

# LENNOX®

## G81-220V UP-FLO GAS FURNACE 220,000 Btuh Input Add-On Cooling — 7-1/2 Thru 11 Nominal Tons

ENGINEERING DATA

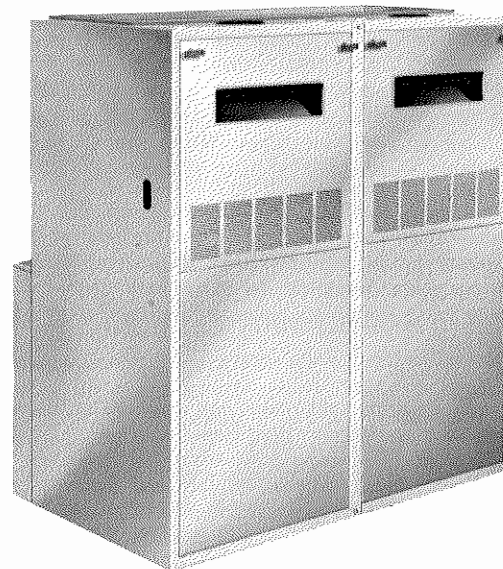
HEATING UNITS

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April 1, 1980

Supersedes 10-15-79

- DURACURVE® Heat Exchanger with LENNOX DURAGLASS II® Coating
- Sulky Blower
- Sized For Air Conditioning
- Extra Large Filter
- Continuous Port Steel Burners
- Low Height Compact Unit
- Crisp Cabinet Lines
- Return Air Choice
- Complete Service Access

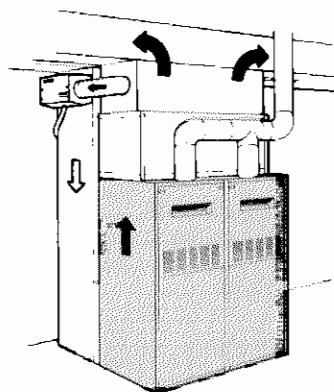


### Up-Flo Gas Furnace Features Dependability and Application Flexibility

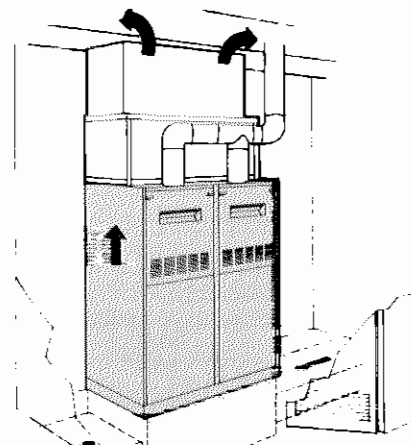
The Lennox G81-220V gas fired up-flo furnace is equally applicable to residential, small business or commercial installations. Especially designed to handle large air volumes required for air conditioning and also supply adequate heating requirements. The spacious cabinet, extra large sulky blower, air filters and compact heat exchanger have been sized to quietly and efficiently supply air conditioning in areas where conditions require more cooling than heating. Traditional Lennox quality is evident in the attractive cabinet with a durable, electro-bonded automobile like paint finish. Die formed panels and doors have a ruggedness and appearance unequalled. A Lennox direct expansion evaporator unit with matching remote condensing unit and automatic

humidifier can easily be added to the up-flo furnace for a complete Total Comfort all season installation. The design of the G81 unit is completely certified by A.G.A. In addition, the unit has been rated and tested according to Department of Energy (D.O.E.) test procedures and Federal Trade Commission (F.T.C.) labeling regulations in the Lennox Research Laboratory. The unit is test operated at the factory insuring proper operation. Blower data is from actual unit tests conducted in the Lennox Laboratory air test chamber. Unit is shipped factory assembled with all controls installed, piped and wired. Filter adaptor box, blower motor and drives are shipped separately. Installer has only to mount thermostat, make duct, vent, gas and electrical supply connections.

### Typical Applications



Basement Installation  
With Cooling Coil & Humidifier.



Closet Installation  
With Cooling Coil;  
Return Air Under Floor.

NOTE — Specifications, ratings and dimensions subject to change without notice.

