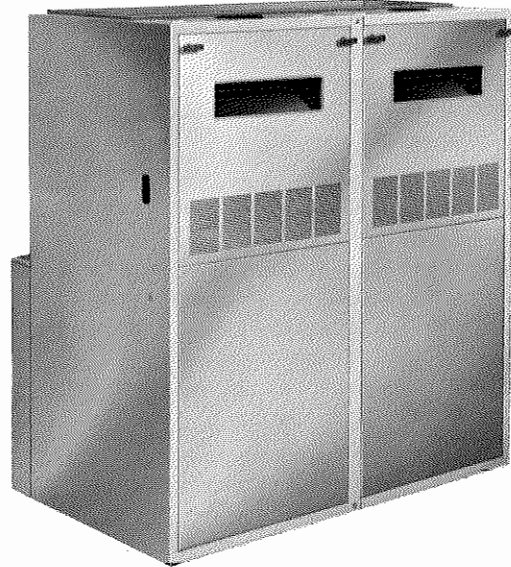




G81-220
UP-FLO GAS FURNACE
 Add-On Cooling — 7-1/2 or 10 Nominal Tons

ENGINEERING DATA
 HEATING UNITS
 GAS
 Page 4
 August 1986
 Supersedes Feb. 1984

- DURACURVE® Aluminized Steel Heat Exchanger
- Dual Belt Drive Blowers
- Sized For Air Conditioning
- Automatic Gas Controls
- Aluminized Steel Burners
- Baked-On Cabinet Paint Finish
- Optional Filter Box
- Return Air Choice
- Complete Service Access
- Factory Assembled

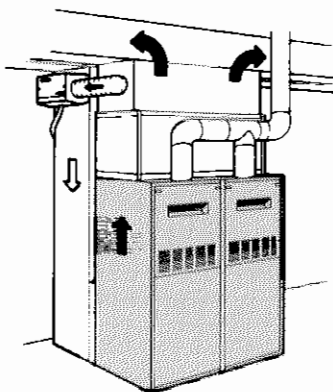


UP-Flo Gas Furnace Features Dependability and Application Flexibility

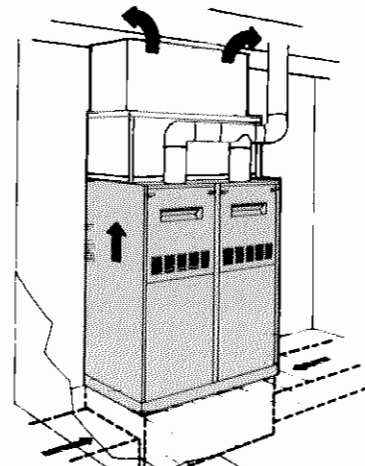
The Lennox G81-220 gas fired up-flo furnace is equally applicable to residential, small business or commercial installations. Especially designed to handle large air volumes required for air conditioning and also supply adequate heating requirements. The spacious cabinet, extra large sulky blower, air 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 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 all season installation. Filter adaptor box and thermostat are not furnished and must be ordered extra. The G81 unit is design certified by A.G.A. and ratings are certified by GAMA. In addition, the unit has been rated and tested according to Department of energy (DOE) test procedures and Federal Trade Commission (FTC) labeling regulations in the Lennox Research Laboratory. 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 make duct, flue, gas and electrical supply connections.

Typical Applications



Basement Installation
 With Cooling Coil & Humidifier.



Utility Room Installation
 With Cooling Coil,
 Return Air Under Floor.

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

FEATURES

DURACURVE Aluminized Steel Heat Exchanger — 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.

Aluminized 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.

Dual Blowers — Equipped with twin belt drive 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. Draft hood is constructed of aluminized steel. 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. Return air duct connection may be made at rear or bottom of cabinet.

Filter Adaptor Box (Optional) — 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. Filter box must be ordered extra, see specification table.

Cabinet and Blower Paint Process — The cabinet panels and blower housing 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 panels and blower housing 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 parts 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 close off of gas to the 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.

SPECIFICATIONS

| Model Number | | G81-220 |
|---|-----------------------------|--|
| Input Btuh | | 220,000 |
| Output Btuh | | 166,000 |
| †A.F.U.E. | | 62.2% |
| Temperature rise range (°F) | | 45 — 75 |
| Flue 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 diameter x width (in.) | | (2) 12 x 12 |
| Blower pulley bore x diameter (in.) | | 1 x 9 — A |
| Blower motor horsepower | | Choice from drive kit selection table (shipped separately) |
| Adj. motor pulley bore x diameter (in.) | | |
| Rpm range with drives furnished | | |
| Belt length (in.) | | 7-1/2 or 10 |
| Tons of cooling that can be added | | |
| *Electrical characteristics (60 Hertz) | | 115-230v/1ph, 208-220v/3ph 230-460v/3ph, 208v/3ph |
| Shipping weight (lbs.) | | 555 |
| Number of packages in shipment | | **3 |
| Filter Box (Optional) | Part No. | LB-19768C |
| | No. & size of filters (in.) | (4) 16 x 25 x 1 |
| | Shipping weight (lbs.) | 49 |

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

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

*Specify voltage and phase when ordering.

