulletin in Accessories section and Lennox Price Book. For all-season applications, heating and cooling thermostat is available with the condensing unit.

LPG/Propane Conversion Kit (Optional)
For LPG/propane models two conversion kits are required for field changeover from natural gas. See specifications table for order numbers.

Filter Box (Optional)
Filter box is available for field installation. Box may be installed under furnace for bottom return air or behind furnace for rear return air. Filter access panel on side and front of box allows easy filter maintenance. See dimension drawing. Disposable type filters are furnished as standard. See Specifications table for filter sizes and filter rack order number.

SPECIFICATIONS

Model No.		G24–200
Input Btuh (kW)		200,000 (58.6)
Output Btuh (kW)		160,000 (46.9)
A.G.A./C.G.A. Thermal Efficiency		80.0%
Flue size connection diameter (number) – in. (mm) round		(2) 4 (102)
Temperature rise range – °F (°C)		25 – 55 (14 – 31)
High static certified by A.G.A./C.G.A. – in wg. (Pa)		.90 (224)
Gas Piping Size n.p.t. – Natural (LPG/Propane)		3/4 (1/2)
Blower wheel nominal diameter x width – in. (mm)		(2) 12 x 12 (305 x 305)
Blower pulley bore x diameter – in. (mm)		1 x 10 (25 x 254)
See Drive Kit Selection Table for blower motor, drive and electrical information		
Nominal cooling that can be added – Tons (kW)		7.5 or 10 (26.4 or 35.2)
Shipping weight – lbs. (kg)		460 (209)
Number of packages in shipment		2 (assembled unit – drive kit)
Optional Accessories (Must Be Ordered Extra)		
LPG/Propane kit **(2 kits required)**		LB–69845K **(81J14)**
Filter Box	Catalog No.	**15L02**
	No. & size of filters – in. (mm)	(4) 16 x 25 x 1 (406 x 635 x 25) disposable filter
	Shipping weight – lbs. (kg)	49 (22)

BLOWER DATA

Air Volume cfm (L/s)	Total Static Pressure – in. w.g. (Pa)																	
	.10 (25)		.20 (50)		.30 (75)		.40 (100)		.50 (125)		.60 (150)		.70 (175)		.80 (200)		.90 (225)		1.00 (250)		1.10 (275)	
	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)	RPM	BHP (kW)
2400 (1135)	- - - -		- - - -		535	0.30 (0.22)	600	0.35 (0.26)	665	0.45 (0.34)	720	0.55 (0.41)	755	0.65 (0.48)	825	0.75 (0.56)	875	0.85 (0.63)	920	0.95 (0.71)	965	1.05 (0.78)
2600 (1225)	- - - -		- - - -		545	0.35 (0.26)	610	0.40 (0.30)	670	0.50 (0.37)	725	0.60 (0.45)	780	0.70 (0.52)	830	0.80 (0.60)	875	0.90 (0.67)	920	1.00 (0.75)	965	1.10 (0.82)
2800 (1320)	- - - -		- - - -		560	0.40 (0.30)	620	0.45 (0.34)	680	0.55 (0.41)	735	1.05 (0.48)	785	0.75 (0.56)	835	0.85 (0.63)	880	0.95 (0.71)	925	1.05 (0.78)	965	1.15 (0.86)
3000 (1415)	- - - -		- - - -		570	0.45 (0.34)	630	0.55 (0.41)	690	0.60 (0.45)	740	0.70 (0.52)	790	0.90 (0.60)	840	0.90 (0.67)	865	1.00 (0.75)	930	1.15 (0.86)	970	1.25 (0.93)
3200 (1510)	- - - -		- - - -		585	0.50 (0.37)	640	0.85 (0.45)	685	0.70 (0.52)	750	0.80 (0.60)	800	0.90 (0.67)	845	1.00 (0.75)	890	1.10 (0.82)	935	1.20 (0.90)	975	1.35 (1.34)
3400 (1605)	- - - -		535	0.50 (0.37)	595	0.55 (0.41)	655	0.65 (0.48)	710	0.75 (0.56)	760	0.85 (0.63)	805	0.95 (0.71)	855	1.05 (0.78)	895	1.20 (0.90)	940	1.30 (0.97)	- - - -	
3600 (1700)	- - - -		550	0.55 (0.41)	610	0.65 (0.48)	665	0.75 (0.56)	720	0.85 (0.63)	770	0.95 (0.71)	815	1.05 (0.78)	860	1.15 (0.86)	905	1.25 (0.93)	945	1.40 (1.04)	- - - -	
3800 (1795)	- - - -		570	0.60 (0.45)	625	0.70 (0.52)	680	0.80 (0.60)	730	0.90 (0.67)	780	1.05 (0.78)	825	1.15 (0.86)	870	1.25 (0.93)	910	1.35 (1.01)	955	1.50 (1.12)	- - - -	
4000 (1890)	- - - -		585	0.70 (0.52)	645	0.80 (0.60)	695	0.90 (0.67)	745	1.00 (0.75)	790	1.10 (0.82)	835	1.25 (0.93)	880	1.35 (1.01)	920	1.45 (1.08)	960	1.60 (1.19)	- - - -	
4200 (1980)	550	0.70 (0.52)	605	0.80 (0.60)	660	0.90 (0.67)	710	1.00 (0.75)	760	1.10 (0.82)	805	1.25 (0.93)	850	1.35 (1.01)	890	1.45 (1.08)	930	1.60 (1.19)	970	1.70 (1.27)	- - - -	
4400 (2075)	570	0.80 (0.60)	625	0.90 (0.67)	675	1.00 (0.75)	725	1.10 (0.82)	770	1.20 (0.90)	815	1.35 (1.01)	860	1.45 (1.08)	900	1.60 (1.19)	940	1.70 (1.27)	- - - -		- - - -	
4600 (2170)	590	0.90 (0.67)	645	1.00 (0.75)	695	1.10 (0.82)	740	1.25 (0.93)	785	1.35 (1.01)	830	1.45 (1.08)	870	1.60 (1.19)	**915**	**1.75 (1.31)**	**950**	**1.85 (1.38)**	- - - -		- - - -	
4800 (2265)	610	1.00 (0.75)	660	1.10 (0.82)	710	1.25 (0.93)	755	1.35 (1.01)	800	1.45 (1.08)	845	1.60 (1.19)	**885**	**1.75 (1.31)**	**925**	**1.85 (1.38)**	**965**	**2.00 (1.49)**	- - - -		- - - -	
5000 (2360)	630	1.10 (0.82)	680	1.25 (0.93)	730	1.35 (1.01)	775	1.50 (1.12)	815	1.60 (1.19)	**860**	**1.75 (1.31)**	**900**	**1.90 (1.42)**	**940**	**2.00 (1.49)**	**975**	**2.15 (1.60)**	- - - -		- - - -	