## FEATURES

**Lennox DURACURVE Heat Exchanger with DURAGLASS II Coating** — Lennox developed heat exchanger eliminates fatigue failure, ticking resonance and cleanability problems. In the unique design of this heat exchanger the sides of the clam section form a flue restriction zone comprised of sections of two concentric cylinders. As the sides grow they expand and move, but in the same direction and at the same rate. The result is perfect combustion, proper venting and absolute freedom of movement for the metal. Design of heat exchanger will allow cleaning with a flexible cleaning tool. Compact construction permits low overall design of the furnace cabinet and smooth lines give minimum resistance to air flow. Life cycle test insures long life of heat exchanger. To insure maximum service life the heavy gauge steel heat exchanger is coated with Lennox DURAGLASS II. It is a porcelainized coating fused to the entire heat exchanger, inside and out. It protects against combustion acids, shrugs off moisture and corrosion, will not burn off, oxidize or peel. In addition, it is a good radiator of heat, helps to spread heat evenly over the heating surfaces for maximum efficiency.

**Steel Burners** — Each burner has four rows of practically continuous ports which result in quiet and clean combustion. A crossover igniter of actual burner ports, perpendicular to the main burner, carries a positive flame from burner to burner to achieve quiet and sure ignition.

**Sulky Blower** — Equipped with twin belt drive sulky blowers. All moving parts are mounted on a rigid steel frame secured to blower housing on resilient rubber mounts assuring quiet operation. Motor mount design allows easy belt adjustment and pulley alignment. Blower wheels are statically and dynamically balanced. Adjustable motor pulley permits various speed adjustments. Bearings are rubber enclosed, self aligning, solid bronze grooved and graphite filled. Large grease cups are furnished for lubrication.

**Rugged Cabinet** — Constructed of heavy gauge cold rolled steel. Interior metal liners and insulation keep outer surface temperatures low. Provisions have been made in cabinet base for leveling. Service access is accomplished by removing furnace and blower compartment access panels. Safety interlock switch, located in blower compartment, automatically cuts power to the unit when blower access panel is removed. Gas piping and electrical inlet knockouts are provided in both sides of cabinet. A choice of return air openings is available in cabinet. Supply air plenum opening matches the supply air opening in add-on Lennox up-flu evaporator units. 7-1/2 thru 11 tons of cooling is available.

**Cabinet and Blower Paint Process** — The cabinet and blower have a special "Electro Deposition" process paint finish. Metal preparation consists of a special 6 station wash metal process. 1 — Spray application of a strong alkaline cleaner. 2 — Spray water rinse. 3 — Spray application of a corrosion resistant, paint bonding iron phosphate compound. 4 — Spray water rinse. 5 — Spray application of a chromic acid. 6 — Spray rinse with "de-ionized" water. After the final rinse the cabinet parts and blower enter a drying oven and are completely dried before receiving the paint finish. They are then completely submerged in the paint vat where the electroplating paint finish is applied. The paint solution and metal are given opposite electrical charges resulting in positive adhesion and even coverage of the paint to the metal surfaces. This process completely covers the entire surfaces, inside and out, including the edges of assembly holes. Following the paint process the finished components enter a high temperature oven where the finish is baked on.

**Automatic Gas Controls** — Silent operating gas controls provide 100% safety shut off. 24 Volt redundant combination gas control valve combines automatic safety pilot, pilot and bleed gas filtration, automatic electric valve (dual) and gas pressure regulation into a compact combination control. Additionally, manual main shut-off valve is included. Dual valve design provides double assurance of 100% close off of gas to the pilot and main burners on each heating cycle. Manual lighted standing pilot provides sure and safe main burner ignition. For LPG specified models a field conversion kit is required and must be ordered extra.

**Fan and Limit Controls** — Factory installed and accurately located fan and limit controls give protection against abnormal operating conditions and controls blower operation.

**Transformer** — 24 Volt control transformer is furnished as standard equipment and factory installed.

**Blower Cooling Relay** — Relay is furnished as standard. Relay activates blower operation during cooling cycle in air conditioning applications.

