L - Series

Installation and Service Instructions

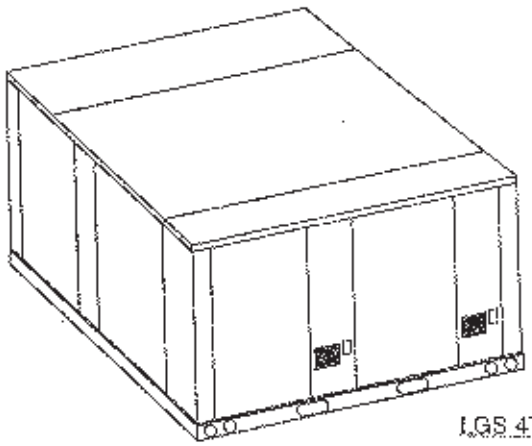
LGS 130

LGS 235

LGS 260

LGS 470

LGS 470D



LGS 470 SHOWN

ROOFTOP GAS HEATING & VENTILATION UNITS
CE CERTIFIED

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RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE

LENNOX®

Lennox LGS Series Gas Heating Data – Models LGS-130 to LGS-470

Natural Gas cat. index 2H: AT, DK, ES, FI, GB, IE, IT, PT, SE. 2ELL: DE 2E(R)B: BE. 2Er: FR (Factory Setting).

Gas Type		LGS 130		LGS 235		LGS 260		LGS 470	
G20		low fire	high fire	low fire	high fire	low fire	high fire	low fire	high fire
input gross	kW	21.8	33.5	39.2	60.3	43.6	67.0	78.3	120.6
input net	kW	19.6	30.2	35.3	54.3	39.2	60.3	70.5	108.5
output	kW	17.4	26.8	31.3	48.2	34.84	53.6	62.66	96.4
Gas cons.	m³/hr	2.07	3.19	3.73	5.74	4.15	6.38	7.46	11.48
press. setting	mbar	3.1	7.4	3.1	7.4	3.1	7.4	3.1	7.4

Natural Gas cat. index 2L: NL (2E(R)B: BE 2Er: FR -G25 SETTING ONLY) - Pressure setting by installer.

Gas Type		LGS 130		LGS 235		LGS 260		LGS 470	
G25		low fire	high fire	low fire	high fire	low fire	high fire	low fire	high fire
input gross	kW	21.8	33.5	39.2	60.3	43.6	67.0	78.3	120.6
input net	kW	19.6	30.2	35.3	54.3	39.2	60.3	70.5	108.5
output	kW	17.4	26.8	31.3	48.2	34.8	53.6	62.7	96.4
Gas cons.	m³/hr	2.41	3.71	4.34	6.68	4.83	7.42	8.68	13.35
press. setting	mbar	4.7	11.6	4.7	11.0	4.7	11.6	4.7	11.0

Propane cat. index 3P: BE, DE, ES, FR, GB, IE, NL, PT, Factory or field conversion

Gas Type		LGS 130		LGS 235		LGS 260		LGS 470	
G31		low fire	high fire	low fire	high fire	low fire	high fire	low fire	high fire
input gross	kW	21.8	30.5	39.2	55.0	43.6	61.0	71.5	110.0
input net	kW	19.6	28.1	35.3	50.6	39.2	56.1	64.4	101.2
output	kW	17.4	24.4	31.3	44.0	34.8	48.8	57.2	88.0
Gas cons.	m³/hr	1.55	2.18	2.80	3.93	3.12	4.36	5.11	7.86
press. setting	mbar	11.0	21.7	11.0	21.7	11.0	21.7	11.0	21.7

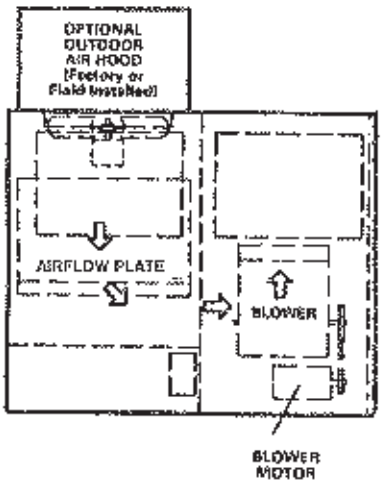
Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

These appliances are suitable for use under the conditions defined by the gas categories listed above for the country of installation.

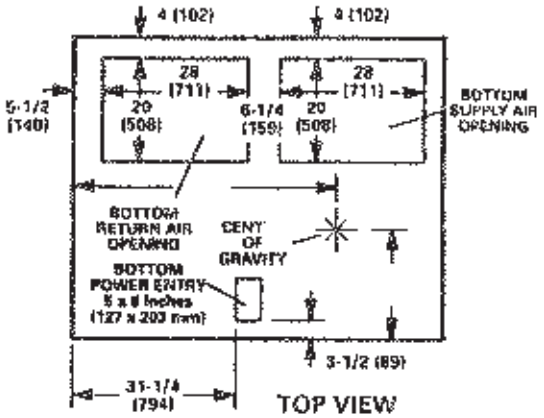
LGS series gas heating units are factory adjusted for 'G20' type natural gas for direct installation in Great Britain, Spain, Italy, Denmark, Ireland, Germany, Belgium and France.

For installation in The Netherlands (cat. I_{2L}) the gas pressure should be adjusted for natural gas type G25 as shown in the table above and the supplied rating plate label should be affixed to the appliance. In Belgium this adjustment may be made if the appliance is installed permanently on a network supplying gas type G25 (Ei). In France this adjustment may be made if supplied with gas type G25 (Fi) BUT the appliance MUST be returned to the factory setting above if it is subsequently supplied with gas type G20 (Es).

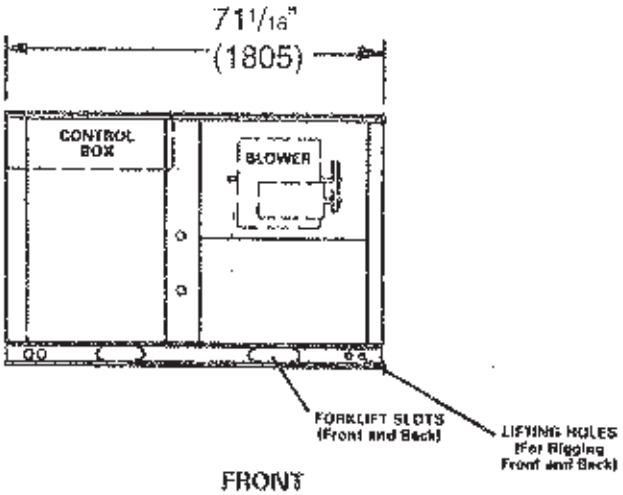
LGS 130 & 235 DIMENSIONS



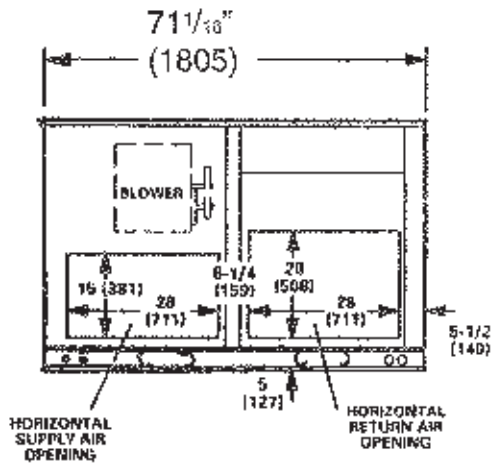
TOP VIEW



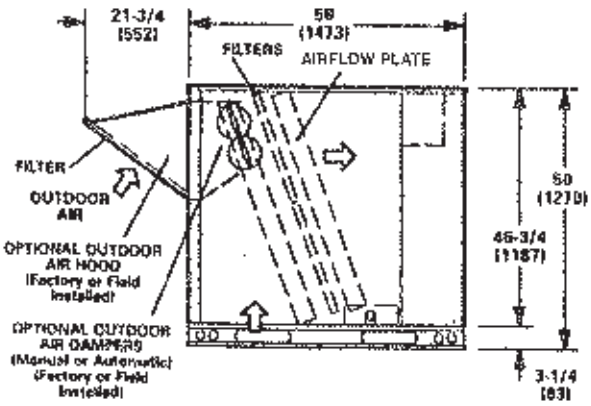
TOP VIEW
Base Section



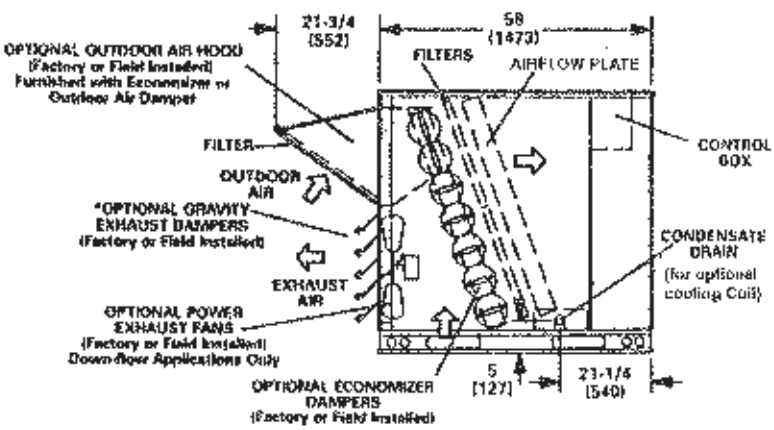
FRONT VIEW



BACK VIEW



LEFT SIDE
(Outdoor Air Dampers)

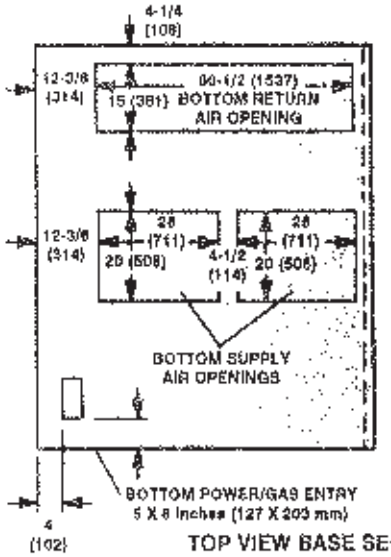


LEFT SIDE
Return Air Section

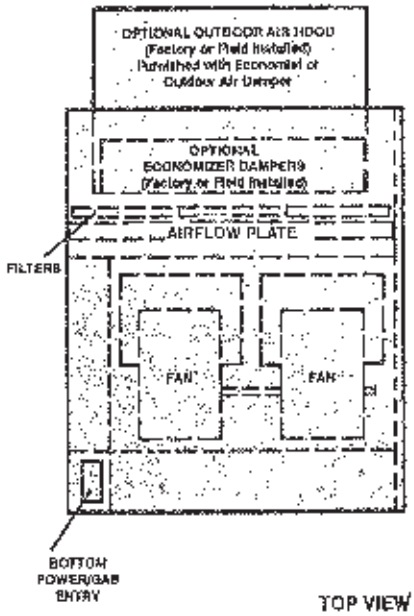
*NOTE — Field Installed in Return Air Duct for Horizontal Applications.

LGS 260 & 470 DIMENSIONS

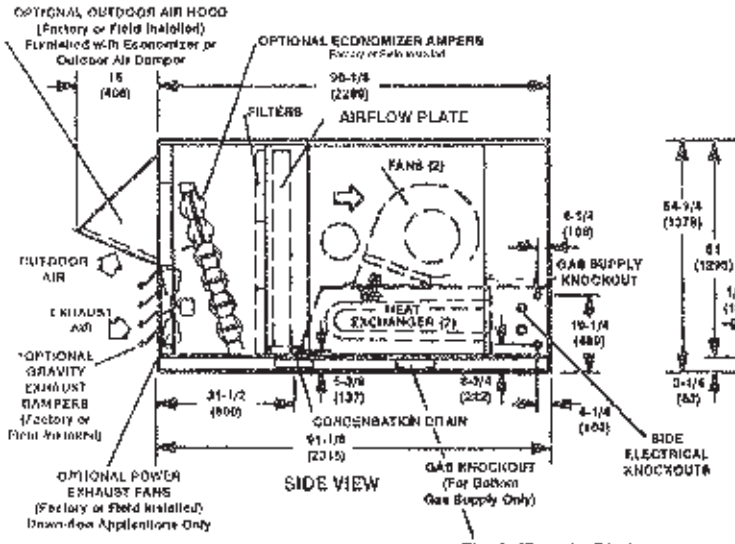
Note: Optional equipment shown for information only. See Engineering Handbook for standard and optional features.

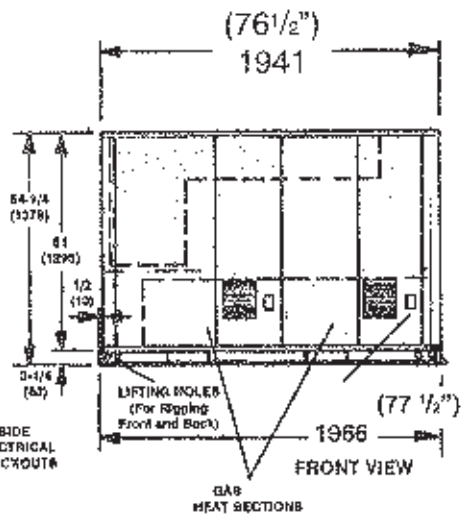


TOP VIEW BASE SECTION



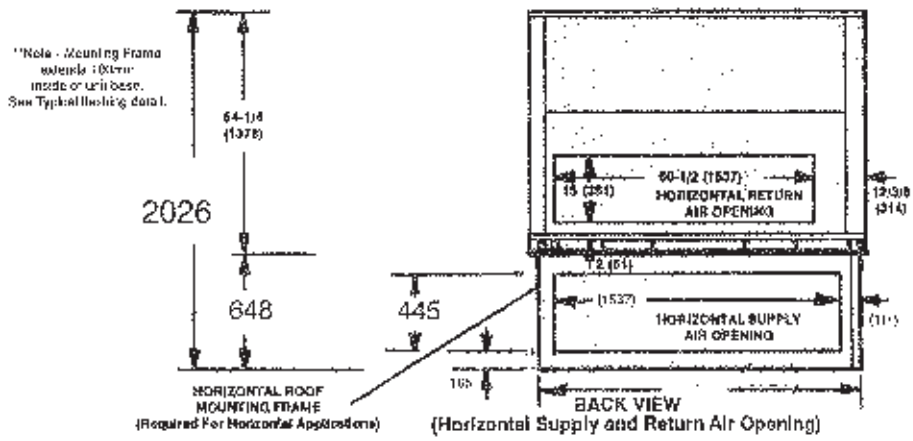
TOP VIEW





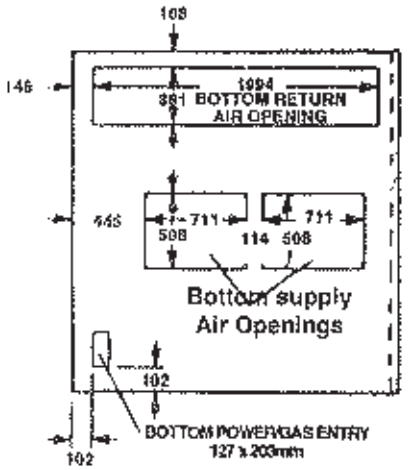
Fork Truck Slots
(4 Sides)

*NOTE - Field Installed In Return Air Duct for Horizontal Applications.