NOTE – All air data is measured external to furnace using rear return air opening without air filters in place.
Bold text indicates 2 H.P. (1.5 kW) drive kits.

DRIVE KIT SPECIFICATIONS

Additive Cooling Tons (kW)	Drive Kit Model No.	Voltage & Phase	Motor Output hp (kW)		[2]Minimum Circuit Ampacity	Motor Pulley (in.) & Groove	Blower Pulley (in.) & Groove	RPM Range	Belt	Shipping Weight lbs. (kg)
			min.	[1]max.						
7.5 or 10 (26.4 or 35.2)	DKG24–200–1	115v–1ph	1.5 (1.1)	1.7 (1.3)	25	7/8 x 4–3/4 – A	1 x 10 – A	535 – 772	A – 52	42 (19)
	DKG24–200–2	230v–1ph			14					42 (19)
	DKG24S–200–3	208/230v–3ph			9					48 (22)
	DKG24S–200–4	460v–3ph			4					48 (22)
	DKG24S–200–5	575v–3ph			3					48 (22)
10 (35.2)	DKG24–200–6	208/230v–3ph	2 (1.5)	2.3 (1.7)	9	7/8 x 6 – A	1 x 10 – A	802 – 977	A – 52	57 (26)
	DKG24–200–7	460v–3ph			4					57 (26)
	DKG24–200–8	575v–3ph			3					57 (26)

[1] Maximum usable output of motors furnished by Lennox are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, keep within the service factor limitations specified on motor nameplate.
[2] At rated voltages shown.
NOTE – All drive kits include matching 24 volt control transformer. All kits (except 208/230v) include matching auto–transformer for combustion air blower operation.

ACCESSORY AIR RESISTANCE

Model		C17–090/120 Coil		Pleated Filter – 1 in. (25 mm)		*Disposable Filter – 1 in. (25 mm)	
cfm	L/s	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa
2400	1135	0.14	35	0.17	42	0.05	12
2600	1225	0.16	40	0.18	45	0.06	15
2800	1320	0.19	47	0.20	50	0.07	17
3000	1415	0.22	55	0.22	55	0.08	20
3200	1510	0.24	60	0.23	57	0.09	22
3400	1605	0.27	67	0.25	62	0.10	25
3600	1700	0.30	75	0.27	67	0.10	25
3800	1795	0.33	82	0.29	72	0.11	27
4000	1890	0.36	90	0.31	77	0.12	30
4200	1980	0.38	95	0.34	85	0.13	32
4400	2075	0.42	104	0.36	90	0.14	35
4600	2170	0.45	112	0.39	97	0.16	40
4800	2265	0.48	119	0.42	104	0.17	42
5000	2360	0.51	127	0.44	109	0.18	45

* Furnished with filter box.