**Thermostat (Not Furnished)** — Thermostat is optional equipment and must be ordered extra.

**Optional Filter Adaptor Box** — Frame type filters with washable or vacuum cleanable polyurethane media are included with the filter box. Complete access is provided in box for quick and easy service. Filter box field installs under unit for bottom return air or behind unit thru the back panel. See dimension drawing.

## SPECIFICATIONS

Model Number		G81-220V
Input Btuh		220,000
†Output Btuh		166,000
†A.F.U.E.		62.2%
Temperature rise range (°F)		45 — 75
Vent size (in.)		(2) 5 (oval)
High static certified by A.G.A. (in. wg.)		.85
Gas piping size I.P.S. (in.)	Natural	3/4
	††LPG	1/2
Blower wheel nominal diam. x width (in.)		(2) 12 x 12
Blower pulley bore x diam. (in.)		1 x 9 — A
Blower motor horsepower		Choice from drive kit selection table (shipped separately)
Adj. motor pulley bore x diam. (in.)		
Rpm range with drives furnished		
Belt length (in.)		
Tons of cooling that can be added		7-1/2 or 11
*Electrical characteristics (60 Hertz)		115- 230v/1ph, 208-220v/3ph 230-460v/3ph, 440v/3ph
Shipping weight (lbs.)		555
Number of packages in shipment		**3
Filter Box (Optional)	Model No.	LB-19768C
	No. & size of filters (in.)	(4) 16 x 25 x 1
	Shipping weight (lbs.)	49

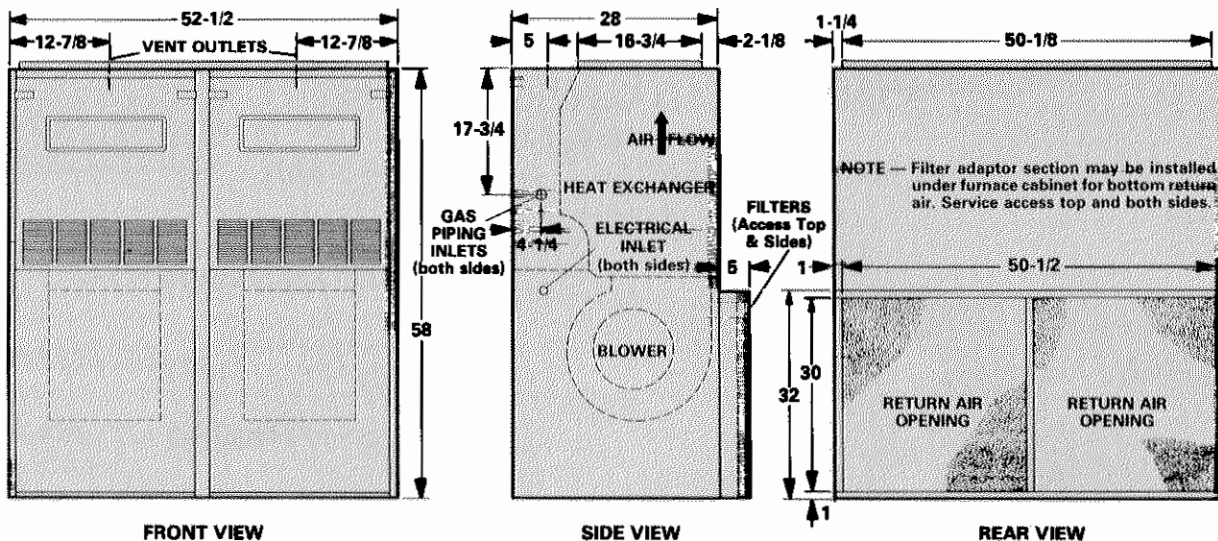
†Annual Fuel Utilization Efficiency based on D.O.E. test procedures and according to F.T.C. labeling regulations.

††For LPG unit a field changeover kit is required and must be ordered extra. Order Kit LB-32672D.

\*Specify voltage and phase when ordering.