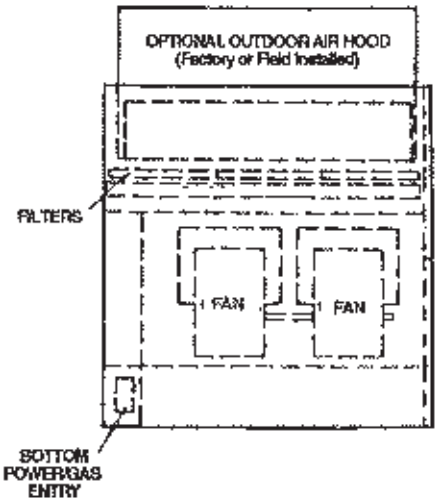


LGS 470D DIMENSIONS

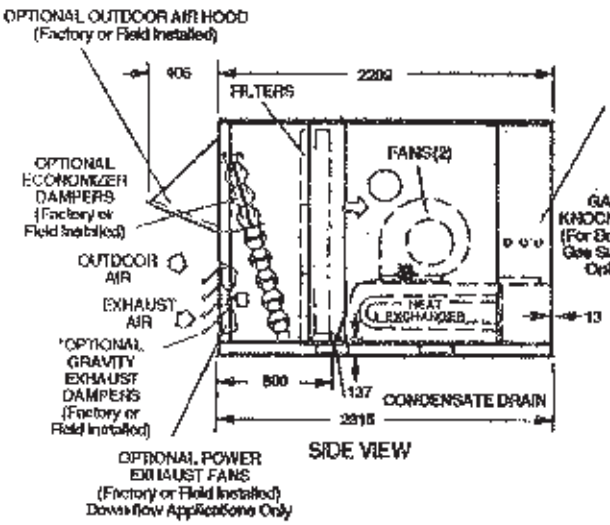
Note: Optional equipment shown for information only. See Engineering Handbook for standard and optional features.



TOP VIEW BASE SECTION

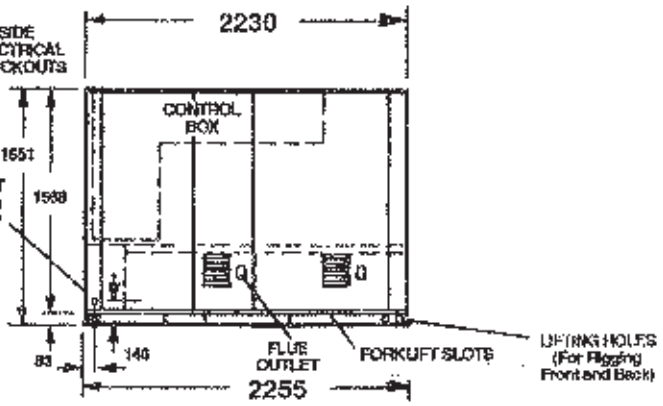


TOP VIEW

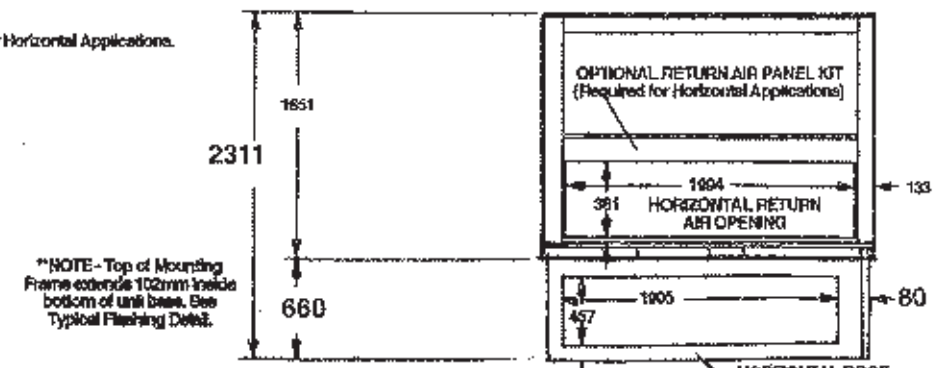


SIDE VIEW

*NOTE - Field installed in Return Air Duct for Horizontal Applications.

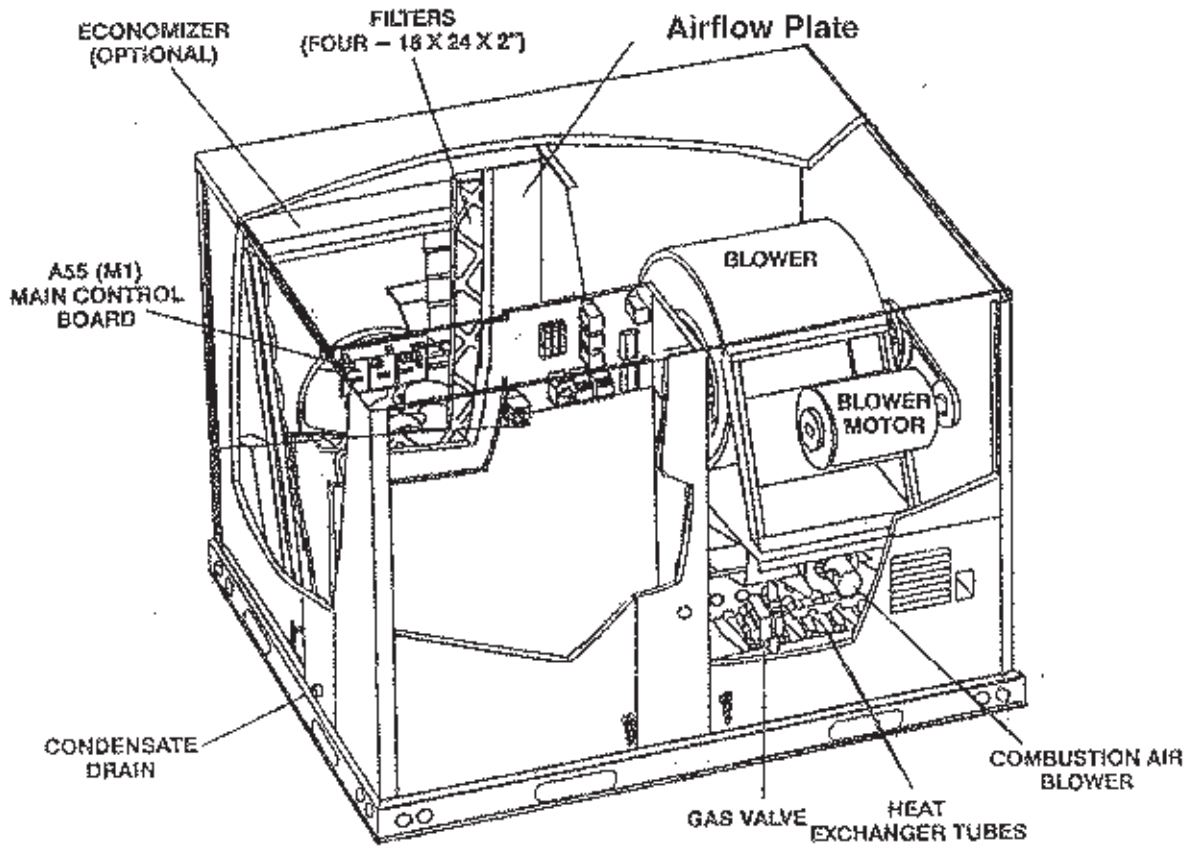


FRONT VIEW

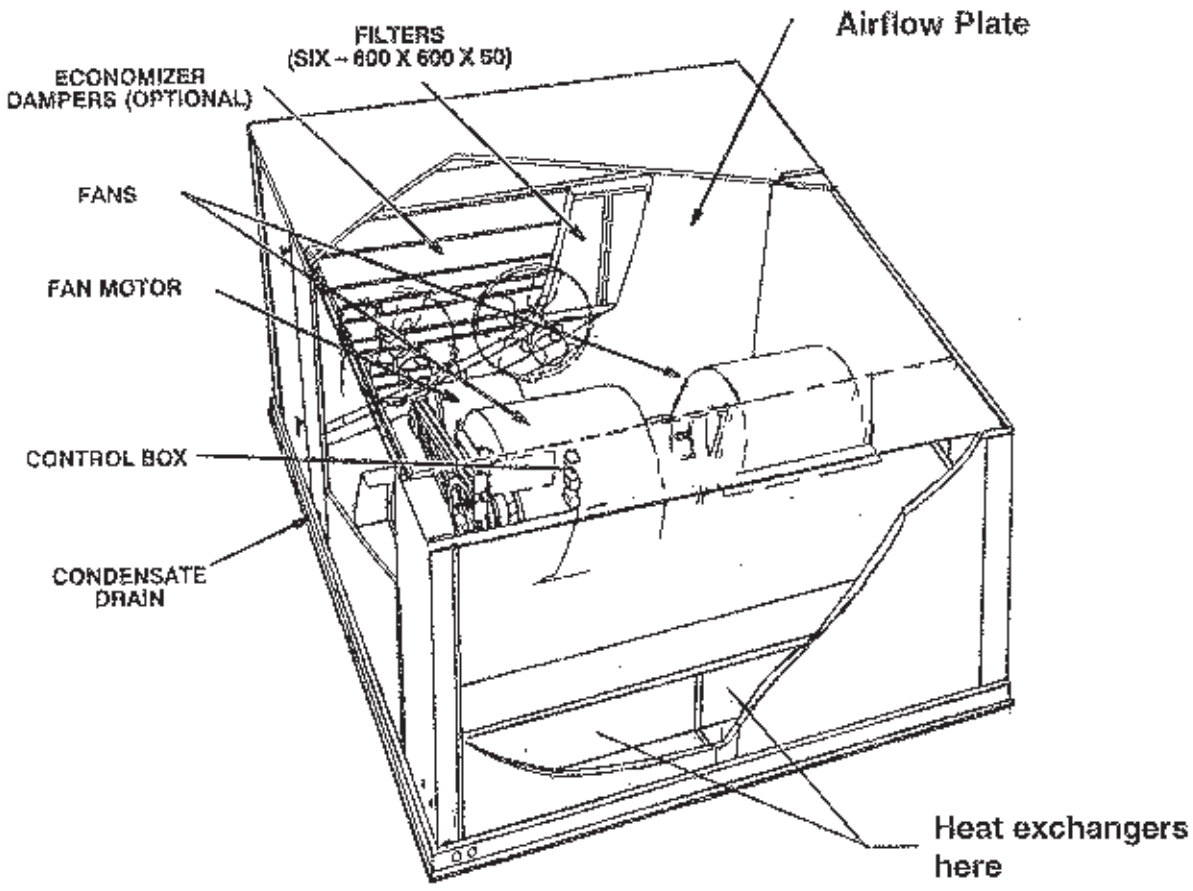


BACK VIEW
(Horizontal Supply and Return Air Opening)

LGS 130 & 235 PARTS ARRANGEMENT



LGS 260, 470 & 470D PARTS ARRANGEMENT



SHIPPING AND PACKING LIST

Package 1 of 1 contains:

1 – Assembled unit

Check unit for shipping damage. Receiving party should contact last carrier immediately if shipping damage is found.

GENERAL

These instructions are intended as a general guide and do not supersede local codes in any way. Authorities having jurisdiction should be consulted before installation.

The LGS series are "CE" certified in accordance with the requirements of the European Gas Appliance Directive.

REQUIREMENTS

See figures 1 and 2 for unit clearances.

NOTE – These units must not be used as a "construction heater" at any time during any phase of construction. Very low return air temperatures, harmful vapours, and misplacement of the filters will damage the unit and its efficiency.

LGS 130 & 235

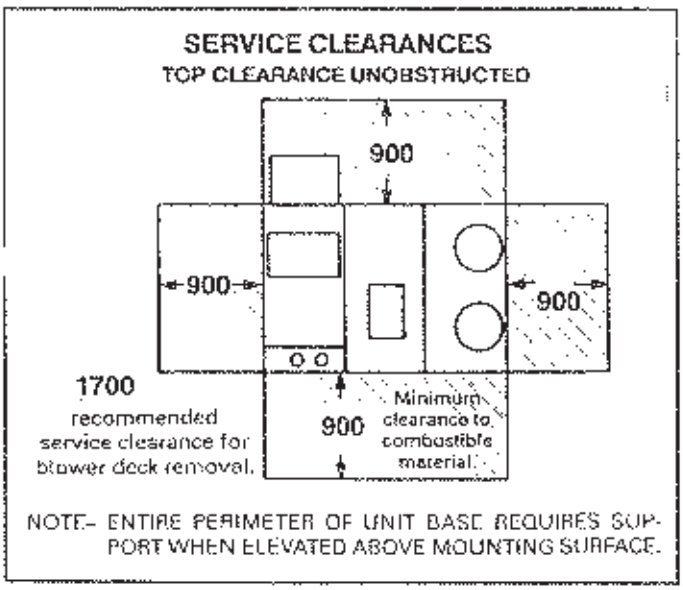


FIGURE 1

⚠ WARNING

This equipment must only be installed and serviced by properly qualified personnel. Equipment contains dangerous voltages and moving parts. Always switch off power supply before opening any access panel. Electrical control panel doors and fan access door must be locked to prevent unauthorised access.