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

HIGH ALTITUDE DERATE

Units must be derated when installed at an elevation of 2000 feet or more above sea level. Table shows the derate manifold pressure for high altitude operation with both natural gas and LPG. Operating the unit at manifold pressure specified will insure proper unit heat input at high altitude.

| Elevation Above Sea Level (feet) | Manifold Pressure (in. wc) | | | | | |
|----------------------------------|---|------|------|------|------|------|
| | †Heating Value (Btu/ft ³) Natural Gas | | | | | LPG |
| | 900 | 950 | 1000 | 1050 | 1100 | Only |
| Sea Level — 0 | 4.32 | 3.88 | 3.50 | 3.17 | 2.89 | 10.5 |
| 1000 | 4.32 | 3.88 | 3.50 | 3.17 | 2.89 | 10.5 |
| 2000 | 3.65 | 3.30 | 2.95 | 2.70 | 2.45 | 8.00 |
| 3000 | 3.35 | 3.00 | 2.70 | 2.45 | 2.25 | 7.15 |
| 4000 | 3.05 | 2.75 | 2.45 | 2.25 | 2.04 | 7.40 |
| 5000 | 2.77 | 2.48 | 2.25 | 2.05 | 1.85 | 6.70 |
| 6000 | 2.50 | 2.25 | 2.00 | 1.85 | 1.65 | 6.05 |

†Heating value is based on an atmospheric pressure of 30 inches mercury and temperature at 60°F. Consult your gas utility for the local natural gas heating value.
NOTE - This is the only permissible field derate for the units.

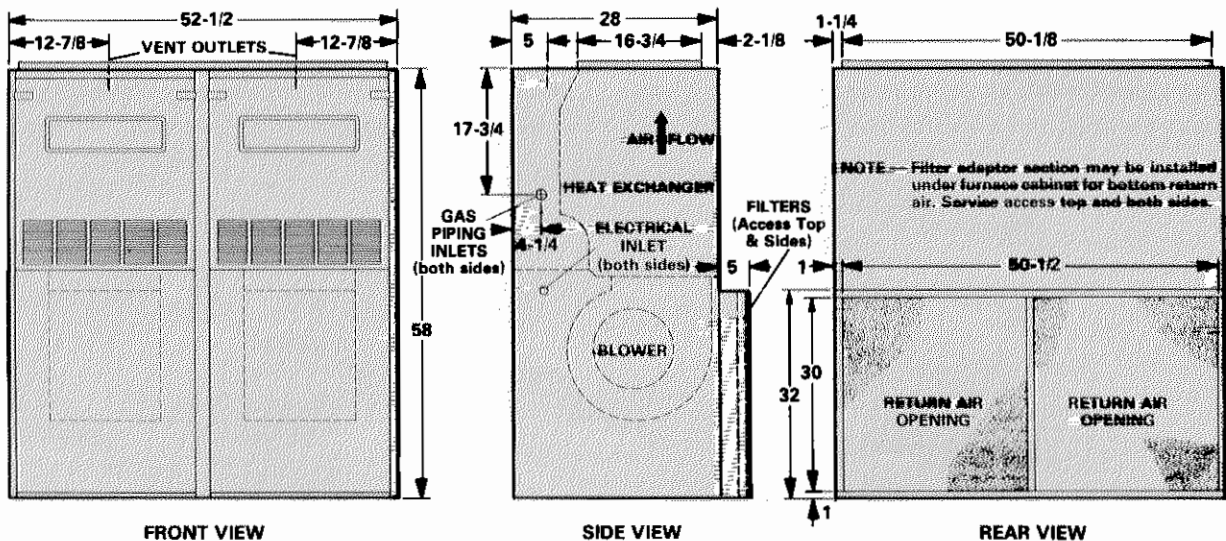
A.G.A. INSTALLATION CLEARANCES

| | |
|-------|-------------|
| Sides | 1 inch |
| Rear | 1 inch |
| Top | 1 inch |
| Front | 6 inches |
| Floor | Combustible |
| *Flue | *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.

DIMENSIONS (inches)



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 | RPM |
| 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 | 1.08 | 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 & 10 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 |
| 10 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.