\*\*Assembled unit — Drive Kit — Filter Adaptor Box (order separate)

## DIMENSIONS (inches)



### A.G.A. INSTALLATION CLEARANCES

Sides	1 inch
Rear	1 inch
Top	1 inch
Front	6 inches
Floor	Combustible
*Vent	*6 inches

\*This is clearance to all vent pipes except type "B". Type "B" vent clearance as listed by U.L.

NOTE — Air for combustion and ventilation must conform to the methods outlined in American National Standard (ANSI-Z223.1) National Fuel Gas Code.

### 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 value, 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/ft<sup>3</sup>, the unit will require a 16% derate.

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

### BLOWER DATA

#### BLOWER PERFORMANCE

Air Volume (cfm)	STATIC PRESSURE EXTERNAL TO UNIT (Inches Water Gauge)																					
	0		.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2400	370	.22	450	.30	520	.37	580	.45	645	.55	700	.62	750	.72	800	.82	840	.90	880	.96	925	1.05
2600	400	.27	470	.35	535	.42	600	.51	660	.60	710	.70	760	.80	810	.88	850	.96	895	1.05	935	1.12
2800	435	.35	500	.41	565	.50	625	.57	675	.67	725	.76	775	.86	825	.95	860	1.04	905	1.13	945	1.20
3000	470	.40	525	.48	585	.56	645	.65	700	.76	750	.86	790	.94	840	1.05	880	1.14	920	1.23	960	1.32
3200	495	.48	550	.56	610	.62	660	.75	715	.85	765	.95	805	1.05	850	1.13	895	1.24	930	1.33	970	1.42
3400	530	.55	585	.65	635	.75	685	.84	735	.95	780	1.07	825	1.15	870	1.27	910	1.35	945	1.43	985	1.57
3600	565	.67	605	.75	655	.85	705	.97	750	1.06	800	1.17	845	1.28	885	1.37	925	1.45	965	1.57	1000	1.66
3800	585	.73	640	.88	685	.97	730	1.07	775	1.18	820	1.30	865	1.40	900	1.50	940	1.60	980	1.70	1015	1.78
4000	615	.88	660	.98	710	1.10	755	1.20	800	1.32	840	1.40	880	1.52	920	1.64	955	1.72	995	1.83	1030	1.95
4200	645	1.00	695	1.12	735	1.22	780	1.35	820	1.44	860	1.57	900	1.67	940	1.77	975	1.88	1015	2.00	1045	2.10
4400	680	1.16	720	1.23	765	1.37	805	1.50	845	1.60	880	1.70	920	1.80	960	1.92	995	2.02	1030	2.17	1070	2.25
4600	710	1.30	745	1.38	795	1.52	830	1.65	870	1.76	905	1.83	945	2.00	980	2.12	1015	2.20	---	---	---	---
4800	750	1.50	770	1.57	820	1.70	850	1.80	895	1.93	930	2.05	970	2.15	1000	2.26	---	---	---	---	---	---
5000	785	1.65	805	1.77	845	1.85	880	2.00	920	2.12	955	2.22	---	---	---	---	---	---	---	---	---	---

NOTE — All cfm data is measured external to furnace using standard return air opening and with the air filter in place.

### DRIVE KIT SELECTION

Additive Cooling	Drive Kit Model No.	Voltage & Phase	Motor hp	Motor Pulley (in.) & Groove	**Blower Pulley (in.) & Groove	*Rpm Range	Belt	Shipping Wt. (lbs.) 1 package
7-1/2 Tons	DKG81-220-1-9	115-230v/1ph	1	5/8 x 4-3/4 — A	1 x 9 — A	660 — 858	A — 49	38
	DKG81-220-1-10	208-220v/3ph						36
	DKG81-220-1-11	440v/3ph						44
7-1/2 & 11 Tons	DKG81-220-1-5-12	208v/3ph	1-1/2	7/8 x 5-3/8 — A	1 x 9 — A	765 — 960	A — 48	42
	DKG81-220-1-5-13	230-460v/3ph						48
11 Tons	DKG81-220-2-14	208v/3ph	2	7/8 x 6 — A	1 x 9 — A	892 — 1086	A — 49	46
	DKG81-220-2-15	230-460v/3ph						57

\*At 1725 rpm motor speed.

\*\*Factory installed in furnace package and not included in drive kit.