UNIT SUPPORT

In downflow discharge installations, install the unit on a non-combustible surface only. Unit may be installed on combustible surfaces when used in horizontal discharge applications or in downflow discharge applications when installed on an LSRMF roof mounting frame.

NOTE – Securely fasten roof frame to roof per local codes.

A – Downflow Discharge Application

Roof Mounting with LSRMF

1 – The LSRMF roof mounting frame must be installed, flashed and sealed in accordance with the instructions provided with the frame.

2 – The LSRMF roof mounting frame should be square and level to 5mm per linear metre in any direction.

3 – Duct must be attached to the roof mounting frame and not to the unit; supply and return plenums must be installed before setting the unit.

LGS 260, 470 & 470D

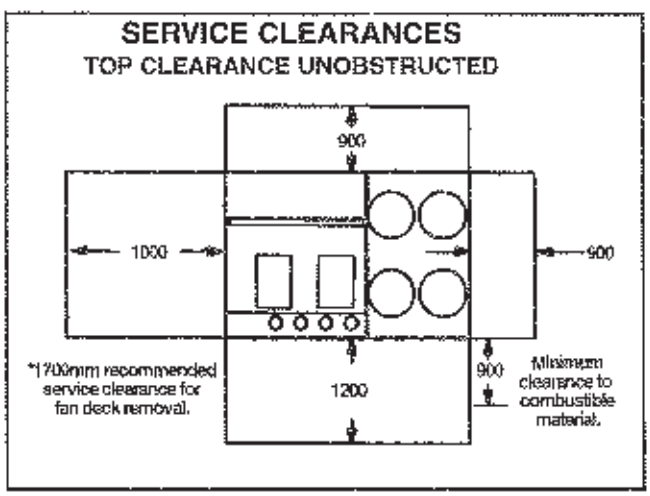


FIGURE 2

UNIT SUPPORT – Continued

Installer's Roof Mounting Frame

Many types of roof frames can be used to install the unit depending upon different roof structures. Items to keep in mind when using the building frame or supports are:

1 – The unit base is fully enclosed and insulated, so an enclosed frame is not required.

2 – The frames or supports must be constructed with non-combustible materials and should be square and level to 5mm per linear metre in any direction.

3 – Frame or supports must be high enough to prevent any form of moisture from entering unit. Recommended minimum frame height is 350mm.

4 – Duct must be attached to the roof mounting frame and not to the unit. Supply and return plenums must be installed before setting the unit.

5 – Units require support along all four sides of unit base. Supports must be constructed of steel or suitably treated wood materials.

NOTE – When installing a unit on a combustible surface for downflow discharge applications, an LARMF roof mounting frame is required.

B – Horizontal Discharge Applications

1 – LGS 130 & 235 units do not require horizontal roof mounting frame, both ducts connect to unit horizontal openings. All units require a horizontal conversion kit to provide the necessary horizontal duct openings and/or bottom opening covers.

56K53 (130 - 235)

38K47 (260 - 470)

38K48 (470D)

2 –260 to 470 units installed in horizontal airflow applications must use an LSRMFH horizontal roof mounting frame. The supply air duct connects to the horizontal supply air opening on the LSRMFH. The return air duct connects to the unit horizontal return air opening. Refer to unit dimensions.

3 – Specified installation clearances must be maintained when installing units. Refer to figures 1 & 2

4 – Top of support slab should be approximately 100mm above the finished grade and located so no run-off water from higher ground can collect around the unit.

5 – Units require support along all four sides of unit base. Supports must be constructed of steel or suitably treated wood materials.

DUCT CONNECTION

All exterior ducts, joints and openings in roof or building walls must be insulated and weather-proofed with flashing and sealing compounds in accordance with applicable codes. Any duct passing through an unconditioned space must be insulated.

⚠ CAUTION

In downflow applications, do not drill or punch holes in base of unit. Leaking in roof may occur if unit base is punctured.

RIGGING UNIT FOR LIFTING

Rig unit for lifting by attaching four cables to holes in unit base rail. See figure 3.

1 – Detach wooden base protection before rigging.

2 – Connect rigging to the unit base using both holes in each corner.

3 – All panels must be in place for rigging.

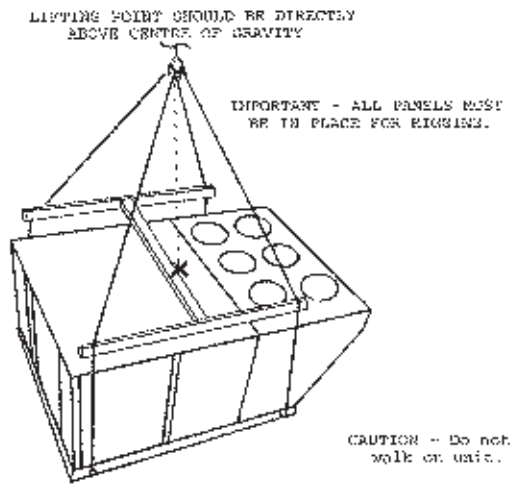
4 – Place field-provided H-style pick in place just above top edge of unit. Frame must be of adequate strength and length. (H-style pick prevents damage to top of unit.)

Note – Lifting frame is not required if four hoisting cables are at least 5m long each.

RIGGING

UNIT	* WEIGHT (Kg)
LGS130	425
LGS 235	455
LGS 260	775
LGS 470	835
LGS 470D	1010

* Maximum weight with all available factory-installed accessories.



Note – Lifting frame is not required if four hoisting cables are at least 5m long each.

FIGURE 3

LENNOX

CONDENSATE DRAINS

UNITS WITH OPTIONAL COOLING COIL ONLY

Make drain connection to the drain coupling provided on unit. A trap must be installed between drain connection and an open vent for proper condensate removal. See figure 4. It is sometimes acceptable to drain condensate onto the roof or grade; however, a tee should be fitted to the trap to direct condensate downward. The condensate line must be vented. Check local codes concerning condensate disposal. Refer to pages 3 to 5 for condensate drain location.

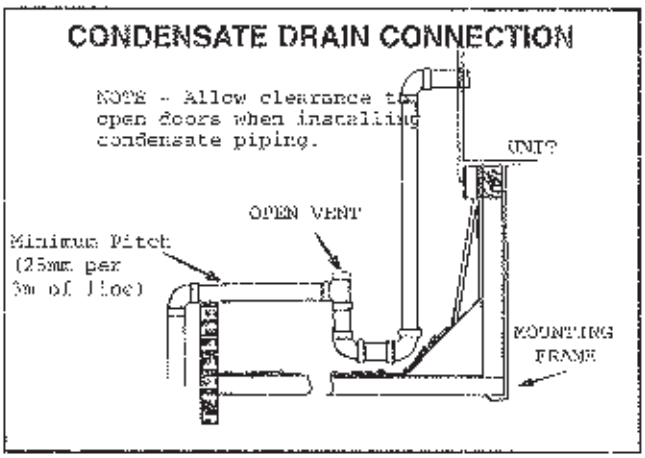


FIGURE 4

GAS PIPING

Before connecting piping, check with gas company or authorities having jurisdiction for local code requirements. When installing gas supply piping, length of run from gas meter must be considered in determining pipe size for 1.2mbar maximum pressure drop. Do not use supply pipe smaller than unit gas connection. For natural gas units, operating pressure at the unit gas connection must be within 5 mbar of nominal supply pressure.

When making piping connections a drip leg may be installed on vertical pipe runs to serve as a trap for sediment or condensate. A plugged tap in field piping accessible for test gauge connection may be required upstream of gas supply connection to the unit. Install a ground joint union between the gas control manifold and the main manual shut-off valve. See figure 5 for gas supply piping entering outside the unit. Adapt existing piping as shown in figure 6 for bottom gas entry. Figure 6 shows complete bottom gas entry piping.

Compounds used on threaded joints of gas piping shall be resistant to the action of liquified petroleum gases.

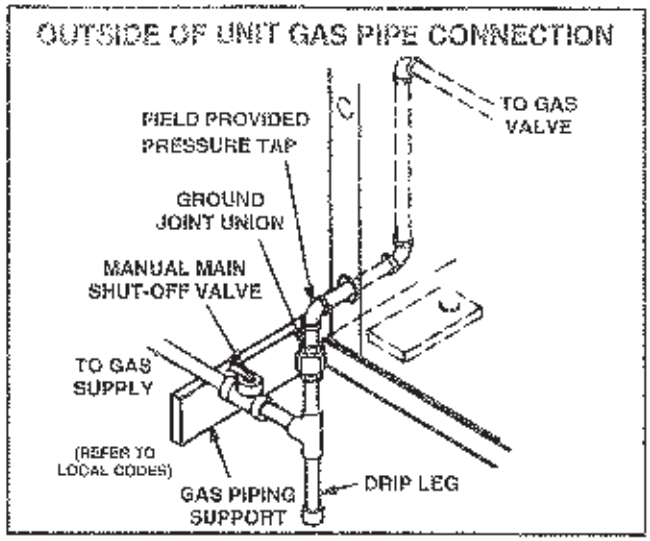


FIGURE 5

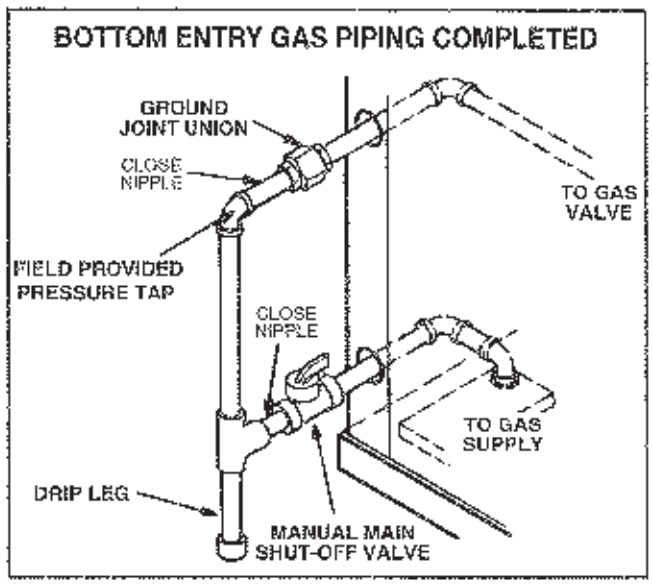


FIGURE 6

PRESSURE TEST GAS PIPING

When pressure testing gas lines, the gas valve must be disconnected and isolated. Gas valves can be damaged if subjected to more than 60 mbar. See figure 7.

If the test pressure is equal to or to less than 60 mbar, use the main manual shut-off valve before pressure testing to isolate the furnace from the gas supply system.

NOTE -- Codes may require that manual main shut-off valve and union (furnished by installer) be installed in gas line external to unit. Union must be of the ground joint type.

After all connections have been made, check all piping connections for gas leaks. Use a soap solution or other preferred means. Do not use matches candles or other sources of ignition to check for gas leaks.

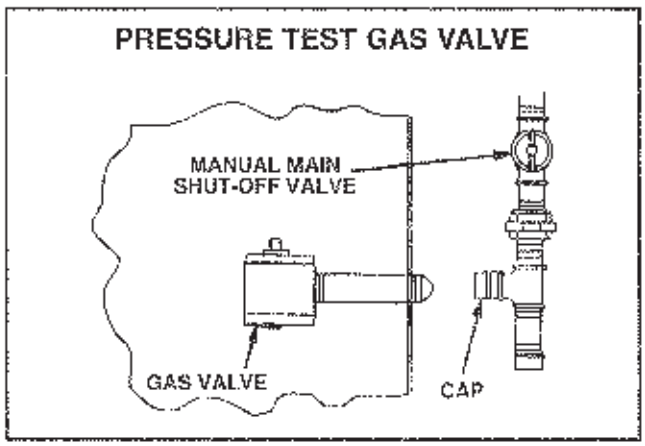


FIGURE 7

⚠ CAUTION

Some soaps used for leak detection are corrosive to certain metals. Carefully rinse piping thoroughly after leak test has been completed. Do not use matches, candles, flame or other sources of ignition for gas leaks.

NOTE – In case emergency shut down is required, turn off the main manual shut-off valve and disconnect main power to unit. These devices should be property labeled by the installer.

FACTORY-INSTALLED OPTIONS

A – Economizer

The A56 EM1 economizer board controls economizer operation and provides potentiometers to control minimum damper position and enthalpy control adjustments. The economizer board is positioned on the A55 (M1) main control board in the unit control box. See the Integrated Modular Control Guide for economizer operation and adjustments.

ELECTRICAL CONNECTIONS

POWER SUPPLY

- not apply power or switch on the isolator until installation is complete. Refer to start-up directions. Refer closely to unit wiring diagram.

Refer to unit nameplate for minimum circuit ampacity and maximum fuse size.

Route power through the bottom power entry area and connect to line side of unit disconnect or circuit breaker. If unit does not contain optional controls package, connect power wiring to TB13 terminal block. See unit wiring diagram.

CONTROL WIRING

A – Thermostat Location

P -om thermostat mounts vertically on any non-conductive flat surface.

Locate thermostat approximately 1.5m above the floor in an area with good air circulation at average temperature. Avoid locating the room thermostat where it might be affected by:

- drafts or dead spots behind doors and in corners
- hot or cold air from ducts
- radiant heat from sun or appliances
- concealed pipes and chimneys

B – Control Wiring

1 – Route thermostat cable or wires from subbase through knockout provided in unit. Use 1.0mm² wire for all applications using remotely installed electro-mechanical and electronic thermostats.