GUIDE SPECIFICATIONS

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

General

Furnish and install a gas–fired up–flow furnace. The unit shall be a standard product of a firm regularly engaged in the manufacture of heating-cooling equipment throughout the United States and Canada.

The installed weight shall not be more than . . . . . lbs. (kg). Unit shall have a width of not more than . . . . . inches (mm), a depth of not more than . . . . . inches (mm) and an overall height of not more than . . . . . inches (mm).

The equipment shall be shipped assembled ready for necessary field connections. Blower motor and pulley shall be shipped separate and field installed.

Heating System

The heating capacity output shall be . . . . . Btuh (kW) with a gas input of . . . . . Btuh (kW).

Dual tubular heat exchangers and inshot type gas burners shall be constructed of aluminized steel. Controls shall consist of direct spark ignition, electronic flame sensor controls, flame rollout switches, limit controls, automatic redundant gas valves and blower prove switches on induced draft blowers. Unit shall be available for use with LPG/propane as an option. Complete service access shall be provided for controls and wiring. Shall be A.G.A. and C.G.A. design certified.

Cabinet

Shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal. Panels shall be insulated with not less than one inch (25mm) thick fiberglass insulation. Openings shall be provided for power entry in bottom and sides of unit. Cabinet shall be equipped with large removable panels providing service access to interior.

Service Access

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

Air Movers

Centrifugal conditioned air blowers shall have statically and dynamically balanced, forwardly curved, double inlet blower wheels, permanently lubricated bearings, adjustable belt drives and be capable of delivering . . . . . cfm (L/s) at an external static pressure of . . . . . .inches water gauge (Pa), requiring not more than . . . . . bhp (W) and . . . . . rpm.

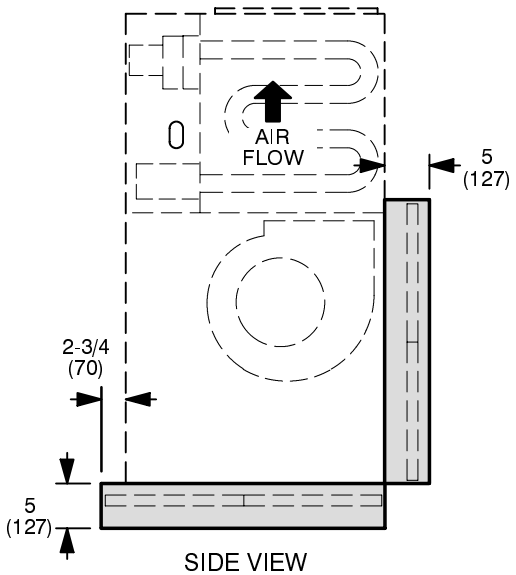
OPTIONAL ACCESSORIES – Must Be Ordered Extra

Filter Box

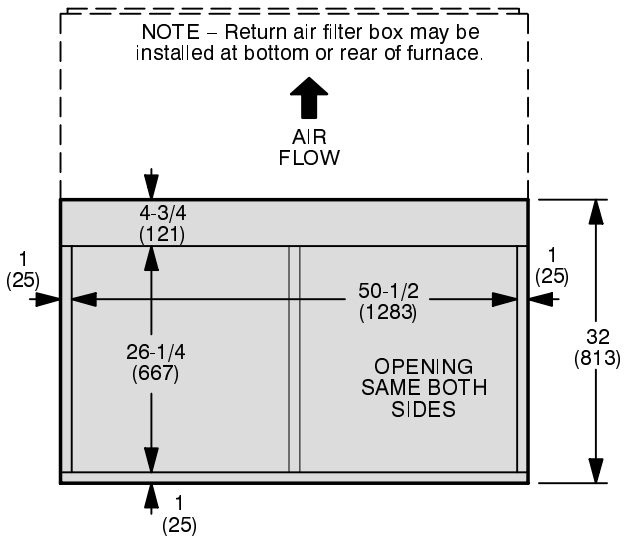
Filter box shall be available for field installation on bottom or rear of furnace. Filter access panel shall be provided ion side and front of box. One inch (25 mm) thick disposable filters furnished shall have not less than . . . . . sq. ft. (m^2) of area.