2 – Install thermostat assembly in accordance with instructions provided with thermostat. See figure 11 for field wiring electronic and electro-mechanical thermostats. If using other temperature control

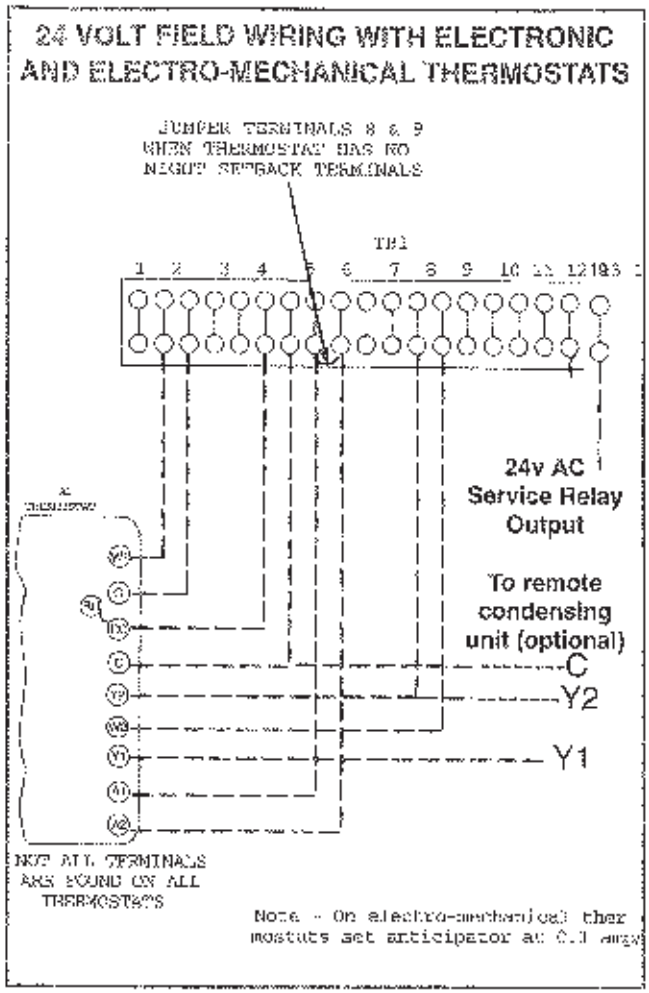


FIGURE 10

2 – Install thermostat assembly in accordance with instructions provided with thermostat. See figure 10 for field wiring electronic and electro-mechanical thermostats. If using other temperature control devices or energy management systems see instructions and wiring diagram provided by manufacturer.

IMPORTANT – Terminal connections at the wall plate or subbase must be made securely. Loose control wire connections may allow unit to operate but not with proper response to room demand.

FAN OPERATION AND ADJUSTMENTS

A – Fan Operation

Initiate fan demand at thermostat according to instructions provided with thermostat. Unit will cycle on thermostat demand. The following steps apply to applications using a typical electro-mechanical thermostat.

1 – Fan operation is manually set at the thermostat subbase fan switch. With fan switch in **ON** position, fans will operate continuously.

2 – With fan switch in **AUTO** position, the fans will cycle with demand. Fans and entire unit will be off when system switch is in **OFF** position.

B – Fan Access

1 – Disconnect jack/plug connector to fan motor. Also disconnect jack/plug connector heating limit switches.

2 – Remove screws on either side of fan assembly sliding base. See figure **11**.

3 – Pull base toward outside of unit.

C – Determining Supply Air Volume

1 – If an optional cooling coil is fitted, the following measurements must be made with a dry coil. Run fan without a cooling demand. Air filters must be in place when measurements are taken.

2 – With all access panels in place, measure static pressure external to unit (from supply to return).

3 – Measure the indoor fan motor RPM.

4 – Referring to table 4, use static pressure and RPM readings to determine air volume. Use table 3 when installing units with any of the optional accessories listed.

5 – The fan RPM can be adjusted at the motor pulley. Loosen Allen screw and turn adjustable pulley clockwise to increase airflow. Turn counterclockwise to decrease airflow. See figure 11.

FAN ASSEMBLY (260/470/470D shown)

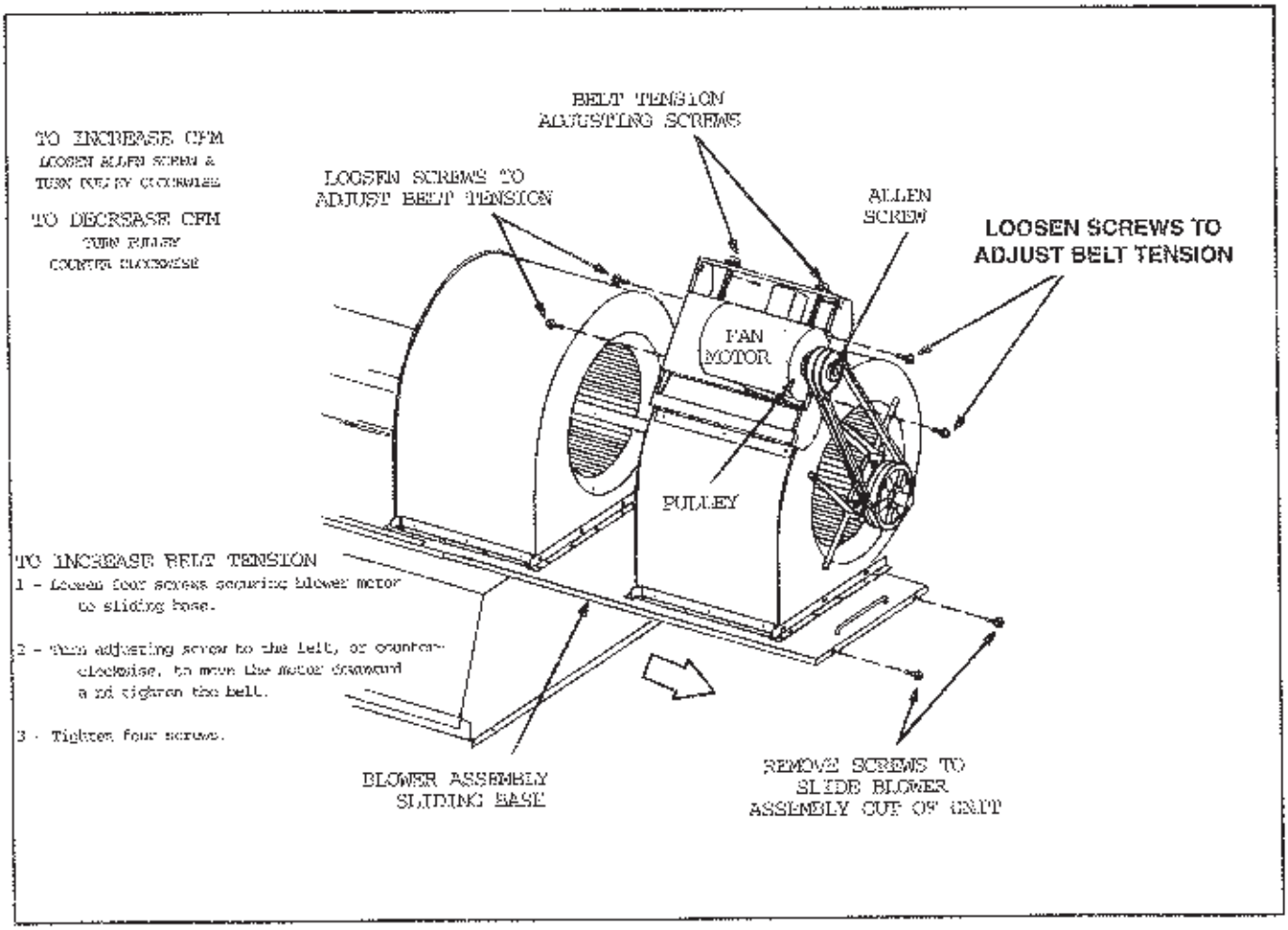


FIGURE 11

– Continued –

D – Fan Belt Adjustment

Maximum life and wear can be obtained from belts only if proper pulley alignment and belt tension are maintained. Tension new belts after a 24–48 hour period of operation. This will allow belt to stretch and seat grooves.

1 – Loosen four screws securing fan motor to sliding base. See figures 11 or 13.

2 – *To increase belt tension –*
Turn belt tension adjusting screw to the left, or counterclockwise, to tighten the belt. This increases the distance between the fan motor and the fan housing.

To loosen belt tension –
Turn the adjusting screw to the right, or clockwise to loosen belt tension.

3 – Tighten four screws securing fan motor to sliding base once adjustments have been made.

E – Check Belt Tension

Overtensioning belts shortens belt and bearing life. Check belt tension as follows:

1 – Measure span length X. See figure 12.

2 – Apply perpendicular force to centre of span (X) with enough pressure to deflect belt 1.5mm per 100mm of span length.

Example: Deflection distance of a 400mm span would be 6mm.

3 – Measure belt deflection force. For a used belt, the deflection force should be 32N (3.2kgF). A new belt deflection force should be 48N (4.8kgF).

A force below these values indicates an undertensioned belt. A force above these values indicates an overtensioned belt.

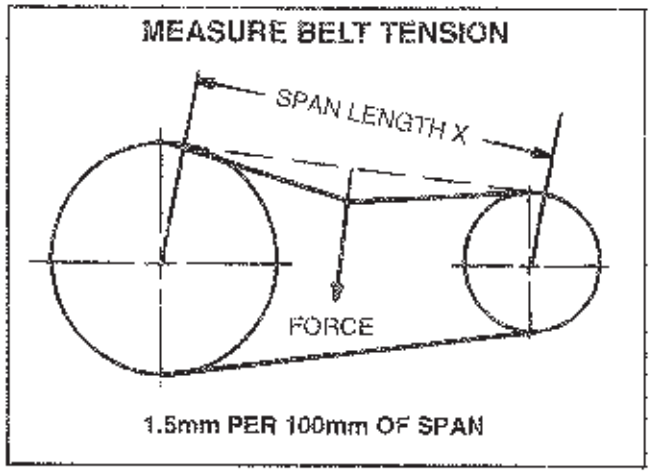


FIGURE 12

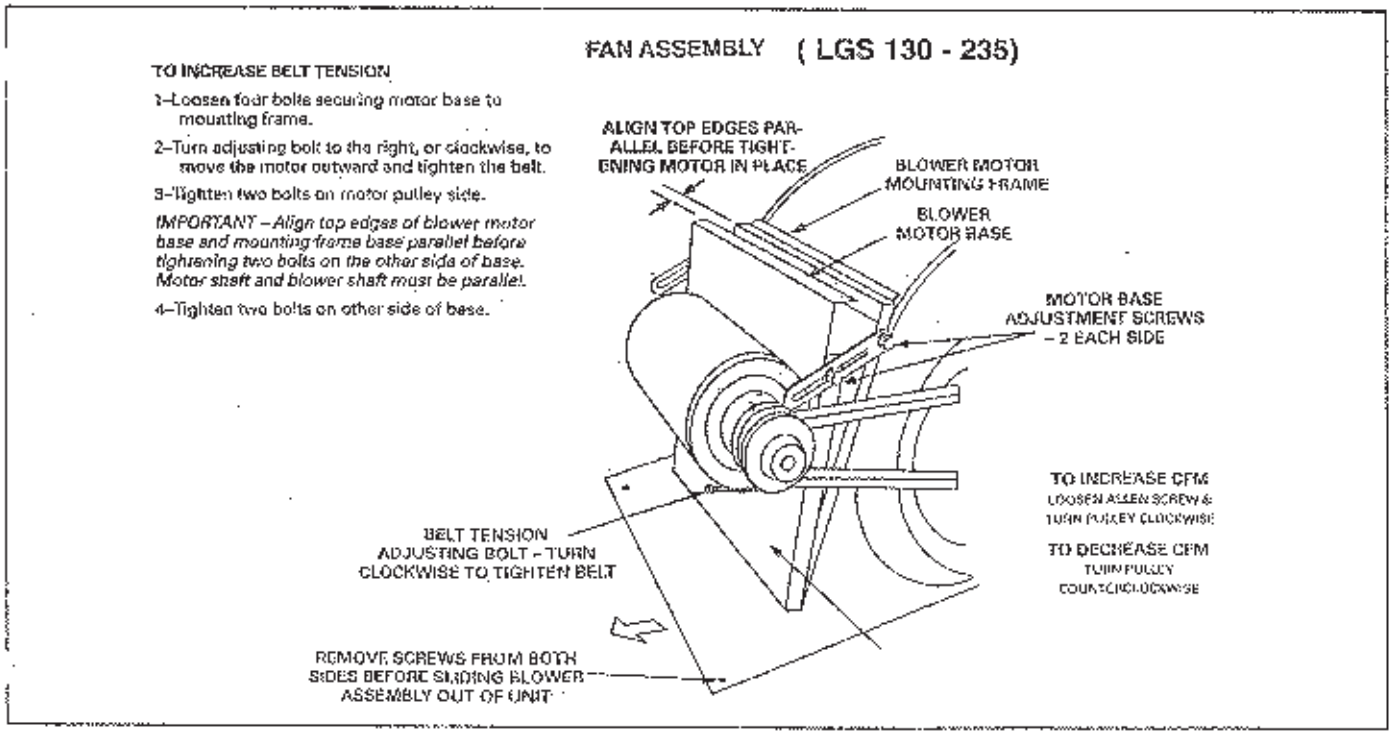


FIGURE 13

TABLE 2

DRIVE KIT PART NUMBER & SPEED RANGE (LOWEST / HIGHEST)

Unit Model No.	Motor Outputs		DRIVE KIT PART NUMBER & SPEED RANGE (LOWEST / HIGHEST)					
	hp	kW	Drive 1	Drive 2	Drive 3	Drive 4	Drive 5	Drive 6
'B' Box LGS 190 & 235 ONLY	2	1.5	LDK10/15-1 562/764	–	LDK10/15-3 739/925	–	LDK10/15-5 917/1152	–
	3	2.2	–	–	–	STD DRIVE 750/938	–	LDK10/15-6(5) 930/1169
	5	3.7	–	LDK10/15-2 561\776	–	LDK10/15-4(5) 739/924	–	LDK10/15-6 916/1151
'C' Box LGS 280 & 470,	3	2.2	–	LDK18/24-2(3) 570/755	LDK18/24-3(3) 710/870	LDK18/24-4(3) 790/990	–	–
	5	3.7	–	LDK18/24-2 570/755	LDK18/24-3 710/870	STD DRIVE 790/990	–	–
	7.5	5.6	–	–	–	–	LDK18/24-5 790/990	LDK18/24-6 870/1070
'D' Box LGS 470D ONLY	5	3.7	STD ON 300 630/790 LDK36-1 630/790	LDK30-2 710/900 LDK36-2 710/900	–	–	–	–
	7.5	5.6	–	–	LDK30-3 710/870 STD ON 360 710/870	–	LDK30-5(7.5) 830/980 LDK36-5(7.5) 830/980	–
	10	7.5	–	–	–	LDK30-4 700/840 LDK36-4 700/840	LDK30-5(10) 870/1020 LDK36-5(10) 870/1020	–

FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE

Air Volume		Gas Heat Exchanger (LGA Models)		Economizer
cfm	L/s	Low Fire	High Fire	
2250	1060	.05 (12)	.09 (22)	.035 (9)
2500	1180	.05 (12)	.11 (27)	.04 (510)
2750	1300	.06 (15)	.13 (32)	.045 (11)
3000	1415	.07 (17)	.16 (40)	.05 (12)
3250	1535	.08 (20)	.19 (47)	.06 (15)
3500	1650	.09 (22)	.22 (55)	.07 (17)
3750	1770	.10 (25)	.26 (65)	.075 (19)
4000	1890	.11 (27)	.30 (75)	.08 (20)
4250	2005	.12 (30)	.34 (85)	.09 (22)
4500	2125	.13 (32)	.38 (94)	.10 (25)
4750	2240	.14 (35)	.42 (104)	.11 (27)
5000	2360	.16 (40)	.47 (117)	.12 (30)
5250	2475	.18 (45)	.52 (129)	.13 (32)
5500	2595	.20 (50)	.57 (142)	.14 (35)
5750	2715	.22 (55)	.62 (154)	.15 (37)
60000	2830	.24 (60)	.68 (169)	.16 (40)

TABLE 3(B) **LGS 260 - 470**

FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE

Air Volume		Gas Heat Exchanger (LGA Models)		Economizer	Horizontal Roof Mounting Frame
cfm	L/s	Low Fire	High Fire		
4500	2125	.05 (12)	.09 (22)	.05 (12)	.07 (17)
4750	2240	.05 (12)	.10 (25)	.05 (12)	0.8 (20)
5000	2360	.05 (12)	.11 (27)	.06 (15)	.08 (20)
5250	2475	.06 (15)	.12 (30)	.06 (15)	.09 (22)
5500	2595	.06 (15)	.13 (32)	.06 (15)	.10 (25)
5750	2715	.06 (15)	.14 (35)	.07 (17)	.11 (27)
6000	2830	.07 (17)	.15 (37)	.07 (17)	.11 (27)
6250	2950	.07 (17)	.16 (40)	.08 (20)	.12 (30)
6500	3065	.08 (20)	.17 (42)	.08 (20)	.13 (32)
6750	3185	.08 (20)	.18 (45)	.08 (20)	.14 (35)
7000	3305	.09 (22)	.19 (47)	.09 (22)	.15 (37)
7250	3420	.09 (22)	.20 (50)	.09 (22)	.16 (40)
7500	3540	.10 (25)	.21 (52)	.10 (25)	.17 (42)
7750	3655	.10 (25)	.23 (57)	.10 (25)	.18 (45)
8000	3775	.11 (27)	.24 (60)	.11 (27)	.19 (47)
8250	3895	.11 (27)	.25 (62)	.11 (27)	.20 (50)
8500	4010	.12 (30)	.26 (65)	.12 (30)	.21 (52)
8750	4130	.12 (30)	.28 (70)	.12 (30)	.22 (55)
9000	4245	.13 (32)	.29 (72)	.13 (32)	.24 (60)
9250	4365	.14 (35)	.31 (77)	.14 (35)	.25 (62)
9500	4485	.14 (35)	.32 (80)	.14 (35)	.26 (65)
9750	4600	.15 (37)	.34 (85)	.15 (37)	.27 (67)
10,000	4720	.16 (40)	.35 (87)	.16 (40)	.29 (72)

TABLE 3(C) LGS 470D

FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE

Air Volume		Gas Heat Exchanger (LGA Models)		Economizer	Horizontal Roof Mounting Frame
cfm	L/s	Low Fire	High Fire		
7500	3540	.15 (37)	.25 (62)	.02 (5)	.11 (27)
8000	3775	.17 (42)	.28 (70)	.02 (5)	.13 (32)
8500	4010	.20 (50)	.31 (77)	.03 (7)	.15 (37)
9000	4245	.22 955)	.34 (85)	.04 (10)	.17 (42)
9500	4485	.24 (50)	.38 (94)	.04 (10)	.19 (47)
10,000	4720	.27 (67)	.42 (104)	.05 (12)	.21 (52)
10,500	4955	.30 (75)	.46 (114)	.06 (15)	.24 (60)
11,000	5193	.33 (92)	.50 (137)	.07 (17)	.27 (67)
11,500	5424	.37 (92)	.55 (137)	.08 (20)	.30 (75)
12,000	5665	.40 (99)	.60 (149)	.10 (25)	.33 (82)
12,500	5900	.44 (109)	.65 (162)	.11 (27)	.37 (92)
13,000	6135	.48 (119)	.70 (174)	.13 (32)	.40 (99)
13,5000	6370	.53 (132)	.76 (189)	.14 (35)	.44 (109)
14,0000	6605	.57 (142)	.82 (204)	.16 (40)	.49 (122)
14,5000	6845	.62 (154)	.89 (221)	.18 (45)	.53 (132)
15,0000	7080	.68 (169)	.96 (296)	.21 (52)	.58 (144)

BURNER CONTROL LED FLASH CODES

1. Normal operation, no demand for heat: LED flashes slowly (approx. 1 flash per secondindicating presence of power and normal control function).
2. Normal operation, demand for heat: LED flashes quickly (approx. 2 per second)
3. Ignition control internal fault: LED steady ON
4. False flame signal: 5 quick flashes repeated until reset.
5. High limit trip: 4 quick flashes repeated until reset.
6. Pressure switch open: 3 quick flashes repeated until switch closes.
7. Flame failure: 2 quick flashes repeated until reset.

Codes 4 to 7 will normally be accompanied by error 58 (burner 1) or 68 (burner 2) on the IMC control indicating that the burner has failed to operate during a heat demand. Repeated locking-out & resetting of ignition control can cause error 59 (burner 1) or 69 (burner 2) to be displayed requiring reset at the IMC control.

TABLE 4(A)

LGS 130 - 235 BASE UNIT BLOWER PERFORMANCE

NOTES – BLOWER PERFORMANCE TABLE INCLUDES INTERNAL RESISTANCE FOR LGS 130 BASE UNIT ONLY.

1)All data is measured with filters in place.

FOR OTHER UNITS, OR BASE UNIT WITH OPTIONS/ACCESSORIES

TOTAL STATIC PRESSURE = TOTAL ADDED INTERNAL STATIC PRESSURE + TOTAL ADDED EXTERNAL STATIC PRESSURE.

TO DETERMINE *TOTAL ADDED INTERNAL STATIC PRESSURE*: For design air volume, determine total air resistance for

1) wet indoor coil of selected unit, if fitted plus

2) all selected factory installed options (heat section, economizer, etc.) and field installed accessories (horizontal roof frame, diffuser, etc.).

NOTE – BOLD INDICATES FIELD FURNISHED DRIVE.

Unshaded area denotes 2 hp (1.5kW) blower motor. | Light shaded area denotes 3 hp (2.2 kW) blower motor. | Dark shaded area denotes 5 hp (3.7 kW) blower motor.

Air Volume cfm (m3/s)	TOTAL STATIC PRESSURE EXTERNAL TO UNIT – Inches Water Gauge (Pa)																			
	.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)		2.00 (495)		2.20 (545)	
	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)
2250 (1.05)	455	0.30 (0.22)	555	0.45 (0.34)	640	0.60 (0.45)	720	0.80 (0.60)	795	1.00 (0.75)	865	1.20 (0.90)	915	1.40 (1.04)	975	1.60 (1.19)	1030	1.85 (1.38)	1080	2.05 (1.53)	1130	2.30 (1.72)
2500 (1.20)	475	0.40 (0.30)	575	0.55 (0.41)	660	0.70 (0.52)	735	0.90 (0.67)	805	1.10 (0.82)	870	1.30 (0.97)	930	1.55 (1.16)	985	1.75 (1.31)	1040	2.00 (1.49)	1090	2.25 (1.68)	1140	2.50 (1.87)
2750 (1.30)	495	0.45 (0.34)	595	0.65 (0.48)	675	0.85 (0.63)	750	1.05 (0.78)	820	1.25 (0.93)	885	1.45 (1.08)	940	1.70 (1.27)	995	1.90 (1.42)	1050	2.20 (1.64)	1100	2.45 (1.83)	1145	2.65 (1.98)
3000 (1.40)	525	0.55 (0.41)	615	0.75 (0.56)	695	0.95 (0.71)	770	1.20 (0.90)	835	1.40 (1.04)	895	1.60 (1.19)	955	1.85 (1.38)	1010	2.10 (1.57)	1065	2.35 (1.75)	1115	2.65 (1.98)	1160	2.90 (2.16)
3250 (1.55)	550	0.65 (0.48)	640	0.90 (0.67)	715	1.10 (0.82)	790	1.35 (1.01)	855	1.60 (1.19)	915	1.80 (1.34)	970	2.05 (1.53)	1025	2.25 (1.75)	1075	2.60 (1.94)	1125	2.85 (2.13)	----	
3500 (1.65)	580	0.80 (0.60)	665	1.05 (0.78)	740	1.25 (0.93)	810	1.50 (1.12)	870	1.75 (1.31)	930	2.00 (1.49)	985	2.25 (1.68)	1040	2.55 (1.90)	1095	2.85 (2.13)	1145	3.15 (2.35)	----	
3750 (1.75)	605	0.95 (0.71)	690	1.20 (0.90)	760	1.45 (1.06)	830	1.70 (1.27)	890	1.95 (1.45)	950	2.25 (1.68)	1005	2.50 (1.87)	1055	2.80 (2.09)	1105	3.10 (2.31)	1150	3.35 (2.50)	----	
4000 (1.90)	635	1.10 (0.82)	715	1.40 (1.04)	785	1.65 (1.23)	850	1.90 (1.42)	910	2.20 (1.64)	965	2.45 (1.83)	1020	2.70 (2.05)	1070	3.00 (2.25)	1120	3.35 (2.50)	----		----	
4250 (2.00)	665	1.30 (0.97)	740	1.60 (1.19)	810	1.85 (1.38)	870	2.15 (1.60)	930	2.45 (1.83)	985	2.75 (2.05)	1040	3.05 (2.28)	1090	3.35 (2.50)	1135	3.65 (2.72)	----		----	
4500 (2.15)	695	1.50 (1.12)	770	1.80 (1.34)	835	2.10 (1.57)	895	2.40 (1.79)	955	2.70 (2.01)	1005	3.00 (2.24)	1060	3.35 (2.50)	1105	3.65 (2.72)	----		----		----	
4750 (2.25)	725	1.75 (1.31)	795	2.05 (1.53)	860	2.40 (1.79)	920	2.70 (2.01)	975	3.00 (2.24)	1030	3.35 (2.50)	1080	3.65 (2.72)	1125	3.95 (2.95)	----		----		----	
5000 (2.35)	760	2.05 (1.53)	825	2.45 (1.83)	885	2.65 (1.98)	945	3.00 (2.24)	1000	3.35 (2.50)	1050	3.65 (2.72)	1100	4.00 (2.98)	1145	4.30 (3.21)	----		----		----	
5250 (2.50)	790	2.30 (1.72)	855	2.75 (2.05)	910	2.95 (2.20)	970	3.35 (2.50)	1025	3.65 (2.72)	1070	4.00 (2.98)	1120	4.35 (3.24)	----		----		----		----	
5500 (2.60)	820	2.60 (1.94)	880	2.95 (2.20)	940	3.30 (2.46)	995	3.70 (2.76)	1045	4.05 (3.02)	1095	4.40 (3.28)	1145	4.80 (3.58)	----		----		----		----	
5750 (2.70)	850	2.85 (2.12)	910	3.30 (2.46)	965	3.70 (2.76)	1020	4.05 (3.02)	1070	4.45 (3.32)	1120	4.80 (3.58)	1165	5.20 (3.88)	----		----		----		----	
6000 (2.85)	885	3.35 (2.50)	940	3.70 (2.76)	995	4.10 (3.06)	1045	4.50 (3.36)	1095	4.85 (3.62)	1145	5.25 (3.92)	----		----		----		----		----	

TABLE 4(B)

FAN DATA – BASE UNITS – LGS 260 - 470

Air Volume cfm (m3/s)	TOTAL STATIC PRESSURE EXTERNAL TO UNIT – Inches Water Gauge (Pa)																									
	.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)		2.00 (495)		2.20 (545)		2.40 (595)		2.60 (645)		2.80 (695)		3.00 (745)	
	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)
4500 (2.10)	*405*	*0.55 (0.41)*	*510*	*0.80 (0.60)*	*605*	*1.10 (0.85)*	690	1.40 (1.04)	760	1.70 (1.27)	825	2.05 (1.53)	885	2.35 (1.75)	*945*	*2.70 (2.01)*	*995*	*3.00 (2.24)*	1045	3.35 (2.50)	1095	3.70 (2.76)	1140	4.05 (3.02)	1185	4.45 (3.32)	1225	4.75 (3.54)	1265	5.15 (3.84)
4750 (2.25)	*410*	*0.60 (0.45)*	*515*	*0.85 (0.63)*	*610*	*1.20 (0.90)*	690	1.50 (1.12)	765	1.85 (1.38)	830	2.15 (1.60)	890	2.50 (1.87)	*945*	*2.85 (2.13)*	1000	3.20 (2.39)	1050	3.55 (2.65)	1100	3.90 (2.91)	1145	4.30 (3.21)	1185	4.60 (3.43)	1230	5.00 (3.73)	1270	5.40 (4.03)
5000 (2.35)	*415*	*0.65 (0.48)*	*520*	*0.95 (0.71)*	*615*	*1.25 (0.93)*	695	1.60 (1.19)	770	1.95 (1.45)	835	2.30 (1.72)	895	2.65 (1.98)	*950*	*3.00 (2.24)*	1005	3.40 (2.54)	1055	3.75 (2.80)	1100	4.10 (3.06)	1145	4.45 (3.32)	1190	4.85 (3.62)	1235	5.25 (3.92)	1275	5.65 (4.22)
5250 (2.50)	*415*	*0.70 (0.52)*	*525*	*1.00 (0.75)*	*620*	*1.35 (1.01)*	700	1.70 (1.27)	775	2.10 (1.57)	840	2.45 (1.83)	900	2.80 (2.09)	955	3.15 (2.35)	1010	3.55 (2.35)	1060	3.95 (2.95)	1105	4.30 (3.21)	1150	4.70 (3.51)	1195	5.10 (3.81)	1235	5.55 (4.14)	1275	5.95 (4.44)
5500 (2.60)	*420*	*0.75 (0.56)*	*525*	*1.05 (0.78)*	*625*	*1.45 (1.08)*	705	1.85 (1.38)	775	2.20 (1.64)	845	2.60 (1.94)	905	2.95 (2.20)	960	3.35 (2.50)	1010	3.70 (2.76)	1060	4.10 (3.06)	1100	4.55 (3.39)	1155	4.95 (3.69)	1200	5.35 (3.99)	1240	5.75 (4.29)	1280	6.15 (4.59)
5750 (2.70)	*425*	*0.80 (0.60)*	*535*	*1.15 (0.86)*	*630*	*1.55 (1.16)*	710	1.95 (1.45)	780	2.35 (1.75)	845	2.70 (2.01)	905	3.10 (2.31)	965	3.55 (2.65)	1015	3.90 (2.91)	1065	4.25 (3.17)	1115	4.75 (3.54)	1160	5.15 (3.84)	1205	5.60 (4.18)	1245	6.00 (4.48)	1285	6.45 (4.81)
6000 (2.85)	*430*	*0.85 (0.63)*	*540*	*1.25 (0.93)*	*630*	*1.65 (1.23)*	715	2.05 (1.53)	785	2.45 (1.83)	850	2.85 (2.13)	910	3.30 (2.46)	965	3.70 (2.76)	1020	4.10 (3.06)	1070	4.55 (3.39)	1120	5.00 (3.73)	1165	5.40 (4.03)	1205	5.90 (4.33)	1250	6.40 (4.80)	1290	6.85 (5.04)
6250 (2.95)	*435*	*0.95 (0.71)*	*545*	*1.35 (1.01)*	*635*	*1.75 (1.31)*	720	2.20 (1.64)	790	2.60 (1.94)	855	3.05 (2.28)	915	3.45 (2.57)	970	3.90 (2.91)	1020	4.35 (3.25)	1075	4.75 (3.54)	1120	5.20 (3.88)	1165	5.65 (4.21)	1210	6.10 (4.55)	1255	6.55 (4.89)	1295	7.05 (5.26)
6500 (3.06)	*440*	*1.00 (0.75)*	*550*	*1.45 (1.08)*	*640*	*1.85 (1.38)*	720	2.30 (1.72)	795	2.75 (2.05)	860	3.20 (2.39)	920	3.65 (2.72)	975	4.10 (3.06)	1025	4.55 (3.39)	1080	5.00 (3.73)	1125	5.45 (4.07)	1170	5.90 (4.40)	1215	6.35 (4.74)	1255	6.80 (5.07)	1295	7.30 (5.45)
6750 (3.20)	*445*	*1.10 (0.82)*	*555*	*1.55 (1.16)*	*645*	*2.00 (1.49)*	725	2.45 (1.83)	800	2.90 (2.16)	865	3.45 (2.57)	925	3.85 (2.87)	980	4.30 (3.21)	1030	4.75 (3.54)	1085	5.20 (3.88)	1130	5.70 (4.25)	1175	6.15 (4.59)	1220	6.65 (4.96)	1260	7.10 (5.30)	1300	7.55 (5.63)
7000 (3.30)	*450*	*1.15 (0.86)*	*560*	*1.65 (1.23)*	*650*	*2.10 (1.57)*	730	2.60 (1.94)	805	3.10 (2.30)	870	3.55 (2.65)	930	4.05 (3.02)	985	4.60 (3.36)	1035	4.95 (3.69)	1085	5.45 (4.02)	1135	5.95 (4.44)	1180	6.45 (4.81)	1225	6.95 (5.18)	1265	7.40 (5.52)	1305	7.90 (5.89)
7250 (3.40)	*460*	*1.25 (0.93)*	*565*	*1.75 (1.31)*	*655*	*2.25 (1.68)*	735	2.75 (2.05)	810	3.25 (2.42)	870	3.70 (2.76)	930	4.20 (3.13)	990	4.70 (3.51)	1040	5.20 (3.88)	1090	5.70 (4.25)	1140	6.20 (4.63)	1185	6.70 (5.00)	1225	7.20 (5.37)	1270	7.75 (5.78)	1310	8.25 (6.16)
7500 (3.55)	*465*	*1.35 (1.01)*	*570*	*1.85 (1.38)*	*660*	*2.35 (1.75)*	740	2.90 (2.16)	810	3.40 (2.54)	875	3.90 (2.91)	935	4.40 (3.28)	990	4.90 (3.66)	1045	5.45 (4.07)	1095	5.95 (4.44)	1140	6.45 (4.81)	1185	6.95 (5.18)	1230	7.50 (5.60)	1275	8.05 (6.01)	1315	8.60 (6.42)
7750 (3.65)	*470*	*1.45 (1.08)*	*575*	*2.00 (1.49)*	*665*	*2.50 (1.87)*	745	3.05 (2.28)	815	3.55 (2.66)	880	4.10 (3.06)	940	4.60 (3.43)	995	5.15 (3.84)	1045	5.70 (4.25)	1100	6.20 (4.63)	1145	6.70 (5.00)	1190	7.25 (5.41)	1235	7.80 (5.82)	1280	8.35 (6.23)	----	----
8000 (3.80)	*480*	*1.60 (1.19)*	*585*	*2.15 (1.60)*	*675*	*2.70 (2.01)*	750	3.20 (2.39)	820	3.75 (2.80)	885	4.30 (3.21)	945	4.85 (3.62)	1000	5.35 (3.99)	1050	5.95 (4.44)	1100	6.50 (4.85)	1150	7.00 (5.22)	1195	7.55 (5.63)	1240	8.10 (6.04)	----	----	----	----
8250 (3.90)	*485*	*1.70 (1.27)*	*590*	*2.25 (1.68)*	*680*	*2.85 (2.15)*	755	3.35 (2.50)	825	3.95 (2.95)	890	4.50 (3.36)	950	5.05 (3.76)	1005	5.60 (4.18)	1060	6.20 (4.63)	1105	6.70 (5.00)	1155	7.30 (5.45)	1200	7.85 (5.86)	1245	8.45 (6.30)	----	----	----	----
8500 (4.00)	*490*	*1.80 (1.34)*	*595*	*2.40 (1.79)*	685	3.00 (2.24)	760	3.55 (2.24)	830	4.10 (3.06)	895	4.70 (3.51)	955	5.30 (3.96)	1010	5.90 (4.40)	1060	6.40 (4.77)	1110	7.00 (5.22)	1160	7.60 (5.67)	1205	8.20 (6.12)	----	----	----	----	----	----
8750 (4.15)	*500*	*1.90 (1.42)*	*600*	*2.50 (1.87)*	690	3.15 (2.35)	765	3.75 (2.80)	835	4.30 (3.21)	900	4.95 (3.69)	960	5.55 (4.14)	1015	6.10 (4.55)	1065	6.70 (5.00)	1115	7.30 (5.45)	1165	7.95 (5.93)	1210	8.50 (6.34)	----	----	----	----	----	----
9000 (4.25)	*505*	*2.05 (1.53)*	*610*	*2.70 (2.01)*	695	3.30 (2.46)	770	3.90 (2.91)	840	4.55 (3.39)	905	5.15 (3.84)	965	5.75 (4.29)	1020	6.40 (4.77)	1070	6.95 (5.18)	1125	7.60 (5.67)	1165	8.15 (6.08)	----	----	----	----	----	----	----	----
9250 (4.35)	*515*	*2.20 (1.64)*	*615*	*2.85 (2.15)*	700	3.50 (2.62)	775	4.10 (3.06)	845	4.75 (3.54)	910	5.40 (4.03)	970	6.00 (4.48)	1025	6.65 (4.96)	1075	7.25 (5.41)	1125	7.90 (5.89)	1170	8.50 (6.34)	----	----	----	----	----	----	----	----
9500 (4.50)	*525*	*2.35 (1.75)*	*620*	*3.00 (2.24)*	705	3.65 (2.72)	785	4.35 (3.25)	850	4.95 (3.69)	915	5.60 (4.18)	975	6.25 (4.66)	1030	6.90 (5.14)	1085	7.50 (5.59)	1130	8.20 (6.12)	----	----	----	----	----	----	----	----	----	----
9750 (4.60)	*530*	*2.50 (1.87)*	*630*	*3.20 (2.39)*	715	3.85 (2.87)	790	4.55 (3.39)	855	5.20 (3.88)	920	5.85 (4.36)	980	6.50 (4.85)	1035	7.15 (5.33)	1085	7.80 (5.82)	1135	8.50 (6.34)	----	----	----	----	----	----	----	----	----	----
10,000 (4.70)	*540*	*2.65 (1.96)*	*635*	*3.35 (2.50)*	720	4.05 (3.02)	795	4.75 (3.54)	860	5.40 (4.03)	*925*	*6.10 (4.55)*	985	6.75 (5.03)	1040	7.45 (5.56)	1090	8.15 (6.08)	----	----	----	----	----	----	----	----	----	----	----	----

NOTE – ALL data is measured external to the unit with dry coil and air filters in place. See pages 23 and 24 for Accessory Air Resistance data.

NOTE – Fan Performance Table includes internal resistance for base unit only. To determine Total Static Pressure for design air volume, add static pressure drop of options/accessories to the total system static pressure drop.

Unshaded area denotes 3 hp (2.2kW) drive kit. | Lightly shaded area denotes 5 hp (3.7 kW) drive | Dark shaded area denotes 7.5 hp (5.6 kW) drive kit | NOTE – Bold italics indicates field furnished drive.

LENNOX

TABLE 4(C)

FAN DATA – BASE UNIT LGS 470D

NOTES – FAN PERFORMANCE TABLE INCLUDES INTERNAL RESISTANCE FOR LGS 470D BASE UNIT ONLY.
All data is measured with air filters in place.
FOR OTHER UNITS, OR BASE UNIT WITH OPTIONS/ACCESSORIES
TOTAL STATIC PRESSURE = TOTAL ADDED INTERNAL STATIC PRESSURE + TOTAL ADDED EXTERNAL STATIC PRESSURE.
TO DETERMINE *TOTAL ADDED INTERNAL STATIC PRESSURE:* For design air volume, determine total air resistance for 1) wet indoor coil and of selected unit, plus 2) all selected factory installed options (heat section, economizer, etc.) and field installed accessories (horizontal roof frame, diffuser, etc.) See pages 19 and 20 for wet coil and option/accessory air resistance data.
NOTE – BOLD ITALS INDICATES FIELD FURNISHED DRIVE

Unshaded area denotes 5 hp (3.7kW) fan motor. | Light shaded area denotes 7.5 hp (5.6 kW) fan. | Dark shaded area denotes 10 hp (7.5 kW) fan.