ACCESSORY DIMENSIONS – inches (mm)

FILTER BOX

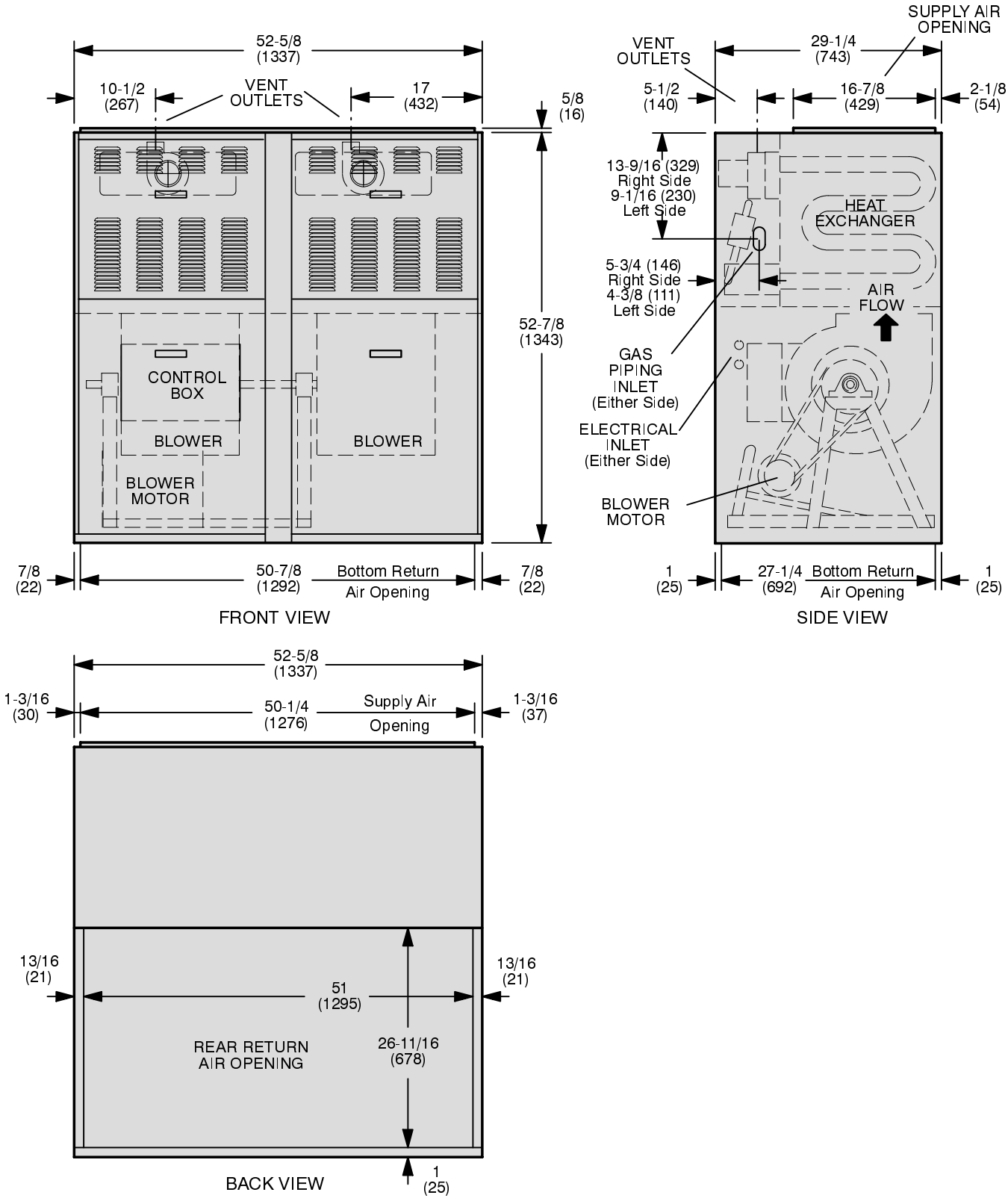


SIDE VIEW



BACK VIEW

DIMENSIONS - inches (mm)



INSTALLATION CLEARANCES - inches (mm)

Sides	0 inches (0 mm)
Rear	0 inches (0 mm)
Top	1 inch (25 mm)
Front	3 inches (76 mm)
Floor	Combustible
Service Clearance (front)	36 inches (914 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 and 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 CAN/CGA-149.2.