Air Volume cfm (m3/s)	TOTAL STATIC PRESSURE EXTERNAL TO UNIT – Inches Water Gauge (Pa)																									
	.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)		2.00 (495)		2.20 (545)		2.40 (595)		2.60 (645)		2.80 (695)		3.00 (745)	
	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)	Rev/ Min	BHP (kW)
7500 (3.55)	*380*	*1.05 (0.78)*	*465*	*1.50 (1.12)*	*540*	*1.90 (1.42)*	600	2.30 (1.72)	660	2.70 (2.01)	715	3.15 (2.35)	765	3.60 (2.69)	*810*	*4.00 (2.98)*	*855*	*4.45 (3.32)*	*895*	*4.90 (3.66)*	*935*	*5.35 (3.99)*	*975*	*5.85 (4.36)*	*1010*	*6.30 (4.70)*	*1050*	*6.85 (5.11)*	*1080*	*7.30 (5.45)*
8000 (3.80)	*390*	*1.25 (0.93)*	*475*	*1.65 (1.23)*	*545*	*2.10 (1.57)*	610	2.55 (1.90)	665	2.95 (2.20)	720	3.45 (2.57)	770	3.90 (2.91)	*815*	*4.35 (3.25)*	*860*	*4.85 (3.62)*	*900*	*5.30 (3.95)*	*940*	*5.75 (4.29)*	*980*	*6.30 (4.70)*	*1015*	*6.75 (5.04)*	*1055*	*7.35 (5.48)*	*1085*	*7.80 (5.82)*
8500 (4.0)	*405*	*1.40 (1.04)*	*485*	*1.90 (1.42)*	555	2.35 (1.75)	620	2.80 (2.09)	675	3.30 (2.80)	725	3.75 (2.80)	775	4.20 (3.13)	*820*	*4.70 (3.51)*	*865*	*5.20 (3.88)*	*905*	*5.70 (4.25)*	*945*	*6.20 (4.63)*	*985*	*6.75 (5.04)*	*1020*	*7.25 (5.41)*	*1055*	*7.75 (5.78)*	*1090*	*8.30 (6.19)*
9000 (4.25)	*415*	*1.60 (1.19)*	*495*	*2.10 (1.57)*	565	2.80 (1.94)	625	3.10 (2.31)	685	3.60 (2.69)	735	4.10 (3.06)	785	4.60 (3.43)	*830*	*5.10 (3.80)*	*870*	*5.60 (4.18)*	*910*	*6.15 (4.59)*	*955*	*6.70 (5.00)*	*990*	*7.20 (5.37)*	*1025*	*7.70 (5.74)*	*1060*	*8.25 (6.15)*	*1095*	*8.80 (6.56)*
9500 (4.50)	*430*	*1.85 (1.38)*	*505*	*2.35 (1.75)*	575	2.90 (2.16)	635	3.40 (2.54)	690	3.90 (2.91)	745	4.50 (3.36)	790	4.95 (3.69)	*835*	*5.50 (4.10)*	*880*	*6.10 (4.51)*	*920*	*6.60 (4.92)*	*960*	*7.15 (5.33)*	*995*	*7.70 (5.74)*	*1035*	*8.30 (6.19)*	*1070*	*8.90 (6.50)*	*1100*	*9.45 (7.05)*
10,000 (4.70)	*445*	*2.10 (1.57)*	*520*	*2.65 (1.98)*	585	3.20 (2.39)	645	3.75 (2.80)	700	4.30 (3.21)	750	4.85 (6.49)	800	5.40 (4.03)	*845*	*5.95 (4.44)*	*885*	*6.50 (4.85)*	*925*	*7.05 (5.26)*	*965*	*7.65 (5.71)*	*1000*	*8.20 (6.12)*	*1040*	*8.85 (6.60)*	*1078*	*9.45 (7.05)*	*1100*	*9.95 (7.42)*
10,500 (4.95)	*455*	*2.35 (1.75)*	*530*	*2.95 (2.20)*	595	3.50 (2.61)	655	4.10 (3.06)	710	4.70 (3.09)	760	5.25 (3.92)	*805*	*5.80 (4.33)*	*850*	*6.40 (4.77)*	*895*	*7.00 (5.22)*	*935*	*7.60 (5.67)*	*975*	*8.15 (6.08)*	*1010*	*8.80 (6.56)*	*1045*	*9.40 (7.01)*	*1080*	*10.00 (7.46)*	*1115*	*10.65 (7.94)*
11,000 (5.20)	*470*	*2.60 (1.94)*	*545*	*3.25 (2.42)*	605	3.85 (2.87)	665	4.45 (3.32)	720	5.10 (3.80)	765	5.66 (4.22)	*815*	*6.30 (4.70)*	*860*	*6.90 (5.15)*	*900*	*7.50 (5.22)*	*940*	*8.10 (6.04)*	*980*	*8.75 (6.53)*	*1015*	*9.35 (6.98)*	*1050*	*9.95 (7.42)*	*1085*	*10.60 (7.91)*	*1120*	*11.30 (8.43)*
11,500 (5.45)	*485*	*2.95 (2.20)*	555	3.60 (2.69)	620	4.25 (3.17)	675	4.85 (3.62)	730	5.55 (4.14)	775	6.10 (4.55)	*820*	*6.70 (5.00)*	*865*	*7.40 (5.52)*	*910*	*8.05 (6.01)*	*945*	*8.65 (6.45)*	*985*	*9.30 (6.94)*	*1020*	*9.95 (6.95)*	*1055*	*10.55 (7.91)*	*1090*	*11.25 (8.39)*	----	----
12,000 (5.65)	*500*	*3.30 (2.46)*	570	4.00 (2.98)	630	4.65 (3.47)	685	5.30 (3.95)	740	6.00 (4.48)	785	6.60 (4.92)	*830*	*7.25 (5.41)*	*875*	*7.95 (5.93)*	*915*	*8.60 (6.42)*	*955*	*9.25 (7.42)*	*995*	*9.95 (7.42)*	*1030*	*10.60 (7.91)*	*1065*	*11.30 (8.43)*	----	----	----	----
12,500 (5.90)	*515*	*3.65 (2.72)*	580	4.35 (3.26)	640	5.05 (3.77)	695	5.75 (4.29)	750	6.50 (4.85)	795	7.10 (5.30)	*840*	*7.80 (5.82)*	*885*	*8.55 (6.38)*	*925*	*9.20 (6.86)*	*965*	*9.90 (7.39)*	*1000*	*10.55 (7.87)*	*1035*	*11.25 (8.39)*	----	----	----	----	----	----
13,000 (6.15)	*530*	*4.05 (3.02)*	595	4.80 (1.31)	655	5.55 (3.77)	710	6.25 (4.66)	760	7.00 (5.22)	805	7.65 (5.71)	*850*	*8.40 (6.27)*	*895*	*9.20 (6.75)*	*930*	*9.75 (7.27)*	*970*	*10.50 (7.83)*	*1010*	*11.20 (8.43)*	----	----	----	----	----	----	----	----
13,500 (6.35)	545	4.45 (3.32)	610	5.25 (3.92)	665	6.00 (4.48)	720	6.75 (5.04)	770	7.50 (5.60)	*815*	*8.25 (6.15)*	*860*	*9.00 (6.71)*	*900*	*9.70 (7.24)*	*940*	*10.45 (7.80)*	*980*	*11.20 (8.36)*	----	----	----	----	----	----	----	----	----	----
14,000 (6.60)	560	4.90 (3.66)	620	5.70 (4.25)	680	6.55 (4.89)	730	7.30 (5.45)	780	8.10 (6.04)	*825*	*8.95 (6.68)*	*870*	*9.85 (7.21)*	*910*	*10.40 (7.76)*	*950*	*11.15 (8.32)*	----	----	----	----	----	----	----	----	----	----	----	----
14,500 (6.85)	575	5.40 (4.03)	635	6.25 (4.66)	690	7.05 (5.26)	745	7.90 (5.89)	790	8.85 (6.45)	*834*	*9.85 (7.00)*	*880*	*10.90 (7.66)*	*920*	*11.70 (8.26)*	----	----	----	----	----	----	----	----	----	----	----	----	----	----
15,000 (7.10)	590	5.90 (4.40)	650	6.80 (5.07)	705	7.65 (5.71)	755	8.50 (6.34)	800	9.50 (6.96)	845	10.5 (7.50)	*890*	*11.60 (8.26)*	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

GAS HEAT START-UP

FOR YOUR SAFETY READ BEFORE LIGHTING

⚠ WARNING

Electric shock hazard. Can cause injury or death. Do not use this furnace if any part has been under water. Immediately call a qualified service technician to inspect the furnace and to replace any part of the control system and any gas control which has been under water.

⚠ WARNING

Danger of explosion. Can cause injury or product or property damage. If overheating occurs or if gas supply fails to shut off, shut off the manual gas valve to the appliance before shutting off electrical supply.

⚠ WARNING

Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

WARNING

Danger of explosion. Can cause injury or death. Do not attempt to light manually. Unit has a direct spark ignition system.

This unit is equipped with an automatic spark ignition system. There is no pilot. In case of a safety shutdown, check ignition control LED 'Flash' code to determine reason for shutdown (see page 18). Control must be reset manually to re-start burner.

A – Placing Furnace in Operation

⚠ WARNING

Danger of explosion and fire. Can cause injury or product or property damage. You must follow these instructions exactly.

1 – Set thermostat to lowest setting.

2 – Turn off all electrical power to appliance.

3 – This appliance is equipped with a fully automatic ignition control. Do **not** attempt to light the burner by hand.

4 – Before starting the burners for the first time ensure that all gas piping to the appliance has been pressure tested (external to appliance) and checked for leaks (including pipework inside the appliance to which the supply is connected), see pages 9 & 10 of these instructions.

5 – Wait five (5) minutes before restarting the appliance, if you smell gas STOP and ensure that the problem is rectified before continuing.

6 – Restore electrical power to the appliance.

7 – Increase thermostat setting so that the appliance receives a demand for heat. The burners should now light automatically (allow two (2) minutes for burners to light, if both burners do not light in this time it will be necessary to manually reset one or both ignition controls before repeating this procedure). When first installed there may be some air in the gas pipework and a number of ignition attempts may be necessary before the appliance lights and operates normally.

8 – When the appliance is first started the gas pressures of both burners must be checked and, if necessary, adjusted both at high and low fire rates.

9 – Once the appliance lights, ensure that access doors are locked and the thermostat is returned to the desired setting.

B – To Turn Off Gas To Unit

1 – Set thermostat to lowest setting.

2 – Turn off all electrical power to unit if service is to be performed.

3 – Isolate gas supply at field-installed external gas cock if fitted.

HEATING OPERATION AND ADJUSTMENTS

(LGS Units)

A – Heating Sequence of Operation

1 – On a heating demand the combustion air fan starts immediately after ignition control checks (ignition control LED – FAST FLASH)

2 – Combustion air pressure switch proves fan operation. Switch is factory set and requires no adjustment.

3 – After a 45-second prepurge, spark ignitor energizes and gas valve solenoid opens.

4 – Spark ignites gas, ignition sensor proves the flame and combustion continues.

5 – If flame is not detected after first ignition trial, ignition control will repeat steps 3 and 4 before locking out the gas valve.

B - Placing Heater In Operation

1 – Set thermostat to lowest setting.

2 – Turn off all electrical power to appliance.

3 – This appliance is equipped with a fully automatic ignition control. Do not attempt to light the burner by hand.

4 – Before starting the burners for the first time ensure that all gas piping to the appliance has been pressure tested (external to appliance) and checked for leaks (including pipework inside the appliance to which the supply is connected), see unit installation instructions.

5 – Wait five (5) minutes before restarting the appli ance, if you smell gas STOP and ensure that the problem is rectified before continuing.

6 – Restore electrical power to the appliance.

7 – Increase thermostat setting so that the appliance receives a demand for heat. The burners should now light automatically (allow two (2) minutes for burners to light, if both burners do not light in this time it will be necessary to manually reset one or both ignition controls before repeating this procedure). When first installed there may be some air in the gas pipework and a number of ignition attempts may be necessary before the appliance lights and operates normally.

8 – When the appliance is first started the gas pressures of both burners must be checked and, if necessary, adjusted both at high and low fire rates.

9 – Once the appliance lights, ensure that access doors are locked and the thermostat is returned to the desired setting

C - Burner Control "LED" Flash Codes.

1 – Normal operation, no demand for heat: LED flashes slowly (approx. 1 flash per second indicating presence of power and normal control

2 – Normal operation, demand for heat: LED flashes quickly approx. 2 per second).

3 – Ignition control internal fault: LED steady ON.

4 – False flame signal: 5 quick flashes repeated until reset.

5 – High limit trip: 4 quick flashes repeated until reset.

6 – Pressure switch open: 3 quick flashes repeated until switch closes.

7 – Flame failure: 2 quick flashes repeated until reset.

NOTE:

Codes 4 to 7 will normally be accompanied by error 58 (burner 1) or 68 (burner 2) on the IMC control indicating that the burner has failed to operate during a heat demand. Repeated locking-out & resetting of ignition control can cause error 59 (burner 1) or 69 (burner 2) to be displayed requiring reset at the IMC control.

D – Limit Controls

Limit controls are factory-set and are not adjustable. One of the primary limits is located in the bottom right corner of fan section. The other primary limit is located under the unit right hand side panel. The secondary limits are located on the back side of the fan housing.

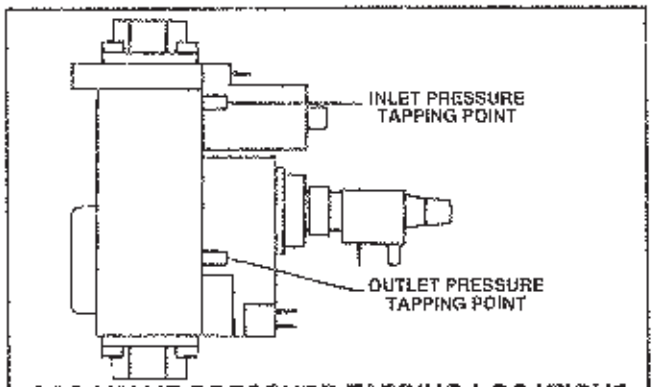


FIGURE 14

E – Checking/Setting Gas Pressures

To adjust the gas pressure, start the unit with a demand for both stages of heating and wait until an outlet pressure reading is obtained, the high stage gas pressure can now be adjusted using an 8mm wrench on the outer adjustment screw on the high/low regulator of the gas valve (located under the grey plastic cap). The high burner pressure should be monitored for several minutes and rechecked several times as the burner warms up, the final setting can only be made with the heater fully warmed up. The pressure setting for these appliances is given in the data table.

After adjusting the high output of the burner the second stage heating demand should be removed to operate the burner at its low setting, the low burner pressure ca then be adjusted using a 3.5mm screwdriver on the inner adjustment screw on the high/low regulator.

HEATING OPERATION AND ADJUSTMENTS

--continued

Following adjustment of the low pressure, the high pressure setting must be rechecked.

When both high and low pressures are correct the cap should be replaced over the adjusting screws.

Note – factory setting is for natural gas group H (G20) for direct use in those countries marked on the rating plate. For use on natural gas type L (G25) the burner pressures must be adjusted on site.

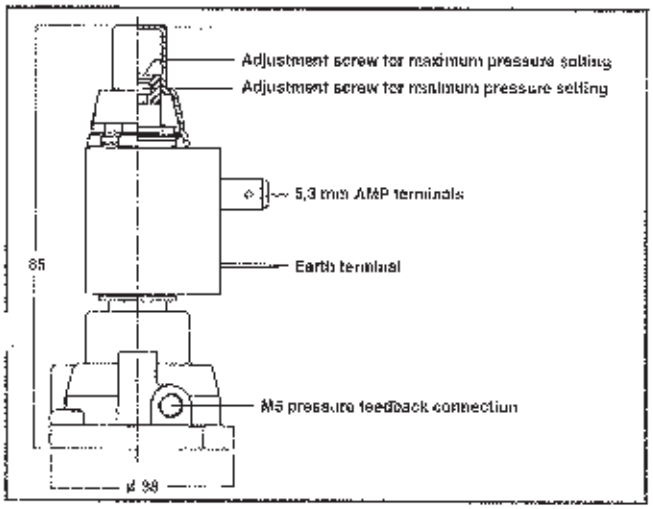


FIGURE 15

SERVICE

The unit should be inspected once a year by a qualified service technician.

⚠ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

⚠ WARNING

Electric shock hazard and danger of explosion. Can cause injury, death or product or property damage. Turn off gas and electrical power to unit before performing any maintenance or servicing operations on the unit. Follow lighting instructions attached to unit when putting unit back into operation and after service or maintenance.

⚠ CAUTION

Danger of sharp metallic edges. Can cause injury. Take care when servicing unit to avoid accidental contact with sharp edges.

A – Filters

Units are equipped with: 130-235, four off 450x600x50; 260-470, 6 off 600x600x50; 470D 12 off 500x500x50 size filters. Filters should be checked and replaced when necessary with filters of like kind and size. Take note of air flow direction marking on filter frame when reinstalling filters. See figure 16.

B – Lubrication

All motors are lubricated at the factory. No further lubrication is required.

Fan shaft bearings are prelubricated. For extended bearing life, relubricate at least once every two years with a lithium base grease, such as Alvania 3 (Shell Oil) Chevron BRB2 (Standard Oil) or Regal AFB2 (Texas Oil). Use a hand grease gun for relubrication. Add only enough grease to purge through the bearings so that a bead of grease appears at the seal lip contacts.

C – Burners (LGS Units)

1 – Periodically examine burner flames for proper appearance during the heating season.

2 – Before each heating season examine the burners for any deposits or blockage which may have occurred.

3 – Clean burners as follows:

a – Turn off both electrical power and gas supply to unit.

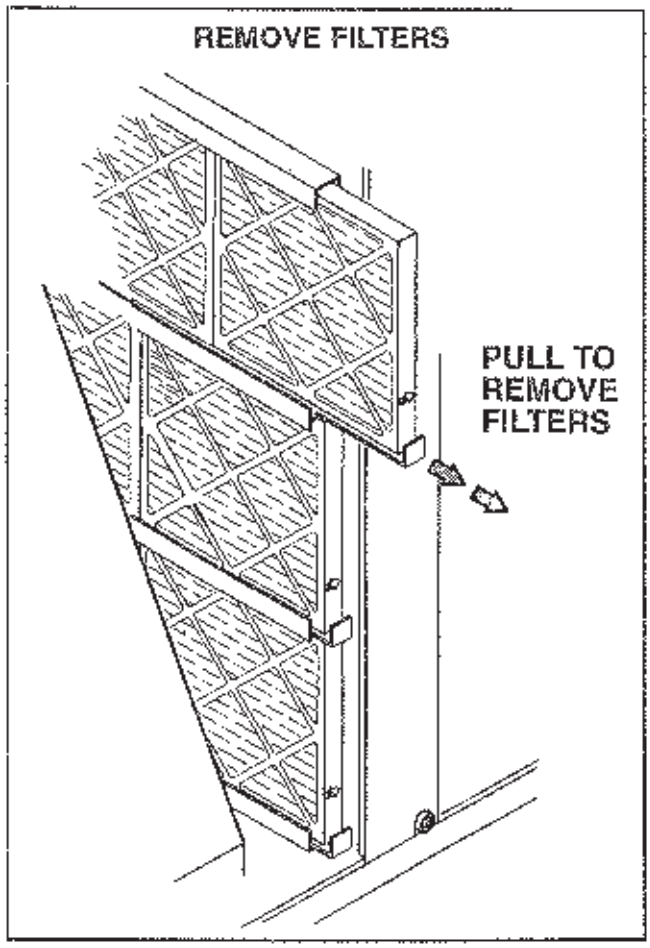


FIGURE 16

LENNOX

b – Open access panel to burner compartment.

c – Remove burner retaining bracket and lift burners from orifices.

d – Clean as necessary and replace burners. Refit retaining brackets. Make sure that burner heads line up correctly. Spark gap on ignition electrode must be properly set. Refer to Heating Adjustment section. Replace access panel.

⚠ WARNING

Danger of explosion. Can cause injury or death. Do not overtighten main burner mounting screws. Snug tighten only.

e – Restore electrical power and gas supply. Follow lighting instructions attached to unit and use inspection port in access panel to check flame.

D – Combustion Air Fan

A combustion air fan proving switch checks combustion air fan operation before allowing power to the gas controller. Gas controller will not operate if fan is obstructed.

Under normal operating conditions, the combustion air fan wheel should be checked and cleaned prior to the heating season. However, it should be examined periodically during the heating season to establish an ideal cleaning schedule. With power supply disconnected, the condition of the fan wheel can be determined by looking through the vent opening.

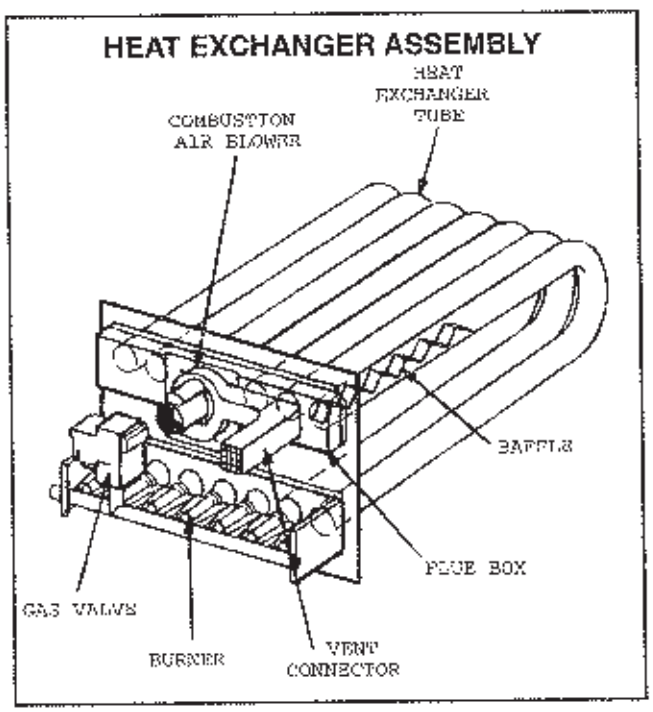


FIGURE 17

Clean combustion air fan as follows:

1 – Shut off power supply and gas to unit.

2 – Disconnect pressure switch air tubing from combustion air fan port.

3 – Remove and retain screws securing combustion air fan to flue box. Remove and retain two screws from bracket supporting vent connector. See figure 17.

4 – Clean fan wheel blades with a small brush and wipe off any dust from housing. Clean accumulated dust from front of flue box cover.

5 – Return combustion air fan motor and vent connector to original location and secure with retained screws. It is recommended that the combustion air fan gasket be replaced during reassembly.

6 – Clean combustion air inlet louvers on heat access panel using a small brush.

E – Flue Passageway and Flue Box

1 – Remove combustion air fan assembly as described in section D.

2 – Remove flue box cover. Clean with a wire brush as required.

3 – Remove flue baffle retaining bracket and pull tube baffles from heat exchanger tubes. Clean tubes and baffles with a wire brush.

4 – Reinsert tube baffles, secure baffle retaining bracket, and reassemble the unit. The flue box cover gasket and combustion air fan gasket should also be replaced during assembly.

F – Evaporator Coil (if fitted)

Inspect and clean coil at beginning of each cooling season. Clean using mild detergent or commercial coil cleanser. Flush coil and condensate drain with water taking care not to get insulation, filters and return air ducts wet.

G – Supply Air Fan Wheel

Annually inspect supply air fan wheel for accumulated dirt or dust. Turn off power before attempting to remove access panel or to clean fan wheel.

Troubleshooting.

Important- Service and repair of this equipment should only be attempted by suitably qualified personnel. If in any doubt, contact the installer or a Lennox service agent. To avoid the risk of electric shock or personal injury, switch off power supply before opening any panel on this appliance.

In the event of this equipment failing to operate correctly:

1. Check electrical supply. All phases into the appliance must be present and should measure between 360v and 440v across phases (200v to 260v from each phase to neutral).
2. For LGS units the gas supply should also be checked, the supply pressure should be within 5mbar of the relevant nominal supply pressure for the country and gas category of the installation (see data table inside front cover).
3. The Lennox L-Series is equipped with microprocessor based 'IMC' controller, a separate manual supplied with the unit explains operation of this control and the error codes that are displayed for diagnostic purposes. The error codes are also listed on a chart fitted inside the control panel door.
4. LGS units are also equipped with a microprocessor based ignition control which provides diagnostic information via a flashing LED, these codes are listed in table 10.
5. These controls all incorporate a 'heartbeat' LED to indicate a healthy low voltage supply. If the 'heartbeat' LEDs do not operate, check 24v circuit breakers (incorporated in control transformers) and fan/control circuit breaker (CB10) as well as main power supply.

Troubleshooting - continued

Low or no airflow-

1. Check that there is a demand for the fan to start (yellow LED 'G' lit on IMC control).
2. Check condition and tension of drive belts.
IMPORTANT - you must ensure that the electrical supply remains switched off whenever the drive guard is removed and not switched on until the drive guard has been properly refitted.
3. Check condition of air filters, blocked filters reduce air flow and unit efficiency. Filters should be checked regularly and changed whenever necessary.
4. Check that fan and motor are free to rotate (not mechanically seized).
5. Check if fan overload (S42) has tripped.
6. Ensure that fan rotation is in the correct direction (backward rotation will give a much reduced airflow).

Heating fault (LGS units only)-

1. Check that there is a demand for heating (yellow LED 'W1' lit on IMC control).
Note- ignition controls take a few minutes to start the gas burners.
2. Check ignition controls for 'lockout' condition (see table 10 for codes), once cause of lockout is cleared the controls can be reset by holding down the small white reset button on the control for a few seconds.
3. If burner fails to light with good gas supply, check gas valve outlet pressure setting, check ignition electrode and lead.
4. If burner lights but quickly shuts down, check flame sensor and lead.
5. If high temperature shut-off limit operates, make checks on airflow as above.

NOTE – Replacement parts for the unit should be ordered from the Lennox parts lists. Do not replace spare parts that are not of the equivalent specifications (use only genuine Lennox parts, inferior components may damage the unit and make void any warranty). Please contact Lennox prior to replacing parts other than those detailed in the servicing instructions.

REPAIR PARTS LISTING		UNIT MODEL NUMBER ST	HI	ST	HI	HI
PART DESCRIPTION	ALL MODELS	LGS 130	LGS 235	LGS 260	LGS 470	LGS 470D
GAS HEAT SECTION						
Combustion Air Fan	97J8501	–	–	–		–
Combustion Air Proving Switch	97J7101	–	–	–	–	–
Burner Insert	79J7401	–	–	–	–	–
Burner Manifold Assembly		LB-59177	LB-66726	LB-59177	LB-66726	LB-66726
Main Burner Orifice	93J2801	–	–	–	–	–
Flame Rollout Switch		97J5801	71G1401	97J5801	71G1401	71G1401
Aux Limit Control (Burner#1)		99G4901	27H8701	98G4601	27H9701	79J8901
Aux Limit Control (Burner#2)				98G4601	27H9701	79J8901
Ignition Electrode Assembly	79J2101	–	–		–	–
Ignition Lead			40J0801 (41")	19K2701 (84")		
Ignition Sensor Assembly	79J2301		–	–	–	–
Combination Gas Valve	2700851		–	–	–	–
Baffle Blockage	LB-67141		–	–	–	–
Primary Limit Control (Burner#1)		79J0901	79J0901	97J8501	97J4901	79J8901
Primary Limit Control (Burner#2)		–	–	97J8901	97J4901	79J8901
Burner Control	82J7401	–	–	–	–	–
Corbel Plate	LD-66725	–	–	–	–	–
Baffle Securing Bracket	LD-66289	–	–	–	–	

ELECTRICAL CONTROLS						
Control IMC M1 Motherboard	56K8601					
Control IMC LM1 Board	81J6901					
Control IMC G1 Board 2nd STG Burner				56K85	56K85	56K85
Circuit Breaker (optional)		P-8-66087	P-8-66087	P-8-66074	P-8-66074	P-8-66074
Transformer (Control)	13H2801					
Transformer (Contactor)	13H2801					
Fan Contactor	P-8-7786					
Fan Motor Overload Relay (5 HP) 3.7kW	53J4601					
Adaptor Overload Mounting	53J4602					
Fan Overload Relay 1.5kW (2hp)	58H4801					
Fan Overload Relay 2.2kW (3hp)	58H4901					
Fan Overload Relay 5.5kW (7.5hp)	48-10501					
Fan Overload Relay 7.5kW (10hp)	43K05					

RECOMMENDED REPLACEMENT ITEMS

ITEM	PART No.	COMMENTS
Belt - Drive # 1 Package (B47)	49K37	LGS 130-235 ONLY
Belt - Drive # 2 Package (BX51)	P-8-8093	LGS 130-235 ONLY
Belt - Drive # 3+6 Package (BX53)	49K38	LGS 130-235 ONLY
Belt - Drive # 4 Package STD.(BX55)	63K05	LGS 130-235 ONLY
Belt - Drive # 5 Package (BX60)	49K69	LGS 130-235 ONLY
Belt - Drive # 2+4 Package (BX62)	57A7701	LGS 260-470 (2PER SET)
Belt - Drive # 3+6 Package (BX64)	97J5801	LGS 260-470 (2PER SET)
Belt - Drive # 5 Package (BX63)	97J55	LGS 260-470 (2PER SET)
Belt - Drive # 1 Package STD. (BX64)	97J5801	LGS 470D (2PER SET)
Belt - Drive # 2 Package (BX62)	57A7701	LGS 260-470 (2PER SET)
Belt - Drive # 3+4 Package (BX71)	31K97	LGS 260-470 (2PER SET)
Belt - Drive # 5 Package (BX70)	31K98	LGS 260-470 (2PER SET)
Main Filter 600 x450 x 50	49K4401	LGS 130-235 (4PER SET)
Main Filter 600 x600 x 50	93G9201	LGS 260-470 (6PER SET)
Main Filter 500 x500 x 50	34K0201	LGS 470D (12PER SET)
O/D Air Hood Filter	P-8-7822	LGS 130-235(2) LGS 260-470(3)
		LGS 470D (5)
Supply Fan Motor 1.5kW (2hp)	49A4301	LGS 130-235 ONLY
Supply Fan Motor 2.2kW (3hp)	49A4401	LGS 130-470
Supply Fan Motor 3.7kW (5hp)	49A4501	ALL SIZES
Supply Fan Motor (7.5hp)	P-8-11298	LGS 260-470D
Supply Fan Motor (10hp)	49A46	LGS 470D ONLY
Economizer Motor	97J3701	ALL SIZES
Control IMC M1 Motherboard	56K86	ALL SIZES
Control IMC G1 Board	56K85	LGS 260-470D

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